

AMERICAN HORTICULTURIST

JUNE 1983



AMERICAN HORTICULTURAL SOCIETY'S 38th ANNUAL MEETING

Join Us in Philadelphia

Last year Philadelphia celebrated its 300th anniversary—a happy marriage of people and plants. Founded as the City of Brotherly Love and as a “greene Country Towne,” it and the surrounding Delaware Valley today boast the largest concentration of botanical gardens and arboreta of any region in the nation. We will explore this region rich in gardens and garden history during our 38th Annual Meeting September 14-17.

In association with the Pennsylvania Horticultural Society, we will visit such well-known gardens as Longwood, the Morris Arboretum, Andalusia, Chanticleer and the Highlands. We will have the rare opportunity to view



The Morris Arboretum

Elizabeth D. Hume

no fewer than 10 other outstanding private gardens. Lectures and panel discussions are on our itinerary, as are such special highlights as cocktails and a private dinner at Longwood and our President's Banquet, which will take place at the Franklin Plaza Hotel.

We will be staying at the new Franklin Plaza, conven-

ient to most of the historic sites of Philadelphia. Sign up for our Post-Conference Tour and visit even more lovely gardens and arboreta in Pennsylvania, New Jersey and New York before returning to Philadelphia for the grand finale, PHS's well-known Harvest Show.

If it's gardens you want to see, don't miss Philadelphia this fall. Look for a brochure in your mailbox later this month, or write the Education Office for a registration packet.



American Horticultural Society
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Holly Shimizu is the first curator of the only national herb garden established in this country. Read about Holly and this garden's development beginning on page 15. Photograph by Jeanne Shojaat.

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ON THE COVER: "Morning Glory." 1952. 16" x 20". Pastel on paper. Happily for those of us who enjoy botanical art, Henry Lindenmeyr began painting flowers during the 1930's. Though he was a graduate of the Art Students League in New York, he played down his talents; very few of his paintings were exhibited during his lifetime. Today, however, his wife and children are reassembling the collection of his botanical work and making it possible for us to enjoy his accomplishment. His pastels and oils have been shown at the Horticultural Society of New York, the U.S. National Arboretum, the Virginia Museum of Fine Arts and Carnegie-Mellon University. Posters of some of his work also are available (see page 39). The American Horticultural Society is pleased to feature "Morning Glory" on the cover of this issue.

ON BECOMING A CONVERT

When I was hired by the Society in 1979, it certainly wasn't because of my horticultural expertise. I felt secure in my knowledge of magazines and the publishing field, but as a gardener I didn't trust myself to be responsible for anything more than a small collection of common house plants.

Fortunately, I've learned a few things about plants in the last four years. In fact, I've become a convert and can no more imagine a future without gardening than a park without trees. Now I must add to my already unmanageable reading list the works of gardeners such as Vita Sackville-West, Russell Page, Rosemary Verey, Eleanor Perenyi, Katherine White. And to my travel wish list I must add the names of Wisley, Sissinghurst, Hidcote and all the other lovely English gardens, as well as our Pacific Northwest, Japan and the entire continent of Australia.

With my knowledge have come new opinions (I have discovered gardeners *are* an opinionated lot): the rose may be the world's favorite flower, but give me a peony any day; we Americans should be proud of our native wildflowers and use them more in the garden; bigger is not necessarily better. I find I often prefer the species to the hybrid; catalogs without indices and those whose listings are not in alphabetical order, by botanical name, drive me mad; American nurseries don't offer nearly enough variety in their plant selections; people who garden regularly are generally a contented, well adjusted lot; botanical names for plants are absolutely necessary, but common names still have more charm; there is no such thing as a spot where nothing will grow—the right plant just hasn't yet been found; good gardens are *planned*.

Certainly my new appreciation for plants and gardening is the thing I am most thankful to the Society for giving me, but I am also grateful for the opportunity I've had to meet new people and visit places I might never have seen otherwise.

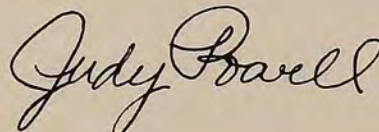
I read an article about Longwood in a magazine once, but I might never have discovered what a remarkable place it is unless I had gone there on an AHS visit. Nor would I have been able to see the lovely private gardens of Savannah in the spring or the wonderful research facilities at Missouri Botanical Garden or an unforgettable rock garden tended with loving care by its owners in Massachusetts.

Many of my most treasured new friends are pen pals. Regularly I correspond with gardeners whose faces I have never seen but whose gardens I feel sure I would recognize in an instant. I am especially touched by those whose gardens have given them solace as they deal with severe illness, physical handicap or the loss of a loved one.

I think I made a wise decision to move from Texas to Virginia four years ago and come to work at River Farm. I am happy to have no regrets, for, as you may have guessed by now, this editorial is not just a thank you letter to the American Horticultural Society, it is also a farewell. I will leave AHS the end of this month as an employee, but I will certainly remain as a member and friend.

The Society's publications will be in the capable hands of Barbara Ellis, who is now Associate Editor of *American Horticulturist*, and whose two years of experience with AHS should make the transition a smooth one. She will continue to have the support of Lucinda Weakland and Louise Baughn, whose able assistance over the last four and two years, respectively, made my job immensely easier.

My new venture doesn't involve plants, but its success may allow me to fulfill a long-held fantasy: to buy a small house in the country and establish a lovely English-style cottage garden surrounding it. Who knows, I just may become a good enough gardener some day to be featured in these pages!



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THE EVENING PRIMROSE FAMILY

The evening primrose family, Onagraceae, is distributed worldwide, but it is most diverse in the western United States and Mexico where all known genera occur. Herbs (or rarely, shrubs), growing in either dry or moist habitats, the majority prefer temperate or subtropical zones. Many herbs with showy flowers are included, among them *Oenothera*, *Fuchsia*, *Clarkia*, *Epilobium* and *Zauschneria*. The chief economic value of the family is in ornamental uses.

Family characteristics include alternate, opposite or whorled leaves, bisexual flowers having four sepals and four petals and eight stamens in whorls. The flowers may be solitary in the leaf axils or grouped in spikes or racemes. The fruit is a dry pod, often holding silky-haired seeds, or it may be a berry.

The evening primrose family has been the subject of considerable cytogenetical study; intense genetic investigation began over 60 years ago, and the evening primrose, *Oenothera*, has long been used to illustrate principles of plant genetics.

Americans ought to have a special interest in evening primroses because they are almost entirely American—North or South—from 90 to 100 of the known species being natives of North America, scattered over many of the states. California has a large allotment of native evening primroses, both perennial and heat and drought-loving annuals.

Oenothera species are prized for their showy, bright, prevailing yellow but also rose or white flowers. Some species are day-blooming, the sundrops; others, night-blooming and fragrant. Annuals, biennials and perennials, selected species have special garden uses.

Oenothera biennis, the common evening primrose, is biennial. It is common in Europe, having been introduced there from its native Virginia as early as 1619. The large yellow flowers of this night-bloomer are fragrant and attract moths. It is a three-foot weedy, branching plant not usually of garden interest, but it is of commanding appearance in natural or meadow gardening. Other night-bloomers are *O. speciosa*, from the Plains states, which has cupped, fragrant white flowers that turn



Pat O'Hara



Block's

LEFT: *Fuchsia* hybrid. TOP: An evening primrose, *Oenothera caespitosa*, blooms amid sand verbena. ABOVE: *Clarkia cylindrica*.

pink soon after they open, and from South America, *O. odorata*, a fragrant yellow-flowered species.

References on edible wild plants include the roots and leaves of *O. biennis* on the lists. Folk legends have led to inquiries as to potential medicinal properties of this evening primrose. Recently there has been a flurry of interest in the numerous reddish seeds of *O. biennis*. *Oenothera* varieties

have been grown for years both in the United States and in Europe for the oil contained in the seed. Seeds are about 29 percent oil by weight. Now with modern technology the oil is extracted and an acid contained therein is removed and used as a diet supplement with supposedly remarkable attributes, resulting in a rapid rise in fame of the evening primrose. It seems absurd that this common roadside weed might contain an essential nutrient absent from our varied modern-day diet or that a deficiency of this one nutrient might be implicated in a wide range of serious bodily disorders. The tremendous amount of research now being directed at evening primrose and its oil-bearing seeds seems to confirm its efficacy in treatment of various diseases. This research suggests that primrose oil may be of use in treatment of heart disease, arthritis, eczema, multiple sclerosis, alcoholism and obesity.

Respected medical researchers are still extremely cautious about claims for the curative powers of evening primrose oil. Meantime, as a dietary supplement, the oil capsules are widely available in health food stores with the label that they may "help treat alcoholism, eczema, and more."

8 Reasons to Join The American Horticultural Society Today!

1. American Horticulturist

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7. Meet fellow gardeners

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8. Visit River Farm

Membership also entitles you to visit and tour AHS headquarters at historic River Farm in Virginia. Enjoy our many official plant display gardens, including our AARS rose garden (500 plants and almost 60 cultivars) and a new addition last year—our six-acre wildflower meadow.

No matter what your interest in gardening may be, the American Horticultural Society can provide you with the information and know-how you'll need to make your gardening easier and more enjoyable . . . all year long.

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Oenothera species grouped as sundrops or suncups offer possibilities in the garden different in some ways from the species usually referred to as evening primroses. These are perennials bearing yellow flowers with stems and leaves often tinged red or bronze. The qualities of *O. pilosella*, *O. fruticosa*, *O. glauca* and *O. perennis* are described in an article beginning on page 31 of this issue of *American Horticulturist*.

From an ornamental viewpoint, the most important genus of Onagraceae is *Fuchsia*. Fuchsias are native to Mexico, Central and South America and New Zealand. The species *F. triphylla*, on which the genus was founded, was discovered in 1703 by Father Plumier and was named for Leonhard Fuchs (1501-66), botanist and physician at Tubingen University.

Fuchsias are woody, sometimes vigorous, shrubs or they may range from ground-creeping species to small trees. Attractive red and purple pendent flowers drape the branches. These are tubular, four long sepals framing four shorter petals, the latter frequently of a different shade. Many kinds produce juicy, edible berries.

In the temperate regions of North America and Northern Europe, fuchsias are rarely hardy; over much of the world they must be grown as greenhouse plants. The New Zealand species and one from South America, *F. magellanica*, from the Straits of Magellan, are the hardiest.

F. magellanica comes from the southernmost tip of South America and is hardy in Zones 5 to 6 in the Eastern United States. Its F₁ hybrid 'Riccartoni' is the most floriferous; it will grow outdoors with protection as far north as New York City and British Columbia on the west coast. Massive hedges of 'Riccartoni', with its scarlet and dark-purple blossoms, amaze American travelers to the islands off the west coast of Scotland and in southwest England and Eire. This variety has even become naturalized in some areas. This hardy fuchsia was the subject of an article in *American Horticulturist*, Vol. 57, No. 2.

F. procumbens, from New Zealand, is hardy in Zone 10; this prostrate creeper with orange flowers and persistent red berries is ornamental as a hanging basket plant.

After the discovery of one species of fuchsia by Plumier, others were found and sent to Europe for propagation and hybridization. Plant hunting expeditions sponsored by nurseries and other organizations were quick to realize the profit-

ability of introducing new species. These beautiful and showy plants received much attention, particularly in England and France where many new hybrids were created in rapid succession. From native forms, which were largely red and purple or entirely red or crimson and single, all of the various colors and forms have been obtained.

The first garden fuchsias were variants of *F. magellanica*. Because of its versatility, early hybridizers concentrated on using it as a parent. Most modern hybrids have *magellanica* in their family tree. The general name *F. X hybrida* is given to the innumerable tender hybrids that are the popular greenhouse, hanging basket and pot plants of today. The majority of new varieties put on the market each year originate in California; many are bred to suit West Coast growing conditions. Americans demonstrate a preference for trailing types suitable for hanging baskets, whereas the British lean toward bush and upright types. There is a multitude of fuchsia specialist nurseries, mostly concentrated in California. For enthusiasts, fuchsia societies in the United States and Canada are: National Fuchsia Society, South Coast Botanic Garden, 26300 Crenshaw Blvd., Palos Verdes, CA 90274 and British Columbia Fuchsia and Begonia Society, 2175 West 16th Avenue, Vancouver, BC V6K 3B1.

The fuchsia had a history all its own, well before its discovery by the Western World. A great number of species originate in countries that were the empires of two great civilizations, the Aztec of Mexico and the Inca of Peru. Many of the tribes that were scattered far and wide after the fall of the Inca empire owed their lives to the fuchsia berries on which they lived while fleeing from the Spanish. Even now, many Indian tribes relish fuchsia berries, which have high vitamin content and are often pleasantly flavorful.

Six species are found in the islands of New Zealand. *F. excorticata*, of tree-like proportions, is common to the New Zealand bush, where it is recognized by the cinnamon-brown bark hanging in strips. The bright-blue pollen for which it is noted was used by Maori maidens as a face powder in imitation of the dusting of blue on pollinating birds.

Familiar as California fuchsia, *Zauschneria* is a Mexican genus of four species. *Z. californica*, hardy in Zone 9, is best known. It bears many narrow, tubular scarlet flowers in autumn. Erect or decum-

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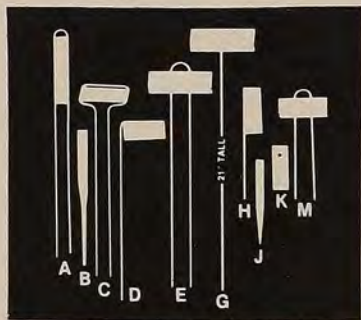
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STRANGE RELATIVES CONT'D

gent, it is a useful wall cover plant, and its drought resistance is an asset.

Fireweed, rock fringe, river beauty—do these names excite the imagination? Yes and no. Fireweed is a weed in truth, but it lends a rosy glory to wild areas when it blooms. Rock fringe clings to gray arctic rocks. River beauty stands defiantly on sandbars in midstream to get its life sustaining moisture. All these are epilobiums.

Clarkia can be successfully grown in the garden in areas where nights are cool or in the greenhouse for winter blooms.

Most widely recognized has to be *Epilobium angustifolium*, the fireweed or great willow herb, found growing naturally over much of North America and Europe. A long-blooming perennial, it displays many-flowered spikes of rose to magenta hues followed by capsules containing seeds bearing milky tufts of hairs that waft the seeds far and wide and account for the spread of this plant.

Fireweed springs to life following forest fires and covers the burned over area with dense growth of three- to five-foot plants. It was one of the first plant pioneers in the Mt. St. Helens area following the 1981 eruption there. After World War II, the people of London were amazed to see flowering plants lining the bomb craters. Speculation was rife as to how they got there for some had never before been seen by Londoners. One of these flowering plants was fireweed, whose wind-borne seeds had been carried aloft from who knows where. Fireweed grows also in riotous profusion amid the blackened remains of the burned taiga in Alaska where, to its liking, water of the thawed surface soil produces a near-bog above the permafrost.

Epilobium angustifolium is important as a source of light-colored, high quality honey in much of eastern Canada, in some of our north central states and on the Pacific Coast. A natural stand in one locality may yield great crops of fireweed honey for two or three years before the plant is

crowded out by other growth. And just incidentally, new leaves, young shoots and flower buds of fireweed are listed among edible wild plants of North America.

E. latifolium, river beauty or red willow herb, is similar to fireweed except it is not so tall. It too is edible; the pith of the stalks is said to have been used as food by American Indians. Growing in rocky debris of a river bed, its three-inch magenta flowers deserve the name river beauty.

Rock-fringe is *E. obcordatum*, a prostrate plant of the high Sierras of the western United States. *E. rigidum* has been described as the most beautiful and desirable of all the decumbent epilobiums for rock gardening. In the Siskiyou Mountains it forms close mounds of light-green foliage above which are borne, on short stems, dense racemes of bright, clear-pink flowers about an inch across.

Clarkias constitute a group of annuals with showy flowers in the upper axils or in terminal spikes; the species, many of which originate in California, have been much improved by domestication. This delicate-flowered native was named in honor of Captain William Clark (1770-1838), who with Captain Meriwether Lewis, took the first transcontinental expedition across the Rocky Mountains in 1806. Now offered in some seed catalogs as a rare annual wildflower, or as rocky mountain garland, some *Clarkia* species are hardier than others; they can be successfully grown in the flower garden in areas where nights are cool or in the greenhouse for winter blooms. Red-ribbons, farewell-to-spring and orchid godetia are other garden names.

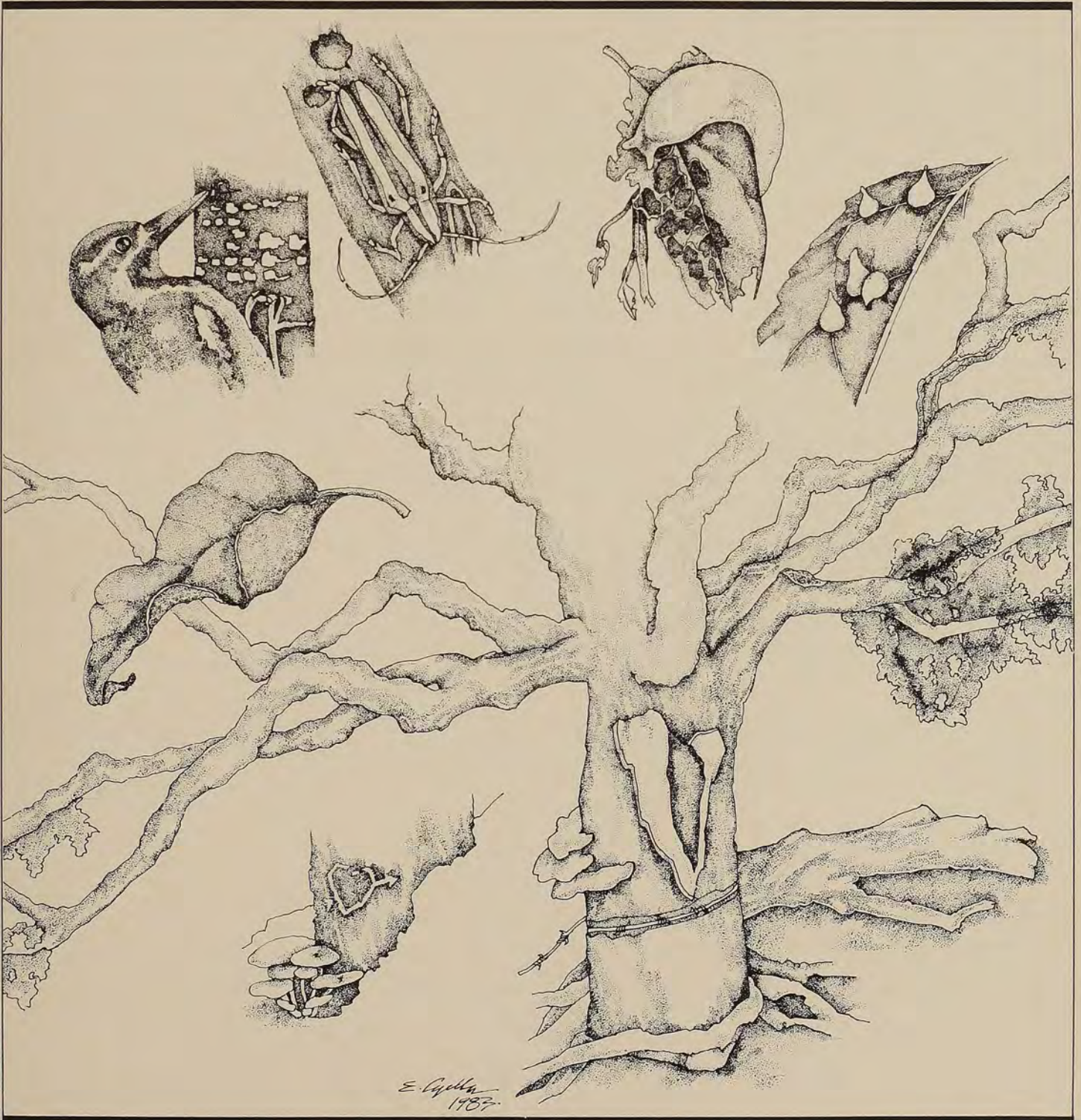
Of different character than other species in the evening primrose family is *Ludwigia*, a genus of aquatic or semi-aquatic plants, often floating, bearing yellow or white flowers that are either solitary and borne in the leaf axils or in terminal clusters. The aquatic forms can be used in the aquarium or in pools. The round red and green leaves of *L. natans* add a spot of floating color.

A few additional representatives of Onagraceae are of horticultural interest, and many can be found in any wildflower field guide. The riches of the evening primrose family all together have added immeasurably to the glory of the garden and beauty of the wayside. ☺

—Jane Steffey

Jane Steffey is the Society's horticultural advisor.

READING TREE LEAVES: A GUIDE TO DIAGNOSING SYMPTOMS



Elizabeth Ayella

When the leaves on a tree fall to the ground, it's a sure sign that some change is taking place in that tree's life cycle. The change may be normal—it's October and the lovely magenta leaves of your prize maple have fulfilled their purpose for the season; or the change may be abnormal—the leaves on that same maple turn brown, shrivel and fall to the ground in July. Something seems clearly wrong, but what? Making one's way through the maze of clues left by the leaves of woody ornamentals (changes in their color, texture, shape or their loss altogether) can be confusing, but deciphering the clues can also prevent the loss of a favorite—and valuable—addition to your garden. These changes may indicate the presence of injury, insects, diseases or adverse environmental conditions.

Deciphering the messages those symptoms convey is a skill that improves with practice. As gardeners, we certainly do receive ample opportunities to work upon our diagnostic techniques. The brief guide that follows should help you to recognize those abnormal leaf symptoms that may call for your intercession on a plant's behalf. This guide will also increase your awareness of the multitude of different factors that influence a plant's well being.

Foliar Symptoms and Nonfoliar Injuries

Any injury to a plant's roots, trunk or branches that interferes with the movement of water from the roots out to the leaves will invariably lead to symptoms of water stress, including leaves that are undersized and off-color, to leaves killed for want of water. Splits or cracks in the woody portions of a plant, cankers that expand to encircle trunks or branches, girdling roots or even wire that was wrapped around a trunk years ago and forgotten will impede a plant's ability to supply its leaves with adequate moisture.

You should also be aware of the role vascular diseases play in harming leaves. Various fungi and bacteria can enter a plant's xylem either through the roots or by way of injuries to the plant's bark. As they spread within the conductive tissues they plug them up, effectively preventing moisture from reaching the leaves. Desiccated, flagging leaves are a sure sign that for some reason those leaves are no longer receiving the water they need to survive. When one side of a plant suddenly wilts and will not recover when watered, a vascular infection may be responsible.

While you check a plant's root collar, trunk and branching for indications of physical injuries, keep an eye out for signs of insect activities that may have impaired that plant's ability to keep its foliage well watered. Holes in trunks or branches from which frass (sawdust often mixed with sap or resin) is expelled are sure signs of borer activity, while grubs or wireworms at a plant's base may indicate trouble in the root zone.

Foliar Symptoms and Environmental Stress

Assume you have a tree that was previously healthy but is now showing signs of distress. Its over-all appearance is poor, with leaves that are oddly shaped and off-color. The canopy is thinning and you are justifiably concerned.

Many of the non-foliar injuries mentioned above could have led to the current state in which this tree finds itself. However, a careful examination has uncovered no apparent injury that could account for the tree's decline. At this point, an examination of the conditions under which the tree is growing may yield the source of its distress.

There will be many occasions when the aid of a professional diagnostician will be needed to unravel the relationships between the foliar symptoms of environmental stress and the specific factors in a plant's surroundings that have put it under stress. However, by using the following chart and your knowledge of a plant's habitat, you should be able to get a handle on what might be responsible for your plant's misfortune.

As you can see from this "stress list," there may be many different sources of environmental distress, although the foliar symptoms they induce are often quite similar. For this reason, the key to diagnosing which environmental factors have gone awry depends not so much on symptom analysis as upon a careful study of a plant's habitat. What changes have taken place in the plant's vicinity both prior to and during the occurrence of the foliar symptoms that first caught your attention? If you have a good grasp of the cultural history of a plant, you will be in a better position to determine what environmental factors may have adversely affected it.

Foliar Symptoms and Insects

There are a variety of insect activities harmful to leaves. Feeding on roots, boring

into stems, transmitting diseases as they feed and feeding on the leaves themselves all come quickly to mind. The direct assault on a plant's foliage is probably the least harmful in terms of a plant's overall well being, but it does seem to command the bulk of our attention because of the visual distress such an infected plant causes us.

How an insect feeds on a leaf and the symptoms its feeding activities leave behind are discussed in the accompanying table.

If you cannot identify the insect devouring your leaves, or if it has moved on and left only its handiwork behind, the following three steps will help you name the troublemaker:

- Determine what feeding symptom you are dealing with (see the chart).
- Properly identify the species of plant that has been injured.
- Using a reference on insects that feed upon plants, look up the species of the plant injured in the index. Turn to the page indicated where there will be either a list of symptoms or a list of insects. If symptoms are given, find the symptom that matches your leaf trouble and which insect(s) are potentially responsible. If a list of insects is given you will have to read through the list until you arrive at an insect(s) whose described feeding habits match the injuries to your plant.

In diagnosing plant disorders, there is no substitute for comprehensive and accurate reference books (see the list of titles in Sources, page 37).

Foliar Symptoms and Foliar Diseases

A good many of the most frequently encountered leaf abnormalities can be traced back to the injurious activities of parasitic fungi, bacteria and a host of viruses. The symptoms produced by these pathogens include leaf spotting, growth irregularities and blights, to name only three.

The foliar symptoms associated with these pathogens can be placed into different groups according to their characteristics, just as the symptoms of insect feeding were grouped earlier. A further distinction based upon the type of pathogen responsible will also be helpful, and therefore fungi, bacteria and various viruses will each be treated separately.

Fungi

When fungi attack a leaf, the process normally begins when a fungal spore germi-

Symptoms of Environmental Stress

1. Drought	Leaves may appear scorched; if drought is prolonged leaves in successive years may be under-sized and off-color. Tree canopies will be sparse. Heavily foliated trees will shed a portion of their leaves to reduce transpiration.
2. Nutritional Deficiencies	Leaves can be under-sized and off-color. Plant growth will be less vigorous, flowering curtailed. Stunting and similar growth deformities may result.
3. Herbicide Injury	Leaves will appear cupped or puckered; needles of evergreens may be twisted and malformed. New growth is particularly susceptible to herbicide injury. If exposure was light afflicted, plants will outgrow the problem.
4. Low Temperatures	Buds can be killed by low winter temperatures. This will lighten spring canopies and reduce flowering and fruiting on affected plants.
5. Late Spring Frosts	New leaves may appear to be burned or even shredded. As the season progresses new growth will appear normal. Late frosts can also damage fruit and flower buds.
6. Excess Water	When water gathers at a plant's base, roots can drown. As a result leaves will brown and afflicted plants will slowly die back.
7. Change in Grade	Adding fill over plant roots, especially of shallow-rooted trees, can suffocate those roots, leading to leaf browning and a gradual die-back of the canopy.
8. Toxic poisoning	Toxic materials, originating from such diverse sources as septic tanks or road salt can lead to plant poisoning. Leaves may first appear scorched and will later be off-color and undersized. Plant death may eventually result.
9. Heat Scorch	Scorched leaves are common on trees growing in shallow soils. Street trees are frequent victims. Trees with shallow root systems are most susceptible.
10. Air Pollution	Depending upon the pollutant, leaves may appear to be scorched, streaked or display a glazed-like appearance. Different plant species often respond quite differently.

Insect Related Injury

		Insects Responsible
1. Chewing	Leaves are eaten, displaying holes, ragged edges. On occasion just the upper or lower surfaces will be eaten, resulting in the leaf surface being covered with distinct brown spots.	Beetles; caterpillars; plant bugs; others.
2. Sucking	Insects insert their mouth parts into leaves and extract the fluids. Afflicted leaves appear pale, often mottled or bronzy.	Aphids; mites; white flies; scales, mealy bugs; others.
3. Rasping	Insects rasp and rupture leaf tissues and then lap up the released fluids. Leaves appear whitened, pale or mottled.	Thrips.
4. Leaf Mining	Insects lay eggs on leaves. When the larvae hatch they tunnel into the leaf and feed on the contents <i>between</i> the upper and lower leaf surfaces. Leaves appear to have a brown, onion-skin type of look to their injured portions or will be riddled with white tunnels.	The larvae of certain flies, sawflies and moths are leaf miners.
5. Galls	Insect feeding irritates the leaf tissues, resulting in abnormal growths of various sizes, shapes and colors.	Certain mites; wasps; flies; also certain fungi.

Obvious signs of an insect's presence include the discovery of insect eggs, larvae or nymphs, cast skins or adults. If no insects are present on a leaf, but symptoms of insect feeding are, it is possible that predators, heavy rainfall or some other natural phenomenon has eliminated the culprits from the leaf sample you are examining. If insects are present, don't be too quick to retaliate. Before doing anything hasty be sure the insects you have spotted are pests and not one of the many species beneficial to your plants.

Symptoms of Fungal Infections

	Description of Symptom	Example
1. Anthracnose	Affected leaves will usually have large, brown patches along leaf margins or between the larger leaf veins.	Maple anthracnose, <i>Gloeosporium apocrytum</i>
2. Leaf Blight	May begin as a brown patch that spreads, eventually swallowing up the entire leaf, which then shrivels, often <i>without</i> falling from the plant.	Early blight of tomato, <i>Alternaria solani</i>
3. Leaf Blotch	A catch-all category defined as a large patch or patches of brown upon a leaf, often without distinct borders. A leaf blotch ordinarily <i>will not</i> engulf the entire leaf.	Horse chestnut leaf blotch, <i>Guignardia aesculi</i>
4. Leaf Blisters	Distortions or deformities in a leaf that may or may not be accompanied by a marked discoloration of the affected areas.	Peach leaf curl, <i>Taphrina deformans</i>
5. Leaf Spots	Typically a brown spot with distinct margin, the margin often a darker hue than the spot itself. Spots can also be gray, black or shades of yellow.	Dogwood leaf spot, <i>Spetoria cornicola</i>
6. Needle Casts	On evergreens, needles turn yellow, brown or reddish brown depending upon the plant involved. Infected needles will subsequently fall in most cases.	Needle cast of Douglas fir <i>Rhabdocline pseudotsugae</i>
7. Downy Mildew	Infected leaves appear covered on their underside with a white felt. The upper leaf surface will eventually turn brown.	Grape downy mildew, <i>Plasmopara viticola</i>
8. Powdery Mildew	The powdery white growth of this fungus will cover the surface of an infected leaf. Probably the easiest disease to identify.	Lilac mildew, <i>Microsphaera alni</i>
9. Rusts	The initial infection will resemble a yellowish leaf spot. Eventually rusty-red spores will cover the spots. Many rusts require two alternative hosts, one to overwinter on and the other to summer on. On pines, needles first show yellow or tan spots. As the disease progresses, blisters appear from which the brightly colored spores are dispersed. On white pine, blisters will protrude through the bark as well.	Cedar- apple rust, <i>Gymnosporangium juniperi-virginianae</i> White pine blister rust, <i>Cronartium ribicola</i>
10. Leaf Scabs	Similar to leaf spots except that a leaf scab will usually include a puckering of the infected areas.	Apple scab, <i>Venturia inaequalis</i>

Symptoms of Bacterial Infections

	Description	Example
1. Leaf Blight	Leaves may first show numerous small spots that eventually coalesce to engulf the leaf; or a sudden wilting and blackening of a leaf may occur.	Fire blight on apple, pear, crabapple.
2. Leaf Spots	Leaf surfaces will be covered with spots that can take many varied shapes and colors, depending upon the plant species involved. Spots can become numerous enough to cause leaves to drop.	Bacterial spot of stone fruits, <i>Xanthomonas pruni</i>



Elizabeth Ayella

nates upon the leaf's surface. Warm, humid weather encourages germination. Once germinated the fungus will send its hyphae in among the tissues of a leaf, "tapping" those tissues for nourishment and often killing them in the process.

The leaf tissues that are killed show up as the leaf symptoms that attract our attention. As a fungus kills leaf tissue, distinct patterns emerge, revealing a fungus' *modus operandi*. For example, the fungus that causes tar spot on maples, *Rhytisma acerinum*, always produces the same raised, black spots upon infected leaves. This symptomatic consistency is a gardener's best diagnostic friend when it comes to determining what disease organism has led to a particular leaf disorder.

The diagnosis of a leaf symptom will often be complicated by the presence of *saprophytic* fungi, which are the essential decomposers of dead plant and animal tissues. The saprophytic fungi move in *after* the primary cause of a leaf's problems have done their damage. For this reason, the presence of fungi on an injured leaf is not automatically proof that a fungus did the initial damage.

The list of fungus-related leaf symptoms on the chart will help to identify which symptom you are dealing with. By using the same three-step process for tracking down the source of an insect-related feeding injury, you will usually be able to run down the disease responsible for a fungal-

induced leaf symptom. In this case, you will also need the services of a plant pathology book.

When tracing symptoms, don't be surprised if more than one fungus, or a number of fungi and bacteria, are listed as possible causes for a particular leaf symptom. If a closer look at the symptom offers no further information with which you can narrow the field of possible candidates, you will have to resort to the art of probabilities. Some diseases are much more likely to be active in your area than others, and on the basis of this information you will often be able to conclude with relative certainty which disease organism you are confronting.

As fungi grow they must eventually produce spores for the next generation. The reproductive organs that will produce those spores will protrude from the infected tissue of the leaf, enabling the spores to be more widely dispersed. Those so-called fruiting bodies are unique to each species of fungus and provide the basis for precise species identification. Using a hand lens you will often be able to spot these minute structures reaching up from a leaf spot or blotch. If the fungus has not yet entered a reproductive phase, infected leaf tissue suspected of hosting a fungus can be cultured in a laboratory until those fruiting bodies appear. This is the method pathologists use to ensure accuracy in diagnosing a fungal-related leaf disorder.

Bacteria

Bacteria can also enter a leaf's tissues and wreak havoc that will appear as symptoms you can identify. Many serious bacterial diseases, such as the wilts that can destroy squash or pumpkins and other members of the gourd family (*Erwinia tracheiphila*), are spread by insects as they feed upon those plants. Others, such as fire blight, *Erwinia amylovora*, overwinter on infected plant tissue, ready to spread on their own with the coming of spring.

The leaf symptoms of many bacterial disorders resemble symptoms of fungal infections. If the fruiting bodies that only the fungi produce can be found upon leaf tissue damaged by an unknown pathogen, you can often discount the presence of bacteria. You may also obtain clues by knowing the probability of a fungus or bacteria being more active in your area at that time.

Viruses

Viruses are an odd collection of tiny, pathogenic organisms, and the leaf symptoms they are responsible for make up an interesting collection of growth abnormalities that often involve foliar discolorations and deformities. Insects spread many viral infections as they feed, but poor sanitation when working among plant species susceptible to viral disorders accounts for disease transmission in far too many instances.

If a foliar symptom is associated with a marked discoloration of a leaf's surface, growth that is either stunted or deformed, then herbicide injury can be ruled out; if leaves appear mottled or exhibit patterned discolorations; or if any combination of these three symptoms is present, you should suspect some viral agent. Plant deformities such as witchesbroom (an abnormal, brushlike growth of weak, closely clustered shoots or branches on a woody plant) can often be traced to a virus. If growth deformities appear on other parts of the plant, the possibility that a virus is responsible increases. In any case, confirming the presence of a virus will require the aid of a professional diagnostician. Take a sample of your troubled plant to your county extension office—something to remember for those times when we all get stumped and could use a helping hand. ☼

—Michael B. Trimble

Michael B. Trimble is a landscape gardener and plant collector. He is the author of "Moss & Lichen Gardens," which appeared in our February 1983 issue.



Photographs courtesy of USDA

Curator of the National Herb Garden

Holly Shimizu

BY JEANNE SHOJAAT

One of Holly Harmar Shimizu's jobs at The National Herb Garden is chasing crickets out of the pot-pourri. This is not one of the many duties listed on her five-page job description. But as the first curator of the U. S. National Arboretum's garden devoted to herbs in Washington, D.C., chasing crickets out of bags of dried rose petals exemplifies what Holly loves about her job—"the combination of working indoors and out, the variety, the telephone calls and visits from stimulating people, and then being around plants, growing them and taking care of them." And, she might add, protecting them from hungry crickets.

Holly, pretty, dark-haired, 28, was managing a Washington area commercial garden center over three years ago when she got the news that she had been selected curator of the two-acre National Herb Garden. "I couldn't believe it," she marvels. "I fell out of my chair!"

Now she oversees not one but three gardens. First, there is the formal entrance garden: brick paving surrounding a pool and, beyond the entrance, a knot garden. The second garden consists of historic roses, roses and more roses. Too many roses, some have criticized. Finally the herb garden itself, an oval grassy area with 10 specialty gardens on its periphery.

How does she answer the "too many roses" criticism? The curator smiles. "There really aren't many roses," she explains. "Old rose bushes just take up more space than herbs." She says there are only 80 old roses while there are 1,000 herbs, adding that roses and their hips have always been important in perfuming, in cooking, in medicine. She talks about rosewater and rose jam. "I taste the hips," she explains. "They are all different."

Holly came to the Herb Garden with years of theoretical and practical experience. She has two degrees in horticulture, is studying for a third and has worked as a gardener in public gardens in the United States, England and Europe. She spent the



Lecture-tours are common during the spring tourist season for Holly Shimizu, The National Herb Garden's curator. At left, she leads a group through the Oriental Specialty Garden, where boxwood borders rice.

summer between her junior and senior university years at Longwood Gardens in Pennsylvania. "That was a very good experience for me. It opened my eyes to the huge field of practical horticulture."

She pruned, planted and propagated plants for more than three years at the Hillier Arboretum in Hampshire, England, in a Belgian arboretum ("the first place where I worked with a lot of herbs and old roses," she remembers), gardens in Germany and Holland and finally at the Royal Horticultural Society's garden at Wisley in England. There she worked in the perennial borders, continued her study of herbs and also worked in the new herb garden.

It was in England that she met Osamu Shimizu, a native of Japan working in Europe as a landscape designer. After deciding to marry, the couple came to the United States and settled down in Washington, D.C. "because of the interesting people and a good market for my husband." She

went job-hunting and became manager of the Potomac Garden Center for a year while her husband set up his own landscape design practice. She applied for the curatorship of the Herb Garden and was chosen. Her days now are filled with the work of each season.

In the spring, "It's crazy!" May is the busiest time for Holly and her two gardeners—preparing and planting beds, checking drainage, digging in sterilized manure and building up the soil in beds at the outer edges of the garden. "I stay away from peat moss—I've had poor results. In dry weather it's too dry, and in wet weather it's too wet and spongy."

May is the time she plants the tender herbs, basil, scented geraniums, dittany of Crete, "although I may try it in the third week of April next year and see what happens," she thinks aloud.

Spring is also the time when all the people come. "They are surprised that there isn't more here in May, but summer is the best time."

In spring Holly is concerned with how everything looks. She walks through the garden making sure the paths are clean, dealing with any catastrophes like fallen trees. She has the pool cleaned. She checks the pamphlets to be sure there are enough for visitors. She dead-heads any early-blooming roses, checks the spray, notes what needs to be planted and gets labels ready for new plants.

In her daily springtime stroll around the garden, she likes to see that everything is happy, everything is in balance. This is the season when she prunes, manicures, clears, tidies. "I'm obsessed with that," she laughs as she eyes the entire display and checks for weeds.

Other spring chores include fertilizing the roses, trees, shrubs and boxwood. None of the fertilizer goes on the herbs, however. The soil is rich, "too rich for some of the Mediterranean herbs. They might be more fragrant without such a rich soil," she notes. She adds that the Mediterranean herbs get

too lush and later the humidity of Washington's summers brings dieback.

A too-rich soil isn't Shimizu's only problem. Rodents and rabbits enjoy the garden "They do a tremendous amount of damage," she laments.

Holly likes to talk to the visitors who crowd the Arboretum in the spring. This is the time, also, when the telephone rings off the hook with calls for information. The Arboretum holds Herb Day in the spring with workshops and displays of herbs.

Holly thinks the garden is at its luxuriant best in the summer. Bees are busily collecting nectar from the Chinese chive flowers, the garden is perfect, but Washington's humid 90° plus temperatures slow the visitors to a trickle. On a 97° day, it's hot, it's muggy, but the herbs are exuding a myriad of scents.

Holly is at work at 7:00 in the morning in a white shirt and work pants. When she leaves in the afternoon she's changed to a different shirt. She's been spraying. She sprays the roses for Japanese beetles and aphids and also adds a fungicide for the roses. "I use spray early in the morning before the bees come," she explains. "I look out for problems and spray as needed but try to keep it to a minimum."

How does she bear up under Washington's miasma of heat and humidity? "I don't mind it," she says. "In Europe, we were expected to work in all kinds of weather. You get used to it." She wears light clothes. "Wear a hat," she counsels her gardeners. If the sun is unbearably hot, she finds indoor jobs for them. "That's the job," she tells both herself and her workers. "You've got to work out in the weather."

That work usually consists of pruning, weeding, watering the newly-planted gardens, dead-heading the roses and basil and gathering herbs for potpourri. The Arboretum has a drying room where Holly and her assistants take the herbs and rose petals after they are gathered. Then she puts the dry fragrant material in a dark-blue plastic garbage pail in her office where it remains, being added to until the following winter.

Now it's fall, but the days are still warm. Holly stands in the workroom adjoining her office talking to a visiting professor of horticulture. A gardener brings in bunches of Chinese chive blossoms (*Allium tuberosum*) that Holly had wanted clipped before they seeded. "Why?" asks the professor. "I just let the seedlings come up."

"Most people ask how to grow herbs indoors, but herbs inside are usually a failure. They do poorly, then you plant them outside and they take off."

Holly disagrees. That might be fine for a home garden, but "they come up in the cracks. They are very, very tough and too vigorous," for her purposes she explains. She has them cut at the base of the flower stem, then she dries the seed heads and uses them in herb wreaths.

She and the professor continue discussing the chives and research. "Someone should look into the potassium levels in chives," the professor suggests. "I think the levels are high and that's what attracts the bees." Holly agrees that the flowers seem to attract more bees than any other plant. "There are usually three bees per flower."

Research interests her. She is involved in two projects at the University of Maryland. In one she is studying the effect of different mulches on root development, using the rue anemone (*Anemone thalictroides*), a wildflower. "It's a worthy garden plant but not easy to establish, so it's a good test for root development," she explains. A second project involves research into the root hardiness of French tarragon, *Artemisia dracunculoides* var. *sativa*. Does she enjoy this research? "Yes, I need to know how to do it. It's important to understand how to research. I should get very interesting results."

Holly is very enthusiastic about a project being carried out by some members of The Herb Society of America at the National Agricultural Library. She takes a long computer printout out of her bookcase to explain that 1,600 herbs have been cross-referenced so that information on any point—name, characteristic, use, color and a number of other variables—can be retrieved quickly. The editing process is still to be done by the NAL, but once accomplished, it should be a very useful tool.

Holly and her visitor discuss the research possibilities of the project and then the curator turns to her next task on this fall day. Some of her (and her gardeners') heaviest work comes in the fall. They are busy planting bulbs—crown imperial, narcissus, saffron crocus, colchicum and madonna lily. Holly and her staff dig up tender plants or take cuttings in late summer or early fall.

"It's a big job digging them up," she says. "The plants get bigger and heavier and harder to work with. You wish everything could be hardy." So she usually takes cuttings.

"A plant has to have some reason for being here," she feels. She does want to increase the collection of herbs, however.

Now December has come and the thermometer reads 25°—not very cold so far this winter. Snow patches the ground. Holly walks around the specialty herb gardens. The seed pods are brown on the tall common teasel, but the Italian oregano (*Origanum heracleoticum*) shows some green in the garden named for the Greek physician and pharmacologist Dioscorides. Yellow flowers are bright on the *Calendula officinalis* in the Dye Garden. In the Early American Garden, dark-green stars grow on the garden thyme. She stops to look at the American Indian Garden where the Virginia rose offers red hips for food and medicine, and at the Industrial Garden, which displays soft spikes of *Euphorbia lathyris* and beige rice from Southeast Asia. The clove pinks are still a soft green in the Fragrance Garden. Holly examines the Chinese chives, pale beige now, their stalks ending where she had them cut in the fall.

The weather is blustery, chilly, but as she goes into the small building that houses her workroom and office the rooms are warm, and the smell of dried herbs is strong and pleasant. She enjoys talking about making potpourri. The rose petals in the plastic garbage pail are ready to be mixed now. She adds lemon verbena, rose geranium and the tender perennial, *Pogostemon patchouli* from which the fragrant oil is extracted. "I add orris root, nutmeg, cinnamon, essential oils and cloves, which I grind." The oils might be rose, bergamot or sandalwood. As she speaks, she takes out samples of patchouli and lemon verbena, crushing them in her fingers. She smells the mixture, crushes it again and holds it out for her visitor to smell.

Most of the potpourri material is grown in the Herb Garden, but Holly buys lavender, "pretty in potpourri," she says. She



Jeanne Shojat

Taking specimens of pot marigold, *Calendula officinalis*, Shimizu plans a class in drying herbs.

also likes to add vetiver root, *Vetiveria zizanioides*, which, if dampened, “has a nice sort of woody smell.” She dampens it and she and her visitor smell it.

In winter the dried chive blossoms come into use too. Holly makes herb wreaths with a dried annual artemisia base and all kinds of trimmings, including the chives. In her workroom she hangs one wreath of roses, chive seed heads, tabasco peppers, tansy, sage, rue, thyme and lemon verbena. Another wreath includes nutmegs that she wires on, marigolds, feverfew, fennel seed, baby’s breath, peppers and green ribbons. She has made wreaths for many of the classes she teaches, with the help of her assistant, Albert Brown, and Betty Rea of The Herb Society.

Winter doesn’t really slow down the work. Holly and the gardeners work as a team. Today she is supervising her workers

who are covering the English boxwood with snow fencing. “In January and February, the winter sun burns the bushes and they need shade,” she says, so she ordered the fencing and organized the project. While the work goes on, she labels and keeps up the records.

If it begins to snow heavily, Holly, as on the hottest summer days, gives the gardeners something to do in the greenhouse or in her small building.

She doesn’t mulch the herb garden, and regular tilling keeps the soil surface from crusting and allows winter rain to percolate into the soil. “Some plants reseed and you get two or three crops per season: coriander, dill, fennel, caraway,” Holly notes. “I just let them go to seed.” This is one of the advantages of no mulch, she adds. She mulches only the trees and shrubs. She also has the workers add sterilized

manure to the grass and break up the ice that forms in the pool to keep the bricks from cracking.

On a bone-chilling January day Albert Brown is chopping ice from the large pool. During the night Holly had experimented by leaving the fountain on to see if the moving water would keep the pool from freezing so badly, but high winds blew the fountain spray onto the brick reception area around the pool and now there is more ice to crack. As Brown chops, the curator picks up pieces of ice to throw into the pool.

While the outside winter work continues Holly tries to catch up on her writing. Today it’s an article on culinary herbs for a Brooklyn Botanic Garden herb publication. “I’m writing about the slightly unusual herbs, their culture and use. I want to get away from the usual rosemary.”





Jeanne Shojaat

This is a good time to plan lectures, too, which are a part of her duties. A one-day class at the Morris Arboretum in Pennsylvania focuses on how herbs grow in the wild. She explains that if a gardener learns that Mediterranean herbs flourish in a hot, dry climate, while sweet flag (*Acorus calamus*) grows in bogs, he can treat each herb as an individual with variations and provide proper growing conditions in the garden.

In addition to how herbs grow in the wild, Holly also plans six other presentations for the day at Morris Arboretum: herb garden design, specific herbs and their uses, The National Herb Garden, considerations in making an herb garden—such as soil, walkways and so forth—using culinary herbs in recipes and, finally, how to harvest, dry and store herbs in bunches. For this marathon lecture, Holly prepares slides in addition to making notes. She also prepares for questions after the lecture.

“Most people ask how to grow herbs indoors, but herbs inside are usually a failure,” she counsels. “They do poorly, then you plant them outside and they take off.” Bay (*Laurus nobilis*), rosemary and scented geraniums are good in the house, she says, but most others barely survive without lights.

She writes and she helps other writers with her expertise. On several occasions she has acted as a consultant to magazines, touring with the writer and photographer to gardens in England and the United States.

Smaller celebrations of herbs are important to her also. For example, an annual herb luncheon in Frederick, Maryland, where she gives a slide lecture and takes potted plants and fresh cut herbs with her, unusual plants like *Perilla frutescens* (shiso) used for flavoring rice and as tea in Japan—“we drink it,” she says—and daylily buds, ginger root and cardamom (*Elettaria* sp.).

Vacations are, of course, spent in gardens. Three years ago Holly and her husband went to Japan for five weeks. There she discovered the best herb gardens were those maintained by chemical research companies looking for new drugs. “They don’t have herb gardens as we do. They wouldn’t grow lavender.”

And what kind of garden does a curator have at home? The Shimizus’ home is on a quarter acre in Glen Echo, Maryland,

Shimizu walks around the herb garden each morning, checking to see what needs to be done.

where she and her husband have planted an herb-rock garden. The combination works very well, she says, “and looks beautiful.” They are also developing English-style perennial borders on the property. She likes plants and trees that are not only beautiful but have a use—the Aristotelian harmony of beauty and utility.

Back in her office on a warm sunny day, she talks about her job. “You have to be willing to weed, to get dirty,” she explains. She thinks such an attitude has helped her in her career. “I weed, I know how to transplant and prune.” And she still spends about 50 percent of her working time outside in the garden.

Under Holly’s curatorship, the herb garden will not remain sleeping in the sun. She is constantly working on changes and improvements. She sees a need for more interpretation of the garden for visitors in the form of more booklets. Also, she wants bigger and better classes and workshops, and a better and rarer collection of plants.

She is surrounded by herbs and herb products in her office. Behind her chair, a large weeping fig droops over a small statue of St. Fiacre, patron saint of gardens, donated, but too valuable to put in the garden because it might be stolen. She shows baskets—one she made contains seeds collected from the garden; another, a large, flat basket for drying herbs; and a third filled with dried red peppers that will be used for Christmas ornaments.

Seeds from all over the world come in the mail. On her desk are seed packages from China and Portugal. In the adjacent workroom she points out the tool closet with forks, pruners, shovels, brooms and smaller tools hanging on the wall. She picks up a fan made of vetiver root, fans herself, and a cool smell like cedar drifts across the room.

Why is the potpourri in Holly’s office? It is to be given to the Herb Society for display at its annual spring sale at the Arboretum. Homemade herb breads, herb wreaths, tussie-mussies, vinegars and other goods produced from the members’ gardens are also sold. So Holly punctuates her telephone calls, her record keeping, her directions to the gardeners with forays against the crickets, while the herbs outside under her care grow lazily, fragrantly in the sun. ☼

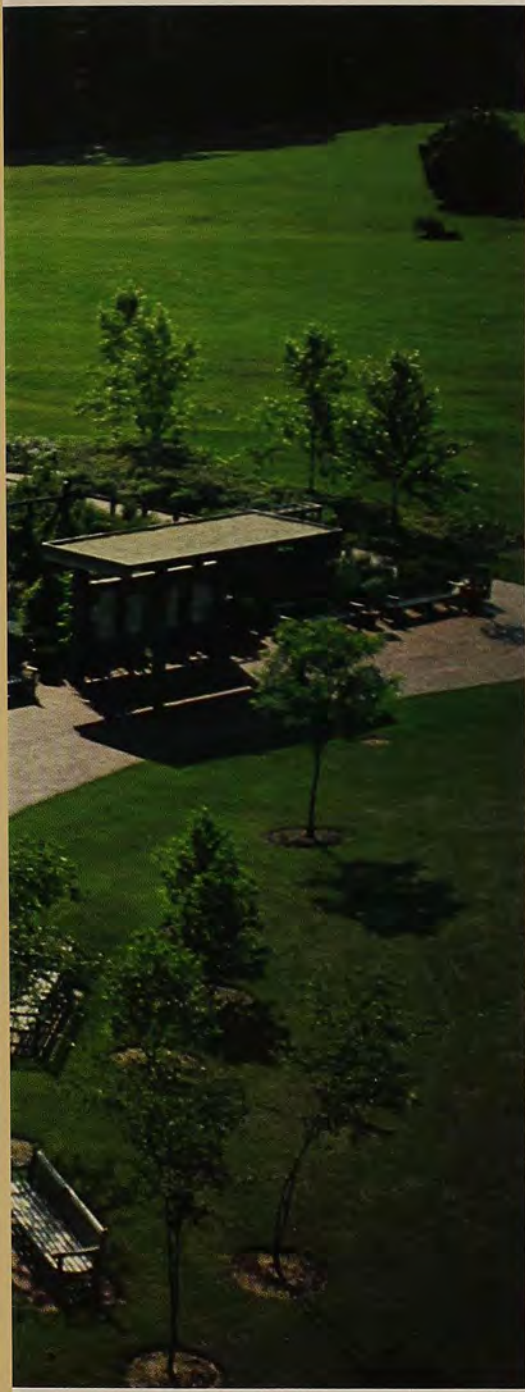
Jeanne Shojaat teaches at Strayer College in Washington, D.C., where she also gardens. She is a free lance writer and photographer as well.

The National



ABOVE: Photographed from a cherry picker, this bird's eye view of the herb garden gives one a sense of its scope and scale. Situated on two acres and consisting of three sections, the garden is designed to teach. RIGHT: One of 10 specialty gardens, the Dye Garden contains plants from which dyes are derived, some from the flowers, others the roots, still others the leaves and stems. Both historic and contemporary dye herbs grow here. Pictured are *Calendula officinalis* and *Anthemis tinctoria*.

Herb Garden



TEXT AND PHOTOGRAPHY BY JOAN SAYERS BROWN

The National Herb Garden, part of the National Arboretum in Washington, D.C., is a cooperative project of the United States Department of Agriculture and the Herb Society of America. In 1978 the Society presented a check for \$200,000 to Secretary of Agriculture Bergland, and Congress voted matching funds. The Herb Society then raised an additional \$200,000, bringing the total amount raised to \$600,000. The two-acre garden, designed by Sasaki Associates, A.S.L.A., Watertown, Massachusetts, is framed by an expanse of meadow surrounded by wooded areas. It contains over one thousand plants divided into three sections or "rooms": a knot garden, a historic rose garden and a large specialty area—a rectangle, a square and an oval respectively. There is also a small building and enclosed yard that serves as the trial and propagation center. Plants in the garden are labeled, each with its common name, Latin name, family and native range.

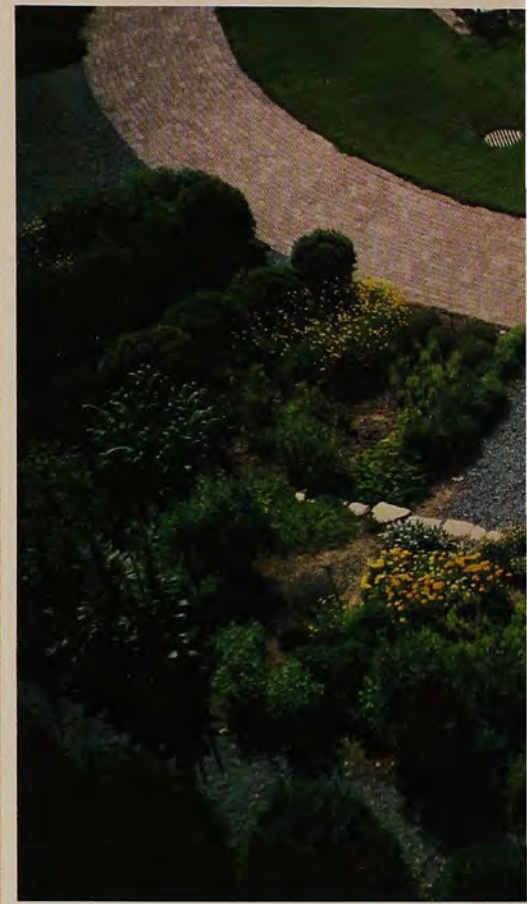
The entrance from the main road leads to a simple fountain courtyard with the knot garden beyond. Each of the three chains in the garden's rectangular knot garden consists of a single plant species. Dwarf arborvitae, *Thuja occidentalis* 'Globosa Rheinlandia', Japanese holly, *Ilex crenata* 'Helleri', and dwarf cypress, *Chamaecyparis pisifera* 'Squarossa pygmaea', form distinctive strands of colors and textures against crushed brick that matches the nearby brick walks. English ivy and English boxwood border this traditional garden. Eventually *Clematis* and *Aristolochia* growing on trellises on either side will provide shade for visitors.



The square “room” of historic roses adjacent to the knot garden contains over 80 types. Wild roses established their importance in herb gardening centuries ago when the ancient Egyptians extracted scented oil from rose petals, and the Greeks and Romans cultivated roses for their therapeutic value as well as beauty and fragrance. They are the direct descendants of wild roses and are not hybrid teas. Traditionally, sundials of various forms decorate herb gardens; therefore, an armillary sphere cast in bronze provides the focal point for this square.

The speciality garden consists of 10 trapezoidal sections around a large, grassy, treed ellipse. A staggered hedge of American boxwood provides a windbreak and visual background for these individual gardens. Each garden is devoted to some person or group, era, part of the world or function for which herbs have been important. These include one honoring Dioscorides, the Greek author of *De Materia Medica*, a famous herbal; plots on herb uses—dyes, culinary, industrial, beverage and fragrance; herbs common to Early American gardens, modern botanical gardens, Far East gardens; and, finally, a section devoted to herbs used by American Indians. ❖

Joan Sayers Brown is a free lance writer who contributes regularly to *Antiques Magazine* and *Southern Accents*. She wrote an article on the William Paca Garden in Annapolis, Maryland for *American Horticulturist* in 1981.





FAR LEFT: The Historic Rose Garden contains roses representative of those long used for perfume, medicine, food and pleasure. The collection includes French, Damask, rugosa, cabbage, China and Alba roses. TOP LEFT: Viewed from above, the Early American garden clearly forms one arc in the circular arrangement of specialty gardens. It contains plants important to the lives of early colonists, some native to this country (goldenrod) and some imported (pot marjoram and rosemary). BELOW LEFT: The knot and rose gardens are visible beyond these trellises, which will eventually be covered with *Clematis* and *Aristolochia*. TOP: Another bird's eye view affords the onlooker a chance to see the design of the knot garden as a whole. The interwoven chains of dwarf arborvitae, Japanese holly and dwarf cypress are reminiscent of an embroidery pattern, which is just how knot garden designs were derived when they originated during the Renaissance.

Buttercups of the world

BY WILL INGWERSON



Ranunculus bulbosus

Dick Keen

W eeds are one of the burdens that gardeners everywhere have to bear, and there are a few species of *Ranunculus*, the buttercups, that are a trial and a tribulation if they are allowed to obtain a firm foothold in any garden. Among the worst offenders in British gardens are the three ubiquitous—admittedly lovely—but invasive species, *R. acris*, *R. bulbosus* and *R. repens*. All three have double forms that are allowed in the garden, but cautiously. These black sheep, however, should not condemn the great genus *Ranunculus*. Scattered about the temperate world are many very desirable members of this clan, a few of which are described in the following paragraphs. Not all of them will flourish without some special care and attention, but their beauty justifies any extra trouble involved in contenting them.

In New England are found several very handsome buttercups, most of which are not successfully cultivated, yet *R. lyallii*, a magnificent plant, is grown in Britain with a considerable measure of success. I have not seen it in American gardens, but there is no reason why, especially in the Western states, it should not be grown with every hope of victory. Its long, deeply-delving roots like to plunge into moist but not necessarily boggy soil. When pleased with the conditions provided, it produces bold tufts of glossy-green, saucer-shaped leaves up to eight inches or more in diameter and stately, branching flower stems rising to a height of at least three feet, which are adorned by panicles of immense, snow-white flowers. It really is a traffic-stopper. My own greatest success was achieved when it was planted in deep, rich soil adjacent to a water tank. During spring and summer



Pamela Harper

Ranunculus repens 'Flore Pleno' is a cultivar of buttercup "allowed" in the garden.

everyone who passed splashed water over the plants, and the result was phenomenal.

From the Atlas Mountains of North Africa comes lovely *R. calandrinoides*, which might present some problems in the colder American States. In Britain it is hardy, but it is usually grown in unheated alpine houses. A deciduous plant, it dies down for its late summer and winter dormancy, during which time it should be kept dry rather than wet. The actual period of dormancy is short, and it begins to show signs of life in late December, at which time, if grown in pots, it should be shaken free of soil and repotted in a new, gritty compost that is rich in humus. Its lusty roots feed greedily.

With the first long, wide, rather fleshy leaves, appear the nine-inch stems, each carrying from one to three very large flowers, usually white, but sometimes deli-

cately flushed with pink. The petals of the flowers are as fragile as tissue paper and, as it may be in blossom even before spring has arrived, the blossoms can easily be weather damaged if the plants are grown in the open. It is for this reason alone that it is most often grown under glass. In my own gardens it has survived in the open and emerged from arctic conditions unscathed, but I give it the protection of a glass cover during stormy weather.

The delight and despair of alpine gardeners is *R. glacialis*, which inhabits high altitudes in the European Alps, usually growing in gritty, non-chalky soil. Its beauty in the wild is quite breathtaking, but it has never accepted captivity with any happiness. From prostrate tufts of fleshy, gray-green, cleft leaves spring short-branching stems carrying rounded flowers of goodly size and dazzling whiteness. After the

flowers are fertilized the color of the petals changes to pink, deepening to rich red. Occasional successes have been achieved by growing it in deep pans in soil that is just grit and humus, with plentiful watering as it begins to show signs of life in the spring.

Much better tempered is tiny *R. alpestris*, a precious alpine buttercup from the European Alps. It forms neat tufts of small, round leaves, lobed and toothed on their margins. Its very short stems carry shapely, rounded, pure-white flowers. From the more Eastern Alps comes *R. alpestris* var. *traunfellneri*, which is a smaller plant with more finely cut leaves and flowers of similar substance and loveliness.

Among the many flowers that beautify the alpine meadows of the Pyrenees is handsome *R. amplexicaulis*. The erect stems

Continued on page 38

The Cutting Garden

The trend toward naturalistic, romantic bouquets has come on the heels of the trend toward low-maintenance gardens. This creates an obvious vacuum leading to a renewed interest in perennials and a growing curiosity about the old-fashioned cutting garden. What does it take to create a cutting garden? Can it be adapted to our space and busy life?

I have a free-lance flower arranging business I call the Cutting Garden because when I started out 10 years ago I grew flowers to sell in bunches. When people saw the charming little mixed bunches on an old wagon in a local antique and gift shop they often said, "Whoever grew these must have a fantastic garden. I'd love to go to see it." The clerk was sworn to secrecy because, of course, there was no fantastic garden—every bloom approaching its peak on any given day had been picked and placed on that wagon, and my yard was a hodge-podge of experimentation to find the best cut flowers for our area. I remember lettering a little sign that began, "The Cutting Garden is not a place, it is an idea..."

The Cutting Garden is still not just one place, although I have rented a plot where I grow annuals in rows. In addition to these cutting garden beds the big airy arrangements I like to make also depend on my yard full of perennials and shrubs, floral wholesalers, roadsides, woodlands and vacant lots. In the naturalistic style of the Constance Spry school of flower arranging, which is affecting home, wedding and party flower decorations in America, branches, leaves and berries are as important as flowers. Growing all the needed plants would be a challenge even on a large, fully-staffed estate. However, even in the

average small yard, homeowners can increase their bouquet potential by choosing shrubs for their landscapes that are also suitable for arranging. With a variety of interesting foliage on hand they can add florist flowers and create pleasing arrangements. Fitting in one or two carefree perennials will yield additional dividends. Peonies, for instance, are as permanent as deciduous shrubs, unequaled for dramatic blooms in the spring and a source of interesting leaves in summer if sparingly cut so that the strength of the plant is not diminished.

Without extra space or gardening time, a few undemanding perennials and shrubs chosen for their useful lines, foliage, flowers or berries will boost anyone's ability to make a fresh, natural-looking arrangement. Does this mean that the old-fashioned cutting garden is an outdated notion? The landscape type plants will sometimes yield a complete bouquet, but usually they are supplements. If you dream of having an abundant supply of your own glowingly fresh blossoms all summer, then a separate area for cut flowers, not a full perennial border, is the next logical step. A cutting garden is not an extravagance; it is the most efficient way to achieve your goal.

Growing cut flowers in their own plot of ground is as sensible as growing vegetables in a vegetable garden. Most gardeners have found it never takes as large a space as one thought to produce a generous harvest, and grouping plants to suit

their needs and the convenience of the gardener without worrying about aesthetics can also turn out a bumper crop of flowers. Flowers grown for cutting can be closely spaced, if care is taken to enrich the soil, because tall, straight stems are desirable. Staking is simple, involving corralling an entire row or bed with wires or string.

Placement is easier than in a mixed border. In my own yard much time is wasted wandering around deciding where to put things. In the cut flower plot you don't worry about how a plant looks next to its neighbor; the joy will come when you cut whatever is at its peak and discover surprising new combinations of colors and textures even as you drop them into the bucket. In the garden you only have to remember the old rule of running rows north and south, putting your tallest beauties at the northern or western edge. Graduating heights isn't as crucial here as in the border where appearance counts. With walking space left between beds and rows, getting enough sun is no problem. In fact, if the flowering tobacco (*Nicotiana*) seems daunted by the hot afternoon sun, why not tuck a row of it just east of the row of six-foot Mexican torch flower (*Tithonia*)?



TEXT BY LIBBY MATTHIS FEREBEE
ILLUSTRATION BY ANNIE LUNSFORD

Since your cutting garden is ideally in an open space that receives sun for most or all of the day, close spacing not only increases production but also cuts down on overheating and drying of the soil by the sun. Tall, bushy plants are best grown in single rows. When plants of one variety—let's say crown asters (*Callistephus*)—are grown in long beds, rather than single rows, weeding is greatly reduced and watering is more effective. I recommend beds no more than three feet wide, because they will give you room for three lines of plants one foot apart instead of two conventional rows with walking space between them. Zinnias or asters I might plant 18 inches apart in each line. With smaller plants like gomphrena (do try the orange one, *Gomphrena haageana*) that don't shade out weeds, six inches is plenty. This would allow five abreast, planted in a line across the bed rather than lengthwise. These handy little crosswise rows can be spaced one foot apart so you can skim a hoe between them to wipe out emerging weeds without stepping on the bed.

I have come the hard way to believe in rows—and in hoes. I admire the gardens created to be both attractive and cuttable,

but be aware that any move away from rows and toward more informal grouping or artistic placement will slow you down. It is a shift of focus away from the goal of the most blooms for the least effort. The six-by-twelve-inch spacing suggested for *Gomphrena* would allow a five-foot by

three-foot bed to hold 25 plants. Unless dried flowers are your hobby or your business, 25 gomphrena plants will have you absolutely overrun with button-like flowers. You will find that 25 plants grown uniformly in a cutting garden do not take much longer to care for than five plants of the same variety planted in a mixed border.

To simplify caring for your cutting garden, it is important to check out the needs of all the plants you choose to grow and divide them into sections: the ones needing even moisture, liking dry conditions, thriving



“The cutting garden is not a place, it’s an idea . . .”

ing on heavy feeding, the ones loving or hating lime. Naturally a plant requiring pampering in a specialized environment does not belong here.

Growing hints in general would be similar to instructions for preparation and care of a vegetable garden, and that subject has been very well covered in many recent books and articles. The plot I rent for annuals and biennials is only 50 by 30 feet. My landlord hires a tractor to plow and disc it along with his much larger vegetable garden. The tractor can make the rows, or we make them ourselves with a hand-

pushed plow! Having the plot mechanically prepared makes the area a breeze to plant compared with my back yard perennial beds. If you are starting a small cutting area in your back yard, a spade may be all you need, or a rototiller can usually be hired (with operator) or rented.

If you should decide to rent a garden plot it should be within a few miles of your home or apartment, it should have a water hose hook-up, and you should be able to park your car (your portable tool shed) very close to your plot. Whether planting on your own property or not, it is a good idea to have a soil sample analyzed and follow advice on general enrichment. I must confess that I am neither scientific nor diligent in my gardening techniques. But still the flowers come.

It is in deciding what to grow that most enthusiasm gets misdirected and dreams of big bouquets get buried. The open conditions plus the desire for dependable bloom will lead to some obvious candidates like zinnias and celosia, but a typical cutting garden is as hard to describe as a typical landscape. It can be from eight by 10 feet to half an acre or more, and your choice of plants will depend on your favorite colors, the growing conditions in your area of the country and in your specific garden site, and the type of flower arrangements you prefer. One problem is that no one book tells you everything. You may read four or five references to a certain bloom praising it as a great one for cutting, but it’s



only in the sixth article that the author casually mentions that this bloom does close at night. . . or that this plant won't do well where summers are hot. Time spent reading everything you can about cut flowers may save you from wasting a season growing flowers you aren't happy with, or aren't happy with you. Perusing flower-arranging books, as much for what they use as how they use it, can be helpful. Your goal is to build a repertoire of dependable annuals and biennials that fit your needs. One or two new or questionable plants can be tried each year.

I like to order my seeds from catalogues of reputable companies. This gives me time to plan and compare. Do not be tempted to order anything on impulse because of the charming picture. Check to see that, as far as you can ascertain from books or local horticulturists, it can be expected to perform well in your garden and in a vase. If space is limited, and the flowers will be mostly for use in your own home, you will want to select flowers that will enhance (not necessarily match) the color schemes of your rooms. In a small plot you've no room to throw in rows of mixed colors and then just pick your favorites after they

bloom. Order small packets of separate colors. They will be a little more expensive, so you might want to start them in a flat or protected area rather than sow them directly in the row. Always think of zucchini when you are tempted to order more than the smallest packet of any one item. Six well grown plants of almost any annual you choose will more often than not produce a surplus.

A cutting garden must be cut. Any bloom on which the pollen has matured should be clipped off at the neck (dead-headed) and thrown into the trash. If you try to "save" it, it will not be fit to cut the next day, and development of new blooms will be slowed or stopped. Flowers should be cut while the peak of their beauty is still ahead of them. Since my partner and I may have a big wedding or party followed by several weeks of little activity, I probably dead-head more blooms than I use, but it isn't a waste. For the frugal-minded a plant like statice (*Limonium sinuatum*) is satisfying because if you don't need it for fresh arrangements at the moment before maturity, you can hang it for later use. Statice is an example of a flower that can be ordered in separate colors like yellow or rose or the florists' staple—blue. If your space or color preferences are not so limited, a mixture will sometimes give you unusual shades that turn out to be treasures.

The types of arrangements you prefer will influence your selections no matter how large your garden. Someone who cre-

ates stylized, geometric arrangements may stroll through a garden filled with dainty pastel larkspur, cornflowers and daisies and find nothing to use, then be thrilled to discover one bold, round marigold. If you are that someone you might grow snapdragons instead of larkspur, and you could try disbudding cornflowers (*Centaurea cyanus*) to produce sturdier single blooms. Whether you like Japanese flower arranging, big blousy English-style arrangements or neater, more symmetrical colonial masses—or you just enjoy dropping a few posies into a vase—your choice of flowers will be as individual as you are. One secret of successful cutting gardens, though, is variety: a little bit of a lot of things. The objective is not a plot full of bright flowers; it is to have a selection of suitable blooms when you need them.

One common denominator in all cutting gardens is that they are likely to contain zinnias. Nothing "cuts and comes again" as obligingly as a zinnia. Modern fungicides overcome powdery mildew and make them easier than ever to grow. Luckily, they are flowers of many faces, some not recognized as zinnias when people see them in vases. You will want some 'Lilliput', a cultivar that seems especially charming when the flowers turn out to be orange, peach or cream-colored, and the rather formal, three-inch Ruffles series in pink or white, perhaps, as well as a few of the large dahlia-flowered and the shaggy cactus-flowered cultivars. How about the multicolor patterned 'Whirligig'? Yes, careful shopping will give you great variety even if half your space is covered with zinnias. No matter how distinctive their forms, however, all are basically strong, round

Continued on page 39



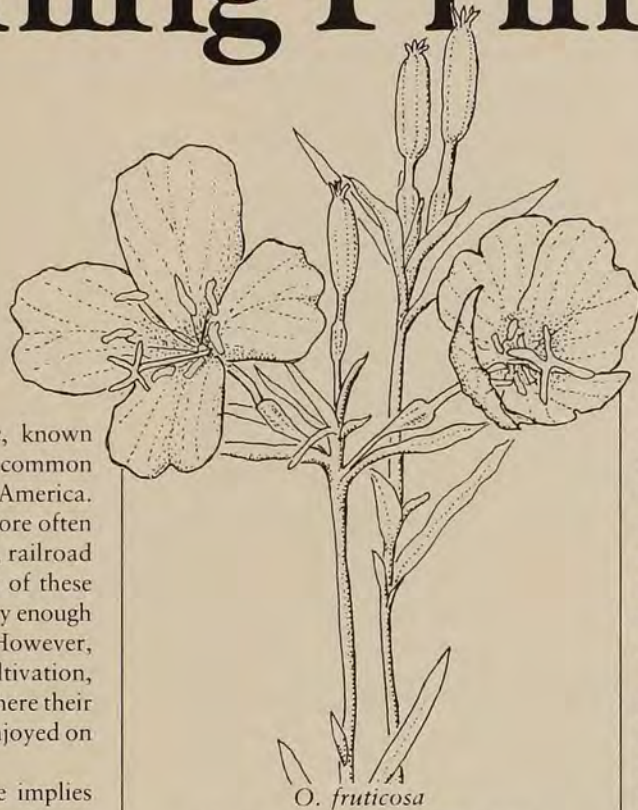


Oenothera fruticosa

30 June 1983

Eliza McFadden

The Other Evening Primroses



O. fruticosa

BY GERALD BANE STRALEY

Several species of *Oenothera*, known as evening primroses, are common sights in much of North America. Appreciated as wildflowers, or more often known as weeds along roadsides, railroad tracks and in fallow fields, most of these plants are too weedy and not showy enough to warrant a spot in the garden. However, some of them are worthy of cultivation, especially if grown near a patio where their fragrant yellow flowers may be enjoyed on summer evenings.

Although their common name implies kinship with the primroses, *Primula* sp., the oenotheras are members of the Onagraceae, linking them to *Clarkia*, the fuchsias and *Ludwigia*, commonly called false loosestrife. The flowers of evening primroses, as their name implies, open in the evening, but on cloudy days the flowers remain open at least part of the day.

There are three species of oenotheras native to eastern North America that are commonly called sundrops or sun cups. Unlike the evening primroses, these three open their flowers at dawn and close them in the evening. They are clumped or rhizomatous perennials, growing wild in a wide variety of habitats from Newfoundland to northern Florida and west to southeastern Manitoba and eastern Texas. These species are members of the *Oenothera* subgenus *Kneiffia*, which has been considered a separate genus by some students of the oenotheras. They are separated from the remainder of the large genus by their relatively large, bright-yellow flowers, four-angled or four-winged seed capsules, day-flowering habit and their perennial nature. Their faintly fragrant flow-

ers are attractive to butterflies, bees and flies, in contrast to the stronger fragrances of the evening primroses, which attract sphinx moths at night. There are two closely related annual species in the subgenus, *O. linifolia* and *O. spachiana*, which have smaller flowers and are of little or no horticultural value.

The sundrops produce a basal rosette of leaves their first year and an elongated simple or branched flower stalk the second and successive years. Both the basal and stem leaves are dark green and often blotched or flecked with red or purple. Plants become clumped, forming more rosettes around the parent plant. An established clump may send up dozens of flower stems, two to three feet high in late spring or early summer.

Oenothera pilosella is the most commonly cultivated of the three perennial species. It is characterized by its long, soft hairs covering the leaves and stems and is the only species that is rhizomatous, often forming large colonies in its native habi-

tats, usually in moist flood plains of the Midwest. It is especially common in Ohio, Indiana and Illinois, where low, open fields are often yellow with the two-inch flowers in May and June. This species is known in nature as polyploid populations with eight sets of chromosomes, an unusual occurrence in the genus.

To my knowledge no one has selected cultivars of *O. pilosella*. This is unfortunate, because there are many wild populations that are especially large flowering, or very branched, or low-growing, or with pleasing gray, soft foliage—all of which are potentially superior to those forms now in cultivation. There is a very rare subspecies, *O. pilosella* subsp. *sessilis*, which is not rhizomatous. It was apparently much more common in the past in prairies of Arkansas, Louisiana and Texas, but it is now restricted to a few locations along roadsides and railways in small remnant prairies surrounding rice fields and other croplands.

The most variable and widespread species in nature is *O. fruticosa*, which is seen somewhat less frequently in cultivation than *O. pilosella*. The species is so variable that it has long confused the botanists who have applied no fewer than 72 names to this single species. I recognize two subspecies within the species, *fruticosa*, with a southern, lower elevation distribution and relatively narrow, hairy leaves and smaller flowers, and a more northern, higher elevation subspecies, *glauca*, with broader leaves, larger flowers and no hairs or mostly gland-tipped hairs on the foliage that give the plants a glistening appearance. This later subspecies has often been referred to

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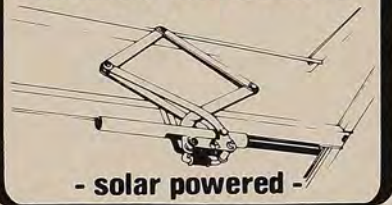
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EVENING PRIMROSES CONT'D

in the literature as *O. tetragona*. It is listed in *Hortus Third* under that name.

Populations of *O. fruticosa* grow in a variety of habitats from Quebec and Michigan to northern Florida and eastern Oklahoma, and from the tops of the highest Appalachians to the sea coast. Unlike *O. pilosella*, the plants are not rhizomatous

O. fruticosa is so variable that it has long confused the botanists who have applied no fewer than 72 names to this species.

but form tight clumps. On the average the plants are shorter, the leaves narrower and flowers smaller than *O. pilosella*. *Oenothera fruticosa*, too, is known in nature only as polyploid populations, mostly tetraploids, with a few hexaploids, and rarely, octoploids.

There have been a few named selections of *O. fruticosa*, including 'Fireworks', 'Highlight', 'Major', and 'Youngii', but there is much confusion in the cultivar names. A cultivar from one source may not be the same as one bearing the same name from another source. There is so much variation in the natural populations of this species that there are still many possibilities for someone to select superior cultivars to fit many garden situations. There are wild populations in full sun, partial shade, partially submerged in fresh or brackish water, in dry oak forests, heavy clay soils and dry sandy soils. Growth forms range from low, spreading plants a few inches tall to robust, upright plants up to three feet tall. An especially beautiful form is found at high elevations in the Southern Appalachians, notably along the Blue Ridge Parkway of Virginia and North Carolina. These plants growing in the forest edge have very broad gray, glaucous leaves and large, pale-yellow flowers.

The smallest of the group, *O. perennis*, is also the least variable. It is usually less than a foot tall at flowering time, with half-inch, dark-yellow flowers. In nature it is

found only as diploid populations growing from the Maritime Provinces to Manitoba and, moving southward, at higher elevations to South Carolina. Again there are no named selections of this species. There are some populations, especially in the New England states, with flowers twice the usual size; this species, too, shows unrecognized potential as a cultivated perennial.

Propagation of these perennials is best done by divisions of established clumps in the spring or fall. Pieces of the leafy flowering stem sometimes can be rooted in sand in late summer. Seed is slow to germinate and seedlings grow very slowly for the first few months. However, once a basal rosette is established, the plants grow quickly, flower the first year or remain as a basal rosette until the second spring.

Oenothera pilosella and *O. fruticosa* have a well-deserved place in the perennial border in all but the most extreme climates in North America. *O. perennis*, because of its small size, is best used in the alpine garden. All three can be used in wildflower gardens to give color between the spring and summer flowering natives. There is usually one major flush of flowers in late spring or early summer. For continued flowering for several months, cut back the stems after flowering to encourage branching.

I believe there are only limited possibilities for developing superior strains of *Oenothera* by crossing some of the species. My experience with crossing has been that little seed is set and there is virtually no germination of the resulting seed. This is probably due to poor chromosome pairing from the different polyploid levels of the species. There may be some possibility for development of improved varieties by crossing populations within one species and selecting for hardiness, heat tolerance or more compact forms with larger flowers. One example might be to use a southern population of *O. fruticosa*, which is heat tolerant, crossed with a larger flowered, bushy form from the north to possibly produce a more desirable form for southern gardens.

Herein lies a great opportunity for some enterprising Eastern plantsman to collect, propagate and introduce new forms of the sundrops to our gardens. Their presence in gardens would be most welcome. ☉

Gerald Bane Straley is Research Scientist and Curator of Collections at the UBC Botanical Garden in British Columbia.

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Other horticultural explorations available in 1983 are: Fall England (Sept. 8-22), Germany and IGA '83 (Sept. 6-20), Canadian Rockies (July 16-30), Fall New England (Oct. 3-17), Fall Orient (Nov. 1-24).

For any of these programs, please request your free brochure from the Education Department, American Horticultural Society, Box 0105, Mt. Vernon, VA 22121. OR telephone 1-703-768-5700.

BOOK REVIEWS

THE GARDENS AND GROUNDS AT MT. VERNON.

Elizabeth Kellam de Forest. The Mount Vernon Ladies Association of the Union. Mt. Vernon, Virginia 1982. 116 pages; hardbound, \$17.95. AHS discount price, \$17.15 including postage and handling.

This beautifully illustrated book tells the firsthand story of George Washington's efforts to develop his gardens at Mt. Vernon through comments in his diaries and letters. A series of plant lists identify all plants in each section of the gardens, and a bibliography will allow the interested reader to pursue the subject further. If you are interested in Colonial gardens, this book will be very useful; if you are visiting the

gardens at Mt. Vernon, it should be considered required reading.

HERBACEOUS ORNAMENTAL PLANTS.

Steven Still. Stipes Publishing Co. Champaign, Illinois. (3rd edition). 1982. 303 pages; paperbound \$16.80; hardbound \$21.80. AHS discount price, \$15.10 or \$19.65 including postage and handling.

Like the previous book, this revised edition from the same publisher is also greatly expanded. The format is the same and in addition to the line illustrations of each plant, 64 color plates are also included. The one shortcoming of the book is that



LEFT: Vegetables in planting beds of the Lower Garden at Mount Vernon are arranged so attractively they could function as an ornamental garden as well. ABOVE: The Upper Garden at Mount Vernon became known as Washington's Flower Garden. Today only those varieties known to have been grown in the 18th century are planted there.

the author does not clearly distinguish between perennials and annuals, and in fact, some of the plants that one might infer to be annuals are actually tender perennials.

FIELD GUIDE TO NORTH AMERICAN EDIBLE WILD PLANTS.
Thomas S. Elias and Peter A. Dykeman. Van Nostrand Reinhold Co. New York, New York. 1982. 286 pages; hardbound, \$22.95. AHS discount price, \$18.70 including postage and handling.

Over 200 species of edible wild plants are described and illustrated. Plants are arranged by primary season of use and in addition to excellent descriptions (key features for identification are highlighted in bold italics), colored photographs of the whole plant and distinctive parts (leaves, fruits, flowers, young shoots) and a distribution map help in identification. A series of special symbols in the margin indicate potential use such as salad, fruit, seasoning and also provide warnings about any danger involved in use of the plant or dangerous look-alikes. This is a very practical and well thought out book that should be easy to use for anyone interested in the subject.

GROWING CYCLAMEN.

Gay Nightingale. Croom Helm, Ltd. London and Canberra. 1982. 148 pages; hardbound. \$17.95. AHS discount price, \$15.85 including postage and handling.

This is another "all about" book covering all phases of the plant subject. History, culture, botany and even art are discussed for the many cultivars of the tender florist's cyclamen and all of the species. With 18 species native to the area surrounding the Mediterranean Sea and extending eastward into Asia Minor, there are plants that are adaptable to almost all but the very coldest areas of the United States. This well written book is illustrated with black and white drawings and colored photographs. Whether you grow *Cyclamen* on your windowsill or in the rock garden, this book is a useful addition to gardening.

MANUAL OF WOODY LANDSCAPE PLANTS.

Michael A. Dirr. Stipes Publishing Co. Champaign, Illinois. (3rd edition). 1983. 826 pages; paperbound \$19.80; hardbound, \$28.80. AHS discount prices, \$17.85 or \$25.95 including postage and handling.

In this new edition of a very useful and

well prepared book on trees, shrubs and woody vines for the garden, the author has added approximately 300 new species and 500 cultivars that were not included in the earlier editions. Over 300 additional line drawings have also been added. For each plant, a clear description is followed by excellent information on size, hardiness, habit, growth rate, culture, diseases, landscape value, cultivars and propagation. This is a very personal book, and the author freely states his personal feelings and opinions about each plant, which I feel makes an important contribution to an already very useful work. If you grow woody plants in your garden, this book is definitely worth having.

WALLED GARDENS—THEIR PLANTING AND DESIGN.

Diana Saville. B. T. Batsford Ltd., London, England. 1982. 168 pages; hardbound. \$42.00. AHS discount price, \$35.50 including postage and handling.

This is an English book about a typically English subject, but one which has a great deal to offer to the American gardener. Walled gardens have a particular charm whether they are part of a large estate or the necessary product of urban living. This latter situation, in particular, should recommend this book to the American gardener. Lots of pretty pictures, good ideas and sensible instruction are all positive features. The only caution comes with the discussions of recommended plants, many

of which will be too tender for American use, except in the more climatically favored portions of the country.

HOW TO IDENTIFY FLOWERING PLANT FAMILIES—A PRACTICAL GUIDE FOR HORTICULTURISTS AND PLANT LOVERS.

John Philip Baumgardt. Timber Press. Beaverton, Oregon. 1982. 269 pages; paperbound. \$22.95. AHS discount price, \$19.85 including postage and handling.

Those plant families with representative species in cultivation in our gardens are described in detail, but the descriptions are written for the serious gardener, not the botanist. A key to the included families actually does provide a means of identifying an unknown plant although the real value of this book lies in the thorough descriptions of the plant families, which can be read individually by the inquiring gardener. Good line illustrations and a list of the more common genera are provided as part of the treatment of each family. Written in response to requests from members of the Garden Club of America Rare Plant Group, this book should help the advanced gardener better understand the relationships between plants. ♣

—Gilbert S. Daniels

Gilbert S. Daniels is the Immediate Past President of the American Horticultural Society.

ORDER FORM

- The Gardens and Grounds at Mt. Vernon \$17.15
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PRONUNCIATION GUIDE

Guide to Botanical Names in This Issue

The accent, or emphasis, falls on the syllable that appears in capital letters. The vowels that you see standing alone are pronounced as follows:

i—short sound; sounds like i in “hit”

o—long sound; sounds like o in “snow”

a—long sound; sounds like a in “hay”.

Allium tuberosum

AL-ee-um too-bur-O-sum

Anemonella thalictroides

ah-nem-o-NELL-ah thal-ik-tro-EYE-deez

Aristolochia air-riss-toe-LO-kee-ah

Artemisia dracunculus var. *sativa*

ar-tem-EEZ-ee-ah dra-KUN-kew-lus

sa-TY- va

Calendula officinalis

ka-LEN-dew-la o-fiss-i-NAY-liss

Callistephus kal-ISS-tef-fuss

Cedrus libani SEE-drus li-BAN-ee

Celosia cristata

see-LOWS-ee-ah kris-TAY-ta

Centaurea cyanus

cen-TAW-ree-ah sy-AN-us

Chamaecyparis pisifera

kam-ee-SIP-er-us pi-SIFF-er-ah

Clarkia CLARK-ee-ah

Clematis CLEM-ah-tiss/clem-AT-iss

Colchicum KOL-ki-kum

Crocus sativus CROW-kuss sa-TY-vus

Cyclamen SYKE-la-men/SICK-la-men

Cynoglossum amabile

sy-no-GLOSS-um ah-MA-bil-ee

Elettaria el-le-TARE-ee-ah

Emilia javanica eh-MEEL-ya ja-VAN-i-ka

E. sagittata e. saj-i-TAY-ta

Epilobium angustifolium

ep-i-LOW-bee-um

ANG-goose-ti-FO-lee-um

E. latifolium e. lat-i-FOL-ee-um

E. obcordatum e. ob-cor-DAY-tum

E. rigidum e. RIDGE-i-dum

Euphorbia lathyris

yew-FOR-bee-ah la-THIGH-riss

Fritillaria imperialis

frit-ill-A-ree-ah im-peer-ee-A-liss

Fuchsia excorticata

FEW-she-ah/FEW-sha ex-cor-ti-KAY-ta

F. X hybrida f. HY-brid-ah

F. magellanica f. madge-el-LAN-i-ka

F. procumbens f. pro-KUM-benz

F. triphylla f. TRI-fill-ah

Gaillardia gail-AR-dee-ah

Gomphrena haageana

gom-FREE-na hay-gee-A-na

Gypsophila elegans gyp-SOPH-il-ah

EL-e-ganz

Helianthus he-lee-AN-thus

Ilex crenata EYE-lex kren-A-ta

Laurus nobilis LORE-us NO-bil-iss

Lilium candidum LIL-ee-um CAN-did-um

Limonium sinuatum

li-MO-nee-um sin-you-A-tum

Ludwigia natans

lewd-WIG-ee-ah NAY-tanz

Magnolia X soulangiana

mag-NOL-ya sue-lan-gee-A-na

M. stellata m. stell-A-ta

Molucella laevis mo-lew-CELL-ah LEE-vis

Nicotiana ni-ko-ti-A-na

Oenothera biennis

een-o-THEER-ah by-EN-iss

O. fruticosa subsp. *fruticosa*

o. fru-ti-KO-sa fru-ti-KO-sa

O. fruticosa subsp. *glauca*

o. fru-ti-KO-sa GLAW-ca

O. linifolia o. lin-i-FO-lee-ah

O. odorata o. o-door-A-ta

O. perennis o. per-EN-iss

O. pilosella subsp. *sessilis*

o. py-lo-SELL-ah SESS-i-liss

O. spachiana o. spack-i-A-na

O. speciosa o. spee-see-O-sa

Origanum heracleoticum

or-i-GA-num her-ah-klee-OT-i-kum

Perilla frutescens

pe-RILL-ah fru-TRESS-enz

Pogostemon patchouli

po-go-STEM-on pat-CHEW-lee

Polianthes tuberosa

pol-lee-AN-theez too-bur-O-sa

Primula PRIM-yew-la

Ranunculus acris ra-NUN-kew-lus A-kris

R. alpestris var. *traunfellneri*

R. al-PRESS-triss traun-FELL-ner-eye

R. amplexicaulis r. am-plex-i-CALL-iss

R. andersonii r. an-der-SON-ee-eye

R. b Buchananii r. bew-CAN-an-ee-eye

R. bulbosus r. bul-BO-sus

R. calandrinoides

r. cal-an-dri-nee-o-EYE-deez

R. ficaria r. fi-CARE-ee-ah

R. glacialis r. glay-see-AL-iss

R. gramineus r. gra-min-EE-us

R. lyallii r. lee-AL-ee-eye

R. montanus r. mon-TAN-us

R. parnassifolius r. par-nass-i-FO-lee-us

R. repens r. REE-penz

R. seguieri r. seg-wee-AIR-ee

Rhododendron schlippenbachii

ro-do-DEN-dron schlip-en-BACH-ee-eye

Salix babylonica

SAY-licks bab-i-LON-i-ka

Sciadopitys verticillata

sigh-ah-DOP-i-tiss ver-ti-sill-A-ta

Thuja occidentalis

THOO-ja ock-si-den-TAY-liss

Tithonia ti-THONE-ee-ah

Vetiver zizanioides

VET-i-ver zi-zan-ee-o-EYE-deez

Zauschneria californica

zowsh-NAIR-ee-ah kal-i-FORN-i-ka

SOURCES FOR PLANTS & BOOKS

OENOTHERA

The sundrops are available from the following nurseries under a variety of names, including *Oenothera fruticosa*, *O. tetragona* and *O. youngii*.

Plants

Busse Gardens, 635 East 7th Street, Route 2, Box 13, Cokatom, MN 55321, Catalogue \$1.00.

Carroll Gardens, P.O. Box 310, 444 East Main Street, Westminster, MD 21157, Catalogue free.

Powell's Gardens, Route 2, Box 86, Princeton, NC 27569, Catalogue.

Andre Viette Farm and Nursery, Route 1, Box 6, Fishersville, VA 22939, Catalogue \$1.00.

Seed

J. L. Hudson, Seedsman, P.O. Box 1058, Redwood City, CA 94064, Catalogue \$1.00.

Thompson and Morgan, P.O. Box 100, Farmingdale, NJ 07727, Catalogue free.

RANUNCULUS

A few of Will Ingwersen's favorite buttercups are available by mail order in this country and Canada.

Plants

Alpenglow Gardens, 13328 King George Highway, Surrey, British Columbia, Canada V3T 2T6, Catalogue \$1.00, carries *R. gramineus*.

Siskiyou Rare Plant Nursery, 2825 Cummings Road, Medford, OR 97501, Catalogue \$1.50, carries both *R. gramineus* and *R. montanus*.

Seed

Thompson and Morgan, P.O. Box 100, Farmingdale, NJ 07727, Catalogue free, carries seed for two species: *R. glacialis*, *R. gramineus*, and they also carry a species mixture that includes *R. calandrinoides* and three other species he does not mention, *R. lingua*, *R. pyrenaicus* and *R. aconitifolius*.

READING TREE LEAVES:

There are several excellent books on the insects and diseases that attack woody ornamentals. The following books are worth considering for any library.

Destructive and Useful Insects. Metcalf, Flint and Metcalf. McGraw-Hill. 1967.

This is a text book with very helpful keys to insects based on the injuries they cause.

Diseases and Pests of Ornamental Plants. Pirone. Wiley-Interscience, Publishers. 1978.

The Gardener's Bug Book. Fourth Edition. Westcott. Doubleday. 1973.

Insects That Feed on Trees and Shrubs. Johnson and Lyon. Cornell University Press. 1976. This is an excellent photographic reference.

Westcott's Plant Disease Handbook. Fourth Edition. Westcott. Van Nostrand Reinhold. 1979.



JEWELS OF THE PLAINS

Wild Flowers of the Great Plains Grasslands and Hills

Claude A. Barr

Barr, a self-trained botanist, lived most of his 95 years as a rancher in South Dakota. This is the warmly personal, delightfully readable account of his abiding love for the native plants of the plains and grasslands. In prose akin to poetry he describes his "prairie gems" and, at the same time, provides botanically accurate, invaluable information for all rock gardeners and landscapers. 119 color photos. \$19.95

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BUTTERCUPS CONT'D

from page 25

are adorned with narrow, pointed, glaucous, stem-clasping leaves and are topped by several large, splendidly rounded, pure-white blossoms. It is not unusual to discover forms that are semi-double; one exceptionally large-flowered form has been selected and named 'Grandiflora'. It presents no difficulty if grown in open, sunny positions in sharply drained soil.

Our British roadsides are made colorful each spring by sheets of the lesser celandine, whose flowers present a great temptation to gardeners. Beware! It is a fiendish weed.

One of your own North American buttercups is *R. andersonii*, which I have not grown but would like to. It is said to have glaucous, pinnatifid leaves, and the flowers are described as "pinkish," which could be nice or nasty! Perhaps one of your readers can tell me more about it.

New Zealand also offers us *R. buch-ananii*, whose deeply cleft, gray-green leaves form dense tufts from which rise nine-inch stems, each carrying one or more spectacular flowers of glistening white.

One of the loveliest of European alpine species is *R. parnassifolius*, but it naughtily produces forms with small and unattractive flowers, which are sometimes purchased by the unwary buyer. Buy the type with small, leathery, dark-green, heart-shaped leaves and short, branching stems that carry numerous snow-white flowers with wide, overlapping petals.

Our British roadsides are made colorful in early spring by sheets of the lesser celandine, *R. ficaria*, whose flowers of minted, glistening gold present a great temptation to gardeners. Beware! Bringing it home is a fatal mistake for it is a fiendish weed in cultivated ground and almost impossible to eliminate since it produces many tiny tubers, each of which grows into a vigorous plant.

There are, however, several selected

forms, all found in the wild, that are less invasive. One of the best of these is *Ranunculus ficaria* 'Aurantiaca', whose short-stemmed blossoms are of a rich, coppery-orange color. It does spread, but modestly, and never becomes a pest. There is also a pure white variety and one with primrose-yellow flowers, but of these one should be slightly suspicious and confine them to areas where a moderate invasion is acceptable.

The grass-leaved buttercup, *R. gramineus*, is a lovely, easy-to-grow plant from the mountains of southern Europe. When not in flower it looks for all the world like a tuft of narrow-leaved grass, but in spring nine-inch stems carry many large, saucer-shaped flowers of rich yellow. It is good-tempered and long-lived and is a popular and much loved plant.

A divergent species, scattered throughout Europe, is known collectively as *R. montanus*. In its best forms it is a small but desirable plant, but all the wild types are surpassed by a cultivar named 'Molten Gold'. It forms the neatest of tufts of either glabrous or slightly hairy leaves, and the whole plant disappears in spring beneath galaxies of bright-gold flowers on very short stems.

A species of which I am particularly fond, partly, perhaps, because it was one of the first alpinists I collected on my very first plant-hunting expedition many years ago, is *R. seguieri*. It is to be found in widely separated areas of the European Alps, usually on limestone. It forms low, loose tufts of finely divided gray-green leaves and bears rounded, milk-white, golden-eyed flowers on very short stems. It is a plant for the stoniest of rock ledges and prefers a spartan diet.

These, then, are a few of the buttercups that delight me. There are many more. They can be propagated by division in early winter or spring, or they all can be raised from seed. It is important to sow the seed as soon as possible after it ripens. Many of the buttercups shed their seed while still apparently green and unripe. Seed stored and dried may be reluctant to germinate. Sow seed as you would for most any perennial, in flats filled with sterile medium for seedlings in the late winter or early spring. Transplant when danger of frost is past, or pot the seedlings on and grow them in a protected location for a year. ☼

Will Ingwersen has devoted his life to collecting and growing alpinists. He is a recipient of the Royal Horticultural Society's Victoria Medal of Honour.

CUTTING GARDEN CONT'D

from page 29

shapes, as are crown asters, scabiosa, strawflowers and dahlias (buy named tubers, not bedding dahlias). For round, but flat, disc shapes try *Calendula* for cool climates and *Tithonia*, which thrives on heat.

To contrast with the round shapes your arrangements will need some vertical spikes like snapdragons or bells of Ireland (*Molucella laevis*) or feathery *Celosia cristata* 'Pampas Plume', a mix including some soft pastels, or 'Tango', a rich orange. Tuberoses (*Polianthes tuberosa*) and miniature gladiolus are summer bulbs that can easily be fitted into an annual cutting area. Add some informal daisies such as *Gaillardia* and cosmos and 'Italian White' sunflowers, *Helianthus*. The arching stems and pendent trumpets of *Nicotiana* add grace to any bouquet, especially in the lime-green color, which enhances either pink or yellow combinations. The search for a diversity of shapes sometimes leads to the discovery of a treasure like *Emilia javanica* (formerly *E. sagittata*), whose tiny scarlet tassels are adorable scene-stealers in any company. Then there are the flowers valued, not for their individual shapes, but as airy fillers. These might include white *Gypsophila elegans* 'Covent Garden', commonly called baby's-breath, yellow-green dill (yes, the herb) or cool-blue *Cynoglossum amabile*, the Chinese forget-me-not.

Once you have fantasized about many, and then painfully narrowed your list down to a few appealing and suitable inhabitants for your cutting garden, carefully check the height of each variety you order. Some plants are naturally short and yet good for cutting, but in the naturally tall species the hybridizers are working against us by seeking ever bushier, lower plants—putting nice long stems in danger of extinction. There is hope. After all, home-grown flowers of any kind were becoming rare a few years ago as suburban yards were all being covered with compact evergreens and ground-covers. As more people show an interest in growing their own sturdy, long-lasting cut flowers, the plant breeders will take note. In the meantime, with careful selection and efficient gardening, we can know the thrill of being able to step out of our doors and fill a big basket or a petite bud vase with just the right blooms at just the right stage of growth—all beautifully, unbeatably fresh. ☺

Libby Ferebee owns a free lance flower arranging business called The Cutting Garden in Newport News, Virginia.

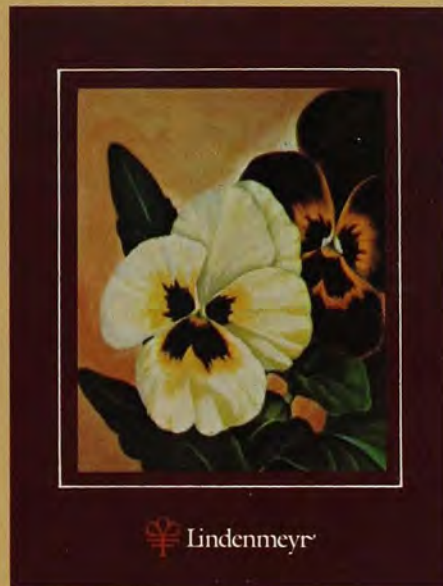
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TREES

One of the biggest commitments and perhaps the wildest stretch of imagination a gardener can make is to plant a tree. Planting a ball and burlap cedar-of-Lebanon (*Cedrus libani*) for the benefits it may provide a century hence calls for a firm act of faith and a strong interest in creating shade for your grandchildren.

But shade, whether it is the dappled shadow of birch or locust or the dense shade of sugar maple, is only one reason to plant trees. Trees provide year round architectural and textural interest and define space within a landscape. They also serve as background for other plantings. Despite their height and presence, trees do not stand alone in a garden. They are part of a constantly changing seasonal relationship with surrounding plants.

Used as background, trees can help create pleasant, sometimes brilliant plant associations such as the plantings of Japanese umbrella pine (*Sciadopitys verticillata*) and *Rhododendron schlippenbachii* in the Pinetum at Winterthur in Wilmington, Delaware. In late April and early May, the royal azalea's almost transparent blooms are beautifully poised on the still leafless branches. Visible through this shimmering mass are the thick, dark-green whorls of pine needles glistening in the sunlight. The interplay that results makes a striking statement about the various qualities of light. In autumn, the red-orange foliage of the azalea provides another effective, if totally different foil.



LEFT: Trees create moods in a garden. Consider the difference in mood established by these two plantings. At left, tall, stately trees create a feeling of grandeur along this path at Winterthur. Above, an idyllic and tranquil mood prevails along this pond at Westbury.

Trees can also define the boundaries of your property. Their forms against the sky create one of the most powerful lines in any landscape. Along with their silhouette, trees should be selected for color (of leaf and bloom), texture, ultimate height and width and season of bloom. But even before you select or plant, consider where you want open spaces, enclosure and sunlight.

Trees provide a framework and volume in a garden. Without evergreens, for example, or the strong architectural branching of trees, a northern garden can become almost one dimensional in

winter. On a larger property, trees give shape to a landscape, either by emphasizing existing land contours or through their own undulating masses.

Selecting and planting trees is a great lesson in looking ahead—not a mere four or five years but often 20 to 30 years down the road. Because trees take time to grow, there is the temptation to plant them too closely or select fast growers. But time is a funny thing. Looking back, 15 years becomes a remarkably short time. If you planted fast growing third or fourth choices instead of the trees you really wanted, you can only look

toward the future with mixed emotions.

When selecting a tree, as with any garden plant, it is crucial to consider the site for the degree of moisture, soil type, pH, etc. Of equal consideration is the environment the maturing trees create around them. Along with an expanding breadth of shade that will naturally affect plants under and nearby, trees offer stiff competition for water and nourishment and in some cases can dramatically affect soil pH.

Your selection of a tree(s) can also create distinct moods within the garden and perhaps complement an existing

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DESIGN PAGE CONT'D

planting or setting. I don't know how many ponds or streams I've seen planted with willows. But no matter. Whether the tree is the common weeping willow (*Salix babylonica*) with its long, pendulous branches, one of its cultivars or another species altogether, the imagery of their fluid, whispering branches, like the water itself, is never redundant.

You certainly want to select some of your favorite trees for your garden, but chances are, in the interest of visual unity, you won't include even a third of those you originally had in mind. A landscape of trees is not like a collection of porcelain boxes, held together simply because they are the same thing. A planting selected by the "one of those and one of these" method will look like it.

When it becomes necessary to reconsider trees in an existing landscape, it is important to carefully observe why they are there and judge their validity for the garden you have envisioned. Often some fairly basic, albeit difficult decisions have to be made; some trees may, regrettably, have to go, perhaps because they are fast growers now on the decline, less desirable varieties or simply in the wrong place.

In some cases, existing trees may be out of scale, the result of the limited vision of the person who planted them. Large trees can dramatically reduce the size of an area simply by filling it. A saucer magnolia (*Magnolia soulangiana*) may overwhelm a city garden. On the other hand, star magnolia (*Magnolia stellata*) as a single specimen or limited grouping, perhaps on the same site, may create the illusion of greater space simply because the trees are smaller and more delicate in branch and bloom.

When selecting trees for a landscape, it is not enough to read catalogs and books. However assiduous the research, this approach will only provide a rough intellectual idea of trees. Nor is it enough to waltz into a favorite nursery and see possible choices neatly labeled in containers. Only through careful and sensitive observation, a kind of all-season tree watching, observing the texture of bark, the way a branch meets a trunk, the wind rippling through the leaves, the fragrance of newly opened leaves—all the tree's various stages of growth—will you more fully comprehend the role a tree can play in your garden. ♣

—Margaret Hensel

Margaret Hensel is a landscape designer and garden writer living in Massachusetts.



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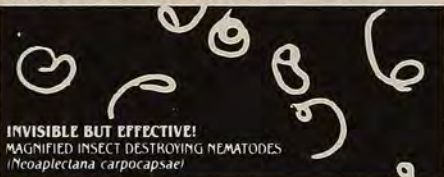
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