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Volume 56 Number 5 Fall, 1977

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COVER PHOTO: A last look at the Summer meadow by Martha Prince

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An Editorial

Tired of Vanilla?

Have you had the fortune of thumbing through a seed catalog from the 1890's? Do you remember the plethora of plants offered by popular seed houses during the 1930's and 1940's? Hundreds of species and even genera are no longer offered by the plant trade. Often the reason for the disappearance of certain plants is that the demand was no longer supportive of the production expenses. This is indeed unfortunate, because many interesting plants have been permanently lost from cultivation.

How do we change such a trend? Recently during the meeting of the Society's Development Committee in Pittsburgh, AHS Board Member Harold Epstein proposed that we start a program with a select group of plant people, plant species and cooperating nurserymen. The object would be to provide interesting and hard-to-find plants to advanced horticulturists who find petunias, chrysanthemums, privet, ligustrum and ficus pleasant but boring.

A recent letter from Richard M. Adams, II, a graduate student at Cornell University's Bailey Hortorium, echoed our thoughts precisely. To quote Adams,

"everyone is aware of the growing interest in horticulture today, but it seems as though academic horticulturists are responding by researching new methods to produce more marketable specimens of the 'same old plants'. You can go into a department store or houseplant shop in New York, Florida or California and find little variation in the material offered". To most observers it seems that efforts are only being made to develop floriculture crop plants with just a seasonable market desirability.

Mr. Adams notes that more and more people are finding it rewarding to grow botanically interesting specimens such as carnivorous plants, species orchids, unusual palms, ferns, succulents, flowering plants, vegetables and herbal teas. "There are thousands of people who would rather buy an interesting 'botanical specimen' than a Christmas plant or a chrysanthemum for Easter."

Although academic horticulture plays a supportive role to commercial growers, this responsibility could be better met through leadership in the introduction of such new and intellectually stimulating plants as are currently in demand. We must find out how to grow these plants and document them in popular oriented magazines.

Much hardy and beautiful plant material is not generally available to the would-be American grower. Important plants from England, such as hardy herbaceous specimens, small shrubs, and bulbs are difficult to find, yet they grow as well here if not better than in the climate of the British Isles. Where can an interested gardener acquire the beautiful Japanese natives so closely related to our Eastern seaboard plants? Not from a U.S. nursery—we must acquire them from abroad. Many authorities believe that the finest Japanese natives are not in cultivation in America, yet they could and should be.

I do not mean to condemn the nursery trade, because they sell what is popular. If vanilla is in vogue we may all drown in a sea of privet. There are a few excellent nurseries where the discerning gardener can quench his thirst for unusual plants. Let's drink to the appearance of more of them.

Henry M. Cathey
President

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Plants to Please a Child

Pamela Harper
219 Robanna Drive,
Seaford, VA 23696

Involvement in the natural world, early begun, is the seed from which grows a lifelong interest. Most keen gardeners can trace the thread of their involvement back to early childhood. I cannot recall a time when plants were not part and parcel of my life. "Do you like butter?" asked the three year old, holding a buttercup under the chin of a friend to see if it made a patch of reflected light. Making slots in the stem ends of daisies we threaded them together as necklaces. I knew where to find the earliest lambstail catkins (and—later—the hazelnuts), and I searched assiduously for luck-bringing four-leaved clover. Red poppies made "poppy dolls". Just turn down the petals away from the head (ovary) with its black or golden hair (stamens), tie a bit of grass at waist level round the petal "dress", leave sufficient stem for one leg and insert a piece of similar length alongside. Another bit of stem is inserted through the petals at shoulder level to form the arms. Ours were the wild poppies of European grainfields, an annual species which can be bought as 'Flanders Field', commemorating the dead of World War I and stained appropriately with a black cross inside the petal cup. Shirley and Iceland poppies will do as well, but choose the single kinds. Bits of botany, poetry and legend went along with the flowers, and folklore too. "If you pick dandelions you'll wet the bed", my father would say. Not for another thirty years did I learn that dandelions have been used medicinally for diuretic purposes. Of course we

picked them; how else than by puffing at the seed heads could we know that lunch time had arrived?

Not every child is lucky enough to grow up in the countryside—though goodness knows dandelions abound—but gardens offer an even wider range of interest. The tiniest patch will grow pansies. There are many beautiful hybrids and selections, but for the children's sake choose those with the typical pansy faces. German children sometimes call them "Stiefmutterchen" (stepmother). The five petals represent pillows and the five green sepals a woman, her own two children and her two stepchildren. Look at the flower from the back and the top sepal (stepmother) is seen to occupy two pillows. The two smaller sepals on either side have one petal each (her own two children), but the two little stepchildren must snuggle protectively together on the one remaining lower petal pillow. In relating this it might be as well to point out that such stepmothers belong in stories like Cinderella, not to real life.

The child-endearing qualities are missing from some modern flowers. Snapdragon "mouths" for instance, into which I poked a finger half fearing they might bite—or at least stick out a tongue. The newest sorts are beautiful but some no longer "snap", so stick to the old fashioned kinds if you have children in mind.

Moses, the bible tells us, hid his face when "the bush burned with fire, and the bush was not consumed", but children will squeal with delight and plead "do it again" if you can pull off this trick with *Dictamnus albus* (white) or *D.a.purpureus* (pink). There is no reason to suppose that this is the biblical bush, but it shares the same propensity to burn, briefly, without suffering damage and thus got the name Burning Bush. A handsome perennial, about three feet high, the leaves are large and pinnate, the flower spikes sturdy and long. Choose a hot, still day in summer as the seed pods start to ripen, hold a lighted match at the base of the spike and, with luck, a puff of flame will run up the stem. *Dictamnus* grows to a bulky, shrublike three feet; it does not transplant well, so sow the seeds individually in pots, knocking them carefully out (breaking the pot if necessary) for planting into their permanent, sunny quarters immediately roots begin to appear through the drainage hole.

One of my childhood favorites was *Dicentra spectabilis*, usually called Bleeding Hearts but to me "Lady in the Bath". Turn a flower upside down, gently separate the two edges, and there sits the pale skinned, dark haired lady in her tub. Another was *Physostegia virginiana*, called Obedient Plant because the flowers have short hinged stalks and can be rearranged on the stem. *Impatiens*, usually grown as a bedding plant, is also fun to play with because of the way the pods explode in your hand when touched and catapult out the contents, an object lesson in seed dispersal.

Apartment dwellers need not be without plant toys. Children get bored with a plant that just sits there looking pretty—to capture their interest it must "do something". Star performer is the Sensitive Plant (*Mimosa pudica*), guaranteed to give more hours of amusement than many a plastic toy. When touched, the paired leaflets of the ferny leaves fold themselves together protectively. If a lighted match is held near (but not near enough to burn) the whole leaf will fold itself down. Grow Sensitive Plant on a sunny windowsill, or under lights, in a warm room, and do not let the soil dry out. Though not long lived, it is inexpensive and easily raised from seed.

Another plant to play with is the Venus Flytrap, *Dionaea muscipula*, a fine example of plant adaptability. Unable to obtain necessary nitrogen from the acid swamps in which it grows, it gets it instead from the bodies of small insects. When a fly alights on the fringed leaf it touches tiny spines on the inner surface, triggering the mechanism by which the hinged leaves fold together over their prey, remaining closed until it is digested. Don't pry them apart to force feed or the plant may die of indigestion—it has a small appetite and a fragment of hamburger will nourish it for days. Venus Flytrap needs high humidity and constant moisture, conditions best provided by terrarium culture, with the tubers planted in sphagnum moss. City water is usually too alkaline and may contain chemicals which can kill or injure these plants; rainwater is best, or distilled water (no need to buy this, save the refrigerator defrostings) warmed to room temperature. And don't spray the leaves, they may blacken. Lacking a terrarium grow it standing on pebbles in a tray containing water. This way it can catch its own food—you'll be surprised at how many small insects flit around the average room.

Much easier to grow is the Magic Leaf or Air Plant, *Kalanchoe (Bryophyllum) pinnata*. This tropical plant will not stand frost, but it enjoys being planted outside in the summer sunshine and will grow three feet tall. With a long enough growing season it may produce masses of small delicately colored bells. The plump, waxy leaves are crimped

Continued on page 24

What You Should Know About Growing Roses

J. Benjamin Williams
200 Elnora Street
Silver Spring, MD 20902

Year by year roses are becoming more interesting and desirable. A fascinating new range of colors, more fragrance, new shapes and sizes make it truer than ever that there is a rose for every need and purpose—outdoors, indoors, and on the patio.

Presently, it is easier to grow roses than it was a few years ago. Now we have new vigorous, dependable, disease-resistant varieties, and better materials and methods for taking care of them.

With the rewards for growing roses higher than ever, this may be the time to get some of the new roses and see for yourself! The rose grower's deep satisfaction in watching and assisting healthy, vigorous plants develop and produce handsome, unblemished flowers in colors never seen on a printed page, is achieved by these steps:

(1) Get the right roses; (2) Plant them properly; (3) Fertilize, water, and spray once a week; (4) Prune once a year.

While designed primarily for the beginner, this brief guide may also help experienced rose growers who have strayed from the path and found problems. Rose growing is not complicated, but all the steps must be followed.

The Right Roses

Selection of the right rose varieties is the most important step in the successful growing of roses.

Photo Courtesy Jackson & Perkins Co., Medford, OR.

Hybrid Tea 'White Masterpiece'

Only a small proportion of the more than 30,000 named rose varieties of the world are suited to the average American garden. Even the best roses available on the American market, such as those listed in the American Rose Society's *Handbook for Selecting Roses,* differ widely in vigor, soil requirements, resistance to disease, and other important respects.

The thirty modern roses marked with an asterisk (*) in the list on page *41* are the ones most likely to grow and flourish wherever you live. Chosen for their outstanding form, color, and fragrance, they also are vigorous growers under the widest possible variety of cultural conditions. Furthermore, all of them are strongly resistant to disease and pests.

Anyone would be proud to grow any of the roses on the list, though it was compiled specifically for trouble-free easy growing. If all these roses were planted in one garden and cultivated by the method outlined below they would produce armloads of beautiful blooms from the beginning to the end of every growing season, and for as many years as they were cared for.

The other varieties on the list are all outstanding roses and will do well in most situations, but should be tried by beginners only after experience with those marked with an asterisk.

Planting Them Right

Plant your roses where they will get at least six hours of sunshine a day, away from the root competition of trees and other shrubs. Plant at least two feet apart—miniatures less, but climbers six to eight feet apart—to allow free circulation of air and access to sunlight. For the same reasons avoid large circular beds and plantings more than two rows across.

Sadly, some people buy the best rose plants on the market, but fail to follow the planting instructions supplied by the nursery. No wonder their results are disappointing.

Grandiflora 'Hotel Hershey'. A strikingly brilliant orange-red rose reflects the blue ribbon qualities of its heritage. The new rose has a delightfully delicate fragrance and offers a long-lasting flower, on the bush or cut for indoor display, a testimonial to its parents ('Queen Elizabeth' and 'Comanche'), both All-America Award winning roses. 'Hotel Hershey' was hybridized by J. Benjamin Williams, one of America's leading independent rose specialists. Among his other creations were the 1975 All-America Award winner 'Rose Parade' and the climbing shrub 'Red Fountain'.

Photo by J. Benjamin Williams.

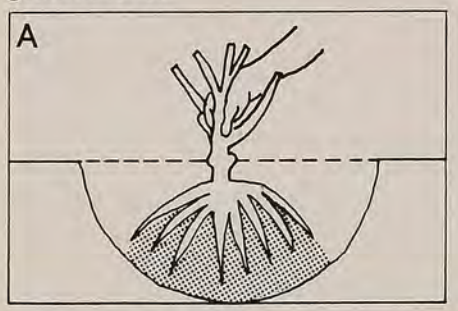
Since the beginning of modern rose cultivation, the basic rules for planting roses have been, and still are:

(1) Place the plant properly in an ample hole; (2) Mound earth over it after planting; (3) Prune back the canes and paint the cut ends.

Dig the hole for each plant—whether separately or in a bed—at least eighteen inches wide and deep, and big enough to hold all the extended roots.

Mix with the soil from the hole at least one-third as much (by volume) compost, peat moss, or other form of humus. Add half a cup of bone meal or super-phosphate. Use the same proportion of humus and fertilizer in all the earth dug for a bed.

Set the plant in the hole on top of a mound made of the soil mix (Fig. A) so that the bud union (knob) is at ground level after the soil settles. In warmer climates the knob belongs slightly above ground level, in severely cold climates slightly below. A stick laid across the hole indicates ground level.



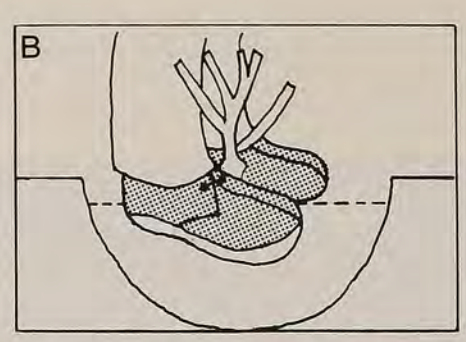
Spread the roots gently, tucking soil under them with your hands. Leave no air pockets!

Cover the roots completely until the hole is about three-quarters full, then firm the soil by treading gently with both feet (Fig. B). Don't stomp!

Fill the hole with water slowly, without loosening the soil. After the water has soaked in, fill the hole completely with the soil mix. Make sure the bud union is at the proper height.

Water again, gently but thoroughly, and let it soak in again (Fig. C).

MOST IMPORTANT: Now make a mound six to eight inches high around and over the canes (Fig. D).



The mound will protect the canes against the drying action of sun and wind. It gives the canes and the roots—your entire investment—the chance they need to start growing for you.

Leave the mound in place. It will settle and disappear gradually from rain, watering and weeding.

If there was not enough soil mix for the mound left over from the hole, you will need extra material. Use soil if you have it, otherwise compost, mulch, other humus.

Finally, cut back the canes to just above the ground, leaving no more than six inches of the old canes. Paint the ends with a water-resistant dressing, such as tree wound paint, shellac, Elmer's Glue, or even fingernail polish. Don't use paint.

Keep a two-inch mulch over the root area summer and winter to equalize soil temperatures, conserve moisture, discourage weeds, and help prevent black spot. Mulch may be made of well-rotted cow manure, compost, leaf mold, pine bark, cocoa bean mulch, or any organic material available.

After several years, the leaves and other loose material on the mulch are removed as part of the general cleanup. After the bushes are pruned and a dormant spray is applied, put down new mulch. If dormant spray is not used, spray the bushes and the ground around them with one of the regular spray materials to be described later.

The Weekly Care Program

Roses must have regular weekly care—weekly applications of fertilizer, water, and pesticides through the growing season, from the time the leaves come out in the spring until they drop in the fall.

Fertilizer

New roses need no fertilizer during their first year, unless your soil is deficient in nutrients—a rare condition. Your County Extension Agent or state university can tell you how to get a soil test.

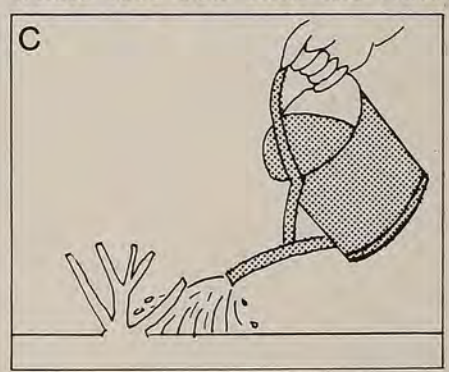
After the first year, use any good dry fertilizer designed for roses or general garden use. Once a month, from May to September, sprinkle it around (not on) the plants at the rate indicated on the label.

Roses also respond very readily to weekly applications of soluble fertilizer, most commercial formulations of which call for one tablespoon per gallon of water. Half a gallon of the mixture is poured around (not on) each plant once a week if you hope to grow roses of exhibition size.

Water

It takes plenty of water to carry roses through the hot, dry summer and to produce the best blooms. Nature is not always helpful. Light rains contribute little to the deep watering which roses require, and even a half-inch downpour does not send a significant amount to the roots eighteen inches below.

Every week, with an open hose or a soil-soaker nozzle, slowly fill the whole rose bed until the water



comes up from the bottom and runs off. Don't wet the foliage. The amount of water required will vary with the porosity of the soil.

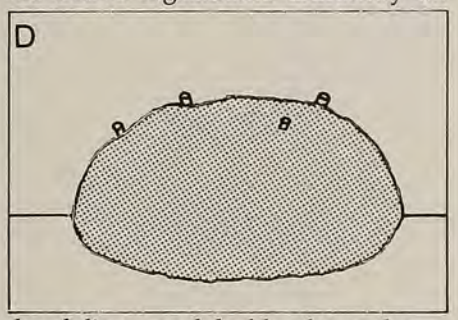
Your roses will not do their best unless you give them all the water and fertilizer they can use. Without generous weekly watering and feeding, they will be semi-dormant—half asleep—when they should be in full, vigorous, growth.

Spraying

Roses must have a weekly preventive spray through the growing season. If you keep a protective coating on the plants according to instructions you may never see mildew or black spot on your roses.

Various commercial formulations for multi-purpose sprays give satisfactory protection when applied properly. In selecting a dry spray material, avoid formulations which call for more than two tablespoons of material per gallon of water. At this rate they usually are loaded with powdered clay or talc which clogs your sprayer and leaves an unsightly residue on your plants.

All formulations for multi-purpose rose sprays contain fungicides (like Captan, Phaltan and/or Benlate), insecticides (like Malathion or Sevin), and miticides (like Kalthane), plus a spreader-sticker which spreads the active ingredients uniformly on



the foliage and holds them there. Combination insecticide-miticide preparations like Isotox include the spreader-sticker, and only the fungicide must be added.

An effective spray formulation may be made by combining, for each gallon of water (or as directed on the label): 1 tablespoon Phaltan (75% formulation), ¼ teaspoon Benlate, and 1 tablespoon Isotox. When Japanese beetles are a problem, substitute 1 tablespoon Sevin for the Isotox.

Whether you use ready-made multi-purpose sprays or mix them yourself, follow all label instructions closely and Environmental Protection Agency's regulations for spray material and application.

The best sprayer for small gardens is the trombone type which you work like a slide trombone to pump a solution from an open bucket to the tops and bottoms of your rose leaves in a continuous mist. Tank or pump types having an adjustable nozzle that produces a fine mist are also satisfactory. The atomized mist is essential. Fogging sprayers used by professional gardeners for years now are available in lighter versions, with small electric pumps, for home garden use.

Hose-end spray devices, squeezer dusters, or aerosol spray cans are of little value in controlling rose diseases. If you use a tank-type sprayer with a disc-type nozzle, check the size of the orifice frequently; if it has become too large to throw an atomized mist, it must be replaced.

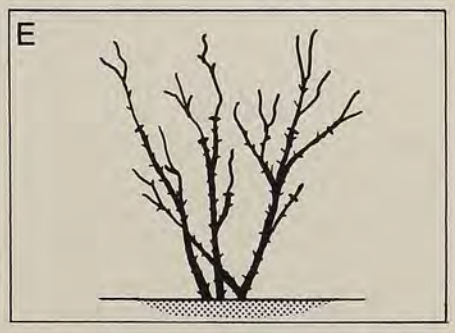
Pruning

Early every spring, pruning cancels all the errors of the year gone by and gives the rose grower a fresh start in the quest for prize-winning roses. A scissors-type pruning shears and a pair of leather gloves are needed.

First, remove dead, damaged and diseased wood, cutting back to healthy wood. Canes may have to be cut down to the ground. From the four or five remaining canes (Fig. E) remove all twigs smaller than a lead pencil, and all branches growing toward the center of the plant.

Then take off the top one-third of the plant, leaving it two-thirds as high as it was (Fig. F).

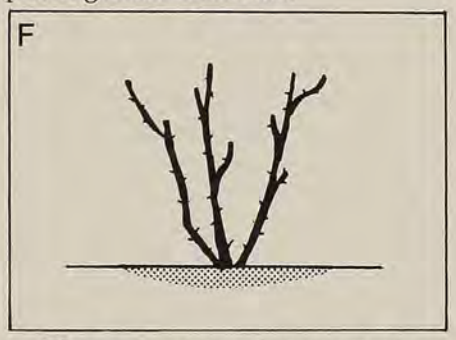
This formula applies to all types of rose bushes**. Like people, they come in different shapes and sizes, and look and do their best in their own natural habit of growth rather than in rigid uniformity.



**Except climbers which require little if any pruning the first four years. They should be trained with main canes running parallel to the ground and only the laterals need be pruned to four to six inches in the spring and after each blooming cycle.

IMPORTANT: Make all cuts at a 30 degree slant one-fourth inch just above outward pointing bud. Seal every cut with tree wound paint, shellac, or any water-resistant material—except oil paint. If left unsealed, sawflies or borers will lay their eggs in every open cane, and their larvae will have an inside track to the future buds and blossoms which they will eat or destroy.

Winter pruning usually is unnecessary in moderate and warm climates. To avoid snow and wind damage in cold climates, it is often better to stake and tie tall plants, rather than pruning them in the fall.



After you have followed these basic rules and succeeded in growing your first beautiful roses, you may wish to explore some more difficult roses, or try new methods and gadgets in rose culture. *Don't forget the basic steps! Keep it simple and do it when it needs to be done!* Then you will find rose growing an incomparable pleasure.

When you buy roses, look for the label of the All-America Rose Selections (AARS) and for varieties scoring high in the *Handbook for Selecting Roses* published by the American Rose Society (ARS). Addresses:

All-America Rose Selections
Box 218, Shenandoah, Iowa 51601

American Rose Society
P.O. Box 30,000,
Shreveport, Louisiana 71130

The ARS will give you the name of your local Consulting Rosarian, who will be glad to help with your rose problems without charge, and a free copy of the AARS *Handbook for Selecting Roses.*

Continued on page 41

Flowering Shrubs An Ideal Investment

Lorraine Marshall Burgess
Photos by
Guy Burgess
202 Old Broadmoor Road
Colorado Springs, CO 80906

If you're looking for the miracle garden ingredient, consider flowering shrubs now for fall planting. Nothing else does so much for a garden so quickly and so inexpensively as groupings of flowering shrubs. The obvious choices are lilac *(Syringa)*, mock orange *(Philadelphus)*, and spirea, but there are many other shrubs worthy of your attention —azaleas, buddleia, caryopteris, cornus, deutzia, forsythia, hydrangea, jasmine, lonicera, prunus, pyracantha, rhododendron, tamarix, viburnum, and weigela, to name a few.

Young plants, well-placed, establish the framework for a new garden immediately. They can fill a skimpy corner in a single season, or provide magnificent bloom and tempting berries through an entire lifetime. Trees are the bones of a garden, shrubs the muscle, and flowers the flesh. Flesh and bones are not enough. Our gardens need muscle to round out the boney forms and to sustain the flesh.

Shrubs are ideal for screening out unwanted views, and as thorny barriers against neighborhood invasion. Most of the best deciduous varieties offer handsome foliage spring through summer, brilliant autumn color as the summer wears down, and delicate linear traceries when they stand leafless in winter. Choices cover all climates and sun/shade situations. But equally important, many shrubs offer spectacular floral displays spring or summer, plus decorative or edible berries in late summer or fall.

Once established, and this may take a year or two, flowering shrubs give assurance of extended and expanded blooming cycles for years to come. Compared to the impact of a couple dozen crocus, one golden forsythia can do much more at the same cost to announce the coming of spring. As lawns green up and tulips surface, a backdrop of flowering almond can make the season sing.

In mild climates rhododendron, azaleas, and camellia compete for attention in April and May, and laurel carries on in June to produce one long and glorious display. Farther north lilac buds fatten and come into fragrant bloom in time to accompany the poppies and iris. Various spirea offer bridal white in June, pink and carmine blossoms in July, and sky-blue blossoms (*Caryopteris*) in August and September. Philadelphus and viburnum are especially fragrant in spring and early summer flowering. The butterfly bush, (*Buddleia*) raises sweetly-scented spires May through June in lavender, white, and purple. The firethorn (*Pyracantha*) has small white flowers in June that give way to magnificent orange and red berries in late summer. Barberry flowers are golden in the spring, transforming into brilliant red or purple berries fall into winter. Cotoneaster has hanging white flower clusters in spring, but its most conspicuous features are glistening red or black berries and red foliage in the fall.

The euonymus, known to some as the spindle tree because of the alternate facings of its stems, is found as tree, shrubs, and vine, in both evergreen and deciduous strains. Its flowers are modest and delicate in white or pink, but decorative. Its leaves are rich green and in some instances of variegated hues. But most delightful are its pink autumn fruits wrapped in orange or scarlet capsules.

Hibiscus is generally a tender plant but there is one species, *H. syriacus*, that flowers in late summer, bringing forth hollyhock-type blooms in white, purple, and pink at a time when there are few other attractions. The hydrangea is another late bloomer, producing great mounds of blossom in white and in colors depending upon the quality of the soil. In an acid soil the blues are predominant; with an alkaline base the emphasis is on pinks. The giant flowerheads dry on the stem and hold well into the winter.

The hypericum and potentilla both produce small golden flowers in a sunny, well-drained location through the summer months. The much-maligned honeysuckle, both shrub and climber, offers white to pink to orange-red flowers of delicacy and sweet fragrance in early spring, and translucent berries in such abundance in mid-summer that the robins flock in to feast. The honeysuckle grows quickly and sometimes rank, but pruning can correct this tendency. For instant privacy there are few shrubs that are so effective. Another fast-growing shrub is the sorbaria (False Spirea). It offers creamy-white plume sprays in July and August, and grows up to 9′ high with little encouragement. Fall pruning will increase the number and size of the following year's plumes.

Too often we do not think of the

Top *Cassia alata*—Candlebush Below *Pyracantha*—Firethorn

rose as a shrub, but before it was hybridized into special lonely specimens it was and still is a highly valuable shrub. Roses can be grown into large scratchy forms, first for their flowers, then for their vitamin-rich rose-hip fruit and autumn color, and finally for their barrier thorns. There are many old-fashioned roses worthy of consideration. The albas have blue-grey foliage, the Bourbons larger flowers, the cabbage or centifolia rose great fullness. The China, French, Damask, the Moss roses and the Sweet Briars all have special properties. Most of these grow easily in rich, well-cultivated soil in sunny sites. As they mature plants grown on their own roots rather than alien stock produce suckers that can be dug out to use in new plantings.

Most all shrubs can be propagated from soft cuttings taken from young shoots soon after the blooming period. The cuttings should be set in sand and kept moist until they have enough root to sustain themselves. Mature harder cuttings can, as a general rule, be made in early fall and set in sand in a cold frame or sheltered place to root through the winter.

Some shrubs can be propagated from seed on a greenhouse bench, or by budding or grafting on sturdy seedling root stock.

An enterprising young gardener can invest in a few choice shrubs, grow them for a year or two, and then launch a propagation program that can increase his stock tenfold in a short time. What he cannot use himself he can offer in trade to other gardeners for desired varieties.

By careful selection of shrub material it is possible to develop a succession of bloom beginning with the witch hazel and *Jasminum nudiflorum* in February through all the special joys of spring, into early and late summer. Then enjoy the berries and bright colors of autumn, and to bring the circle round, the red twigs of dogwood and the catkins of willow. It is a pleasant cycle to contemplate, and in a short time a joy to experience.

How to Buy a Greenhouse

By Derek Fell
Box 1, Gardenville PA 18926

Greenhouse gardening used to be thought of as an expensive luxury—to be indulged in by the wealthy who specialized in growing exotic plants such as orchids, bromeliads and alpines. Today, that concept is fast disappearing as more practical-minded home gardeners realize that a greenhouse is the key to greater success and enjoyment of gardening.

The greenhouse is now being seen as a basic gardening tool that gives us the freedom to grow *whatever* we please *whenever* we please. We can grow hundreds—even thousands—of transplants to fill our gardens with the kind of color and variety we've always dreamed of; we can raise hard-to-start seeds, cultivate vegetables and fruit out-of-season, raise our own house plants for pennies apiece, and carry out a multitude of other propagation techniques.

With a greenhouse there's the advantage of a 12-month growing season, and the ability to create a controlled environment in which it's possible to grow any plant we please no matter what part of the world it comes from. A greenhouse is also a sanctuary—an escape from the pressures of everyday life—where the mind and body can relax—and we can be creative in harmony with nature.

Wander A. Mall, a hobby greenhouse gardener and founder of the Hobby Greenhouse Association of America, defined a greenhouse as "a temple of beauty, a shrine to nature . . . inside those four transparent walls we forget our worries, problems and anxieties . . . it may be a fleeting moment, but it's a moment of true happiness."

The wonder is that greenhouse gardening has taken so long to catch on in stress-worn America. The British have comforted themselves with more than 1,800,000 greenhouses, representing 10% of all British households. The potential for the same kind of greenhouse ownership in America is there, and in anticipation of it dozens of greenhouse companies have sprung up like mushrooms. But a lot of misunderstanding exists, and many home gardeners interested in owning a greenhouse are holding back, confused by the proliferation of designs, and in need of help.

Prices of greenhouses run from less than $100.00 for flimsy plastic jobs with a life expectancy of little more than a year, to more than $3,000.00 for a life-time unit installed by a contractor and requiring an excavated foundation. There is the choice between a lean-to and a free-standing unit, and various combinations of materials. Frames can be wood, galvanized steel, or aluminum, and coverings can be plastic, fiber glass, window glass or safety glass. There are traditional designs and contemporary shapes, such as geodesic domes. After you've decided on the structure there is then the problem of heating. Should you install an electric, oil,

gas or solar heating system, and what are the differences in cost and performance?

With these kinds of decisions to be made, no wonder it is taking America time to become a nation of greenhouse gardeners. Let's see if we can cut through some of this confusion.

Generally speaking, the most desirable combination of materials for best growing results is an aluminum frame and glass panes. Aluminum is strong and maintenance-free, never needs painting and looks good. Glass allows maximum light penetration during dull winter months and also gains top marks for appearance. The argument that glass is risky because it breaks so easily no longer holds true. Safety glass is now available, and its slight extra cost is well worth it.

In Great Britain, where greenhouse ownership is the highest in the world, aluminum frame greenhouses with glass panes are by far the most popular, and as many as 100,000 greenhouse gardeners each year upgrade from wood and plastic to aluminum and glass.

There's nothing wrong with buying inexpensive greenhouses featuring other materials. Many people prefer to gain experience on a low cost, inexpensive structure and then upgrade to a more permanent model.

If you buy your greenhouse through a dealer and want him to erect it on your site, be sure to get in writing his installation charge before you give him the go-ahead, since the cost of having a contractor excavate the foundation and erect a greenhouse can be more than the greenhouse itself. There are ways to avoid this installation cost, and an increasingly popular choice is the "assemble-yourself" kit, requiring no foundation.

Normally it is the free-standing units that are most easily assembled as a do-it-yourself project since lean-tos need professional help to first build a firm foundation, and a carpenter to attach the unit to the house. Building permits also may cause problems. You should also be aware that lean-tos do not encourage best plant growth since light is always from one direction. The even, overall light of a free-standing unit will produce best plant performance every time. Usually a building permit is not required if the unit can be erected without a foundation.

Assemble-yourself greenhouses are installed in three stages. First the site must be made firm and level. Then the frame is put together using nuts and bolts, and finally the glass is installed. When buying assemble-yourself greenhouses, first be certain of two important features:

1. Find out if the greenhouse comes with a *base wall*, or whether you must make your own to erect the frame on. The easiest to assemble greenhouses will include an aluminum base wall and save you a lot of trouble and expense.

2. Send a dollar to the greenhouse company and request a copy of their assembly manual *before* you part with your money. Some greenhouse companies offer very poor assembly instructions so you spend a frustrating amount of time erecting by trial and error. By studying the assembly manual first you will be able to anticipate any problems.

I bought a greenhouse kit featuring an aluminum frame and safety glass panes. The installation was quite straightforward. My wife and I completed the entire assembly over a weekend, spending a day to erect the frame and another day to complete the glazing.

When choosing a greenhouse look for heat-retaining features. For example, check whether the glazing system has overlapping panes or panes that butt snuggly together. Overlapping panes with steel clips to hold them in place is now an out-of-date system that can cause gaps and draughts. Also check whether the aluminum frame is on the *inside* or the *outside* of the greenhouse. An aluminum frame that sticks out will catch the wind and draw cold air into the house. It is not so efficient in retaining heat as a frame that is located *under* the glass.

Depending on size, it's possible to buy a good quality assemble-yourself greenhouse for $800–$1,000. These greenhouses represent extremely good investments since they will usually add value to a property. Unlike other items of gardening equipment like lawn mowers and tillers, a long-lasting quality greenhouse has the potential to *appreciate* in value.

The best way to shop for a greenhouse is to read the advertisements in the gardening press. Send for brochures describing different makes, and compare design features and prices. It's not easy to buy a greenhouse locally from a garden center since few garden centers are willing to put up a display model. Even among those who do, the choice is limited. Mail order is still the most widely used form of greenhouse purchasing.

Don't be fooled by all the talk about "solar greenhouses" There are greenhouses that incorporate solar heating *systems*. Solar heating systems for greenhouses consist largely of black metal containers filled with water. As the daytime sun shines on the greenhouse the water inside the containers heats up (black absorbs heat efficiently, metal is an excellent heat conductor and water retains the heat for long periods).

Frankly, solar heating is not popular because the number of black containers presently needed for heat retention takes up a lot of greenhouse space. It is also unsightly for the average homeowner. Nor is it a reliable system, except for cool greenhouse crops, since you need at least 2 gallons of water per square foot of greenhouse space to keep the temperature inside the greenhouse 30° above outside temperatures.

The most widely used source of heat for hobby greenhouses is electric, and there are some simple insulating techniques that can help to

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Plants Worth More Than Animals in The San Diego Zoo

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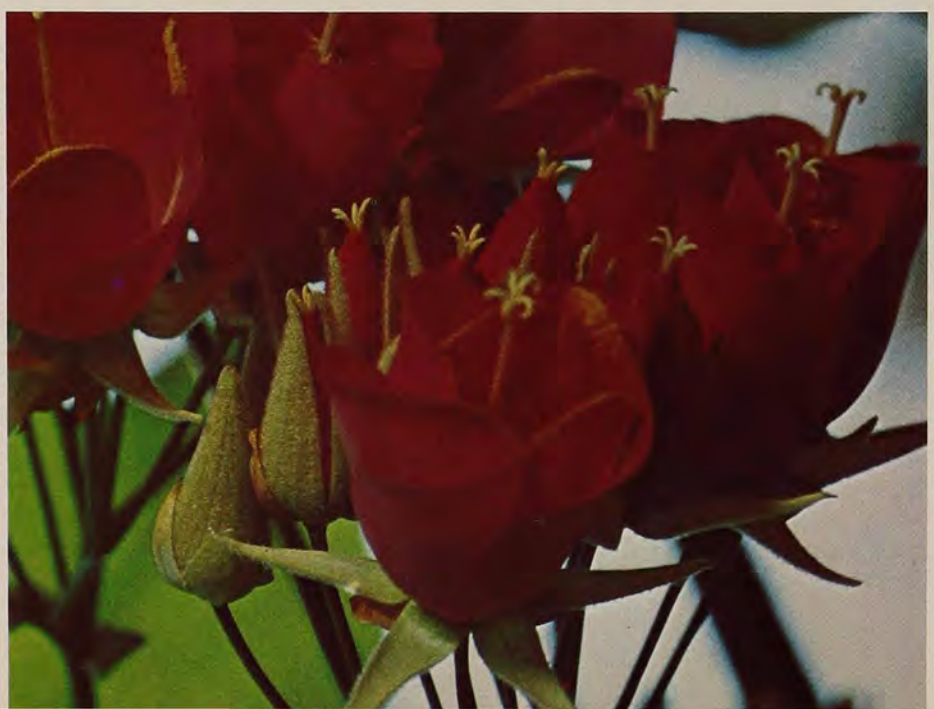
TOP—*Erythrina phlebocarpa*, BELOW—*Dombeya cacuminum*



Photos Courtesy Zoological Society of San Diego © 'Zoonooz'

Is it a botanical garden with animals or a zoological garden with plants? Whatever your point of view, this fine animal-plant symbiosis was the brainchild of Harry Wegeforth, founder of the San Diego Zoo and a modern practical ecologist long before his time. On many an afternoon you could find the Doctor on the steep slopes of a canyon planting trees collected from across the country and around the world. There was not much money to take care of the seedlings and cuttings he needed, but surely today he would be surprised to read on the place mats in the restaurant: "Did you know that the total value of the plants and flowers in the zoo exceeds that of the animals?"

How do you calculate the value of a botanical garden? How do you put a price on a 50 year old rare palm? Appraisal of plants is always a difficult undertaking. "One thing is certain, though," Ernest B. Chew, horticulturist for the garden says, "the plants are certainly the largest exhibit in the zoo."

Since Mr. Chew has been in charge, the last six years, many new ecological concepts have been introduced; animals from Madagascar, for instance, are surrounded with plants from the same country. A continual effort is being made to keep it attractive and introduce and grow new plants suited to the climate of Southern California. Some of those which are most unique are the zitherwoods: *Citharexylum*

lucidum from Veracruz, *C. hidalgense* from Hidalgo, and *C. spinosum* from the West Indies. The fever tree, *Acacia xanthophloea*, so called because of its association with the malaria-carrying mosquito in wet areas of South and East Africa, is appropriate for the animals that originate in those areas, as is the Cape chestnut, *Calodendrum capense*. Suitable for Australian animals are grevillias, greyias and proteas. *Pistacia chinensis* is grown for autumn color as a novelty in this sub-tropical climate.

Dombeyas and Erythrinas are two genera of which the gardening staff of twenty-two are most proud. Six species: *Dombeya cacuminum, D. calantha, D. dregeana, D. nyassica, D. sparmannioides, D. rotundifolia,* and one hybrid *D. cayeuxii, (D. Wallichii* x *D. Mastersii)* are part of their collection from Africa, Madagascar, and the Mascarene Islands. The hybrid grows so rampant in San Diego that it requires severe pruning to curb its growth of up to 12 feet a year. Thirty-five species of Erythrina are being grown. *Erythrina phlebocarpa* from Australia is just now becoming available in California. It is especially attractive because it drops its foliage in December and produces spectacular red inflorescences in January on nude stems. With severe pruning of the new growth, half way through the season, many more flowers are produced. The introduction of this new plant to Southern California is typical of the educational contribution of the garden.

The gardens were started when the zoo was established at its present location in 1922, but it was not until 1971, when Mr. Chew took charge, that any kind of general plan was established. The plan, based basically on the micro-climates in the area required a great deal of plant moving. Within the 128-acre garden, tropical and sub-tropical ornamentals have been grouped in the warmest location where the minimum temperatures never fall below 40°F. Orchids, cycads, bananas, palms, bromeliads and bauhinias have been naturalized with the reptiles and monkeys. Hoofed and horned animals are surrounded by aloes and euphorbias. Conifers are reserved for a more temperate location where the temperatures often drop down to 28°F.

Although it is a center of recreation, the zoo is dedicated also to zoological and botanical education and research. Researchers at the University of California at Berkeley, are isolating hydrocarbons as a source of oil from *Euphorbia tirucallii* that came from the San Diego Zoo. At Riverside, embryo culture for rapid reproduction of palms is in progress.

Because of the presence of so many rare animals that could be severely affected by toxic insecticides, biological control of insects is imperative. Mr. Chew has achieved remarkable success in establishing several colonies of predators. Without using toxic substances, he rarely has any trouble with insects. "Once in a while," he says, "thrips and red spiders get ahead of the predators." But the worst pests are the beautiful peacocks and the jungle fowl that wander freely around the grounds. Plants, before they are removed from the nursery, must be tall enough that a peacock can't reach the new growth.

One specialty that must rarely be the responsibility of a horticulturist, is the production of food supplements for such a variety of animals. Without the luxury of any specific growing area for this purpose some parts of the garden are interplanted with eugenias, bamboo, palms, hibiscus, eucalyptus, bananas, etc., merely for animal fodder. Many members of this large population of animals eat hibiscus leaves and flowers, prunings from palm fronds, and large quantities of banana leaves, eugenia leaves and berries. All commercial fruits are purchased on the market.

The koalas are a very special feature of the San Diego Zoo because it is the only place in the country

where these marsupials reside. The famous Qantas commercial koala, Teddy, lived here. Others were sent as a special Australian gift to the United States for the Bi-centennial. "Koala" is Australian aborigine for "I do not drink water". It is not exactly a true statement because these animals get most of their water from the green eucalyptus leaves as long as they are young enough to be pendulant. With 500 species of eucalyptus in Australia (95% of their forests), the zoo designed a project to screen the species most appetizing to koalas living in San Diego. Some days they apparently like one species better than another and it was resolved that there are 18 species that are most desirable 75–100 percent of the time. Now 30,000 of these trees are being planted as food on city property.

San Diego Zoo is supplemented with the new 1800 acre Wild Animal Park at San Pasqual where plant and animal combinations were introduced at the time the park was established. It is also being developed as a botanical garden under the direction of Mr. Jim Gibbons.

The San Diego Zoological Society, and the botanical garden it includes, is a non-profit organization which pays for itself. It receives only a modicum of support from the city. It is mainly financed by admissions, donations and memberships. In the last year it attracted over 3½ million visitors and has a membership of over 60,000. Surely all of these people don't just come to see the animals and many who do are surprised to find a well labelled botanical garden where 2500 species and cultivars are on an inventory which is being entered into the computers at the Plant Sciences Data Center of the American Horticultural Society.

The San Diego Zoo is a member of the American Association of Botanical Garden and Arboreta and will host the Western Regional meeting in September of this year.

AHS members should plan to take the Post-Congress Tour to San Diego after the Annual Congress in October.

AMERICA'S VAGABOND TREE

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The Quaking Aspen, *Populus tremuloides* Michx., is the most widespread single tree species on the North American continent. Although reputed to be a weed, it is being recognized currently as one of the most valuable and versatile of our trees. This member of the poplars, known variously as trembling aspen, quaking poplar, trembling poplar and popple, ranges from Labrador and Newfoundland on the east across the northern United States and Canada to British Columbia on the west, thence northward to northwestern Alaska into the area of the permafrost and southward through most of the mountains of the western United States into northern Mexico.

Facts concerning this exceptional member of the North American flora often seem paradoxical. Although it is generally a small to medium sized tree, its growth form varies from dwarfed, contorted trees a few feet in height at high elevations to magnificent specimens three feet in diameter and nearly 100 feet tall in areas most favorable to its growth. Quaking aspen is usually recorded as a relatively short-lived tree of 50 to 60 years of age, yet in the Rocky Mountains 100-year-old stands are common, and some 200-year-old groves are known. Near the northern limits of its range in Alaska this aspen occurs at elevations up to 5,800 ft.; in the mountainous states of the west it ranges from 6,500 ft. to 10,500 ft. in elevation; while in areas of Maine and Washington, aspen may be found growing nearly at sea level.

Climatic variations endured by different populations of this tree are astonishing. In interior Alaska minimum low temperatures of -78° and maximum temperatures of over 100°F. have been recorded; near the northern limit of the range of this tree, January temperatures average -22°F., with the July average being 61°F. The annual precipitation is only about 7 inches here. Around Gander, Newfoundland, winter temperatures may be as low as -30°F., with maximum summer temperatures at around 90°F.; here the average January temperature is 20°F. and the average July temperature is 60°F. The annual precipitation is over 40 inches usually. At Fort Wayne, Indiana, the coldest recorded temperature is -24°F., and the warmest is 106°F. The average January temperature is 27°F. and the average July temperature is 74°F. Precipitation averages 34 inches annually. In Alaska, the growing season averages 81 days, while at Fort Wayne it averages 176 days.

Quaking aspen is found associated with numerous other trees throughout its range. In the eastern, central and northern sections it intermingles rather commonly with softwood species such as jack pine, red pine, white and black spruce, balsam fir and eastern red cedar; and with hardwoods including oaks, basswood, white ash, birches, pin cherry, bigtooth aspen and red maple. In the western states the aspen forms vast stands where it is the only deciduous tree species of any consequence. However, it is often associated with ponderosa pine, lodgepole pine, bristle-cone pine, limber pine, Rocky Mountain juniper, blue spruce, Engelmann spruce and subalpine fir.

P. tremuloides is readily recognizable by its smooth white or light-colored bark (grayish-green, yellowish-green), tending to become ridged and black near the base of the trunk in older specimens. It has irregularly-shaped dark scars left as a result of the self-pruning process especially noticeable in trees growing in dense stands. Its small bright-green leaves vary in shape from nearly circular to strongly ovate. (The bark never peels as it does in birches with whitish bark.) The margin of the leaf has a finely scalloped appearance from its very short teeth which are rounded at the outer edge. This character of the margin of the leaf separates *P. tremuloides* from its close relative, the bigtooth aspen, *P. grandidentata* Michx., with coarse, widely spaced teeth edging the leaf. The ranges of the two aspen overlap widely in central and eastern U.S., and in this area natural hybrids between the two species occur (*P. tremuloides* X *grandidentata*). The slightest breeze will set the leaves to fluttering or trembling, which is accompanied by a soft and pleasant whispering sound. The dancing leaf motion is due to the long, strongly flattened petiole attached at right

Photo by Loraine Yeats

angles to the horizontal leaf surface. Any air movement is readily intercepted.

Flowers of the aspen appear in April or May, well before the leaves, in furry, gray catkins which gradually elongate and become pendant to a length of more than two inches. Male and female flowers are usually on separate trees. The young fruits reach only one-fourth inch in length, and are quite inconspicuous until they open. The seeds are tiny (over 3 million per pound), clothed in silky white hairs which enable them to be carried by the wind for many miles. Seed viability is short, lasting only ten days or two weeks. Germination occurs best on moist, well-lighted and recently exposed mineral soils. Aspens grow rapidly. Successful seedlings can reach a height of twelve inches in the first growing season.

Quaking aspen seedlings take hold and flourish in areas which have been denuded or opened by fires, windstorms, avalanches, and disturbances due to the activities of man. They are highly tolerant of strong light, drought, wind, heat and cold. Aspen trees maintain and enlarge their hold on areas originally colonized by seedlings primarily through the process of suckering. Suckers arise from buds borne on shallow lateral roots in such numbers that a single tree can give rise to extensive clones which cover several acres.

In autumn the light green of aspen foliage gives way to hues varying from pale yellow to rich, clear gold. Some trees have light crimson tones. Because of extensive stands in the western mountains, the autumnal gold of these trees contrasted with the dark green of accompanying conifers, paints vast areas with an awesome spectacle of color. The intermingling of clumps of aspen with conifers, particularly noticeable in the fall, has an interesting origin. Seedlings of pines, spruces, firs, as well as herbaceous plants, flourish in the cool shade of aspens. Eventually the conifers grow tall enough to shade the intolerant aspens which die out and are replaced by the conifers, which form a permanent forest. This process of displacement takes place under optimum conditions within a span of fifty years. If the conifers are then cut, or destroyed by a forest fire, aspen seedlings begin the cycle again.

Aspen is of prime importance as a food source for certain of our native animal species. Its bark is the favorite food of the beaver, and the trunks and branches are used in the construction of their dams. Species of grouse feed on the winter buds, and snowshoe rabbits and other ro-

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Buying a Greenhouse

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reduce heating bills. Perhaps the simplest and least expensive is the use of bubble plastic on the inside of the greenhouse. By wetting the bubble plastic it will adhere to the glass without taping, and is easily removed during summer months. About $30.00 worth of this plastic will comfortably insulate an 8ft. by 12 ft. greenhouse. When insulating a greenhouse this way it is advisable to leave the roof clear, otherwise condensation problems will occur. But covering the sides and ends can reduce your heating bill by as much as 30%.

Costs for heating hobby greenhouses vary widely depending on size and location, severity of winter, and the type of plants you wish to grow. Cool greenhouse plants such as alpines and primulas will require far less heat than hot house plants such as tomatoes and bromeliads. A 220 volt electric heater delivering 16,360 BTU's is sufficient to heat a greenhouse up to 8 ft. by 12 ft., and costs about $150.00. In my area of Pennsylvania, costs for electrically heating an 8 ft. by 12 ft. greenhouse are about $150.00 a year.

Equally important are ventilation and cooling systems. The use of an automatic vent opener will eliminate the need for you to keep opening and closing vent windows. Automatic vent openers that utilize an hydraulic fluid can be purchased for about $70.00 each, and once installed they raise and lower the vent windows as the temperature inside the greenhouse fluctuates. What's more these units never need recharging.

During fiercely hot, sunny days even wide open vent windows are not enough to keep plants comfortable, and an efficient cooling system is the only way to prevent the greenhouse from turning into an oven. Compact, fan-type evaporative air coolers are not expensive, and for a hobby greenhouse they do a good job of creating air circulation and delivering cool air at the same time. The $300.00 they cost is money well spent, and the energy they use to operate is minimal.

Naturally, there are some people who have totally disregarded brand-name greenhouses and the assemble-yourself kits in favor of building their own using lumber and acrylic panes purchased locally. But don't expect to save a lot of money unless you can make use of scrap lumber and junk-yard plastic. By the time you have added up the cost of redwood or cedar (the only wood capable of resisting rot), plus the cost of acrylic (or glass) panes bought from a glass merchant you will more likely discover you'd have been better off buying an assemble-yourself kit in the first place.

You should also consider joining the Hobby Greenhouse Association of America. A non-profit organization founded in 1975, this group is helping gardeners with their greenhouse gardening problems, particularly in the area of greenhouse systems. The $5.00 annual membership includes a subscription to The Planter, a publication containing advice about greenhouse gardening. Membership also includes a "plant swap" service, a library, slide lectures, seeds and samples, and an advisory board with specialists who can answer questions on such divers subjects as pest control, greenhouse management, hydroponics, orchids, African violets, vegetable gardening, engineering, insectivorous plants and many other important fields of interest. The Association is made up of chapters that meet monthly to discuss various topics concerning greenhouse gardening. You don't have to be a greenhouse owner to join. In fact 50% of the membership does not currently own a greenhouse.

The address for Hobby Greenhouse Association is Box 695-F, Wallingford, CT 06492.

The Forgotten Witch Hazels

by
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"Pop!" go the witch-hazels, sending a volley of seed several feet into the air. It is that crackling sound on a warm autumn day which reminds us of this native shrub no longer popular in American gardens. Yet, the witch-hazel has always been a part of our heritage.

Much has been written in American folklore regarding the medicinal and supernatural powers attributed to the Common Witch-hazel (*Hamamelis virginiana*). Forked branches, called "water witches", were cut from this plant and employed to locate ground water and deposits of minerals in the earth. Extracts made from the dried leaves and twigs were and are still used today in the manufacture of lotions. American Indians made significant use of the plant's medicinal properties and used the ground-up leaves as a poultice for tumors, sores, and ulcers. In addition, snuff made from the finely-powered dry leaves reportedly will quickly stop nose bleeds.

The Common Witch-hazel provides food for our wildlife in the fall and winter months. The white-tailed deer often feed upon the twigs in the winter, and the seed is occasionally eaten by the ruffed grouse and bobwhite quail. Squirrels sometimes eat the fruits in early fall.

The current popularity of indoor plants has, for many people, fostered a year-round enthusiasm for gardening. Northern gardeners, however, tend to abandon outdoor interests in late September and give little consideration to extending the season by planting witch-hazels. Few plants bloom in the fall and winter seasons as do the witch-hazels. The Common Witch-hazel is the last shrub to flower in the fall, and Vernal Witch-hazel (*H. vernalis*) blooms in the early winter. The Chinese (*H. mollis*) and Japanese (*H. japonica*) Witch-hazels complete the winter season in February and early March. Their flowering can be called a prelude to spring.

It takes but a few days of mild temperatures in late October and November to burst open the floral buds of Common Witch-hazel. Every bud contains a cluster of 3 to 4 blossoms, each with four tiny yellow petals. The flowers are fertilized (pollinated) and development of the hard dry seed capsules begins the following spring. These fruits mature in late summer. On a warm day in late October, usually following a frosty night, tension within the fruits builds to explosively discharge and propel the seeds 10 to 30 feet away. The clatter of bursting seed capsules and seed falling upon dry leaves blanketing the ground is enough to evoke thoughts of witches and goblins.

There are four species of witch-hazels grown in American gardens and a limited number of hybrids available. The leaves of all witch-hazels are similar in shape and are distinctly coarse-textured. Often termed "a leaf like a hazel", the leaf is more oval shaped and surrounded by a wavy, toothed margin with an irregular base. The slender strap-like flower petals differ among species both in size and in color tones ranging from lemon-yellow to copper.

Witch-hazels grow in a wide range of soil types and will tolerate "wet feet". The two native species are inexpensive to purchase, making them suitable not only for home landscapes but also for mass planting along roadsides, in parks, and on steep embankments to prohibit soil erosion.

Common Witch-hazel is native to a wide range of eastern United States and Canada (Nova Scotia to Minnesota southward to Georgia and Louisiana). The plant frequents woodland borders and areas with a high water table and will tolerate semi-shaded areas of the garden. Flowers persist from late October through November and are not as strongly fragrant as other witch-hazels. Fall leaf color is a good yellow and flowering generally peaks as the last leaf falls to the ground.

Vernal Witch-hazel (*H. vernalis*) is native to the central United States from Missouri to Louisiana and Oklahoma. The lightly scented flowers, copper colored and not very conspicuous, open in late December through February depending on the location and weather conditions. Three or four 40 °F (4.4 °C) days may provide

Photo by Paul Roselli

Hamamelis mollis

enough stimulus to force the flower buds of this very hardy species. A sudden snowfall or ice storm does not injure the open flowers.

Approaching late summer the leaves of Vernal Witch-hazel may prematurely turn yellow, almost simulating fall leaf coloration. This chlorotic condition is an indication that the soil may be either deficient in nutrient iron or the soil pH is too high—changing the iron to a form which is unavailable to the plant. The soil should be analyzed and the proper remedy taken. Chelated iron or iron sulfate applied by foliar feeding or as a soil drench in early summer may only correct the deficiency problem temporarily. A more-lasting solution may be to gradually lower the soil pH over a 3 to 4 year period using aluminum sulfate.

Chinese Witch-hazel (*H. mollis*) is the showiest of the group because the flowers are large (for a witch-hazel) and very fragrant. Flowers open in February and earlier where shrubs are planted in protected courtyards. When kept properly pruned this witch-hazel develops into a specimen plant with year-round beauty: attractive blemish-free leaves in spring and summer, a yellow fall foliage color, and a floral display in mid-winter. Two cultivars 'Brevipetala' and 'Superba' are noteworthy selections, but are in rather limited supply in the nursery trade.

Japanese Witch-hazel (*H. japonica*) flowers a few days to several weeks after Chinese Witch-hazel. The yellow flowers have a slightly deeper hue than the Common Witch-hazel. The unusual reddish-yellow fall leaf color of the Japanese rates it the best over all other witch-hazels. A tree-form, *H. japonica arborea*, is listed as available, but, as Japanese Witch-hazels are not popular in this country, locating a plant for purchase is rather difficult.

In recent years a number of hybrid witch-hazels have found their way to retail garden shops. The best of this group are the Chinese-Japanese hybrids of which the cultivar 'Arnold Promise', introduced by the Arnold Arboretum, is most widely grown. Its bright yellow flowers, very large for a witch-hazel, open around Valentine's Day. 'Arnold Promise' is extremely hardy and vigorous, reaching a mature height of 15 to 18 feet. Fall leaf color is reddish-yellow like its Japanese parent.

The contribution that witch-hazels can make as landscape plants lies in a knowledge of where they should be planted around the home and how they should be maintained to satisfy their intended uses. Witch-hazels are best planted where they may be viewed from indoors as well as from out. These shrubs are particularly desirable in courtyard gardens when planted in close association with broad-and narrow-leaved evergreens. Their fall leaf color and off-season flowering stand out well against a natural green or snowy-white background.

Pruning is a must for witch-hazels, and they should be kept confined to a limited area. These tall, vigorous-growing shrubs easily reach heights of 10 to 12 feet. Proper pruning maintains their natural open and V-arching form. They should be kept clipped back to 5 or 6 feet or can be shaped as small trees and espaliers. Along roadsides hedge-row clipping may be practiced to develop a dense, uniform planting.

In the spring and summer months the witch-hazels are simply no match for the more showy shrubs and trees to which we have become accustomed for use around our homes. It is their unseasonal time of flowering which is to be enjoyed when little else catches our attention.

Hamamelis japonica 'Rubra'

Photos by Clarence E. Lewis

Hamamelis japonica

Plants to Please a Child

Continued from page 5

around the edges, and in each notch little plantlets form, complete with roots. Even if detached from the plant and fastened to a curtain or wall the leaf will still form plantlets. If summered outside, leaves drop off from time to time, so by the end of summer there will be young plants aplenty to lift and pot before frost carries off the parent plant, probably by now too big to bring back indoors.

Children are fascinated by the diverse ways in which plants perpetuate their kind. *Camptosorus rhizophyllus* is called the Walking Fern because the slender leaves taper off into a tail which roots at the tip, and thus this little fern gradually extends its territory. Like most ferns, it likes high humidity. Though often grown in terrariums it is quite hardy and probably happier out of doors. In the wild it is often found on limestone rocks, but lime is not essential to its well being. It must, however, be grown in shade.

Walking Iris, *Neomarica gracilis* (not hardy) behaves in somewhat similar fashion. Irislike flowers form at the tip of what looks like a leaf (actually a leaflike stem), followed by a miniature fan of leaves which weighs down the stem until the baby plant reaches and roots into the soil. Growing two feet high, *Neomarica* makes quite a conversation piece when in flower, but it blooms only on well established plants, and sparingly at that. It can be grown in a sunny living room but the leaf tips may brown, indicating a need for more water or higher humidity. A greenhouse or plant room suits it best, with the temperature approximately 68°F by day, 60°F at night.

Spider Plant, *Chlorophytum*, is always popular, but sometimes it declines to produce babies. The commonest cause of this problem is exposure to too much light. Young children need more sleep than adults but are often reluctant to go off and leave the rest of the family. Make it their task, at the appointed hour, to "put the spider plant to bed" in a dark room, and they may themselves go more readily. Explain that the plant must not then be "woken up" by switching on the light before morning.

Another child intriguer is the "Piggyback" (correctly, Pick-a-back—have the children look this up in the dictionary) Plant, *Tolmiae menziesii*, with baby plantlets riding on top of the leaves. This is hardy outside in the warmer zones and makes good ground cover.

Just for a change, *Cyperus alternifolius* (Umbrella Plant) roots readily if stood on its head in water—an unlikely sounding story I know, but try it and see. Overwatering is the major cause of houseplant deaths, but Umbrella Plant is moisture loving and easy for a child to grow. The pot in which it is planted can stand inside a shallow bowl, water in the outer container being replenished whenever it dries out. The tall, stiff stems are crowned with an umbel of slender, radiating leaves, and if this umbel is cut off and placed upside down in a dish of water it will root and grow. Umbrella Plant grows four feet high, so stand it on the floor in a well lighted corner, or look for the dwarfer forms sold as *nana* or *gracilis*. *Cyperus papyrus*, the papyrus or paper plant of ancient Egypt, has finer, more numerous drooping leaves. This too can be grown indoors for a while but will ultimately reach eight feet.

Attention to routine tasks comes hard to the volatile nature of a child; we all know who ends up feeding the dog and cleaning out the bird cage! Thus any plant cared for by a child must be able to tolerate some neglect. The dwarf gloxinia, *Sinningia pusilla*, grown in a covered brandy snifter or small terrarium, needs less attention than anything else I know. It also appeals to a child's love of extremes—gigantic or scaled down to doll's house proportions. A peaty potting soil is best, over half an inch of grit for drainage. Covered and placed under fluorescent lights it will go for months without attention, taking occasional rests but flowering most of the year. It is evergreen and self sown seedlings soon appear in abundance.

Every link in nature's chain—plants, insects, animals, man—is vulnerable to injury and death and must protect itself as best it can. Plants cannot run away, but many have developed other ingenious methods of protection. Some are poisonous—or just taste nasty, many are prickly, and the Sensitive Plant "plays possum" by folding down its leaves and stem in an attempt to look wilted and unappetising. Perhaps most curious of all are those which adopt a disguise, and none more so than the group called Living Stones, among which *Lithops* and *Fenestraria* are easiest to find. Lithops mimic the pebbles among which in the wild they grow, but from a central slit in the "stone" a white or yellow daisy emerges. *Fenestraria* (from *fenestra*, a window) prefers to hide, burying itself in the sand, but it cannot live without light and so it has a tiny transparent area in the top of each stubby growth. Living Stones are succulents, fleshy plants able to store sufficient moisture to tide them over periods of drought. As desert plants they need strong light, either on a bright windowsill or under fluorescent lights. The soil should be light and well drained, best accomplished by the addition of coarse sand or fine grit to the potting mix. Stand the pots in water until the surface is moist rather than watering from overhead. Allow them to dry out between waterings, and give no water at all during the winter months.

Other examples of nature's infinite variety are not hard to find. Involvement with plants arouses first a sense of wonder, then the curiosity which is the surest spur to learning. There is no better gift to give a child.

Quotables

Interesting and important quotes from some interesting and important people

By Tom Stevenson

"A landscape contractor recently brought a small pick-up truck load of dead junipers for me to examine and determine the cause of death," says Dr. Francis R. Gouin, University of Maryland Professor of Ornamental Horticulture.

"It was evident that the plants had died from desiccation during the winter months. He informed me the plants had been in the ground for two growing seasons and that he had cared for them during that time.

"As I began to examine each plant, I immediately noticed that all the plants had been container grown. It was apparent that the contractor had very carefully removed the containers without damaging the root balls.

"In most instances I was only able to find a few small roots that had grown into the backfill. Most of the roots at the bottom of the root-ball had rotted. I have seen these same symptoms on several landscape jobs where I have been asked to give my unbiased opinion.

"We are all accustomed to planting B & B stock. The roots of these plants have already been pruned in digging and most of the feeder roots are in the upper half of the root ball. We all appreciate the fact that if we disturb the roots of B & B plants, soil balls are likely to fall apart increasing chances of losses.

"Therefore we have never been in the habit of disturbing the roots of ornamentals when transplanting them in the landscape.

"There is little need to remind you that times have changed and the method of growing ornamentals has also changed. Every year there is an increasing number of ornamentals being grown in containers. If you are familiar with container culture you should know by now that relatively few container-grown ornamentals have soil around their roots.

"Most of the container mixes used today are bark and sand; peat, bark and sand; peat and sand; peat and perlite; or, bark, peat and perlite. Plants grow rapidly in these soil-less mixes especially when water and nutrients are supplied when needed. Plant growth is often so rapid that roots fill the containers within one growing season, especially if the containers are small. It is not uncommon to find pot-bound container-grown plants after only one growing season.

"Failures in transplanting container-grown nursery plants can generally be attributed to poor transplanting technique. When landscape contractors or home owners transplant container-grown ornamentals into the landscape, they generally follow instructions or job specifications.

"In many instances, these instructions or job specifications generally state to carefully remove the plants from their containers without disturbing the roots. Some even advise not to remove the containers before planting.

"I feel that such advice is given to guarantee total failure and repeated customers. Landscape architects, and garden center operators should be urged to change their planting instructions.

"For years I have advised gardeners to damage the root balls of container-grown plants, especially those growing in soil-less mixes, just prior to transplanting. Feeder roots of container-grown plants grow much deeper than if the plants had been grown in the field.

"Because most container mixes have a high air-filled pore space ratio, feeding roots generally grow to the bottom of the container and frequently form a solid mat on the outer edge of the root ball. The best and most effective method of damaging the root balls is to cut through the lower half of the root ball with a digging spade or shovel.

"As you place the plant in the hole, spread (butterfly) the lower half of the root ball.

"Butterflying the lower part of the root ball does three things: 1, it prunes the roots forcing them to develop new lateral roots into the backfill; 2, it stops the circular habit of growth that the roots have developed from growing in the containers; 3, it raises the roots that were growing in the bottom of the container near the surface where soil conditions are favorable for root growth.

"Simply cutting the roots is not enough. This process may seem cruel, but it does reduce transplant losses and it encourages early establishment of container-grown plants in the landscape.

"Remember that the majority of the feeding roots of established or-

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Superior Ground Cover Junipers for the Great Plains

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The genus *Juniperus* is quite large comprising over fifty species which are generally hardy and drought resistant. The majority of junipers can withstand hot, dry conditions well and certain cultivars can be planted in alkaline soil. Since the climate of the Great Plains region is often hot and dry with severe winters and the soils tend to be slightly alkaline, members of the genus *Juniperus* are more adaptable to this area than many other evergreens. Junipers are available in varying sizes, colors, and textures. They also vary in shape from completely prostrate forms to spreading, globose and pyramidal forms. The prostrate forms interest me the most. Many members of this genus have green colored leaves in just about every hue along with golden, glaucous blue-gray, and variegated forms. Some plants take on rich purple hues in winter months. Junipers often have thin flaking bark with finely divided branchlets with two types of leaves. The two leaf types include the juvenile or needle-like leaves and the adult scale-like leaves which in different species may occur separately or on the same tree. Female plants form fleshy cone scales which coalesce to form a berry-like fruit containing one or more seeds.

Evaluation research of plant material adaptable to the climatic conditions of the Northern Great Plains especially in the genus *Juniperus* has been conducted by South Dakota State University for many years. In McCrory Gardens, which is the trial garden where the Horticulture-Forestry Department conducts woody ornamental research, approximately seventy different cultivars of *Juniperus* are tested with new additions planted yearly. Several cultivars of creeping junipers in this collection have proven to be outstanding and have real merit for Great Plains landscapes. Ground cover junipers have multiple uses but are especially useful for modern residential landscapes. Generally they are fairly maintenance-free and give both good winter and summer color to any landscape situation.

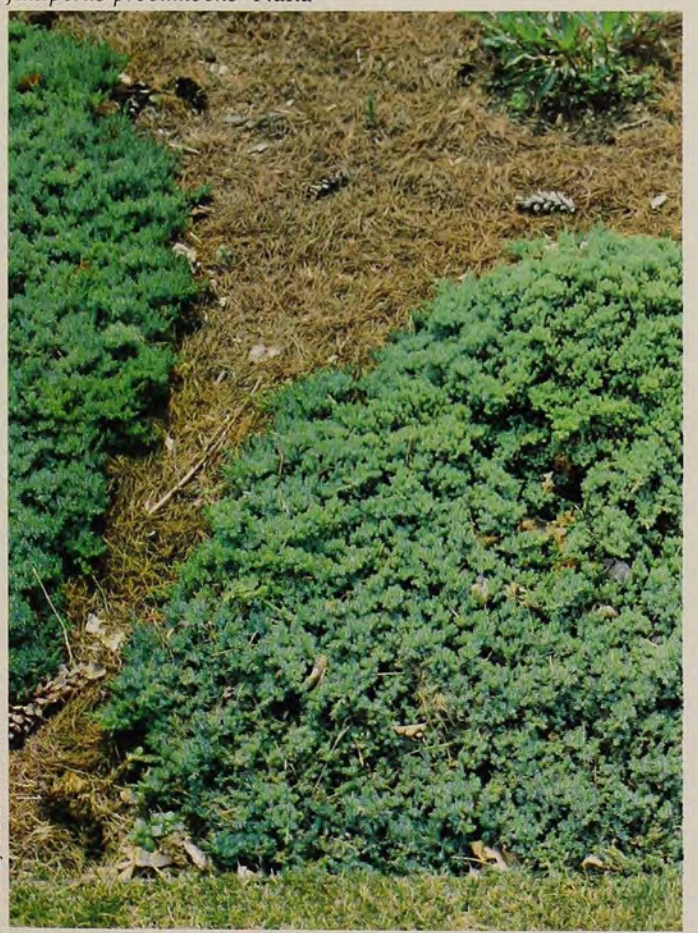
Three cultivars of this genus with distinctive green foliage that have proven to be superior over a period of years include: *Juniperus sabina* 'Arcadia' (Arcadia Juniper), *Juniperus sabina* 'Broadmoor' (Broadmoor Juniper) and *Juniperus sabina* 'Skandia' (Skandia Juniper). These three cultivars are selections from many thousand seedlings from seed which was imported from Russia in 1933. The seed was imported from a government forestry station near Petersburg and collected near the Ural Mountains. The seedlings were raised by the D. Hill Nursery Co., Dundee, Illinois. All three cultivars have shown resistance to juniper blight which attacks many cultivars of *Juniperus sabina*. *Juniperus sabina* 'Arcadia' has a rich grass green color and develops a spreading growth habit of a somewhat ragged constitution. The leaves are almost entirely scale-like and are borne on strong nearly horizontal branches. The green color persists through much of the winter with just the edges turning yellow-brown. It approaches 20 inches in height and has grown rapidly. This cultivar has shown no appreciable winter dieback since planting in 1969.

Another excellent hardy juniper from this same Russian source is the cultivar 'Broadmoor'. This is often referred to as a more refined form of the popular Savin Juniper cultivar 'Tamariscifolia'. This is the dwarfest form of these three Savin cultivars which have a spread-

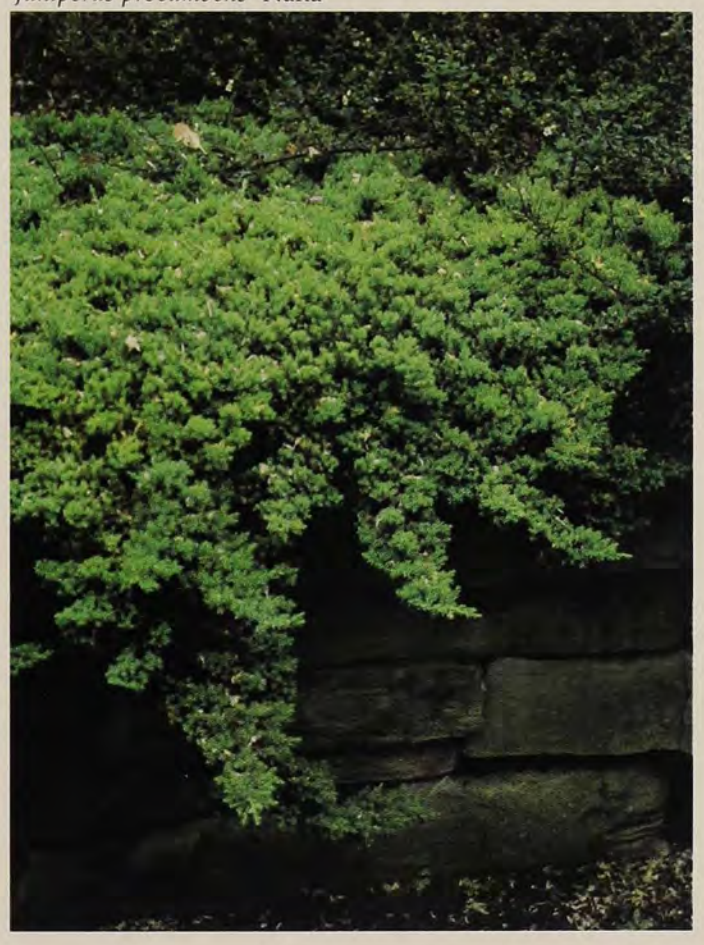
Juniperus sabina 'Blue Danube'

Juniperus horizontalis 'Blue Rug' or 'Wiltoni'

Juniperus procumbens 'Nana'



Juniperus procumbens 'Nana'



Photos by Clarence E. Lewis

ing growth habit. The main branches are strong and grow horizontally with short branchlets that turn upwards. It generally doesn't reach over twelve inches in height and spreads fairly fast. It also maintains a fairly good green color into the winter months. It has proven to be hardy with no winter dieback problem and is one of the best green foliaged ground cover types in our research trials.

The third cultivar selected from the numerous seedlings from the Russian exploration is 'Skandia', which is extremely hardy. It has a mid-green foliage color. This color is maintained throughout the year. This cultivar has a more flat growing habit than that of the cultivar 'Arcadia' but is not as prostrate as 'Broadmoor'. It is very dense in growth habit. The foliage has a slightly yellow tinge in the winter at Brookings. It makes an excellent ground cover and withstands adverse climatic conditions quite well.

Juniperus horizontalis is a species in which numerous cultivars have been selected and named. In our trials we have many cultivars of this species and all have a more or less prostrate growth habit. The branches of this species are long; branchlets are numerous and short but dense. Three cultivars of *J. horizontalis* have proven to be exceptional under our adverse hot and dry growing conditions. These superior cultivars include: *Juniperus horizontalis* 'Glauca' (Blue Creeping Juniper), *Juniperus horizontalis* 'Blue Rug' or 'Wiltoni' (Blue Rug Juniper) and *Juniperus horizontalis* 'Plumosa' (Andorra Juniper).

The 'Glauca' cultivar is a completely prostrate variant of this species. It lays its foliage flat on the ground and forms a mat with long straight main branches. Since planting in 1970 it has built up some height but generally it is less than six inches tall. The main branches on 'Glauca' are sturdier and straighter running than other *J. horizontalis* cultivars to be discussed. The leaves are mostly scale-like and very densely appressed, giving it a 'whip-cord' effect. Occasionally a few juvenile leaves are present in the center of the plant. The foliage color is an outstanding blue color turning to bluish-gray in winter.

Juniperus horizontalis 'Blue Rug' or 'Wiltoni' is similar in many respects to 'Glauca' except that 'Blue Rug' is a slightly slower grower and has a more prostrate growth habit. This cultivar has excellent silvery blue foliage during the growing season and is grayish-blue during the winter. This plant gives a very neat appearance and makes an excellent ground cover plant or rock garden gem. The foliage and stems of 'Blue Rug' are a little finer textured than 'Glauca'. This along with its more prostrate growth habit makes it one of the best cultivars in our collection. It is less than six inches in height and develops fruit fairly early, which adds to its other excellent ornamental characteristics.

Another cultivar of *J. horizontalis* which doesn't run true to the typical growth habit of the species is 'Plumosa' or Andorra Juniper. This plant builds itself up into a low, many branched shrub which can reach 15-20 inches in height. The branches of Andorra Juniper are upward facing at about 45° and bear awl-like foliage loosely appressed and arranged plume-like. Andorra Juniper is a vigorous grower. It has bluish-gray-green foliage color during the growing season turning to a distinct purplish color in winter. This plant is used extensively in foundation plantings since it adds unique winter color during winters in the Great Plains. Occasionally a little dieback is observed on this cultivar since it seems a little less hardy than the previous two cultivars of *J. horizontalis* described.

The juniper species *communis* is variable in growth habit. Many are upright and tree-like, others are superior prostrate cultivars especially one called *J. communis* 'Repanda' (Creeping Common Juniper). This is a vigorous dense grower, a characteristic useful for a ground cover. This plant is very soft to the touch without the pricklyness associated with some *J. communis* cultivars. The leaves are awl-shaped and grow straight out at an angle from the stem in whorls of three. They are quite small giving the plant a very neat appearance. The branches are flexible and brown in color. The leading shoots send out their laterals in regular flat sprays. The upcurved foliage is mid-green in color with a well defined broad stomatic line on the upper side. This cultivar exhibits a low mound growth habit and is generally less than ten inches in height. The foliage turns a slight yellow green in more exposed areas in the winter but not enough to be of concern.

Another superior ground cover juniper in our trials is *Juniperus procumbens* 'Nana' (Dwarf Japanese Juniper). This is a very prostrate species which eventually covers a large area. The main branches of this cultivar are stiff and stout and the growing tips tend to turn upward. The leaves are formed in threes and are linear with sharp points. Two glaucous bands develop on the underside of the needle. Our trial plants have become dense and are less than a foot in height. The foliage is blue-green in color changing to bluish-gray in the winter. This cultivar is a more desirable landscape plant than the straight species and is particularly useful as a ground cover for rock garden areas. The new growth is a bright green color which later turns to the typical blue-green color. We have both the cultivar 'Nana' and the straight *J. procumbens* planted side by side in our trials, and find the cultivar 'Nana' is superior to the species in just about every way.

These eight cultivars are examples of superior ground cover junipers which have proven to be exceptional in our ground cover juniper plots over the past ten years. Each of these junipers has many outstanding ornamental characteristics and all have shown hardiness and adaptability. Their low-growth habit makes them well suited for use as ground cover plants for contemporary maintenance-free landscaping. By planting juniper ground covers, homeowners can enjoy them throughout all seasons of the year making for a more liveable environment throughout the Great Plains area.

Quotables

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namentals can be found in the upper 6 inches of soil. The roots of species like azaleas and rhododendrons can be found mostly in the upper 3 to 4 inches of soil. However, in container-grown plants, roots of these species can be found growing in the bottoms of 3 and 5 gallon containers. Planting these bottom roots in the bottom of a planting hole is just like placing 10 to 12 inches of soil over the roots of an established tree or shrub. We know what happens when tree roots are buried without proper ventilation.

"Increasing the survival of container-grown nursery stock has attracted the attention of container manufacturers. There is a container now on the market that has a vertical partition molded into the lower half of the container. Plants grown in these containers need only be butterflied, lessening the gardener's pain of having to cut through the root ball."

* * * *

The winter of 1976 will long be remembered by the nursery industry in the East, says William Flemer III, Princeton Nurseries, Princeton, N.J.

While it was no match for the destruction caused in the winter of 1935, it certainly was the most severe since that time.

The succession of increasingly mild winters we had experienced in the East had lulled growers into a false sense of security. Large areas were planted without a single windbreak to interrupt the force of the wind, and, in such wide open places, windburn of conifers and broad-leaved evergreens approached the catastrophic.

Young conifers that are reliably hardy in much colder climates, such as American arborvitae, Canadian hemlock and Norway spruce, were ruined even on temperate Long Island, creating shortages that will persist for many years.

This was certainly the time to prove that nursery windbreaks are worth many times the area they occupy. In one notable example, a row of 30-foot tall *Thuja plicata* ran through part of a block of salable hemlocks, at right angles to the prevailing winter winds.

All of the hemlocks in the lee of the windbreak were salable this spring, whereas all those in the unprotected half of the field were dead almost to the ground. In two other cases, windbreak protection saved blocks of yews and arborvitae.

The effects of woodland protection or windbreaks are even more dramatic in the case of broad-leaved evergreens, particularly Japanese hollies and rhododendrons. Even mountain laurel, which is hardier than any of the popular hybrid rhododendrons, was badly burned wherever it was growing in exposed locations.

The differences in cold hardiness between various clones of the same species were very clearly highlighted last winter. Most results were what was to be expected, but there were some curious surprises too.

Among *Thuja occidentalis* clones, it was demonstrated all over again that *nigra* is much hardier than *pyramidalis*, and the latter is hardier than *elegantissima*. The old original *globosa* is far hardier than 'Woodward', which is in turn hardier than *compacta*.

Some growers have strayed from the old-time gospel concerning the winter hardiness of the commonly grown clones of *Ilex crenata*. Last winter illustrated very forcefully that 'Hetzi' is much hardier than 'Compacta' and that the latter is hardier than *latifolia* (*rotundifolia*).

Oddly enough, Rhododendron 'Nova Zembla' suffered much less than *roseum elegans*, which is normally considered among the most reliable of all hybrids.

Plant losses were by no means confined to the open fields. Container stock in plastic houses suffered very badly, especially varieties such as Japanese hollies that are very intolerant of low root temperatures.

Those who believe that the larger the container house, the safer the stock is inside it, received ample justification for their views. The worst losses occurred in the smallest houses, and the best survival was in houses 30 feet or larger in width.

For some unexplained reason, plants in ultra-light growing mixes were killed, while the same species and clones growing in heavier mixes containing soil were unharmed, even when they were wintered in the same houses.

These surprising results, combined with the notorious difficulty in establishing plants grown in ultra-light mixes in the open ground, suggest that growing mixes should be reexamined.

The light mixes are a grower's dream, but the landscaper's nightmare.

* * * *

Walnut fever is attacking many Ohio home owners this year, says Robert Touse, Ohio State University specialist in wood utilization. The chief symptom, he says, is a sudden urge to strike it rich in the backyard.

Dozens of walnut tree owners have called hoping that their tree—or perhaps two or three—may be a money tree in disguise.

Recently one buyer is said to have paid $30,000 for a single walnut tree in northwest Ohio. So owners of a walnut tree or two think their tree may be valuable too.

But the backyard isn't the ideal place to grow lumber or veneer-quality walnut (or other hardwood) logs. Good lumber trees need the competition of other forest trees to grow tall and straight. Also, this competition for a place in the sky causes the tree to shed its lower branches before they make large knots. Backyard trees grow more bushy, with branches spreading outward. Those branches should be at least 20 feet above the ground to make useful lumber.

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The Golden Fossil Tree

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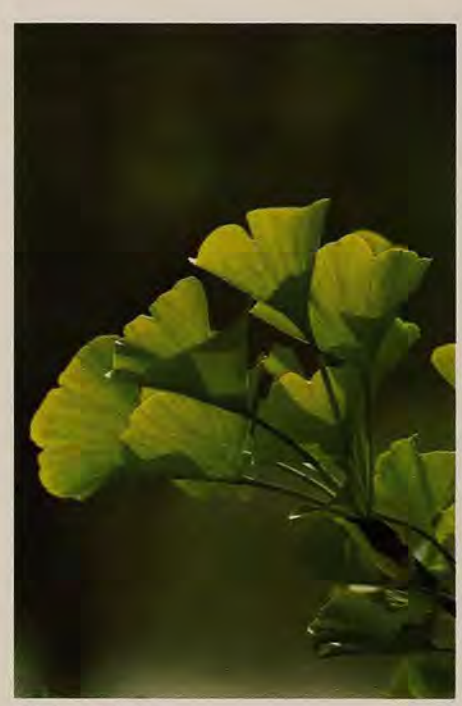
At least 250,000,000 years before homo sapiens pushed through the mists of antiquity, the Ginkgo tree dotted the reptile-ridden landscape of the Mesozoic era. Of the thousands of plant species existing today the Ginkgo is a remarkable and tenuous link to that remote past. How remote is summed up in a tribute to the Ginkgo by the late Sir Albert Seward: "An emblem of changelessness, a heritage from worlds of an age too remote for our human intelligence to grasp, a tree which has in its keeping 'the secrets of the immeasurable past'."

Only one species, *Ginkgo biloba*, remains of what was a numerous tribe fossilized in past geological ages. Irreverent botanists tend to disregard its timeless image and lump it in with the conifers. The Ginkgo is no more a conifer than it is a cauliflower. Charles Darwin called it a "living fossil", remarking on its primitive fan-veined leaves as mute evidence of preliterate times.

Irreverent horticulturists, casting around for a common name to hang on the Ginkgo noted its leaves somewhat resembled a much enlarged leaflet of the Maidenhair Fern. The Ginkgo became known throughout western civilization as the Maidenhair Tree. Honor would have been served had they renamed the Maidenhair Fern and called it the Ginkgo Fern.



Ginkgo biloba

The Chinese, who have fostered the Ginkgo from time immemorial, also noting the shape of its leaves, dubbed it the Duck's Foot Tree.

I have to believe the Ginkgo is deserving of more veneration from a common name. Maidenhair Tree and Duck's Foot Tree detract from its stature; from its uniqueness of being. From here on I shall call it the Golden Fossil Tree—in token of the autumnal glory it resurrects from prehistoric times.

The western world first heard of the Ginkgo in 1712 when a surgeon named Kaempfer, in the employ of the Dutch East India Company, published an account of his travels in Japan back in 1690 where he had observed the tree growing around Shinto temples. One Ginkgo tree in Japan is known to be over 1,000 years old.

The Ginkgo was introduced to Holland in 1735, to Britain in 1758, and to the United States in the early 1800's.

It has male and female forms, and trees of the latter gender produce fruits resembling plums. The kernels are a food source in the Orient. Unfortunately, when the fruits fall they give off a disagreeable odor as the pulp begins to decay. For this reason it is advisable to plant trees propagated vegetatively from male forms.

The Golden Fossil Tree grows to 100 feet with a characteristic diagonal upright form, and before dropping its leaves brings an ethereal radiance and a daffodil glint to the autumn scene.

It is practically free from attacks by insects and disease, a factor attributed to the leathery texture of its leaves.

Why not sanctify the past, serve the present, and salute the future—plant a *male* Golden Fossil Tree in your neighborhood. In all of the circumstances the Women's Liberation movement should forgive you!

Photos by Clarence E. Lewis

Collecting and Storing the Seeds of Woody Plants

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Everyone is familiar with the seeds of annuals, perennials and vegetables. They may be purchased almost any time of the season, and often remain viable for several years.

Some gardeners have been disappointed in their efforts to grow the seeds of woody plants because they did not germinate. The reason is that seeds of many woody plants must be sown as soon as they are ripe; or they must be stratified a few months until they are properly conditioned to germinate. There are, however, a large number that can be collected, dried and stored for months or several years, then sown to produce a reasonable number of seedlings. It is necessary to know "which is which".

Some seeds are produced in dry capsules, like those of mock-oranges, deutzias, lilacs, azaleas,

Seeds Which Can Be Kept Dry for a Year or Longer: 1. Locust, 2. Golden Rain Tree, 3. Wisteria, 4. Broom, 5. Ash, 6. Fothergilla, 7. Evodia, 8. Juniper, 9. Beauty Bush, 10. Lilac, 11. Rhododendron, 12. Linden, 13. Hypericum, 14. Catalpa, 15. Hemlock, 16. Pine, 17. Clematis, 18. Plane Tree, 19. Tree of Heaven, 20. Kentucky-coffee Tree, 21. Spruce, 22. Yellowwood, 23. Mock-orange, 24. Honeylocust, 25. Fir, 26. Arborvitae.

and rhododendrons. These capsules are easily broken and the seed retained. Then there are the cone fruits, like those of hemlock, spruce, pine and fir. They should be collected just before the cones open on the trees. Cones of such trees are collected about mid-October (although pine cones should be collected by September 25th and Cedar of Lebanon cones about August 15th). They should open if placed in the sun on a screen for a few days, or in the kitchen oven with the heat at a very low temperature for an hour or so.

There are many fleshy fruits, like the barberry, dogwood, viburnum and euonymus, that should be cleaned quickly and properly in order to obtain viable seed. If the fruits themselves are sown, or stored, the flesh of the fruit will rot and may impair or even prevent proper germination. Cleaning such fruits is simply done by maceration, then putting the whole pulpy mass in water for a few days and stirring it occasionally. The viable seed should sink to the bottom of the container, and the pulp, or chaff, and poorly formed seeds will float to the top and can be easily skimmed off.

We have used an ordinary Waring kitchen blender at the Arnold Arboretum for this type of cleaning process. The metal blade is removed and a small piece of rubber, 1-1/2" square from a tire casing, is screwed on and held horizontally on the axis of the machine. The metal blade would score or injure many seeds, but the rubber blade will not. The machine should only be run just long enough to macerate the fruits. Cleaning is sometimes helped by soaking the fruits in warm water a few days first, then placing them in the blender, for only two or three minutes. Obviously the fruits should be thoroughly ripe before they are picked in order to facilitate this process.

After this the seeds are thoroughly dried and then sown, stratified or stored, according to the requirements of the particular type of seed. If one wants to be certain that disease does not get into the cleaned seeds, washing with a 5–10% solution of potassium permanganate is helpful. Rotenone can also be dusted on the seeds to kill any weevils or worms that are in them. Acorns and seeds of genera of the Pea Family are frequently infested with weevils especially if the fruits are picked up from the ground. Place some carbon bisulfide in a container with the seeds, cover the can tightly so no air escapes, and leave a day or so until the weevils are killed. The amount used, and the length of time treated, depends on the quantity of seed. Weevils can do a lot of damage to some seeds unless they are killed as soon as the seed is collected.

Those woody plant seeds that should *not* be allowed to dry out before shipping or sowing, are important to remember. In shipping, they should be mixed with some moist peat and placed in a polyethylene bag. If some can not be sown at once, they can be stratified. This is a common nursery practice of mixing the seed with moist peat or a mixture of peat and sand and storing at an approximate temperature of 41°F. Usually the home refrigerator (not the freezer) will do. Some seeds, like willow, will only remain viable a few days, hence they must be sown immediately. In fact, all in the following group are best sown as soon as ripe, since in any case they will only retain their viability from a few weeks to 6 months if dried.

Alder ..... *Alnus*
Ampelopsis ..... *Ampelopsis*
Angelica-tree ..... *Aralia*
Bayberry ..... *Myrica*
Beech ..... *Fagus*
Buffalo-berry ..... *Shepherdia*
Cedar ..... *Cedrus*
Chestnut ..... *Castanea*
Cinquefoil ..... *Potentilla*
Cryptomeria ..... *Cryptomeria*
Dove tree ..... *Davidia*
Elm ..... *Ulmus*
Franklinia ..... *Franklinia*
Glorybower ..... *Clerodendrum*
Hickory nut ..... *Carya*
Hop-hornbeam ..... *Ostrya*
Hornbeam ..... *Carpinus*
Horse-chestnut ..... *Aesculus*
Katsura-tree ..... *Cercidiphyllum*
Maple ..... *Acer*
Magnolia ..... *Magnolia*
Mahonia ..... *Mahonia*
Nandina ..... *Nandina*
Oak ..... *Quercus*
Papaw ..... *Asimina*
Persimmon ..... *Diospyros*
Poplar ..... *Populus*
Sassafras ..... *Sassafras*
Service Berry ..... *Amelanchier*
Silverbell ..... *Halesia*
Snowbell ..... *Styrax*
Sophora ..... *Sophora*
Spicebush ..... *Lindera*
Spirea ..... *Spiraea*
Stewartia ..... *Stewartia*
Sumac ..... *Rhus*
Sweetgum ..... *Liquidambar*
Tulip-poplar ..... *Liriodendron*
Tupelo ..... *Nyssa*
Walnut ..... *Juglans*
Willow ..... *Salix*
Zelkova ..... *Zelkova*

Seeds of other woody plants should be thoroughly dried first, then placed in tightly closed bottles or polyethylene bags and stored in a cool, dry place. The majority of seeds of woody plants, except those in the first list and others to be mentioned later, can be simply stored this way.

Some seeds require a dormant period before they germinate. When seeds are sown out of doors in the fall, this dormant period is often taken care of naturally. However, unless you completely surround seeds that are nut-like (as dogwoods, viburnums, and true nuts) rodents will frequently find them and eat them before spring.

Stratifying certain seeds is a simple process. Moist peat, or a mixture of moist peat and sand is prepared and a layer approximately an inch thick is placed in the bottom of a greenhouse flat. Then a thin layer of the seed to be stratified is placed on top. Succeeding layers of the mixture of peat and sand and the seeds are placed on top until the flat is full.

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Drying Flowers in a Microwave Oven

Grace Rymer
1755 Ocoee Street, N.W.
Cleveland, TN 37311

Photo by author

A new miracle in the floral design world has come about with the use of microwave ovens. A microwave unit in your kitchen enables you to instantly dry flowers. This can save four weeks of ordinary drying time and produces fresher and more colorful materials for use in floral designs.

Preparation for microwave drying requires a supportive substance for flowers that wilt. This drying agent absorbs moisture so the flower can dry in its natural form.

I have found three drying agents to be most effective. First is Silica-Gel, available in most hobby shops. Second, an equal mixture of borax and corn meal can be used. A third agent which is inexpensive and easiest to use is "kitty litter". I recommend the Hartz brand. It has great absorbing quality and is made of ground clay. For smoother surfaces, such as an orchid or daisy, Silica-Gel is most satisfactory. All of these agents can be used over and over again.

Containers for drying can be any size and made of glass or paper. Dessert or cereal size bowls, shoe boxes and cardboard platters work fine.

Drying Flowers

Here is a step-by-step procedure for drying:

1. Select fresh flowers or leaves you wish to preserve.

2. Select containers deep enough so the drying agent covers the entire bloom.

3. Place a 1/2 inch layer of the drying agent in container. Clip stem of

flower about 1/2 inch long. Then place flowers in agent, face up. With a spoon, sprinkle granules of the agent gently between petals of flowers, making certain every petal is covered and not bent out of shape.

4. After flowers are carefully covered by agent, slip dish into the microwave oven. Also place a cup of water inside the oven to provide moisture. Set timer for about 1–3 minutes, depending upon the particular flower. (Later on I'll explain how to estimate proper oven drying time.)

5. After flowers have been "cooked", remove from oven and leave in agent for at least 36 hours. When removing material from agent, gently tap the flower until all granules are removed.

6. One of the most important problems is storage of these beautiful blooms. I have found that plastic shoe and garment boxes work fine. Place a thin section of styrofoam in the base of the boxes—then place flower head in position into styrofoam with a long corsage pin. Small bank pins are sufficient for smaller flowers. These transparent boxes can then be stacked away until needed.

7. Stem sections can be added to the flowers when needed in design, by using a florist wire 18" long, gauge #20. Floral tape the entire length, forming a loop on one end, then use a quick drying glue. Spread glue lightly over the circle and place flower into position. Cut the wires according to the length needed in your arrangement.

8. Occasionally after the flowers dry they become brittle and may shatter when placed in the design. I have found a practical way to avoid this by using a humidifier. Wave the flower through the steam until it then becomes pliable. After you place the flowers in the arrangement they will again become dry and retain the desired form.

Flowers dried in this manner are not as dry and perishable as flowers dried the old way. They feel and look more like fresh flowers.

Like everything else worth doing at all, drying flowers must be done properly to get the best results. All flowers should be picked just as they are reaching their peak of bloom. If picked past their prime, when they have already started to turn brown, flowers will continue the browning process. Nothing will successfully prevent this. Correct timing, therefore, is the first requisite.

When drying roses, use Silica-Gel. Carefully cover with the agent —sprinkle between each petal until completely submerged. Place in oven for 2½ minutes. Let these stand in the agent overnight. One or several roses can be dried at once—using the same timing.

When drying miniature roses and smaller flowers such as pansies, approximately 1½ minutes baking time is all that is necessary, with about 10 hours set-up time. Daisies, small dahlias, black-eyed susans, zinnias, marigolds, carnations, and small type chrysanthemums again use 2½ minutes—with about 10 hours cooling off period. Large dahlias, peonies, Chinese peonies, large chrysanthemums, bake approximately for 3 minutes—and let stand in drying agent for about 36 hours.

Orchids should be baked in Silica-Gel for approximately 1½–2½ minutes—with set-up time of 24 hours.

Leaves can be microwaved dry, particularly the beautiful ones of interesting color and texture that are available in the fall. Foliage can form the major part of winter arrangements, with just a few flowers used in the focal area.

To dry foliage, place a shallow box lid or platter in the bottom of the oven, next place a section of paper towel over the box, then start layering your leaves with paper towels. Use as many clean leaves as will easily go into the oven. Turn the microwave oven to 1½ minutes. When the bell rings turn leaves and towels completely over and repeat the process, giving a total of three minutes exposure. Remove branches when the leaves are dry and beautiful. No set-up time is needed—they are ready for placement in your design.

Magnolia branches and leaves, ferns of all types, camellia foliage—all may be dried by the same method and timing.

I think it is wonderful to discover a new use for the microwave oven, and at the same time a new means of speeding up the process of the ever popular dried flowers. Dried arrangements by this new method are as colorful as fresh flowers and, needless to say, the results are beautiful.

Quotables

Continued from page 29

Also, backyard trees may be filled with nails, screws, wires, bolts and other metal. This hardware often results from a lived-in yard with fences, treehuts, and clothes lines attached to the tree.

No timber buyer will tackle backyard trees. Just one spike or bolt might cause hundreds of dollars of damage to milling equipment.

The importance of air, or more specifically oxygen, to the roots of plants cannot be overestimated, says Boyett Graves, Virginia Tech horticulturist, Eastern Shore Branch.

Roots respire (use oxygen) just as the above ground portion of the plant does, he says. When the oxygen supply is cut off or depleted, the roots die or are severely damaged. Almost all the oxygen used by the roots is extracted from the air in the pore space between soil particles.

As oxygen in the soil air is used, a constant circulation of new air from above ground takes place. This circulation may become critical in heavy clay soils when soil compaction becomes too great or when all the pore spaces become filled with water for an extended period of time.

The sandier soils generally used for vegetable crops and the soils with high organic matter content that are used for most nursery crop production have larger pore spaces for air exchange, and oxygen supply to the roots rarely becomes a problem related to compaction or excess water. Good plowing, cultivation practices and especially adequate drainage are usually sufficient to maintain open pore space for air exchange in the plant root zone of the heavy soils.

The raising of the soil level around trees and some large shrubs sometimes results in death or serious injury. It is generally felt that the damage is caused by oxygen starvation of the roots due to restriction of free air exchange in the root zone.

Oaks and conifers (pines, fir, cedar, etc.) are the trees that appear to be most susceptible to overfill damage.

The damage may be prevented or reduced by constructing a well around the tree trunk and installing several porous tile tunnels radiating from the well to the outer edges of the overhanging branches. The overfill is placed on top of the tiles which supply air to the root system in the soil under the overfill.

* * * *

During the past four years research has been conducted here (University of Arkansas Agricultural Experiment Station) on characteristic and potential use of two tomato mutants (nor and rin), says Dr. R. W. Buescher, associate horticultural food scientist. Here is a report summarizing results and observations on these mutants and on crosses with them:

Fruit of the nonripening (nor) and ripening-inhibitor (rin) tomato mutants do not soften and develop pigmentation as do normal fruits, although in other characteristics such as shape and size they appear normal.

Because of the lack of softening these fruits can be stored for exceptionally long duration (four or more) months even without refrigeration. These tomato mutants can be used advantageously by the green-tomato pickling industry since they will allow concentrated harvesting of green fruits and subsequent storage, without the problem of ripening.

Attempts to ripen rin and nor fruits have so far been unsuccessful. Red color can be developed in both rin and nor fruits by treating with 2-(4-chlorophenylthio) triethylamine hydrochloride, but this compound is not cleared for use on foods. Ethepon (2-chloroethyl phosphonic acid) also will induce red color development in rin but not in nor tomatoes; however, the maximum red color obtained is only about 10% of that in normal fruits. Softening does not accompany color development with treatment by either chemical.

The greatest benefits are from tomatoes produced from crosses of nor with normal plants. Fruit from such crosses develop pigmentation equivalent in appearance to normal fruits, but their softening is much slower. Since softening is retarded, storage life of the nor hybrid fruits is at least twice that of fruits from the normal parent when harvested firm ripe, and three to four times that of normal fruits harvested as breakers.

The fresh market tomato industry can benefit from nor hybrid fruits because of their retarded softening and greater storage life without reduction in quality.

In addition, these fruits will remain on the plant for longer times than normal fruits, which allows for concentration of ripe fruit and facilitates once-over harvesting. Fruits of the nor hybrid can be harvested when red and still marketed before excessive softening occurs.

Fruits from rin crossed with normal plants also will ripen normally but their storage life, softening, processed quality, and polygalacturonase activity are similar to those of fruits from the normal parent.

Studies are being continued using the rin and nor tomato mutants and their hybrids to study the factors that control tomato ripening and methods for improving storability and processed quality attributes.

* * * *

Packing and moving house plants can be tricky and steps must be taken before, during, and after the move to protect the plants from many hazards, says Fred C. Galle, chief horticulturist, Callaway Gardens.

The three major factors to consider when moving plants are water, temperature and physical damage, he says.

The first step to take when prepar-

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Collecting and Storing Seeds

Continued from page 33

Place the flat in a cool, dark place for 2–3 months (different seeds require different stratification periods). Do not allow the flat to dry out. It should never be actually wet, however. When the seeds start to germinate, remove from the peat mixture and sow.

Seeds which should be stratified and the approximate stratification time in months

Abies sp. (Fir) 2–3
Acer sp. (Maple) most kinds 3
Aesculus sp. (Horsechestnut) 4
Berberis sp. (Barberry) 2–3
Betula sp. (Birch) 2–3
Campsis sp. (Trumpet Creeper) . . . 2
Carpinus sp. (Hornbeam) 3–4
Carya sp. (Hickory 3–4
Cedrus sp. (Cedar) 1–2
Celastrus (Bittersweet) 3
Chamaecyparis sp. (False Cypress) 2
Clematis sp. (Virgin's Bower) 3
Cornus florida (Flowering Dogwood) 3
Cornus kousa (Japanese Dogwood) 3
Fagus sp. (Beech) 3
Fraxinus sp. (Ash) 2–3
Ligustrum sp. (Privet) 3
Liquidambar sp. (Sweetgum) 3
Magnolia sp. 3–4
Malus sp. (Apple) 1–3
Nyssa sp. (Tupelo) 3
Picea sp. (Spruce) most species . 1–3
Pinus (Pine) most species 2
Prunus sp. (cherries, etc.) 3–4
Pseedolarix (Golden Larch) 1
Pyrus sp. (Pear) 3
Ribes sp. (Currant and Gooseberry) 3
Sorbus sp. (Mountain-ash) most kinds 3
Syringa sp. (Lilac) 2–3
Thuja sp. (Arborvitae) 2
Tsuga sp. (Hemlock) 3
Vitis sp. (Grape) 3

There are a few seeds that if sown out doors in the fall may take two years to germinate and so require a double dormant period. To handle these seeds properly, they must be cleaned and mixed with a moist sand-peat mixture and placed in a tightly closed polyethylene bag. Store the bag in a normally heated room (65°–85°F) for 4–6 months, then place the bag in the home refrigerator (but not the freezer) for 3 months, before sowing. Seeds from plants such as the Fringe-tree, Cotoneaster, Hawthorn, Dove Tree, Witchhazel, Silverbell, Holly, Juniper, Sumac, Yew and Viburnum fall into this category.

Finally, there are some seeds which have such hard seed coats that water will not penetrate easily—sometimes for years. These include the Silk Tree (*Albizia*), Siberian Pea-Tree (*Caragana*), Yellowwood (*Cladrastis*), Broom (*Cytissus*), Honeylocust (*Gleditsia*), Kentucky Coffee-tree (*Gymnocladus*), Golden-chain (*Laburnum*), Locust (*Robinia*), Japanese Pagoda Tree (*Sophora*), and Wisteria. For best germination the seeds should be scarified with a sharp file or knife, just enough to make a minute opening through the seed coat for water to enter. An alternative method is soaking in hot water. Water just below the boiling point should be poured over them, and left in the container overnight. The seed should be sown immediately thereafter, without being allowed to dry out. Some of the most difficult seeds in this group may be treated with concentrated sulfuric acid, but an experienced propagator is best qualified to do this.

NOTE: For further reference on seeds of woody plants refer to *"Wyman's Gardening Encyclopedia"*, especially for the dates on which many seeds ripen. Also the Agriculture Handbook (#450) of the U.S. Forest Service entitled *"Seeds of Woody Plants of the United States"* has many interesting facts about methods of handling those types of woody U.S. plant seeds.

A POLYSCIAS COLLECTION

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Is there anyone who doesn't remember the fun of collecting as a child—shells, butterflies, stamps, leaves, flowers or bugs? The thrill of finding that one stamp, perhaps, to complete a set?

As we grow older, we turn to teacups, perhaps, or guns, paperweights, eggs, or even wigs!

As for me, my collection of *Polyscias* started with the finding of one plant that had grown to 40 feet trying to find the sun in a forest of eucalyptus at Pupukea on the North Shore of the Island of Oahu. And how it got there, no one knew, but as it was on my son's property, I was allowed to cut it to the ground. And that day I returned home with enough cuttings for a twenty foot hedge enclosing my patio.

The fun of a garden has always been for me, the joy of being able to trade or barter with other gardeners. So before long every friend had at least one potted *Polyscias scutellaria*, while cuttings of other varieties began appearing in my mail box, at my front door and even with my newspaper!

In Hawaii there are thousands of feet of *Polyscias paniculata*, known to all as "panax" although it actually belongs to the *Aralia* family. This I learned as I became more and more involved in the horticultural world.

My big break came when house guests, who had lived in our guest cottage for two years, decided to build a Japanese style home in Honolulu. Dr. Horace F. Clay, the well known horticulturist, writer, professor and our guest had a large and very miscellaneous collection of plants. He decided to take only those that would fit into an Oriental garden and the rest he simply planned to give away or throw out.

Having been brought up on "waste not want not", I retrieved all of my guests' discarded plants and among them discovered several different varieties of polyscias. My collecting temperature started to rise and I was on my way to a most fascinating hobby.

In 1970, Dr. Donald Wyman, who was then at the Arnold Arboretum, wrote Dr. Donald Watson, who was at the University of Hawaii Department of Tropical Horticulture, to say that when their Arboretum set out to make a study of polyscias, they found that they had only three plants. "I understand", he wrote, "that there is a woman in Hawaii who collects polyscias. Do you happen to know her?" He certainly did and was responsible for my delightful visit to Jamaica Plains, Massachusetts, where the Arnold Arboretum of Harvard is situated. It was Dr. Wyman himself who gave up a whole morning to show me around. Again "truth was stranger than fiction" and how delighted I was to be able to help!

Following this request and much correspondence, a photographer was engaged and large bed sheets were laid out upon the lawn. Samples of each type of polyscias that I had were displayed on the sheets and photographs were taken. They turned out far better than expected and were sent at once to Dr. Wyman.

The enthusiasm of these famous horticulturists, plus their gratitude for my helping with a collection of plants so dear to my heart, only added to my urge to find more cultivars. Before I knew it, I was becoming a pseudo-horticulturist, although my degree was in occupational therapy!

At the time the pictures were taken for the Arboretum I had about 14 different species and cultivars and many of them had not been named. What fun we had! The variety now called "Guatemala" was actually swiped from a garden in that lovely country and brought to me by a horticulturist friend. As we had been asked by Dr. Wyman to name those that had no common names, it became the "Guatemala". Another very tiny tightly curled variety raised by a friend became the "Marianii", and so on.

On the mainland, as we call the United States proper, polyscias cannot be grown as an outdoor plant except possibly in the most southern parts of the country in the summer, in semi-shade. It does not grow as easily or as luxuriantly as in Hawaii,

Polyscias felicifolia 'Golden Prince'

Photo by author

but can be a very satisfactory indoor plant if put near a sunny window on the west side of the house. Be careful about over-watering or over-fertilizing and any new growth will almost certainly appear in the summer, even if you don't move it. Perhaps it has a built in calendar!

Many fertilizers are used for these plants in Hawaii; personally I like Osmocote which is applied once every 4 months; good for the lazy or busy plant person. If your polyscias are indoors, water them well twice a week and do pour the water out of the saucer that you may have under them. Nobody likes wet feet!

Try to find any of the following at your nurseries: *Polyscias balfouriana,* which has thick leathery green leaves, and the cultivar *P. balfouriana marginata,* which looks like a geranium. The *P. balfouriana* 'Pennockii' has large round pale green to yellow leaves edged with a darker tone of green—a very handsome plant, and *P. balfouriana* 'Golden Prince', which loves the sun and turns bright yellow is another of my favorites. In Hawaii, the *P. crispa* with dark papery curly leaves is well known as is its sport or mutation *P. crispa* 'Dowsett' which I have had the fun of raising. Also look for *P. fruticosa* or the "Ming Tree", *P. fruticosa elegans.* This last is often called parsley and can be used beautifully in flower arrangements; it comes from Southern Asia and Polynesia and has never seen China!

If you want to try this lovely plant, by all means do so, but even in Hawaii we do not leave them in the house for more than two or three weeks. Several plants for the same spot are recommended so that they may be changed about. On the mainland or in a condominium this is not possible and it would take great care to keep your polyscias growing well unless you have a greenhouse and are very stubborn.

There are many other *Polyscias* varieties. I have mentioned only the more common ones and new ones are constantly appearing. If you have no luck, just stick to your "rubber trees" and your aspidistra!

Books

By Tom Stevenson

PLANTS FROM 9:00 TO 5:00
Gardening Where You Work
by
Frances Tenenbaum
Charles Scribner's Sons
New York, N.Y.–1977
96 pages, well illustrated, $7.95

About ten years ago, I got a job in a brand-new, modern suburban office building, with large windows and squinty-bright fluorescent ceiling lighting, says the author. In the lobby, which had floor-to-ceiling windows, the telephone operator-receptionist sat on a slightly elevated platform solidly banked with plants.

Naturally, the job of caring for the plants fell to her, and she was conscientious about it, regularly brushing off their plastic leaves and flowers with an old-fashioned featherduster.

Times have changed.

The greening of the offices where people work is a happy outgrowth of the phenomenal boom in house plants.

This book is not intended to replace your basic encyclopedia of house-plant care she says. It is directed at plants in the working environment, with the emphasis on the differences in the selection, placement, and care of the office plant versus the home plant.

If you intend to hire an interior landscape designer or firm to plant and maintain your office plantings, the information in this book should go far to help you judge the quality of the work. Most of all, I hope employers will gain an understanding of what plants can do to improve the quality of the environment for their employees.

The book lists some 40 varieties of plants, large and small, flowering and foliage, hanging and standard, which can be depended upon to survive the special maintenance conditions which office space and hours demand.

MCCALL'S GARDEN BOOK
Written Especially for McCall's
by
Gretchen Fischer Harshbarger
Simon and Schuster
New York, N.Y.–1977
520 pages, well illustrated, $6.95
paperback

Here is everything you need to know to create a flourishing garden just right for your home, says the publisher, step by step, season by season, plant by plant, wherever you live. How to grow luxuriant lawns, flowers, shrubs, trees, fruit, vegetables, even if you have never gardened before. This is rather a tall order but the author comes close to achieving it.

If I were a flower, she says, my name would be Harshbarger gretchen brown-eyed.

Here are some tips for beginners provided by the brown-eyed Gretchen:

Don't get into emotional knots about gardening. Enjoy it.

Don't be too ambitious the first year or so, while you develop your skill. Take on just a little at a time.

Beware of impulse buying. Make a plan, and know why you need a plant and where you are going to put it before you start shopping.

Get the basic plants in first, working on a long-term plan. The first to go in should be your major shade trees.

Remember that plants develop rapidly. Shrubs and trees will grow large sooner than you think.

Don't plant bulbs and flowers in a long single-row. They'll look better in groups.

Keep a notebook of suggestions to yourself about what you want to plant where, dates to do things, and dates you have done them.

You must thin annuals. Otherwise they will stretch up and become lanky.

Get ideas by visiting other gardens. Drive about to see what is in bloom each week.

Learn identification of plants by sending for illustrated seed and nursery catalogues.

HOW TO GROW, PRESERVE & STORE ALL THE FOOD YOU NEED
by
Eddy Rice
Reston Pub. Co.
Reston, Va.–1977
304 pages, well illustrated, $9.95

This is a very good guide for growing vegetables for immediate use or for canning, freezing, preserving and storing. It covers preparation of the garden plot, soil testing, fertilizers, organic gardening, what and when to plant, and how to plant and care for 50 types of vegetables and fruits.

"I would suggest that most of us have grown fat and lazy," says the author, "and become entirely too dependent on supermarkets and convenience foods.

"It is just possible that gardening, canning, freezing, preserving and storing your annual supply of food will serve to eliminate many of the ideas you now have with regard to what to do with your spare time.

"This is a real challenge—a return to our true American heritage, the pioneer spirit—the idea of each man's being able to provide for his family, come what may."

READER'S DIGEST ENCYCLOPAEDIA OF GARDEN PLANTS AND FLOWERS
Edited and designed by
The Reader's Digest Association
W. W. Norton & Co.
New York, N.Y.–1977
799 pages, well illustrated, $15.00

This is a British encyclopaedia and a first rate one. It contains detailed descriptions of over 2,000 plants and flowers and many thousands of varieties. Most of these plants are equally at home in American gardens. There is one disadvantage: the varieties most popular in England are not the ones grown in the U.S.A. However, any American encyclopaedia (this is the way they spell it) two or three years old will not include the new varieties of annuals, perennials and vegetables (there are a lot of new introductions every year).

The fine thing about the book is the wealth of information it provides. There are over 2,000 full-color photographs (good ones), and more than 800 black-and-white drawings giving an over-all idea of the growth habits.

How to prune, propagate, the light, moisture and soil requirements, and hardiness of each of the species is included. All the facts that a gardener needs to know are gathered together in a single comprehensive entry.

Every entry has been triple-checked by leading horticulturists, the editors say. However, latest research in the U.S.A. has shown a few of their conclusions to be in error. But it should be said that this is not serious enough to appreciably lessen the value of the book.

THE DON'T THROW IT GROW IT BOOK OF HOUSEPLANTS
by
Millicent Selsam and Deborah Peterson
Random House
New York, N.Y.—1977
142 pages, illustrated, $8.95

Millicent Selsam is the author and editor of numerous children's books on the natural sciences, and has taught biology at Brooklyn College and in New York City high schools. Deborah Peterson has lectured throughout the Northeast on growing plants from fruits and seeds and is a frequent speaker for the New York Horticultural Society and for

the New York Indoor Light Gardening Society.

Their book gives specific, easy-to-follow directions for growing house plants of all kinds from pits or seeds or other plant parts.

"In our kitchens right now (last winter)," they say, "we have sweet potato vines climbing up the window, beans, peas, lentils and peanuts sprouting in pie plates, casseroles boasting lush turnips, beets, radishes, kohlrabi and Jerusalem artichokes, and a row of fig trees growing in a plastic box. In big bowls on our tables we collect the fruits available in the market each week. It's not so much that we love to eat the fruit but that there are seeds inside all those fruits that can grow into plants.

"We have tried everything, but in this book we will leave out our failures and tell you how to grow only the plants with which we have succeeded.

"Start with a few seeds or tubers and soon you will get the feel of it. Before long you will want to plant more and more, and that's when the fun begins."

WILDFLOWER PERENNIALS FOR YOUR GARDEN

A Detailed Guide to Years of Bloom from America's Long-neglected Native Heritage
by
Bebe Miles
Hawthorn Books, Inc.
New York, N.Y.–1977
290 pages, well illustrated, $10.95

This book was specifically written for the home gardener, says the author.

"I have selected the 100 best perennial mainland American plants that in my experience offer the most for garden use. Related species with garden possibilities are also briefly mentioned so that there are perhaps 500 or so additional native plants covered. With a few notable exceptions, these are the easiest members of the native flora to cultivate. They are also, in my opinion, the showiest or most useful for one reason or another.

"The drawings are designed to give you a view of the physical form of both flower and plant. While the flowers are surely the first thing anyone thinks about, they are not always the most important factor in placing a plant in the garden.

"A species that has interesting foliage all season may offer more to the total picture than one with gorgeous but fleeting bloom. Ideally, a garden contains a blend of both, so that there are not only exciting flowers from time to time but a general aura of pleasant green during the rest of the growing year. The artist shows you how each plant looks in its mature growth."

Growing Roses

Continued from page 9

My Selection of the Best Roses for the Average Garden
Those marked with an asterisk (*) are the most trouble free and easiest to grow

Hybrid Tea
*Carla
Century Two
*Chicago Peace
*Chrysler Imperial
*Command Performance
*Confidence
*First Prize
Fragrant Cloud
Gypsy
Helen Traubel
Isabel de Ortiz
*King's Ransom
*Lady X
*Miss All-American Beauty
*Mister Lincoln
Oldtimer
*Oregold
*Peace
*Pharaoh
Pink Favorite
Portrait
*Royal Highness
Sunrise-Sunset
*Swarthmore
*Tiffany
*Tropicana
White Masterpiece

Grandiflora
*Arizona
Aquarius
Bienvenu
Camelot
Cherry Glow
Golden Girl
*Montezuma
*Mount Shasta
*Queen Elizabeth

Floribunda
*Angel Face
Apricot Nectar
*Circus
Elizabeth of Glamis
*Europeana
Faberge
Gene Boerner
*Ivory Fashion
*Little Darling
Matador
Orange Sensation
*Redgold
*Rose Parade
Sea Pearl
Spanish Sun
Zorina

Miniature
Beauty Secret
Chipper
Cinderella
Easter Morning
Judy Fischer
Magic Carrousel
Mary Marshall
Over The Rainbow
Red Imp
Simplex
*Starina
Toy Clown
Yellow Doll

Climbers
Don Juan
Golden Showers
*Red Fountain
Rhonda

Some Major Sources of Roses
Armstrong Nurseries, P.O. Box 473, Ontario, California 91764
Conard-Pyle Co., Star Roses, West Grove, Pennsylvania 19390
Fred Edmunds, Wilsonville, Oregon 97070
Jackson & Perkins Co., 1 Rose Lane, Medford, Oregon 97501
Joseph J. Kern, Box 33, Mentor, Ohio 44060
Kimbrew-Walters Roses, Wills Point, Texas 75169
Mini-Roses, Box 4255, Station A, Dallas, Texas 75208
Nor'East Miniature Roses, 58 Hammond St., Rowley, Massachusetts 01969
Sequoia Nursery, 2519 E. Noble, Visalia, California 93277
Tillotson's Roses, 802 Brown Valley Rd., Watsonville, California 95076
Melvin E. Wyant, Johnnycake Ridge, Mentor, Ohio 44060

A CITY HERBAL

A Guide to the Lore, Legend, and Usefulness of 34 Plants That Grow in the City, With Recipes for Breads, Salads, Seasonings, Teas, Dyes, Cosmetics, Potpourris, etc, etc.
by
Maida Silverman
Alfred A. Knopf, Inc.
New York, N.Y.–1977
180 pages, well illustrated, $10 hardcover, $5.95 paperback.

The plants described in this book grow wild in cities, says the author, in vacant lots and waste places, along roads and highways, in the poorest of soils, and from cracks in the sidewalk where there seems to be no soil at all, and they manage to flourish and thrive.

"All of them were highly esteemed at one time or another in human history," says she. "Some provided medicine and food, others were the source of beautiful colors for textiles. Many were used in magic and witchcraft.

"I have written about 34 plants that are special to me, all of them worthy of notice, fascinating, and even beautiful, once you get to know them. Many are edible and delicious, and almost all are useful in one way or another.

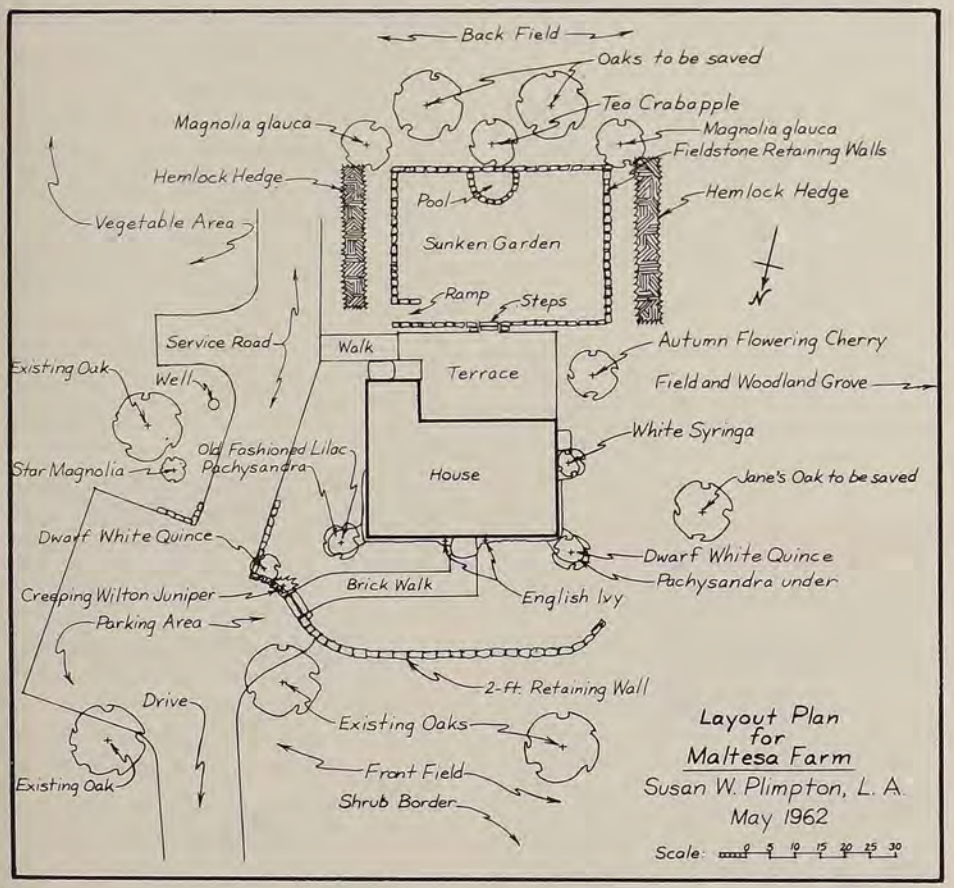
"My wish in writing and illustrating this book is to share these discoveries with you. If I succeed in doing so, it will make me very happy."

Maltesa Farm and Sixteen Years

Susan W. Plimpton,
Landscape Architect
Pojac Point, North Kingstown,
RI 02852

Sixteen years ago my husband and I purchased 16 acres of bullbriered, rocky, second-growth woodland in North Kingstown, Rhode Island. We called our place "Maltesa Farm" after our most loved possession, a sturdy little bugeye ketch, discovered on the Chesapeake Bay and brought along with us when we made the move from Philadelphia to Rhode Island in 1960. The boat has since been sold, but we still have the name and our loyalties have shifted to our land and plants.

Recently we found our original simple design plan in our files, one that we made during the winter of 1961-62 while our house was being built. This conceptual drawing merely designated areas as we wanted to use them and specified a few plants that seemed appropriate. There are no botanical names, no grades specified and no construction details.



Left: Vegetable Area—Development includes outbuildings that serve horticultural needs.

Today we are simply astonished to realize how we've actually made it all happen over the past years. If ever there was an argument for having a landscape plan and following it, then we were holding the evidence in our hands.

The house itself is a simple New England farm house with a gambrel roof and fitted out with wide-board floors and lots of working fireplaces. We are New Englanders by heritage and somehow a feeling has developed between ourselves and this poor infertile ground. Lovingly we hunted for old brick to build our front walk and terrace. With true affection we took apart the walls of an old farm nearby and rebuilt them to carry out our design. And we found a never ending supply of rocks in working the fields and building a paddock.

Over in the vegetable area, we've accumulated a fine collection of outbuildings to serve our varied horticultural needs. The oldest dates from the 1840's. Each building we carefully dismantled, moved and restored as tool and storage sheds.

Now 16 years later, the trees and shrubs on the plan still form the mainstay of planting, all have grown and prospered. The bullbriers have surrendered to relentless mowing and tiny azalea cuttings are growing into graceful maturity.

America's Vagabond Tree

Continued from page 20

dents depend on its bark and twigs. Twigs and small branches are browsed regularly by deer, elk and moose when other food is in short supply. Porcupines eat aspen bark and often damage the tree. Woodpeckers and sapsuckers find insect food in the aspen, and drill holes for their nests in dead trees.

Once regarded as an inferior "weed species", quaking aspen is now looked upon as one of our major hardwood forest species, with the potential of helping fulfill our future timber needs. Quaking aspen produces one of the softer, lighter hardwoods, with a specific gravity of only 0.35. It is relatively low in strength and stiff, but seldom splits when nailed. The largest portion of aspen now harvested goes into the manufacture of pulp products—newsprint, fine book and magazine papers, and insulation board. As recently as 1966 the Lake States provided over 2 million cords in one year for pulpwood. Aspen lumber is made into a host of products such as boxes and containers, crating pallets, furniture parts, interior trim, excelsior, particle board and various sorts of turned products.

The late Donald Culross Peattie once wrote about quaking aspen: "Despised once as the veriest weed of a tree, Popple, as the lumberman prefers to call it, has in our age of paper come to the fore as a valuable pulp source, not, like spruce, for newspapers, but for magazine stock. Deflated boom towns of the worked-out pineries are coming back where Popple grows. When it has been cut, it reproduces itself within 50 years by its unaided exertions and fertility. And so what seems like a shallow-rooted, frail vagabond of a tree may prove to have more value than many a species with a more solid reputation. All that—and charm as well!"

Gardener's Marketplace

Quotables

Continued from page 36

ing them for their journey is to soak them well with water. Most plants should be removed from their container, the pots packed separately and the root balls wrapped tightly with dampened newspaper. Plants with loose soil should be wrapped in sphagnum moss first, and then in dampened newspaper. Enclose root ball in plastic bag or wrapping.

The foliage of plants should be protected by using paper sleeves. To make a sleeve, use newspaper measured the length of the plants, tape the paper together in a cylinder shape wide enough to slip under the entire plant. Then pull the sleeve up over the plant so the foliage is folded upward.

Another method to protect and retain moisture is to use styrofoam peanuts. Use a box which is taller than the plant, and completely fill the empty space with styrofoam particles. There are also some insulated styrofoam bubble sheets which can be used in packaging as additional insulation and protection.

Wrapping plants thoroughly keeps them moist throughout the journey. It is essential to retain this moisture. The major hazard of moving plants is extreme hot or cold temperatures so add a layer of dry paper, inside the container, which will act as an insulator.

Cold weather moves require additional paper layers up to an inch thick. Ideally, plants should be wrapped and packed in individual, styrofoam lined boxes. Movers should be aware of the temperature during the journey. In the winter they should park the van in the sun and in the summer in the shade.

After the plants are prepared for the move, pack them close together in boxes to stabilize them. Pack more paper in between each plant to insure its safety. Brace the plants well inside the van to avoid sliding around during the move.

Movers should be aware of where the plants are placed in the closed van because gases, carbon dioxide and carbon monoxide will kill the plants.

Large plants must be left in their containers. Soak them well. Wrap the root ball in dampened paper and the foliage in a paper sleeve. Set upright but well braced.

Succulents should be kept in pots because of their loose soils. They travel best dry.

Soft foliage plants will rot with too much moisture if they are wrapped for a long period of time.

Put hanging basket plants in individual boxes and pull foliage into box after soaking them well.

Outdoor shrubbery needs special care. A nurseryman should supervise digging up the plants and wrapping them in burlap and then cover them with plastic.

When the plants arrive at their destination, they should be unwrapped immediately and if necessary watered down before placing in the home. It is normal if a few leaves drop off, so don't be alarmed.