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Although most plants are grown for ornamental characteristics such as flowers, foliage, fruit, or bark, many species offer an often-overlooked feature that can add great enjoyment for the gardener—scented foliage. To learn more about the fragrances contained in plant leaves, turn to "Foliar Fragrance" on page 15. Photograph by Anita Sabarese.

On the Cover: The seed-filled heads of giant sunflowers are a sure sign of the coming of autumn. This North American native has long been grown for its nutty-tasting, nutritional seeds, but the plants have been put to many other uses—from ornamental to industrial. For more on this fascinating and colorful plant, turn to "Celebrating Sunflowers" on page 22. Photograph by Ellen Vincent.

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Meet Our New President

This is a first: my first letter to you as AHS President, and the first time you have honored a woman to lead you. At the Society's Annual Meeting in New York City, Everitt L. Miller regretfully submitted his resignation as President of the Board of Directors. As First Vice President, I succeeded him.

As Chairman of the Awards Committee, I became aware of the vast interests, traditions and enthusiasm our members share, and the great potential of channeling these energies.

On the past two Caribbean trips my husband and I led, we saw the excitement we all share in discovering new plants, seeing new gardens, and sharing gardening experiences. Members from more than 24 states joined these trips.

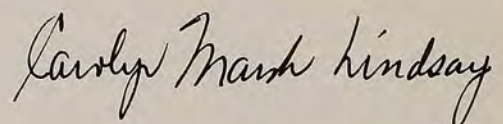
At our Annual Meetings, I see the great excitement generated by learning more about areas of our country, and by sharing ways to solve problems gardeners everywhere share—those at home, in our communities, nationally and internationally.

Gardeners everywhere share a special vision, especially in the spring. Each year the "weed-free, continuous bloom" is bursting in all of us. The American Horticultural Society is a vehicle for all our members—from great, individually diverse traditions and interests—to work toward a common goal to preserve and enhance our country's beauty.

This "weed-free, continuous bloom" vision, coupled with our enthusiasm for learning, is easily translated into what our land can be: "America the beautiful—from sea to shining sea."

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Our great diversity of membership is the strength that will enable us all to pursue this destiny of a caring nation. Do me two favors: Share this destiny with a friend by using the gift membership insert in this magazine; and write to me personally at River Farm and share all your ideas, goals, and ways to accomplish this vision.



—Carolyn Marsh Lindsay
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The Phlox Family

Most gardeners need no introduction to the phlox family, Polemoniaceae. However, many are not familiar with some of the less-well-known plants among the 18 genera and over 300 species in the family.

Phlox family members are widely distributed but are most common in North America. Among the hardy perennial types from the temperate regions of America and Eurasia are *Phlox* and *Polemonium*. From arid southwestern North America and the warm temperate regions of South America come *Gilia*, and the less-familiar *Linanthus*, *Collomia*, and *Ipomopsis*. Some small trees and shrubs, including *Cantua*, are confined to the northern Andes. The genus *Cobaea*, a vine from tropical America, is regarded by some plantsmen as constituting a separate family altogether.

The phlox family contains annuals, biennials, and perennials. The simple or compound leaves of members of the family may be alternate or opposite on the stems. Flowers are symmetrical and grow mostly in terminal clusters; individual blossoms have a five-lobed calyx or a five-lobed corolla with a well-developed tube and wide-spreading petals. Some blossoms are also bell-shaped. The fruit is a capsule.

The great variety of mechanisms for pollination employed by phlox family members are of particular interest. Pollination by bees is most common among the North American genera, although *Gilia* and *Polemonium* are both pollinated by hummingbirds, and beetles are attracted to *Ipomopsis* and *Linanthus*. Several genera are pollinated by butterflies and moths. Tropical species are pollinated by bats (*Cobaea*), hummingbirds (*Cantua*), and hawk moths (*Cantua* and *Cobaea*), as well as by bees.

Phlox, the largest genus among the Polemoniaceae, includes about 60 species. These annuals, perennials, and subshrubs are all native to North America, with the exception of just one species, *P. sibirica*, from Siberia. The name *Phlox*, assigned to these plants by Linnaeus, is a direct translation of the Greek word for flame, in reference to the tall stalks of bright flowers,



LEFT: *Phlox subulata*, commonly called moss pink, is an exceptionally popular garden plant that is especially attractive when allowed to cascade over rocks or cover sunny slopes. ABOVE: *Linanthus nuttallii* is a phlox family member native to western North America.

which may be blue, purple, crimson, pink, or even white. There are numerous natural variants, many cultivated varieties, and some hybrids. British and European hybridizers have played an important part in developing attractive *Phlox* species for the garden.

According to the *New York Botanical Garden Encyclopedia of Horticulture*, phlox “classification and identification present problems. . . . Botanically, phloxes are classified primarily according to their styles relative to the stamens and by their habit of growth.” Indeed, the growth habits of *Phlox* species differ widely. Some are decumbent (that is, they grow along the ground), while others may reach a height of several feet. The plants have simple, lanceolate leaves. The flowers grow in loose

terminal clusters; petals are united in a short tube with five lobes that untwist when they open.

The familiar perennial garden phlox is *Phlox paniculata*, an American native found growing from New York to Georgia, and westward into Illinois and south to Arkansas. This attractive species usually has purplish-pink flowers, and blooms in July and August. There are many popular garden cultivars offering a wide range of colors—from white or pink, to scarlet or purple. Cultivars that bear blossoms with contrasting eyes are also available. Some popular named cultivars include ‘Mt. Fuji’, ‘Fairest One’, and ‘Star Fire’.

Wild blue phlox, *P. divaricata*, is a popular species for wildflower gardens. This hardy perennial, which is sometimes listed



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STRANGE RELATIVES

as *P. canadensis*, is native to New England as well as the southern and south-central states, where it blooms in moist woodlands from April to June. The plant spreads by creeping, flowerless stems that take root. This species is sometimes commonly called wild sweet William. (It has no relation to *Dianthus barbatus*, the biennial sweet William so popular among gardeners.)

Creeping phlox, *P. stolonifera*, is a five-inch- to one-foot-tall species that is hardy to USDA Zones 2 or 3. Like *P. divaricata*, the plants spread by creeping stems. The two- or three-inch-long leaves of this species are covered with hairs. The dense clusters of flowers are purple or violet. 'Blue Ridge' is a popular blue-flowered cultivar; white- and pink-flowered forms are also available. Creeping phlox can be used as a ground cover in shade.

Moss pink, *P. subulata*, is a prostrate perennial that forms dense, semi-evergreen mats and bears needle-like leaves. Its striking, early-spring clusters of bright purple, pink, or white flowers make it a popular garden plant. It is native to sandy, open woods from New York to North Carolina and westward.

Plants, or "sod," of *P. subulata* were sent by the early-American plant collector John Bartram to his correspondent Peter Collinson in England in 1741. Reginald Farner, in *The English Rock Garden*, suggests that "the day that saw the introduction of *P. subulata* ought to be kept as a horticultural festival." It is widely grown and hybridized, and many cultivars are listed. The plant forms a spectacular solid carpet of green and is especially attractive drooping over banks or cascading from rocks in rock gardens and on sunny slopes.

The highly regarded white-flowered phlox 'Miss Lingard' is probably a cultivar of *P. carolina*, a native species commonly called Carolina or thick-leaf phlox. An early-blooming perennial that grows to three or four feet in height, *P. carolina* is native from North Carolina to Florida, and westward to Mississippi and Missouri. 'Miss Lingard' has been available in the horticultural trade for over 80 years. It is not an aggressive spreader, and its leaves seem to be resistant to mildew.

The stalwart Drummond or annual phlox, *P. drummondii*, was named in honor of Thomas Drummond (1780-1835), a Scottish naturalist who collected plants along the American frontier and died during an exploration of the American Southwest. Seeds of *P. drummondii*, sent in one

of the last cases that Drummond shipped to Glasgow in February 1835, were planted in the Glasgow Botanical Garden and produced plants with abundant blossoms. William Hooker, professor of botany at the University of Glasgow, wrote the botanical description and added, "As it is an undescribed species, I am desirous that it should bear the name and serve as a frequent memento of its unfortunate discoverer."

Drummond phlox, sometimes called Texas pride in its native state, is one of the most popular garden flowers in the world. It has naturalized in most of the Gulf states, but it is indigenous only to the plains of southeastern Texas. This erect annual phlox grows about 20 inches tall. The petals of the one-inch flowers are deeply cut, pointed and fringed, or star-shaped. The blossoms generally have conspicuous white or dark eyes. *P. drummondii* has been cultivated for so long that the number of cultivars and the color range of the flowers are legion. It has a natural tendency to produce flowers of various colors (except yellow), a trait that plant hybridizers have used to develop a large number of cultivars.

There are about 20 or 25 species of *Polemonium*. This genus is characterized by pinnately divided leaves, with leaflets that are arranged in pairs. According to legend, this distinctive arrangement represents the ladder dreamed of by Jacob.

April and May bring the annual rebirth of Jacob's-ladder, *P. caeruleum*, another popular garden subject in the phlox family. Also known as Greek valerian or charity, this erect perennial grows to about three feet tall. *P. caeruleum* bears panicles of small blue flowers from May to July, and is hardy to Zone 3. Native to Europe and Asia, it escaped from cultivation and has naturalized in this country.

At least two native species of *Polemonium* are commonly featured in field guides of eastern and midwestern plants. One, *P. van-bruntiae* (often listed as a subspecies of *P. caeruleum*), has been included on lists of potentially endangered species. Its populations are being monitored by botanists, and it is one of the species featured in the American Horticultural Society's *Endangered Wildflowers 1988 Calendar*. *P. van-bruntiae* grows wild from Vermont to Maryland. It blooms between May and July in marshy meadows and along streams.

P. reptans is a blue-flowered American wildflower commonly known as Jacob's-



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STRANGE RELATIVES

ladder or Greek valerian. This species is native to woodlands and bottomlands from New Hampshire to Georgia, and westward to Minnesota and Oklahoma. A weak-stemmed, eight- to 15-inch plant, it has long been a garden favorite because of its bluebell-like blossoms.

Alpine skunkflower is a common name for *P. viscosum*. This species' ill-scented, glandular-pubescent leaves are extremely sticky and are crowded below the plant's blue flowers. The whole plant is only a few inches high. *P. viscosum* blooms in the summer from the mountains of British Columbia to Montana, and southward to northern Arizona and New Mexico. A true dwarf, it is found only at subalpine elevations.

The name *Gilia* honors one or the other of two 18th-century botanists: Felipe Luis Gil, of Italy, or Philipp Salvador Gil, a Spaniard. The genus *Gilia* consists of 20 to 30 species of annuals, biennials, or perennials, all of which are native to the New World, primarily western North America. According to Thomas H. Kearny and Robert Peebles in *Arizona Flora*, "The genus *Gilia* remains a very heterogeneous assemblage even after elimination of the segregate genera *Navarretia*, *Eriastrum*, *Lep-todactylon*, *Linanthus*, and *Langloisia*." (All of these genera are western North American natives.) According to *Wild Flowers of the United States*, "At one time or another most of the herbaceous Polemoniaceae have been placed in *Gilia*. . . . It remains a bewildering group of numerous heterogeneous species. . . . It is not surprising that some species have gone by many names."

Leaves of *Gilia* species are sometimes borne in a basal rosette. They are simple or dissected, usually hairy, and often glandular. Flowers are funnellform; blue, pink, red, yellow, or white; and grow in branched inflorescences. *Gilia* species listed in *Hortus Third* are erect, glandular-hairy annuals. Among these is *G. tricolor*, bird's-eyes, which bears twice-pinnately divided, linear leaves. The flowers, borne in a few-flowered terminal cyme, display corollas with lilac or violet lobes, a yellow tube, and a throat marked with purple. This native of California grows to 2½ feet.

G. capitata is a popular Pacific Coast annual sometimes known as thimble flower or blue gilia. An erect plant with finely dissected leaves, it bears 50 to 100 small blue, violet, or white flowers that are packed in a dense clover-like head.

A number of native American wildflowers listed in *Hortus Third* as belonging to other genera of the phlox family are considered by some botanists to be *Gilia* species. For example, the species listed as *Ipomopsis aggregata* in *Hortus* has been classified elsewhere as *Gilia aggregata*. Commonly called scarlet gilia or sky-rocket, this biennial grows to two feet tall and bears two-inch-long, pinnately dissected leaves. Its one-inch flowers—borne on long, slender, multiple stems—are red, golden-yellow, pink, or off-white. This species is found from the mountains of British Columbia to California and east to the Rockies. It blooms from June to late August.

Ipomopsis rubra (sometimes called *Gilia rubra* or *G. coronopifolia*) is commonly called standing cypress. This unbranched biennial or perennial grows to six feet tall. Its glabrous leaves are pinnately parted into filiform segments that are about an inch long. The flowers, scarlet on the outside and yellow with red dots on the inside, are spaced on a long, narrow, terminal cluster. Also called Texas-plume or trailing fire, this species is native from South Carolina to Florida and west to Texas. Hummingbirds are said to adore it.

Linanthus aureus (also listed as *Gilia aurea*) is a branchy, thin-stemmed plant that grows no more than eight inches high. Commonly called golden gilia, it bears yellow blossoms that are surprisingly large in comparison with its height. The three-cleft leaves are hairy and glandular. This annual is found growing in the wild from southern California to the Baja Peninsula.

Linanthus dianthiflorus (also listed as *Gilia dianthoides*) is commonly called fringed pink or ground pink because of its resemblance to the true pinks, *Dianthus* spp. This six-inch tufted annual is also from southern California and Baja California. Flowers are lilac or pink and are borne in solitary or few-flowered clusters. Leaves are simple and filiform.

Another species listed by some botanists as belonging to the genus *Gilia* is *Langloisia matthewsii* (sometimes listed as *Gilia matthewsii*), desert calico. Both are desert natives of the American Southwest.

The two cultivated tropical genera of the phlox family are *Cantua* and *Cobaea*. *Cantua* is a South American genus, and grows chiefly in Peru, Ecuador, and Bolivia. *Cantua* is the Latinized form of the Peruvian name for these evergreen shrubs or trees, of which there are six species.

Flowers are occasionally solitary but are more frequently arranged in many-flowered clusters. Individual blossoms are tubular, with five well-defined lobes.

Cantua buxifolia, from the Peruvian and Bolivian Andes, grows to about 10 feet tall and bears red-and-yellow streaked flowers in three-inch terminal clusters. It is the national flower of Peru and is known as the sacred-flower-of-Peru. Because of the plant's quick response to rainfall following a drought, it is also sometimes called magic flower. *C. bicolor* is a four-foot Bolivian shrub whose flowers are yellow with scarlet lobes. *C. pyriformis*, from Ecuador and Bolivia, bears yellow-and-white blooms in dense terminal clusters. All three of these handsome Andean cantuas are tender and must be grown in a cool greenhouse, except in mild climates, where they are sometimes grown outdoors.

Cobaea bears the name of Bernardo Kobo (1572-1659), a Spanish missionary and naturalist who worked in Mexico and Peru. This genus is classified by some botanists as a family in its own right, Cobaeaceae. The 10 species of *Cobaea* are shrubby climbers native to tropical America. All of these species can be grown in the greenhouse or outdoors, and are treated as annuals in northern gardens. The leaves are pinnately divided; their terminal leaflets are converted into tenacious tendrils for climbing. *Cobaea* bears large, showy flowers that are borne on long stalks. The five green leaf-like sepals and five petals are cup-like in form and account for the common name cup-and-saucer vine. When the blooms first open, they are green and have an unpleasant scent, but eventually they become purple and take on a honey-like fragrance.

C. scandens, commonly called Mexican ivy, monastery-bells, or cup-and-saucer vine, is the best-known species. Even when grown as an annual, it may climb to 25 feet and will festoon walls or shrubbery with its blooms in autumn. Under glass, it will bloom in spring and summer.

The roster of names in the phlox family includes common and much-loved plants for annual plantings, perennial borders, or rock gardens, as well as exotic blooms for greenhouses or warm-climate gardens. Any gardener can fulfill his or her horticultural fantasies by adopting some of these strange relatives. ☉

—Jane Steffey

Jane Steffey is an editorial advisor to *American Horticulturist*.



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Blackberry Lilies



Joanne Pavia

In late June or early July, when the wild blackberry bushes are thick with ripe black fruits, the freckled blooms of *Belamcanda chinensis* begin to open. Each blossom is open for only a day, after which the petals wither into spirals and drop, leaving a seed chamber that swells during the last weeks of summer. In early September, the seed capsules begin to split, revealing their cargo of large black seeds. These oval clusters of seeds mimic summer's ripe berries—hence the common name blackberry lily.

Because of its spotted flowers, *B. chinensis* is also sometimes known as Chinese leopard flower, leopard lily, or dwarf tiger lily. However, this striking plant is not really a lily; its clumps of flat, pointed foliage that emerge from underground rhizomes mark it as a member of the iris family.

Compared to the more familiar true irises (*Iris* spp.), the blooms of *B. chinensis* are undramatic in size—only about two inches wide. However, they have a certain whimsical charm, and their color is vivid. Each bloom is made up of six tongue-shaped petals that are a clear shade of orange, like the skin of a tangerine. Crimson freckles dot the petals.

The blackberry lily's appearance in the garden at midsummer comes when fresh color is much appreciated. In my terraced bed of perennials, the fringed leaves of columbines are already quite bushy by the time the blackberry lilies send up their first pointed leaf tips in mid-spring. Growing upward and apart, the leaves spread to form fans about 10 to 12 inches high. In late June, a thick stem rises from the center of each clump. Six or more blooms perch along the branched ends of the stems, opening in succession for about a month. The small-petaled blooms provide splashes of orange and red in the border, echoing the scarlet hues of *Monarda* and accenting the rich yellow and chocolate-brown of black-eyed Susans.

In its native land of China, *B. chinensis* grows wild in open grasslands and has been cultivated as a medicinal plant for centuries. Commonly known to the Chinese as

pinyin (its classical name is *Shê Kan*), the plant's rhizomes have yielded tonics and purging medications, as well as treatments for chest and liver ailments.

Blackberry lilies eventually spread from China to India as well as Japan, where it is known as *Hi ôgi*. The Japanese have used the root in remedies for coughs and skin inflammations.

B. chinensis was introduced to Great Britain and the European continent sometime between 1689 and the early 1700's, when Chinese ports were re-opened to foreign trade. Jesuit missionaries and representatives of the East India Company sent many plant specimens and seeds from the Chinese countryside to their correspondents in Europe.

Tracing the blackberry lily's travels can be difficult, since many different botanical names were used to refer to the plant. For example, botanists in Sweden, France, and Germany have called it *Ixia*, *Moraea*, *Gemmingia*, and *Pardanthus*, often in combination with the specific epithet *chinensis*, to designate its origin, or *punctata*, in reference to the spotted blooms. A French botanist, Michel Adanson, is credited with originating the modern botanical name in 1763 by translating *balamtandan*, an East Indian common name, into the Latin *belamcanda*.

By the late 18th century, *B. chinensis* had made its way to the American colonies. Finding a hospitable environment there, it soon escaped from cultivation, naturalizing from Connecticut, west to Nebraska, and farther south. Perhaps because it became so commonplace, the popular flower fell from its favored place in American gardens sometime during the 1800's. As recently as the early 1960's, seeds and plants of blackberry lily were still difficult to obtain from commercial suppliers.

Today, *B. chinensis* is finding its way back into our gardens, perhaps because of the recent surge of interest in perennial borders and low-maintenance gardening. Fortunately for the gardener, *B. chinensis* has an undemanding nature, adapting comfortably to a wide variety of soils. It



LEFT: *Belamcanda chinensis*, a member of the iris family, bears attractive, speckled flowers. ABOVE: In fall, the seed pods of this fascinating perennial open to reveal ornamental blackberry-like fruit.

will even bloom dependably under hot, dry conditions.

Most garden encyclopedias recommend growing blackberry lilies in well-drained soil, in a location that has full exposure to the sun. My own plants are thriving in a heavy clay soil amended with leaf mold. The plants are exposed to about five hours of morning sun and partial shade the rest of the day. I grow them in an informal bed edging a small urban woods.

I started the plants about five years ago from seed purchased from a mail-order company. Although slow to germinate, the seeds of this species are large and easy to handle. I planted mine one June day, in pots filled with ordinary potting mix made up of roughly equal amounts of perlite,

bagged organic peat, and vermiculite. I kept the pots outdoors in a protected area and watered them every other day or so until germination was complete. The seeds sprouted unevenly for two to six weeks. (Some authorities recommend pre-chilling them in the refrigerator for about two weeks to speed up the process.)

After the first green tips appear, the plants grow slowly but steadily, and require little care. (My plants seemed to like an occasional feeding of weak fish emulsion solution at this stage.) Early in the fall, they can be planted outdoors in their permanent location. Since *B. chinensis* is deciduous, the leaves disappear during the winter. Healthy foliage will begin re-emerging the next year (around mid-April in most

Enzymes a Growth Miracle?

by Pat Branin (Branin was the organic gardening columnist for the *San Diego Union*.)

Some readers will remember a story published in the *San Diego Union* April 6 reporting a new soil conditioner made from enzymes. The first inkling I had concerning this product for gardening and commercial agriculture came from *Acres, USA*, a farmer's newspaper published monthly in Raytown, MO.

The editor and publisher, Charles Walters, Jr., gave permission to quote the story about Frank Finger, a biodynamic farmer near Larned, Kan., and his experiments with enzymes on his soybean and alfalfa fields.

The difference between an inkling of information and an in-depth probe is about the same as Mark Twain's definition of the difference between a lightning bug and lightning. So when the opportunity offered, I made a trip to Frank Finger's farm.

There I set foot on the first enzyme-treated soil I have ever knowingly trod upon. All of central and eastern Kansas looks like a beautifully planned and meticulously maintained park, and Frank Finger's farm seemed to have an extra glow of well-being.

To understand what agricultural enzymes are and what they do, you must first know what they are not. Enzymes are not a fertilizer nor a plant nutrient.

They are a catalyst in the form of positively charged electrical particles called ions. They have been on Earth since the beginning of time. Without enzymes, life could not happen in any form, so there's no question of which came first, as in the chicken or the egg argument. Enzymes came first.

The importance of enzymes to animal life has been known for centuries, but their adaptation for improving the soil is a very recent discovery. Research on enzymes for many different uses is going on at a fast rate throughout the world under the general name of enzymology.

Used over a period of time, enzymes can relieve problems of shallow soil by penetrating hardpan and even marl. Finger demonstrated this on a field where he had hardpan near the surface. He pushed a 3/8 inch steel rod its full length of 36 inches into the ground without effort. This could be a boon to hundreds of thousands of acres of land in Southern California.

Agricultural enzymes also will detoxify soils that

have been chemicalized to death with inorganic fertilizers, herbicides and pesticides. They also will adjust the acid-alkaline balance to a favorable pH 6.5 to 7, which nearly all plants prefer. Even high alkali soils can be restored to production.

They will cause heavy soils to flocculate (to loosen and break down) so the structure is loose and plants can develop a more massive root system and irrigation water or rain can penetrate more quickly, evenly and deeply.

Perhaps the most important thing of all that enzymes do is improve the soil's "cation-exchange" capacity. Cation-exchange means the release of the natural minerals and plant nutrients by unlocking them and converting them to a form the plant can use to make its food by photosynthesis.

No matter how bad your soil is, it is almost certain that you have considerable ancient minerals and trace elements which it needs but which are locked in by an imbalance caused by a lack of organic material and enzymes. By adding both to the soil, the enzymes supply the magic key to unlock these things and thereby adjust the cation-exchange capacity.

Researchers have identified about 8,000 types and species of enzymes and all of them serve different purposes. No doubt mankind is just beginning to understand life processes, and learning to control them will be beneficial. We will likely see enzymes at work in medicine, animal husbandry, pollution control and sewage purification.

Whether you are a giant agricultural producer or just a little guy like me with a small city lot, you can be sure that enzymes are going to make your soil healthier and more productive.

More meaningful to you will be the following experiences of hard-headed farmers with a "show-me" attitude. These are all exact quotes, because some of the reports are spectacular and I don't choose to be accused of stretching things.

Joseph B Mahaney of the Colorado-New Mexico Land Co. in Pueblo says:

"Nitron was applied to a 50-acre, second-year hay field; the east one-third was poorly drained. The year following alfalfa planting we cut 800 bales the first cutting and considered plowing it out. I decided to test Nitron on the bad side of that field. The next season the field had alfalfa in places we had seeded

twice, and we got more penetration in the same irrigation time with less runoff. The happy part was 4,000 bales the first cutting."

Robert Herlocker of Girard, Kan.:

"I applied Nitron to 200 acres of soybean ground at the rate of 1/2 gallon per acre in two applications. They received approximately 1 1/2" of rain before harvest, the normal for this period is 5 inches. Even though these beans were hailed on, there was no lodging (bruising or loss of foliage), and the 200 acres averaged 35 bushels per acre."

Frank Finger's wife, Gay, takes care of the vegetable garden, shrubs and house plants:

"Last spring I sprinkled my row of carrot seeds with 1 1/2 gallons of water with 1/4 cup of Nitron added before covering the carrots. In five days the carrots were up so thick I had to thin them several times. We ate them through the season and mulched them when freezing weather came. We have been digging and eating them all winter."

Also, she has a cucumber story: "I accidentally over-treated one of my cucumber plants with a mixture of half water and half Nitron which I had intended to dilute; however, I watered the area deeply and that cucumber plant took over the whole patch. One day in July I picked 79 from it and picked 50 on each of three other days that week. I pulled up all my other cucumber plants to give this one room to spread."

There are many other stories about enzymes that border on fantasy. Perhaps I can tell about them later. Richard G. Wellman, my wife's brother, farms several thousand acres near Alden, Kansas. He visited the Finger farm with me and listened to Frank's rapid-fire enthusiasm.

When we were ready to leave for home, Wellman had decided to treat a problem field down on the bank of the Arkansas River which is so alkaline it has never produced anything. I hope to report his experience with enzymes on that land. I expect it will be positive.

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areas), but sometimes flowering does not commence until the plants' second year from seed. After that, the plants bloom dependably, with little fuss. Most garden manuals recommend dividing the rhizomes in early spring or fall.

The only pest problems I have encountered are periodic bouts with aphid colonies, which cluster on the flat leaves. These pests are easily discouraged with a good spray from the garden hose. Every fall I cover the bed with a thick layer of shredded oak leaves to protect the roots from temperature extremes. The decomposing mulch, amended by a spring application of dried cow manure, provides all the fertilizer the plants require.

The petals close into tight curls a day after the blossoms open fully, exuding dark drops of sap as they spiral. Therefore, the blooms are best picked for short-term use in fresh flower arrangements. Later, in early fall, the tall stems of split seed capsules can be gathered for long-lasting use. Held high on erect stems, with their casings dry and opened into thin parchment wings, the ovals of shiny black seeds add interest to groupings of dried flowers and grasses.

Those gardeners who are interested in experimenting with similar plants may also want to try *Belamcanda flabellata*. The only other known species in the genus, it has yellow flowers with clear or only lightly spotted petals. *B. flabellata* 'Hellow Yellow' bears a solid yellow flower on an 18-inch stem, while 'Freckle Face' offers 12-inch stems and lightly spotted blooms in colors ranging from orange to yellow. A new intergeneric hybrid, developed by crossing *Belamcanda chinensis* with *Iris dichotoma*, is also available. Usually listed as "Candy Lily," it blooms in a variety of colors, with multi-colored combinations of stripes and spots. Like blackberry lilies, it tolerates dry conditions and midsummer heat, and can adapt to most garden soils.

When the sun is at its peak and the soil is parched, the freckled blooms of blackberry lily appear, marking the beginning of the summer season. Then, when the mornings turn cool, the black seed clusters come, announcing summer's demise and imitating her bounty with mock berries. We are indeed fortunate to have such a beautiful plant to mark the stages of summer. ☉ —Barbara Scott

Barbara Scott is a writer and gardener living in Raleigh, North Carolina. Her work has previously been published in *Organic Gardening*.



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ABBREV.: D-Double; E-Early; F-Fragrant; J-Japanese Type; M-Midseason; L-Late; S-Single; EM-Early Midseason; LM-Late Midseason; SD-Semi-Double; VE-Very Early; VF-Very Fragrant

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FOLIAR FRAGRANCE

BY TOVAH MARTIN

One day while I was strolling through a friend's garden, the air was suddenly suffused with the fragrance of roses. Surprised, I glanced around for the source of the scent, but there wasn't a rosebush in sight. A moment elapsed before I realized that the aroma did not originate from a flower; rather, it emanated from the foliage of a scented-leaved geranium that I had just brushed with the hem of my skirt.

Most of us associate fragrance with flowers. Indeed, flowers are often aggressive in advertising their aromatic wares. Floral scents travel considerable distances and linger heavily on the air.

Yet leaves can also be aromatic. Unlike flowers, however, leaves hold their fragrance to themselves until they are touched. Of course, on a sunny day, some leaves may tinge the air suggestively with their bouquet. Similarly, a heavy rain or a strong breeze can bring out the fragrance of foliage. But, in each case, the leaf is actually reacting to slight damage to its surface.

The chemicals responsible for the fragrance, known as the "essential oils," are contained in minute epidermal appendages called trichomes (from a Greek word meaning "a growth of hair"). Trichomes vary in shape and structure, and perform different functions for the plant, including the important role of protection, as in the infamous stinging nettle. Odoriferous leaves possess glandular trichomes that secrete volatile oils, resins, mucilages, and gums, which are stored in pockets between the cell wall and the cuticle. Most foliage scents are actually composed of terpenoids, an

extremely diverse group of substances found throughout nature. Our nose becomes aware of foliar scents when the cuticle is ruptured, setting the oils free.

Generally, one need only pinch or rub the surface of a leaf lightly to become acquainted with its fragrance. The leaf does not usually suffer any permanent damage when the contents of its trichomes are released. Leaves appear to be capable of disseminating their wares indefinitely; there is little danger of "rubbing out" the supply. In fact, some young leaves have the ability to regenerate their wounded trichomes.

The ease with which the volatile oils can be released depends on the shape of the trichomes as well as their location on the leaf. For instance, the leaves of thymes and scented-leaved geraniums need to be touched only slightly for one to enjoy their fragrance, since their thin, flask-like trichomes are easily shattered. In the case of more "stubborn" plants such as camphor or sweet bay, the leaves must be damaged visibly before the aroma is freed. The globule of oil in these plants is contained in a thick capsule embedded in the leaf's surface. (Leaves whose scents are difficult to detect may release their scents more easily when dried.)

Although foliar scents are often compared to floral aromas, they are generally quite different in chemical composition. The fragrance of a blossom is usually made up of a complex combination of diverse compounds; even the sweetest floral aromas may mask a small dose of some rank odor (such as indole) that remains as an "aftertaste" in our nostrils. In contrast, leaves contain a somewhat simple combination of oils. In fact, some leaves owe their aroma to a single substance. For ex-

Spearmint, *Mentha spicata*, is well known for its pungent, minty leaves.

Michael Selig

ample, the balmy aroma of wintergreen (*Gaultheria procumbens*) comes entirely from methyl salicylate, which occurs unadulterated in the leaf. Those foliar fragrances with more than one compound in their configuration often contain eucalyptol, a chemical that is unique to foliage and lends a musky smell to the leaves.

Over the centuries, many people, including Carolus Linnaeus, have attempted to classify the aromas associated with plants. However, it was not until this century that foliar fragrances were grouped in a separate category. In 1925, F. A. Hampton expanded a system devised by Count Kerner von Marilaun in 1893 for classifying aromas. According to Hampton's system, those fragrances that are unique to foliage fall under four distinct categories: the turpentine group, which includes pine needles; the camphoraceous group, which includes wormwood, yarrow, and sage; the mint group; and the miscellaneous group, which contains such varied bedfellows as parsley, onions, watercress, and celery. Other foliar fragrances fall under categories that are shared by flowers and fruits.

Not all foliage is pleasantly scented. (This fact is well known to anyone who is familiar with the odor of skunk cabbage.) In fact, many foliar "fragrances" are ac-

tually fetid. Fortunately, if you are not enamored with the odor of a particular leaf, you can simply avoid physical contact with the plant.

Certain botanical families exhibit a marked tendency toward foliar fragrance. The characteristic is most prevalent in members of the Labiatae. For instance, the genus *Salvia* is notable for its diversity of leaf odors, including such exotic scents as those commonly associated with melon, pineapple, roasted nuts, honey, and citrus.

Many members of the Compositae are also known for their foliar fragrance. Members of the Solanaceae, or nightshade family, frequently bear leaves that have an odor, although they are generally fetid rather than fragrant. The Rutaceae, or rue family, also boasts plants with foliar scents; the trait is especially common in the genus *Citrus*. In addition, members of the Umbelliferae, or carrot family, often have fragrant foliage.

Plants native to certain geographic regions also tend to be aromatic. For example, many species native to hot, sunny desert areas tend to have aromatic leaves, although their blossoms are rarely scented. Many fragrant herbs are indigenous to the Mediterranean region, where summers are warm and dry. In the southwestern United

States, a region that has been dubbed "sage country," aromatic members of the Labiatae thrive in the harsh habitat typical of the chaparral.

Many people react differently to foliar fragrances because the aromas themselves are unstable. Temperature, light conditions, atmospheric quality, soil conditions, and geographic location all affect the intensity of a leaf's scent. For example, it is a well-known fact that the oil of patchouli originating in Singapore is far superior to oils extracted from the same species in Java or Sumatra. The growth rate of a plant may also have an effect on the fragrance of the leaves. Researchers have discovered, for instance, that basil plants that have been stimulated to grow rapidly are less fragrant than basil that is allowed to grow more slowly.

Scientists have yet to formulate a completely satisfactory explanation for the phenomenon of foliar fragrance. Some have surmised that essential oils help heal wounds of the epidermis, since most of these oils have antiseptic qualities. When the leaf is bruised, the trichomes are broken and their contents flow out over the leaf surface, presumably to seal the injured spot.

Another common explanation for leaf aroma is that it serves to protect the plant





Hollen Johnson

LEFT: *Artemisia ludoviciana* 'Silver King' is a fragrant-leafed species native to western North America. RIGHT: The foliage of scented geraniums exhibits a wide variety of fragrances, including rose, mint, and apple. Pictured is *Pelargonium graveolens* 'Grey Lady Plymouth', commonly called rose geranium.

from predators. For example, many animals will not ingest members of the mint family, since the leaves have the pungent taste of menthol. Scientists have observed that aromatic plants tend to dwell in regions with severe climates and thus among sparse vegetation where some form of defense is necessary to protect the foliage from hungry predators. (In the desert, odorless plants are often shielded by sharp thorns.) However, foliar odor does not always deter predators. For example, rabbits do not seem to be bothered by the aroma of carrot foliage. Slugs adore patchouli foliage, and dine on the leaves of many other aromatic plants. Similarly, mealybugs and aphids attack leaves that exude essential oils.

Researchers have also suggested that foliar scent serves to attract pollinators. In the case of mint, basil, and the scented-leaved geraniums, the essential oils are more heavily concentrated and possess a more flowery bouquet in leaves that surround the floral inflorescence, although the corresponding blossoms are typically scentless.

According to another theory, essential oils shield the plant from climatic ex-

tremes. Many plants with foliar fragrance are indigenous to regions that are subject to extreme daily fluctuations in temperature. Desert plants, for example, are often sun-baked during the day, then exposed to a sudden drop in temperature at night. Scientists have suggested that the vapor from the essential oils is released by the burning solar rays to form a protective blanket around the plant. When the sun sets, this vapor "blanket" is said to ameliorate the sudden change in temperature.

Plants with fragrant foliage have been found to have many practical uses. In ancient times, when sanitary conditions were less than optimal, aromatic leaves were used to mask odors in living quarters. (The dried leaves were simply thrown on the floor so that their scent would be released as people walked on them.) Today, the essential oils of foliage are still used in substances designed to mask odors and impart pleasant scents, including perfumes.

Although foliar fragrances have been exploited commercially, the limits of their potential have yet to be explored. There are new aromas to discover, as well as novel combinations that might prove en-

tering. We have hardly begun to delve into the possibilities fragrant-leaved plants present in our gardens, both indoors and out. Such plants could be grown along the edge of paths so that they would catch in our clothes as we walk by. Or they could be wedged between stones in lanes, where their scent would be released by our footsteps. The possibilities are endless.

In recent years, there has been renewed interest in using herbs to make such diverse products as teas, potpourri, sachets, and flea collars. The ancient custom of strewing herbs also shows signs of revival. (One day, I climbed into a friend's car and found the floor strewn with the dried leaves of lemon verbena. Every time I shuffled my feet, the pleasant aroma wafted into my nostrils.)

Foliar fragrance is a domain known only to "hands-on" gardeners. To appreciate the scents offered by leaves, you must not be afraid to explore with your fingers; a wonderful array of olfactory delights awaits the touch of your hand. ♣

Tovah Martin, a frequent contributor to *American Horticulturist*, is the begonia specialist at Logee's Greenhouses in Danielson, Connecticut.



An Artist's Garden

TEXT AND PHOTOGRAPHY BY
PAMELA HARPER

Plants being living, growing (and, alas, sometimes dying) things, a garden is never static. But in the coastal Virginia garden of Gladys Huyghe, change is accelerated by the way the French-born artist rearranges ornaments, garden furniture, and containers of flowers into compositions of many moods: gay or tranquil, stimulating or serene, wistful or whimsical.

Gladys has taken her artistry beyond the canvas to create a beautiful garden that is, in turn, a source of inspiration for her paintings. (One of her paintings is entitled *Garden on the James*.) It is a colorful garden, and one of ever-changing vignettes, each integrated into the garden in such a way that none ever seems isolated or contrived. Little touches abound and are added from day to day: the orange pumpkin at Halloween, for example, set down on the paving alongside a patch of matching orange marigolds.

That the same kind of flower used in different ways can evoke very different reactions was strikingly apparent one autumn day when I visited the garden. Along-

side a path, chrysanthemums tumbled in untrammelled exuberance around an Ali Baba jar in a gay disarray of pink, purple, bronze, and yellow. Not far away, an old ship's hatch, propped up to make a table, staged a composition of quite another genre. On the hatch stood a terra cotta olive jar and a shallow copper reflecting bowl with the green patina of age. Bronze chrysanthemums leaned over the gray, weather-beaten wood, while mealy-cup sage (*Salvia farinacea*) provided just a touch of blue in the foreground. All of the elements were combined to create an emotive still-life composition.

Such scenes—in part, dependent on the whim of flowers and weather—can never quite be recaptured, as any garden photographer discovers on returning to try to repeat a particularly successful shot. Gladys doesn't attempt repetition; there are always other flowers waiting to be tried, other compositions waiting to be born. The following year, the olive jar on the ship's hatch was half-surrounded by long-stemmed white daisies. (The picture was enhanced when, by chance, the Huyghes'

snowy-white Persian cat chose to sun himself nearby.) In autumn of the same year, stems of annual honesty (*Lunaria annua*), sown in situ, leaned over the hatch. A solitary orange daylily—the last remnant of summer—mingled with the silvery moons of the honesty pods.

The white stucco house, roofed with cedar shakes, was designed by Gladys and her husband Alain. It has a romantic French-Basque look, but the design is practical as well as picturesque. In this region, hot and humid summer days often end in thunderstorms, so paths and paving are sloped and led into drains to carry off torrential rain. An attractive center-canted, brick-paved strip along the house foundation channels water away from the gutterless roof. In front of this strip, a foundation planting of rounded Japanese hollies (*Ilex crenata*) forms a backdrop for beds of

ABOVE: A basket of annuals provides color and distracts the eye from the withering foliage of tall bearded irises. RIGHT: On the back terrace, a cultivar of *Hibiscus moscheutos* blooms happily in a half-barrel, the bands of which have been painted pink.





FAR LEFT: Showy tall bearded irises enliven a corner of the garden, while a barrel of golden-leaved *Berberis thunbergii* 'Aurea' picks up the color of *Aurinia saxatilis*. LEFT: Containers of pelargoniums decorate the parapet edging the back terrace. TOP RIGHT: Azalea petals have fluttered down around an old, cracked, ceramic strawberry jar to create a fragile still life in a corner of the garden. BELOW RIGHT: Oxeye daisies (*Chrysanthemum leucanthemum*) and a variety of other plants line the path to the front door.

brightly colored flowers. (The gap between house and hollies is sometimes used as a hidey-hole, where containers of flowers not yet at their best are kept out of sight until their moment comes to emerge and take the limelight.) Tucked between two of the hollies is the statue of a boy, his raised arm supporting a large shallow bowl full of flowers, much as a waiter might carry a tray laden with food through a crowded dining room.

The house stands on a bluff alongside the James River. To the rear of the house is a terrace that is paved with mellow old bricks and is narrow at one end, spacious at the other. A low, curving parapet serves as a bulwark, occasional seating, and a shelf for containers and ornaments. At the wider end, brick raised beds follow the line of the parapet. Curving bands of patterned brickwork along the beds suggest a path and accentuate the sense of flow so apparent in this garden.

The steep slope beyond the parapet is carpeted with lilyturf (*Liriope muscari*), for erosion control and ease of maintenance. It is evergreen, or almost so, during Virginia's comparatively mild winters. Rail-tie steps painted terra cotta provide access to the beach. Ornamental trees are dotted among the lilyturf; those near the top of the bank rise above the parapet to frame views of the river. Crape myrtle (*Lagerstroemia indica*) is a favorite of the artist; the brightly colored, crinkled flowers open in late summer, when many plants look jaded, and the mottled bark has great winter appeal. Hollyhocks rear up over the parapet; one year they may be the pink pompom kind, another year, red or yellow singles.

Neighboring houses, close on either side, are screened with evergreen shrubs: *Nandina domestica*, cheering winter days with leaves of sunset hues and trusses of bright red berries; and the glossy-leaved *Photinia*

× fraseri. A bird feeder—placed atop a broom-handle pole and resembling a tumble-down shanty with a barn-red roof of crumpled tin—emerges from among the coppery photinia leaves. There is artistry in its imperfections, as there is with all the timeworn things scattered throughout the garden: the battered basket, the old rocking chair with peeling paint. (Local antique shops know Gladys Huyghe well.) A pink heart painted around the entrance hole adds a whimsical touch to another birdhouse hanging in a red-leaved maple.

Along the narrow strips at each side of the house run steppingstone paths, which are set in mulch and pebbles respectively. They are edged with such shade-loving plants as hostas, hardy begonias (*Begonia grandis*), azaleas, impatiens, and strawberry geraniums (*Saxifraga stolonifera*).

From the rear terrace there is a tranquil view out over the wide James River. On the terrace itself, however, there is brilliant color. Some comes from plants in permanent beds, but most is provided by flowers growing in a great array of containers: half-barrels, urns and amphoras, clay pots and troughs, jardinières, baskets, bowls, and old kitchen crocks. Hard by the house, casting dappled shade, grows a river birch (*Betula nigra*). Massed around the base of its shaggy trunk are brilliant pink azaleas.

In the containers grow plants of many kinds: annuals, perennials, roses, shrubs, and small trees such as Japanese maples. There are also such tropical plants (wintered indoors) as scarlet hibiscus, stephanotis, and the intriguing yesterday-today-and-tomorrow (*Brunfelsia pauciflora* 'Floribunda'), so called because the flowers open blue, fade to pink, then turn white. Shrubs include butterfly bush (*Buddleia davidii*); the gracefully arching, white-flowered *Spiraea × vanhouttei*; and tree peonies, which flaunt their sumptuous

blooms of red, pink, and white. Two shrubs with more modest flowers give a longer display of color: golden barberry (*Berberis thunbergii* 'Aurea') has bright yellow leaves from spring through fall, while *Abelia* 'Francis Mason' bears glossy yellow leaves touched with pink and copper that are almost evergreen. Although the array of annuals and perennials changes from year to year, geraniums (*Pelargonium*) are always used in quantity, since they bloom profusely from spring well into winter.

There are lessons here in the skillful use of color. One year a shallow dish held impatiens in shades of orange, purple, and pink—colors usually considered inharmonious. In bright sunshine, such a combination might be shocking, but the infusion of dashing color brought animation to a shadowed corner where subtlety would have gone unnoticed.

The terrace furniture provides both elegance and comfort. For outdoor dining, the Huyghes have provided a table and chairs made of delicate, white-painted iron wire. A companion love seat, flanked by containers of flowers, is used occasionally for seating but is primarily for ornament. Sturdier chairs and recliners of metal mesh, painted pink to match the rosy brick, have a light appearance that belies their considerable weight. The recliners have wheels for easy mobility; cushions accommodate the urge to sprawl. A matching pink-painted table might hold such bric-a-brac as a tray of potpourri, a miniature rose in a pot, or a winsome china figurine.

Most of the garden is at the front of the house. The lot is an average suburban size (the front door is only 30 paces, about 78 feet, from the road), yet a remarkable degree of privacy has been achieved without benefit of fence or hedge. The garage, angled across from the house and abutting loggia, serves to enclose—on three sides—an irregularly shaped corner patio, which

narrows as it flows toward the front door. Lush plantings screen this paved area from the road. Beyond a wrought-iron gate situated between loggia and garage is a path to the rear terrace.

A driveway of sand-colored, pebble-textured concrete runs diagonally across the lot to the garage and is intersected by two paths. The first path is constructed of brick and runs from the road to the front door, curving between flower beds as it approaches the house. The lower portion of the second path, near the other side of the lot, doubles as a turnaround or alternative driveway to the garage. This section is paved to match the main driveway. After crossing the main driveway, the surface changes to brick, and the path narrows as it winds to the corner patio.

The angle where the two drives meet is a bit too sharp for easy maneuvering of a car. The design was a concession to one of five 150-year-old red cedars (*Juniperus virginiana*) that originally grew on the lot. In 1979 a freak tornado whirled through the neighborhood, toppling these and other fine old trees, and smashing 30 containers on the Huyghes' property. Gladys now views the storm as a blessing in disguise because it opened the garden up to the sunshine needed by most flowers.

Together, paths and driveways divide the front garden into islands of lawns and flowers. One large bed, filled entirely with a single kind of blue bearded iris, demonstrates the effectiveness of massed monochromatic color. The show is made even



more dramatic when contrasted with a golden barberry growing in a half-barrel placed nearby. Although the drama does not last for long (irises flower for only about two weeks, and soon afterwards, the leaves start to brown at the tips), few people notice this temporary shabbiness in the Huyghes' garden. Instead, they see the large basket of vivid flowers perched on a plinth in the middle of the iris bed—a clever ploy to distract the eye from the unattractive.

Those who delight in flowers and want to grow them *all* often find themselves

wondering where to put a plant they have just bought or raised from seed. When faced with the problem of finding a spot for clock vine (*Thunbergia alata*), a twining vine that needs support and is usually grown on a fence or trellis, Gladys came up with an ingenious solution: An old lantern hangs from the arm of a post at the entrance to the garden. She attached fine thread to the post and anchored it in the ground. (Fishing line also works well as an “invisible” support.) The thread was soon concealed entirely by the massed green leaves and black-eyed flowers of the vine, which looked as though it were magically supporting itself as it spread out to frame the old lantern.

In the Huyghes' garden, there is always something new to contemplate and so many tableaux to admire. One of the boldest and most exciting was a giant-flowered mallow (a hybrid of *Hibiscus moscheutos*) in a half-barrel, the bands of which were painted a matching brilliant pink. But the most memorable scene centered on a ceramic strawberry jar. Only an artist would have seen the potential of the bulbous-shaped jar, which was fancifully painted with pale purple flowers of no known kind and missing half its scalloped rim. One spring day it stood on the rosy brick paving beneath a tubbed azalea trained in the shape of an umbrella. Petals that matched the color of the painted flowers had drifted down onto the pavement. In this setting, that old cracked pot had become a work of art: an ephemeral scene, but one held forever in the mind. ●



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Celebrating SUNFLOWERS

BY LYNN M. LYNCH

If I were stranded on a desert island and could grow only one plant, I would choose the common sunflower, *Helianthus annuus*, without hesitation. This cheerful plant is not only attractive and easy to cultivate, but it serves an astonishing number of functions as well.

"Sunflower" is the common name for members of several different genera in the huge Compositae, or sunflower family, including *Balsamorhiza*, *Geraea*, *Helianthus*, and *Tithonia*. However, it is *Helianthus* (from the Greek words *helios*, for sun, and *anthos*, for flower) to which most people are referring when they use the name. This genus of coarse annual and perennial herbs is composed of approximately 150 different species, most of which are native to North America. Common residents of roadsides, railroad yards, and vacant lots, sunflowers have been introduced and cultivated in many countries around the world. Ironically, the sunflower is more popular in Europe and Asia than in its native land, though it holds a place of honor in Kansas as the state flower.

The exact origins of the oldest cultivated sunflowers remain a mystery. We do know that as Europeans spread across the North American continent, they observed the Indians cultivating sunflowers among crops of maize. According to explorers' accounts, Indians ate raw sunflower seeds or roasted them for consumption. The seeds were also ground to make a flour as well as sunflower cakes, a staple of the Indian warriors' diet. The oil extracted from the boiled seeds proved useful in cooking and in making paints, while the yellow ray florets and purple achenes (fruits) yielded a dye used to color baskets and decorate the skin. The Indians also used sunflower preparations, such as juice from the crushed stems, to treat cuts and wounds, rattlesnake bites, and chest pains.

Like the Indians, 19th-century American colonists used the sunflower for a mul-

titude of purposes: the leaves, for animal fodder and as a substitute for tobacco; the stalks, for fodder and in making cloth; the seed oil, for cooking and in making soap; the ground seed hulls, for a coffee-like drink; and the ray florets, as a base for a yellow dye. Settlers also believed that planting sunflowers near their houses would protect them against malaria.

Europeans marveled at the size of some of the sunflower specimens brought back by the explorers, and grew the plants mainly as a curiosity. Gradually, interest in the plant led to experimentation, and many ornamental hybrids were developed specifically for European gardens.

Sunflowers became popular not only in Europe, but also as far east as Russia, where hybridizing experiments met with great success. Many hybrids, including the giant commercial cultivars, were introduced to the United States from Russia. In fact, most of the sunflowers cultivated commercially in this country today originated in North America but were "re-introduced" from the Soviet Union.

Helianthus species are generally large and coarse, though some are small and on the delicate side. The leaves of most species are opposite below and alternate above, while the flower heads are generally solitary and borne on long peduncles. As with all sunflower family members, the flower heads are composed of disk florets—in the case of some cultivars, sometimes hundreds of them—bordered by a ring of showy ray florets. The ray florets of *Helianthus* species are usually a shade of yellow. ("Floret" is a term often used with members of the Compositae to describe the very small flowers found in an inflorescence.)

Perhaps the most interesting feature of

The dinner-plate-sized blooms of the giant sunflower, *Helianthus annuus* var. *macrocarpus*, are a spectacular addition to any sunny garden.



Anita Sabarese





LEFT: The enormous seed heads of sunflowers generally ripen 80 to 120 days after sowing. When they are mature, cut the heads and allow them to dry for several days before removing the seeds. Be sure to protect your harvest from birds and other small mammals. RIGHT: Ornamental cultivars of the common sunflower are also available to gardeners who want a spectacular show of color in the border.



Pamela Harper

the sunflower are the achenes, found by brushing away the tubular disk florets after they have been pollinated. Each of these small, dry, thin-walled fruits contains a single seed and measures about one-half inch long in the hybrids cultivated for their seeds. The seeds are eaten by birds and small mammals, as well as man.

There are approximately 15 *Helianthus* species in cultivation today, including *H. debilis*, a much-branched annual that grows to six feet and bears solitary three-inch flower heads. The perennial species include *H. angustifolius* (swamp sunflower), which bears lance-shaped leaves and grows in swamps from New York to Florida and west to Texas; *H. decapetalus* (thin-leaf or river sunflower), with thin, eight-inch-long leaves and three-inch flower heads; *H. giganteus* (giant sunflower), which grows to 10 feet high in moist sites from Maine to Georgia, and west to Wisconsin and Iowa; and *H. laetiflorus* (sometimes listed as *H. × laetiflorus*), a vigorous seven-foot-tall species found in dry areas from Indiana to New Mexico. *H. maximiliani* (Maximilian sunflower), *H. mollis* (ashy sunflower), and *H. salicifolius* are all strong-growing perennials native to dry areas of the midwestern states. The most distinctive of the perennial species, *H. tuberosus* (Jerusalem artichoke or “girasole”), grows to 12 feet and is widely cultivated for its edible tuberous roots.

Of all the *Helianthus* species, however, *H. annuus* is by far the best known. Commonly called the common sunflower or “mirasol,” this annual is extremely variable in size and character. (Contrary to popular belief, the sunflower does *not* turn with or “look at” the sun, as the Spanish name *mirasol* suggests.) *H. annuus* subsp.

lenticularis, the sunflower found growing wild in the western portions of North America, has a branched form and bears relatively small flower heads. *H. annuus* subsp. *annuus*, which grows as a weed in the midwestern and eastern United States, gave rise to the red and double cultivars now grown as ornamentals. The most common cultivars are grown primarily for their seeds and are derived from the variety *H. annuus* var. *macrocarpus*. These sunflowers are characterized by a robust, unbranched form and massive flower heads that bloom from late summer to early autumn. The many cultivars available to gardeners and commercial growers vary according to height as well as the markings of the achenes.

Most American gardeners associate the name sunflower with specific cultivars of *H. annuus* var. *macrocarpus*, such as ‘Mammoth Russian’, whose dinner-plate-sized flower heads produce gray-striped achenes. ‘Giganteus’ and ‘Mammoth’ are two other cultivars offered for those who want to harvest seed. Less-well-known cultivars, grown primarily for ornament, include ‘Autumn Beauty’ and ‘Autumn Giant’, both of which have flower heads with showy bronze, gold, lemon, and mahogany ray florets; ‘Italian White’, a four-foot cultivar with pure white to primrose-yellow flowers; and ‘Dwarf Sungold’, a dwarf, yellow-flowered cultivar that reaches only 15 inches in height. (For a list of companies that sell sunflowers, see “Sources” on page 42.)

The larger cultivars of *H. annuus* var. *macrocarpus* (henceforth called simply “the sunflower”) grow to lofty heights of anywhere from 10 to 15 feet. The rough, hairy stems are not only tall but often large in

circumference—“of the bignesse of a strong mans arme,” as John Gerard describes them in *The Herbal*. The hairy leaves, which are ovate, or egg-shaped, and cordate at the base, grow to one foot long, while the solitary flat flower heads often measure a foot or more in diameter. (The largest sunflower heads ever recorded have measured approximately 2½ feet across.) Generally brownish-purple in color, the central disk contains small, fertile disk florets that are packed closely together, like the “honeycombs of Bees,” in Gerard’s words. The bright yellow ray florets, which are sterile and often mistakenly called “petals,” give the sunflower its daisy-like appearance. Green bracts, or small leaves, grow along the outside of the head.

The sunflower is not only visually distinctive but also remarkably versatile. For example, sunflower oil, which is extracted from dried seeds using hydraulic and screw presses or special solvents, has uses in both food and industry. Many people in this country would probably be surprised to learn that the sunflower is the third largest oil crop in the world. Most sunflower seeds contain at least 25 percent oil, and their high protein content rivals that of peanuts. Because sunflower oil is polyunsaturated, it has become increasingly popular as a cooking oil and in the manufacture of margarine and shortening. In industry, its uses range from lamp oil to a constituent in soap and candles. The “oilcake,” or residue remaining after the oil is extracted from the seed, has been used in the manufacture of high-protein food for animals, particularly cattle.

Sunflower seeds are eaten—raw or roasted—the world over. However, Rus-

Continued on page 43

A Garden fo



r Maryland

BY FAITH JACKSON

You come upon it unexpectedly: a small, fragrant herb garden on the campus of St. Mary's College, located near the mouth of the Potomac River in the historic first capital of Maryland, St. Mary's City. Measuring only 20 by 30 feet, the garden is protected on two sides by an L-shaped building, Anne Arundel Hall, which houses offices, classrooms, and a bookstore. The third side of the garden is bordered by a parking lot lined with forsythia, abelia, and tall evergreens. On the fourth side is a shade tree harboring benches, bounded by concrete pathways leading to all parts of the campus.

There was nothing in this bare space before the garden was created except six rosebushes and grass that had been worn down by pedestrian traffic. Today, students, faculty members, and visitors sit on the low brick wall or the benches inside the garden, while others brush past plants or stop to touch them, releasing their scent. It is a refreshing spot, full of lush grays and greens: the bright blooms of 'Croftway Pink' bee balm, and yellow, pink, and white yarrow. *Artemisia* 'Silver King' is scattered throughout the beds and planted outside of the garden, against the building, where it borders the 25-year-old brilliant salmon floribunda roses that had once looked so lonely in the open.

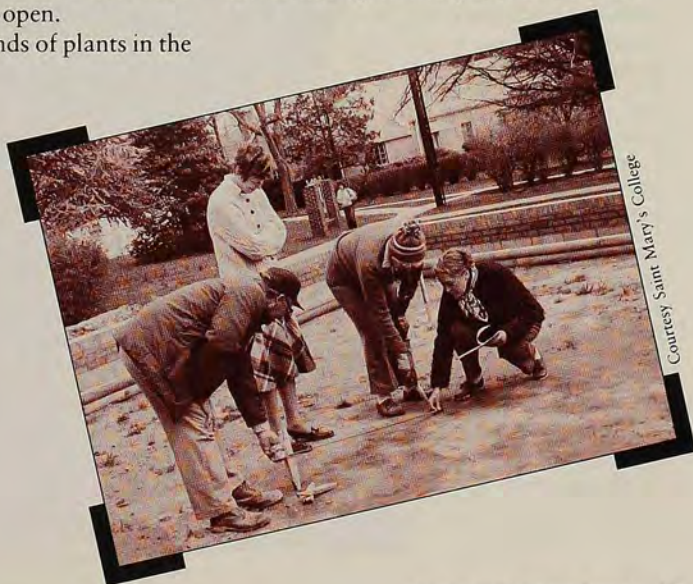
There are some 34 kinds of plants in the

garden, from delicate blue-green rue to tansy, with its thick, fern-like foliage. Small white butterflies hang over the blue hyssop in summer. The sundial in the center bed is surrounded by a variety of thymes and gray santolina. In the corners of the wall beds, low-growing clumps of red and white dianthus meet a border planted with germander and bring the eye down to the path.

The St. Mary's County Garden Club, in cooperation with St. Mary's College, planted the garden in honor of the 350th anniversary of the founding of the Maryland Colony. For its efforts, the club was awarded the 1983 Governor's Cup for Civic Beautification. The club also received a Special Achievement Certificate for Outstanding Garden Club Work at the Convention of the National Council of State Garden Clubs held in Texas.

The garden evolved out of discussions I had early in 1981 with Dr. Rosemary Hein, then Chairman of the Division of Natural Sciences and Mathematics, about an herb garden on campus. I had been lecturing and holding demonstrations on herb garden design and use for local garden clubs, in partial fulfillment of the requirements for my diploma as a Master Gardener. A member-at-large of the Herb Society of America, I had had years of experience gardening in many localities, from Florida and Kentucky to Maryland and Maine.

LEFT: The center of the new herb garden at Saint Mary's College features a sundial surrounded by low-growing, fragrant-leaved plants. RIGHT: Once the wall surrounding the new garden was completed, volunteers marked out the location of the raised beds.



Courtesy Saint Mary's College

In January 1982, with Dr. Hein's approval, I proposed the herb garden as a project for the St. Mary's County Garden Club, of which I was a member. By May 1982, the garden project was approved by the club. It was agreed that St. Mary's County Garden Club would be responsible for designing the garden, as well as providing the plants and garden ornaments. The club would also cover the cost of all materials. In addition to providing the site, St. Mary's College would prepare the beds and provide the expertise and labor for building the walls and pavement. According to the agreement, both parties would be responsible for maintaining the garden once it was completed.

We were very happy with the site, which was approximately 35 by 60 feet and had good light and a water outlet nearby. There would be enough room to walk around the finished garden without feeling crowded, and we would be able to do a little planting on the outside of the garden as well.

In August, we drew up a site plan, which showed a slope of one to three feet. We realized we would have to either dig up the site or fill it in to make the ground level. We deferred to the experts, who told us drainage would be more efficient if we leveled off the site.

We all agreed on the absolute necessity of a wall. A heavily used public area should have a definite sense of boundary or closure, which helps slow down traffic, protect plants, and create a special atmosphere within the space. We wanted the area to be not only rugged but also inviting and sufficiently pleasing to evoke respect for the garden.

Every bit as important as the wall were the pathways. Dirt and gravel are hard on most shoes, and ugly weeds often spring up. Our first choice was brick. However,

unless laid in concrete, it is certain to winter-heave and eventually trip someone. Besides, it would have cost 50 cents per brick to have such a pathway installed—too expensive for us, after paying for the brick wall. Our alternate choice was random-size flagstone laid in concrete.

Because of our limited budget, we often had to compromise. For example, we could not afford as high a brick wall as we would have liked, so we placed tall, round urns with square bases on top of the wall on either side of both entrances to the garden. Nor could we afford as much flagstone as we wished, though we were able to create a pleasing effect when we laid the stones in the concrete. Also because of expense, we vetoed water; there would be no fountain or tiny pond to enhance the garden (or, perhaps fortunately, to fill with soap-suds at graduation time).

As we studied the layout of the garden, we realized that the raised beds would have to be neatly bound into the design. After considering many shapes—square, round, rectangular—we decided to have some beds all the way around the wall and three free-standing beds within the garden: two, the same L-shape as the building sheltering us; and one, a small rectangle for the sundial. (We decided to use round-edged "decorative ties" to construct the beds.) We hoped that by reserving wall corners and the center of the inside beds for tall plants, designing long low borders for eye-pleasing repetition, and planting front and side corners of the beds for interesting arrangements, we could create a dramatic effect.

On November 11, 1982, we broke ground. One of the first things we discovered was that the entrance on the north wall had to be enlarged; what looked splendid on the drawing board did not please the eye outdoors. Once we had set our bronze commemorative plaque on the outside of that wall, to the right of the entrance, and had built three steps up into the garden, we realized the opening looked tight, so the entrance was widened by one foot.

The same thing happened with the beds. We wanted the center beds to be roomy,

TOP RIGHT: The first step in constructing the new garden was to build a brick wall around the site. The wall provides a sense of closure, which helps to slow down traffic and protect the plants. BOTTOM RIGHT: The "bare bones" of the new garden consisted of a series of raised beds accented by paving stones set in concrete. FAR RIGHT: During the summer, the beds are filled with yarrows and a variety of other colorful, fragrant plants. Matching urns filled with zonal geraniums top the south-facing walls of the garden.



Photographs courtesy Saint Mary's College

The St. Mary's County Garden Club, in cooperation with St. Mary's College, planted the garden in honor of the 350th anniversary of the founding of the Maryland Colony.

but we didn't want them to crowd the paths. By the time we finished laying the long ties, the beds had to be widened six inches more than was called for in the original plan.

When choosing specific plants for the garden, we had to consider certain problems associated with a public garden—factors that are generally not as important in home gardens. For example, although we did not want to clutter our small space

with "Keep Off" and "Don't Touch" signs, we knew that children could easily hurt themselves on the thorns and prickles. Furthermore, we realized that otherwise sensible people will pop unknown leaves and berries into their mouths, and that many pungent herbs will cause sneezes and other physical reactions. We therefore decided to plant mainly fragrant herbs, using as few edibles as possible. Still, we were faced with deciding whether such herbs as fox-

glove or wormwood were safe to grow in a public place. As it turned out, we didn't plant foxglove, but we did plant clumps of wormwood. (Surely no one will try to make absinthe!)

One of our major concerns was that the garden look well in all seasons. For example, we considered which plants would disappear completely during the winter months and which would hang on through the snow. We wanted to spread certain plants throughout the garden so there would not be too many bald spots from December through March. In our zone, we rely on lavender, rosemary, germander, santolina, southernwood, sage, thyme, and horehound, which makes a handsome winter bush. These plants also withstand summer heat fairly well.

We also worried about proportion. As stands of herbs grew, how would they look in relation to other plants? When full-grown, would the plants be in balance with the rest of the garden? By planting the garden one year ahead of the state's 350th birthday, we were able to observe just how the plants would look and to make changes, if necessary.

Color choice is a very personal matter. We decided to stay away from strident mixes of red and orange, and to stick with quieter combinations, since the latter do not clash. Our final planting emphasized the different textures of gray and green: silver-white and blue-green foliage, combined with flowers in shades of red, pink, white, white and yellow, yellow, lavender, and blue.

Throughout the winter of 1982-83, several club members, including myself, propagated herbs in the greenhouse. We started with a few plants to use for cuttings, and soon the benches were full. Herbs are easily propagated or grown from seed, which was fortunate for us, since we had 200 linear feet of three-foot-wide beds to fill. Propagating many of our own plants helped us save money. For example, cuttings from six purchased germander plants made enough for the entire border. We grew almost all of our own plants; the Wentworth Nursery donated the rest, including a mag-



Robin J. Laird

Planning a Public Garden

Whether your proposed garden will be small or extensive, on a beautiful site or on a site with little interest, you should consider the following before you begin planting:

- Examine the proposed site. Specifically, you should consider drainage; proximity of water outlets; usual traffic flow in the area; soil condition and soil requirements; light conditions (for example, hours of direct sun and hours of light to heavy shade); electrical outlets (for possible night lights); and interesting natural features such as slopes, vistas, or ponds.
- Estimate costs. Be realistic—and generous. Budget for changes, and make sure you will have adequate funds and manpower for maintenance and refurbishing for many years to come.
- Keep the design simple. Fortunately, the

lack of any distinctive features on our site prevented us from trying anything fancy. Out of many possibilities, we decided on the rectangular plan, which fit neatly along the existing L-shaped sidewalk. Our architectural skeleton, the garden's most important feature, included a wall, which served to define the space; paving between the garden beds; raised beds, both against the wall and freestanding; a small center bed with a sundial on a raised pedestal; and four urns, fastened to the wall on either side of the two garden entrances.

In addition to the architectural design, we considered the following features of the plants we selected: Foliage color—We selected plants in several shades of green, gray, and silver. Flower color—We chose purple, white, yellow, blue, lavender, and red (bright scarlet to burgundy). Texture—

We wanted an interesting mixture of foliage textures. Plant height—To increase interest, we selected plants of various heights, from inches-high thyme (to plant around the base of the sundial) to waist-high southernwood, bee balm, and yarrow.

- Select plants appropriate to your area. We chose only dependable, easy-to-grow perennials and annuals that would perform well in our climate. (As a result, during the dry summer of 1986, our herb garden held up remarkably well with little help.) We also looked for species that would provide winter interest.

After Planting

- Once the garden is planted, stand back and watch how it grows. Trim and weed, but make no drastic changes until you have had a chance to observe how the plants perform and who your garden visitors are. Invasive plants—for example, pink yarrow, artemisia, and sprawling tansy—may require some attention in a small public space. However, their dependable health and vigor are a plus. Other plants die away if they are not set out in large companionable numbers.
- Save space to try new ideas each year. For example, try filling urns with different flowering herbs and trailing ivy or boxwood. (We are designing a simple topiary to plant in our urns next year.) Also, try using more specimens of fewer species or cultivars.
- Don't make changes just to make changes. Plan as carefully as when you started, and justify your new designs.
- Never throw away your cuttings and thinnings. In the fall and spring, when we do heavy "housecleaning," people arrive for "handouts," and we give on-the-spot instructions in propagation and planting. We have increased interest in herbs and helped to start countless herb gardens in the county since 1984. That is our reward.

RIGHT: The brick wall that surrounds the garden is bordered on both sides by fragrant herbs.

FAR RIGHT:

Lamb's-ears (*Stachys byzantina*) were used in the garden for filler the first season, but were replaced by lady's-mantle (*Alchemilla mollis*) in subsequent years.



The day after we planted the garden, a severe storm came without warning. Hailstones the size of golf balls hit the warm earth with such force that the ceiling in the college cafeteria caved in.

nificent hawthorn tree. (The following year, the Federation of Junior Gardeners gave us another hawthorn. We eventually planted both trees on the outside of the garden, on the west side, and created a serpentine border around them consisting of tansy, rue, and lavender plants against the wall, with two of the salvaged rosebushes at the corners.)

At last, in April and May, we put it all together. The college crew double-dug the beds, hauled in manure from a club member's stable, and added humus to the heavy soil. (Once the plants were in the ground, we added a heavy layer of cocoa mulch.)

On May 19, the heads of the maintenance crew, the college administrators, Dr. Hein, and a man from the local newspaper gathered to watch eight garden club members plant a fragrant herb garden in 3½ hours. We went home exhausted but ecstatic.

The day after we planted the garden, a severe storm came without warning. Hailstones the size of golf balls hit the warm ground with such force that the ceiling in the college cafeteria caved in.

The next day, we returned to what looked like a ruined garden. On closer examination, however, we discovered that many of the herbs in the garden, although damaged, were still alive. I went home and dug up all of the lavender, rosemary, bee balm, and yarrow I could find in my own garden that looked salvageable; others did the same. We filled empty spaces with quick-growing, fragrant annual geraniums—rose, lemon, and peppermint. We filled several front corners with lamb's-ears—technically not an herb, but a good filler. Later, we replaced the lamb's-ears with lady's-mantle, removed some of the invasive pink yarrow and feverfew, cut back the lemon balm, and put in more mignonette, patchouli, and curry plants.

By June, the garden had perked up. By July, it looked stunning. In September and October, the bright red pineapple-scented sage was glorious. We could breathe easier; we had an herb garden in time for Maryland's birthday.

We have now had three years to study the growth habits of our plants and to evaluate the garden's design. Although we



Photographs by Robin J. Laird

planned the garden carefully, we realize now that we erred the first year in stuffing the beds too full with fast-growing plants for show until the slow starters could catch up. Nevertheless, these showy plants gave us instant credibility among the garden's skeptical observers because no one believed that such small plants would get so big in one season.

In the last three years, we have rooted out bushels of the invasive pink yarrow, which chokes out other plants and falls over the path. We have also taken out the silver artemisia, leaving just a few clumps for cover. We removed all of the rue, although it made stunning round shrubs. After I pruned it one spring morning, I was left with painful burns on my hands, and the rash and brown "scars" lasted until fall. Although wearing gloves would have solved the problem, we thought it best to get rid of the plants altogether, since inquisitive pickers cannot resist breaking off "just a little piece."

Since public gardens are usually built at the expense of the city, state, or some institution, we learned that one must account for every dollar spent. We also learned that no matter how much money you are given, it is never enough. We would not have been able to create the garden within our budget (in the neighborhood of \$5,000)

without the expertise and labor provided by the college, as well as the generous help of many garden club volunteers.

Maintenance of the garden continues to be a joint undertaking. During the hot summer months, garden club members come once or twice a month and work for a couple of hours. In the spring and fall, members come for a day to spruce the garden up or put it to bed. The rest of the time, the college staff keeps it watered.

Designing a public garden, we discovered, is not the same as designing a private garden. "Public" means "open to the view or knowledge of all," and that is what it was. From the very beginning, everyone from herb garden aficionados to the curious onlooker followed our progress, asking questions and providing encouragement every step of the way. Some observers were inquisitive; others, critical. Almost all proved to be good company as we worked.

What pleases us most is the interest in herbs we have engendered. Herbs are gratifying plants to work with, by themselves or mixed into a perennial border. As we alter the plantings in the garden from time to time, we continue to learn. It is our hope that others will learn from the garden, too.

Faith Jackson is a writer and gardener living in St. Inigoes, Maryland.

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Book Reviews

Gardening for Love: The Market Bulletins.

Elizabeth Lawrence. Duke University Press.
Durham, North Carolina. 1987. 238 pages;
hardcover, \$15.95. AHS member price, \$14.35.

This new book by Elizabeth Lawrence, published posthumously and edited by Allen Lacy, celebrates an aspect of gardening often overlooked by modern urban gardeners—the trading of plants, seeds, and garden lore among individuals who love plants. The book is a collection of essays about the market bulletins to which Elizabeth Lawrence subscribed, and her correspondence with the southern farm women who sold plants through the classified ads in the bulletins. Through fragments of letters and numerous anecdotes, the book covers a variety of topics—from herbal remedies, “old timey” cultural instructions for purchased plants, the characteristics of various breeds of dogs sold through the bulletins, and the confusing array of common names for the many plants advertised in the bulletins. The correspondence presents a unique portrait of the rural South and the women who garden there. *Gardening for Love* is an intriguing book by one of America's great garden writers.

Seaside Plants of the Gulf and Atlantic Coasts.

Wilbur H. Duncan and Marion B. Duncan.
Smithsonian Institution Press. Washington, D.C.
1987. 409 pages; hardcover, \$45.00; softcover,
\$29.95. AHS member price, \$41.00 (hardcover);
\$26.95 (softcover).

Beachcombers and coastal gardeners will appreciate this attractive field guide to seaside plants from Massachusetts to Louisiana (excluding the lower portion of the Florida peninsula). The book contains almost 600 color photographs of both woody and herbaceous plants native to coastal areas, and the text portion of the book provides information on 949 species of wildflowers, trees, shrubs, grasses, rushes, and sedges. Both the photographs and text entries are organized by plant family, and are numbered for easy reference. The text includes common and botanical names, as well as a brief description of the plant and

its habitat and range. Introductory chapters include a discussion of coastal topography, a glossary, line drawings of the various leaf shapes and flower forms, as well as a key to the species. *Seaside Plants of the Gulf and Atlantic Coasts* also contains an index. In short, this is a valuable reference that no gardener or wildflower lover with an interest in seaside plants can afford to be without.

The Gardener's Index of Plants and Flowers.

John Brookes, Kenneth A. Beckett, and Thomas H. Everett. Collier Books. New York, New York. 1987.
272 pages; hardcover, \$24.95; softcover, \$14.95.
AHS member price, \$22.45 (hardcover); \$13.45
(softcover).

With the exception of some brief introductory sections on the basics of buying and cultivating plants, this book is entirely devoted to alphabetical lists of plants—shrubs, trees, perennials, climbing plants, cacti and succulents, bulbs, annuals, and biennials. Each list actually takes the form of a chart. The authors have indicated important characteristics of the many species listed, including size, shape, foliage or flower color, season of interest, cultural requirements, use, and hardiness zone. Each list is preceded by an explanation of the chart headings, and source lists and an index are also provided. In all, over 4,000 species are listed.

This succinct format is very useful when looking for ideas for a particular site, or as a quick, handy reference to cultural requirements for a particular plant.

The Indoor Garden Book.

John Brookes. Crown Publishers, Inc. New York, New York. 1986. 288 pages; hardcover, \$27.50. AHS member price, \$20.65.

Despite the title, this is not a book on how to grow houseplants. Instead, it is a book on designing with plants and plant materials indoors. The author examines the decorative qualities of plants—plant form, leaf shape, color, and texture, as well as flower shape and color—and demonstrates the use of these principles in a beautifully illustrated chapter on plant display.

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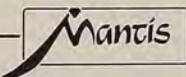
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The discussion on displaying plants depicts containers, and describes the principles of grouping plants for best effect. Lighting effects and decorative styles (art deco, "high tech," and Oriental, for example) are also examined. The book contains illustrated directions on how to construct a moss pole, plant a terrarium, train plants to grow on a trellis, and design hanging baskets or window boxes. Also included are chapters on flower arranging and using dried flowers, as well as using plants to decorate specific rooms such as kitchens, living rooms, bathrooms, sunrooms, and conservatories. The author has also included a section with general information on the most popular houseplants, and a cut flower guide that provides directions for treating cut blooms for longest vase life. Finally, there is a chapter with general information on houseplant care that presents principles of watering, pruning, training, pests, and diseases.

The book is lavishly illustrated throughout with color photographs that depict a wide variety of uses for plants indoors and step-by-step directions for a variety of projects. This is an excellent book for anyone who would like to use plants more creatively in the home, and would certainly be a perfect introduction for the beginner to using plants indoors.

A Weaver's Garden.

Rita Buchanan. *Interweave Press*. Loveland, Colorado. 1987. 230 pages; hardcover, \$16.95. AHS member price, \$14.95.

Weavers use plants in many different ways. Most gardeners know that plants were his-

torically used for dyeing fabric and yarn, but few are aware of the many other ways plants can be used in weaving or related fiber arts. In fact, many plants can be used for fiber, and several species can be used for soap making. Fragrant species are used for stuffing handwoven pillows and for protecting textiles.

In this book, author Rita Buchanan has combined a career in botany and horticulture with a passion for weaving. She has included a wealth of information on both the botany and cultivation of the plants included, as well as their historic and contemporary uses.

The chapter on plants grown for fiber includes information on a variety of different species, from cotton and flax to less well-known fiber plants such as nettles, milkweed, and agave. Each section on a plant includes information on the botany and history of the plant as well as its use in weaving. The chapter listing dye plants provides much the same information, and also includes instructions for making a dye bath, using mordants, and handling different fiber products. The chapters on soap plants and fragrant plants are equally fascinating. Weavers also use many plants to make tools for weaving, including bamboo and teasel, and the author provides information on these species as well. She also lists several suggested plantings of "weaver's" plants. *A Weaver's Garden* is illustrated throughout with black-and-white drawings, and also contains a small section of color plates. —Barbara W. Ellis

Barbara W. Ellis is Publications Director and Editor of *American Horticulturist*.

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Woodland Gardens



Margaret Hensel

In the heat of summer, a woodland garden is a quiet place to get away from it all. While perennial borders are rapidly going to seed, a woodland garden—with its ferns, ground covers, and perhaps a few stands of startling red *Lobelia cardinalis*—is thick and lush. And though this kind of garden is not exactly carefree, at least the weeds are easier to ignore and the need to deadhead is minimal.

Though woodland gardens are lovely and cool in the summer, many gardeners think of them as spring events. Indeed, small native trees like *Cornus florida* and *Amenlanchier canadensis*—underplanted with *Trillium*, *Aquilegia*, and drifts of Virginia bluebells (*Mertensia virginica*)—can make a woodland garden a refreshing place of

dappled shade and subtle fragrance in springtime. In New England, a spring woodland can be full of quiet surprises—for instance, the green snouts of skunk cabbage poking through still-frozen swamps, or the unfurling of the beautifully lobed leaves of bloodroot (*Sanguinaria canadensis*).

Many of the woodland gardens I know were started for practical reasons. In some cases, gardeners faced with such factors as deep shade or intimidating rock outcroppings have found perennial borders or grassy lawns to be out of the question and have begun woodland gardens instead.

Anyone who has ever created a woodland garden no doubt knows that it requires more effort to maintain than one

might think, at least in the first few years. On the surface, a natural woodland may appear to take care of itself; the ferns and *Trillium* come up every year, and their foliage decomposes obligingly each autumn into rich woody compost. But this woodland is the product of the process of natural succession, and may have taken hundreds, if not thousands, of years to establish. A woodland's exceedingly delicate balance becomes immediately evident when you begin meddling with it. For instance, if you thin out a dense grove of trees, it is disconcerting how quickly nature will

Woodland gardens can provide lively spring color, restful shade in summer, and an ever-changing palette of foliage colors.

cover the bare ground with weeds and tree seedlings.

To create a woodland garden, one must work with nature in a spirit of peaceful coexistence. A recent consulting job gave me the opportunity to do just that. On a lot measuring roughly two acres in Westchester County, New York, a small pond was surrounded on one side by a steep hillside with some fairly good-sized oak trees. For years, vines, brambles, and honeysuckle had been allowed to ramble, and much of the hill was an impenetrable tangle, with a thick mulch of oak leaves.

Early on in the project, we considered using heavy equipment and tearing out the unwanted undergrowth, clearing and rototilling the ground, and laying stone paths. However, this standard garden-making approach would have resulted in a raw hillside, subject to erosion and rapid colonization by weeds.

To minimize the disruption and preserve as much of the invaluable oak mulch as possible, the vines and shrubs were grubbed out by hand. The areas for shrubs and ground covers were then carved from this natural mulch using a small Rototiller.[®] (The procedure was rather like taking a cookie cutter and punching various shapes in the dough.) The massing shrubs—acid-loving (or tolerant) plants such as deciduous azaleas, *Rhododendron mucronulatum* 'Shell Pink', and *Fothergilla major*—helped determine path placement and provided seasonal focal points. The oak leaves became the surface of the paths, which were edged with various ferns, as well as 20- to 30-foot-long drifts of ground covers, including *Phlox divaricata*, *Pulmonaria* 'Mrs. Moon', and *Polygonatum odoratum* 'Variegatum'.

Woodland gardens vary as much as the gardeners who conceive and create them. Some are dominated largely by the site, with rocks and mature trees forming the major features. The Azalea Woods at Winterthur, a garden created by Henry Francis du Pont near Wilmington, Delaware, is a brilliant woodland essay featuring masses of hybrid rhododendrons and Kurume azaleas in a setting of mature tulip poplars (*Liriodendron tulipifera*). The poplars are underplanted with native wildflowers, including magnificent sweeps of *Trillium grandiflorum* and *Anemone apennina*, which is native to Italy.

Another woodland garden that has been a tremendous source of ideas for the planning and planting of such gardens is at

Wakehurst Place, the suburban extension of Kew Gardens, in West Sussex, England. Just to the left of the magnificent water garden, a series of gravel steps leads to a small pool surrounded by mature trees and rhododendrons. Although this garden area is small, it serves as a major transition between the more formal landscape gardens—with their mown lawns and gravel paths—and some wonderfully wild woods with steep wooded valleys. This important stylistic transition from garden to woods was created by combining herbaceous plants with ferns and rhododendrons, while the small pond was made the focal point and theme.

Long sweeps of *Alchemilla vulgaris*, *Iris sibirica*, and *Epimedium*, along with sizable clumps of variegated *Hosta*, edge the steps and stone paths around the pond. Although many of these plants are common in perennial borders, their various textures and leaf forms easily assume a woodland character when combined with ferns and planted in long sweeps. Blue and white *Iris sibirica* are set in front of massive mounds of pink and red rhododendrons, providing a simple but effective contrast of scale and character; the iris are all the more delicate and ephemeral against the masses of dark green evergreens.

This whole woodland pond area provides an excellent lesson in how to create pleasing yet unexpected stylistic contrasts. Here, the well-placed Japanese maples are as appropriate as the beautifully carved wooden bridges.

As with most woodland gardens, this garden's main splash of color is in spring. Here, it is provided by rhododendrons—in various shades of red, yellow, and pink—combined with broad sweeps of *Trollius*, *Primula*, and *Iris*. But like any well-designed woodland garden, once the flush of spring bloom is past, foliage textures and shapes become even more important. At Wakehurst Place, the foliage of various plants sustains interest right into autumn: the shiny spears of *Iris sibirica*; the neat, heart-shaped foliage of *Epimedium*; the dew-catching leaves of *Alchemilla vulgaris*, whose flowers should be neatly sheared off after they bloom; and the variegated leaves of many other plants, both in the pond and along its edge. ♣

—Margaret Hensel

Margaret Hensel, a landscape designer and consultant, lives in the Berkshires in western Massachusetts.

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 am-el-ANK-ee-er can-ah-DEN-sis
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 ah-NEM-oh-nee ah-PEN-in-ah
Aquilegia ak-qui-LEE-jee-ah
Artemisia are-tem-EASE-ee-ah
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Liriodendron tulipifera
leer-ee-oh-DEN-dron too-lih-PIF-er-ah

Liriope muscari
ler-RYE-oh-pee mus-CARE-ee

Lobelia cardinalis
low-BEEL-ee-ah car-dih-NAL-iss

Lunaria annua
loo-NAIR-ee-ah AN-yew-ah

Lycoris africana
lie-CORE-iss aff-rih-KAN-ah

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L. incarnata l. in-car-NAH-tah

L. radiata l. ray-dee-AH-tah

L. squamigera l. skwah-MIH-er-ah

Mertensia virginica
mer-TEN-see-ah vir-JIN-ih-kah

Monarda moh-NAR-dah

Moraea more-EE-ah

Nandina domestica
nan-DEE-nah doe-MESS-tih-kah

Navarretia nah-var-RET-ee-ah

Pardanthus par-DAN-thuss

Pelargonium pell-are-GO-nee-um

Phlox canadensis FLOCKS can-ah-DEN-sis

P. carolina p. care-oh-LIE-nah

P. divaricata p. die-vair-ih-KAY-tah

P. drummondii p. drum-MON-dee-eye

P. paniculata p. pan-ick-yew-LAY-tah

P. sibirica p. sigh-BEER-ih-kah

P. stolonifera p. stow-low-NIFF-er-ah

P. subulata p. sub-yew-LAY-tah

Photinia × fraseri
foe-TIN-ee-ah FRAY-ser-eye

Polemonium caeruleum
poe-lee-MOAN-ee-um ser-RULE-ee-um

P. reptans p. REP-tanz

P. van-bruntiae p. van-BRUIN-tee-ee

P. viscosum p. vis-KOH-sum

Polygonatum odoratum
poe-lig-oh-NAY-tum oh-door-AY-tum

Primula PRIM-yew-lah

Pulmonaria pull-mon-AIR-ee-ah

Rhododendron mucronulatum
row-doe-DEN-dron
mew-kron-yew-LAY-tum

Salvia farinacea
SAL-vee-ah far-in-AY-see-ah

Sanguinaria canadensis
san-gwin-AIR-ee-ah can-ah-DEN-sis

Saxifraga stolonifera
sax-ih-FRAJ-ah stow-lun-IF-er-ah

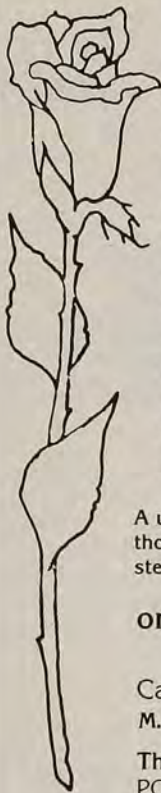
Spiraea × vanhouttei
spy-REE-ah van-HOOT-ee-eye

Thunbergia alata
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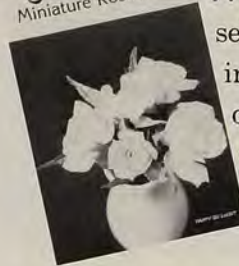
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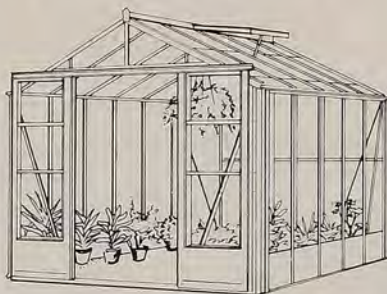
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Saint Mary's College is located in Saint Mary's City, Maryland, which is south of Washington, D.C., near where the Potomac River joins the Chesapeake Bay. To visit the herb garden at the college: from Washington, take Interstate 95 to Maryland, and exit onto Route 301 (Branch Avenue) south to Waldorf. In Waldorf, make a left turn onto Route 5 and follow signs to Saint Mary's City. Continue on Route 5 to the Saint Mary's College campus. Go straight through the first set of blinking lights and make a left at the first

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W. Atlee Burpee Company, Dept. AH, 300 Park Avenue, Warminster, PA 18974, catalogue free.

George W. Park Seed Company, Inc., Dept. AH, P.O. Box 31, Greenwood, SC 29647, catalogue free.

Bulbs

Carroll Gardens, 444 East Main Street, P.O. Box 310, Westminster, MD 21157, catalogue \$2.00.

McClure & Zimmerman, Dept. AH, 1422 West Thorndale, Chicago, IL 60660, catalogue free.

John Scheepers, Inc., Flower Bulb Specialist, Dept. AH, 63 Wall Street, New York, NY 10005, catalogue free.

Anthony J. Skittone, Dept. AH, 2271-31st Avenue, San Francisco, CA 94116, catalogue \$1.00.

Van Bourgondien Bros., Dept. AH, 245 Farmingdale Road, P.O. Box A, Route 109, Babylon, NY 11702, catalogue free.

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

George W. Park Seed Company, Inc., Dept. AH, P.O. Box 31, Greenwood, SC 29647, catalogue free.

Thompson & Morgan, Dept. AH, Faraday & Gramme Avenues, P.O. Box 1308-AM, Jackson, NJ 08527, catalogue \$2.00.

Plants

Busse Gardens, Dept. AH, 635 E. 7th Street, Route 2, Box 13, Cokato, MN 55321, catalogue \$2.00.

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Lamb Nurseries, E. 101 Sharp Avenue, Spokane, WA 99202, catalogue \$1.00.

Milaeger's Gardens, 4838 Douglas Avenue, Racine, WI 53402, catalogue \$1.00.

Wayside Gardens Company, Dept. AH, Hodges, SC 19695, catalogue \$1.00.

White Flower Farm, Dept. AH, Litchfield, CT 06759, catalogue \$5.00.

SUNFLOWERS

Sunflower seeds are available from the following mail-order companies.

W. Atlee Burpee, Dept. AH, 300 Park Ave., Warminster, PA 18974, catalogue free.

Maver Nursery, Dept. AH, RR 2, Box 265 B, Asheville, NC 28805, catalogue free.

George W. Park Seed Company, Inc., Dept. AH, P.O. Box 31, Greenwood, SC 29647, catalogue free.

Southern Exposure Seed Exchange, Dept. AH, P.O. Box 158, North Garden, VA 22959, catalogue free.

Vermont Bean Seed Company, Dept. AH, Garden Lane, Fairhaven, VT 05743, catalogue free.

AHS Travel Program

The American Horticultural Society is sponsoring an exciting program of horticultural explorations for the 1987 season. Plan to join fellow AHS members on one or more of these interesting and educational garden-related tours. Use the coupon below to request more information.

Kenya and East Africa (October 14-31). With its fertile green highlands, vast open plains, thick forests, and semi-arid deserts, Kenya offers an incredible spectrum of botanic wonders. During our tour of this land of contrast we will spend a brief time in Nairobi, and then we'll be off on a horticultural safari, journeying north to the Aberdare National Park, a lush, verdant region typical of an equatorial forest ecosystem. We will cross the equator en route to Samburu Game Reserve, a semi-arid landscape, and continue on to the multi-vegetational zones of Mt. Kenya. Here we will stop at the luxurious Mt. Kenya Safari Club. An exciting adventure follows with three full days of game viewing in the Masai Mara, Kenya's finest game reserve. We will conclude our safari at Lake Naibasha, after touring private estates and gardens. This will be a most unusual trip, encompassing a scope and variety rarely found in other itineraries for Kenya! Leader: Therese Saphieha, expert on wildlife and horticulture. Cost (Exclusive of air fare): \$3,975.00.

Gardens of Burgundy and the Riviera (June 11-25). (Note: Because of a tremendous response to past ads, this tour will be full as of the August issue. For those who missed out on this year's tour but

are still interested, a similar tour will be offered in June of 1988. Write for more information now, before it's too late!) Take a week-long cruise of the canals of Burgundy and the Rhone Valley aboard the luxurious hotel barge *Janine*. Spend a second week exploring the gardens of the Riviera, dividing time between Cannes and Monaco. On the scenic peninsula of Cap d'Antibes, we'll visit the famous Meilland nurseries, where many of the world's most beautiful roses are raised. Leader: Richard Hutton, President of Conard-Pyle/Star Roses and the American Association of Nurserymen, as well as AHS Board Member.

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CELEBRATING SUNFLOWERS

Continued from page 25

sians are probably the most enthusiastic consumers. According to one account related by botanist Charles Heiser, "The Russian people can keep a continuous supply of achenes going into one side of the mouth and at the same time eject a continuous stream of hulls from the other side," displaying a talent similar to that of watermelon connoisseurs in the United States. (If my Chinese friend—who can crack an achene and eat the seed in one second flat—is any indication, the Chinese run a close second to the Russians.) Seeds of the sunflower are also commonly found in birdseed and in poultry mixtures. In some cultures, they are still ground into a flour or roasted for use as a coffee substitute. Although sunflower seeds are not recognized officially by the modern medical world, herbalists consider them useful in treating respiratory ailments and malaria.

Other parts of the sunflower also have functional value. For example, the hulls have been pressed into logs and used as bedding for livestock as well as in the manufacture of ethyl alcohol. The stem provides fodder for animals, and is also used in the manufacture of paper, cloth, fuel, and other products such as acoustical ceiling tile.

Although sunflowers are grown on a large scale throughout the world, their commercial success has been greatest in the temperate regions. More than two-thirds of all commercial sunflowers are grown in Russia. Vast fields of sunflowers are also a common sight in Latin America, as well as the Balkans and parts of Africa and Canada. In the United States, sunflowers are grown primarily for snacks and bird food, and are considered only a minor crop.

Russia also leads the world in the number of sunflower breeding programs, which have led to the development of new hybrids with greater oil content. The seeds of some of the newer varieties of *H. annuus* reportedly contain over 50 percent oil. Because it is easier to harvest smaller plants, many newly developed hybrids are also shorter, with smaller heads and achenes.

H. annuus var. *macrocarpus* is remarkably easy to grow, provided it gets plenty of full sun. This robust plant will grow in almost any type of soil, though it prefers a soil that is well drained and rich in nutrients. (Some growers recommend regular applications of ordinary garden fertilizer.) Seeds are sown in early spring, near the last frost date. Plant seeds directly in the

ground, one-half inch deep and one foot or more apart, and keep the area weed-free. Once seedlings appear, thin to at least two feet apart.

Unfortunately, the sunflower is not immune to pests and diseases. Gardeners should keep an eye out for signs of infestation by the sunflower moth, sunflower maggot, and stalk borer, among others. Diseases such as rust, downy mildew, leaf spot, and black stem are also common.

Sunflowers are especially suitable for children, who can easily lose interest or become frustrated when growing plants that are more difficult to grow than sunflowers. Not only do sunflower seeds almost always germinate, but the plants grow rapidly to an impressive height. (According to Steven Davis, Director of Horticulture at the American Horticultural Society, children come to the Children's Garden at River Farm with yardsticks to measure the sunflowers' progress from week to week.) Once sunflowers bloom, children can take an active part in harvesting the seeds from the brightly colored heads.

Novice gardeners like myself find sunflowers appealing for many of the same reasons. Each time I sow the seeds, for example, I marvel at the "magic" of germination, and my gardening confidence is bolstered. Even the rocky clay soil of the Appalachian region where I live does not seem to deter their growth. If anything, the plants appear to thrive in the mountains' shadow, as if in defiance of the elements and my worst horticultural fears.

For me, one of the most rewarding aspects of growing sunflowers is harvesting the seeds, which are normally ripe about 80 to 120 days after germination. (Birds flocking around the flower heads are a sure sign that the seeds are ready to harvest.) I usually cut the heads off and allow them to dry for several days before removing the achenes. Seeds can be roasted or eaten raw.

In my opinion, a summer garden is not complete without at least one or two sunflowers to brighten the scene. The sight of those enormous yellow-edged heads, bent over by their own massive weight, is somehow reassuring as autumn's chill approaches. And there is nothing quite like the taste of sunflower seeds on a late summer's day—especially on a desert island.

Lynn M. Lynch, who lives in Frederick, Maryland, is an Associate Editor of *American Horticulturist*.



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Lycoris Magic



The delicate pink blooms of *Lycoris squamigera* appear as if by magic in the late-summer garden. In this planting, the stalks appear between the glossy green leaves of *Bergenia cordifolia*.

'T is the first of August. By next week, the bare patch in my garden will be filled with fat green spears. And by mid-month, the garden will be bursting with the glorious, delicate pink flowers of *Lycoris*.

It is no wonder this unusual plant has many descriptive common names, including spider lily, which refers to its spidery, lily-like blossoms. The names magic lily and resurrection lily were inspired by the seemingly magical appearance of the showy flowers, which are borne on smooth, leafless, 2½-foot-tall stalks long after the leaves have faded away. The names autumn or hardy amaryllis refer to the plant's resemblance to *Amaryllis*, the popular gift plant.

Lycoris species are native to Asia. The first of these flowering bulbs were brought to the West around 1712 and were introduced to English gardens by 1750. Evidently, the first species to be named was *Lycoris aurea*, now called *L. africana*. As the years passed, nearly a dozen more species—all native to China, Japan, and Southwest Asia—were named. By the end of the 19th century, *Garden and Forest*, an American horticultural journal, was encouraging gardeners in the United States to plant bulbs of the hardy species.

The most widely grown of all *Lycoris* species is *L. squamigera*, a vigorous, dependable flowering bulb that multiplies rapidly. This Asiatic species can withstand northern winters into USDA Zone 4 and will flourish in gardens as far south as Zone 7. The plants growing in my Twin Cities garden have survived 25 winters. The slightly smaller *L. squamigera* 'Purplea' has a rosier tint to its flowers. (*Hortus Third* indicates that plants sold under this name may actually be *L. incarnata*, a less hardy species.) One other hardy species, *L. sanguinea*, bears bright red blooms in midsummer.

The tender species of *Lycoris* can be planted outdoors in milder climates, specifically, Zones 7 through 10. These include golden-flowered *L. africana*; *L. incarnata*, which bears rose or pink flowers; and *L. radiata*, whose blossoms are orange-red or white. All three of these Chinese natives bloom in autumn and are commonly known to southern gardeners as spider lilies.

Lycoris bulbs should be planted as early in autumn as possible. Five to eight of the long-necked bulbs will multiply to form an impressive grouping within just a few years. In southern climes, *Lycoris* require

partial shade, while farther north, *L. squamigera* thrives with day-long sun.

Although *Lycoris* are easy to grow and require little work, proper soil preparation when planting the bulbs is important. Dig a hole approximately one foot in depth. At the bottom, place a few inches of aged or processed cow manure, along with shredded compost mixed with fertile topsoil. Over this mixture, spread a layer of soil to create a barrier between the fertilizer and the bulbs. (In my clayey soil, an inch of builders' sand beneath the bulbs provides better drainage and helps prevent the bulbs from rotting because of too much moisture.) Set bulbs of the hardy species eight inches below ground level. The cold-tender types should be planted four inches deep.

Lycoris produce lush clumps of daffodil-like foliage in early spring. By early summer, the leaves die back, leaving a bare spot in the garden or disappearing beneath the expanding foliage of nearby perennials. In August, the unobtrusive flowering stalks appear, opening suddenly to display an eye-catching crowd of blossoms atop the tall, straight stems.

Lycoris are not generally bothered by pests, and require little care from year to year. After the blooming period, which lasts about 10 days, cut the flower stalks to the ground. Since *Lycoris* are propagated by offsets produced by each bulb, this is a good time to dig and separate bulblets from the parent bulbs. This is an operation I never seriously contemplated: I prefer to enjoy watching my clumps grow larger each year.

To feed the plants, scratch one fistful of bone meal into established beds late in autumn, or apply a scattering of balanced fertilizer (10-10-10, for example) each spring, letting spring rains soak it into the soil. In frigid areas, after fall's hard frost, spread a layer of raked leaves over the planting to protect the bulbs against winter damage.

Anyone who has grown these fascinating plants looks forward to the spectacular "magic show" they stage each year. Indeed, *Lycoris* seem to transform the late-summer garden overnight with their showy blossoms, as if by magic. Best of all, they require little in return. What more could any gardener want? ♣

—Judith E. Hillstrom

Judith E. Hillstrom is a gardener and writer living in St. Paul, Minnesota.

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Kenneth Wurdaek

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Learn more about Ashe's magnolia and other endangered plant species by purchasing a copy of the American Horticultural Society's *Endangered Wildflowers 1988 Calendar* and reading through the informative text. Funds raised from sales will be used to support conservation projects. To order your calendar, turn to page 40.