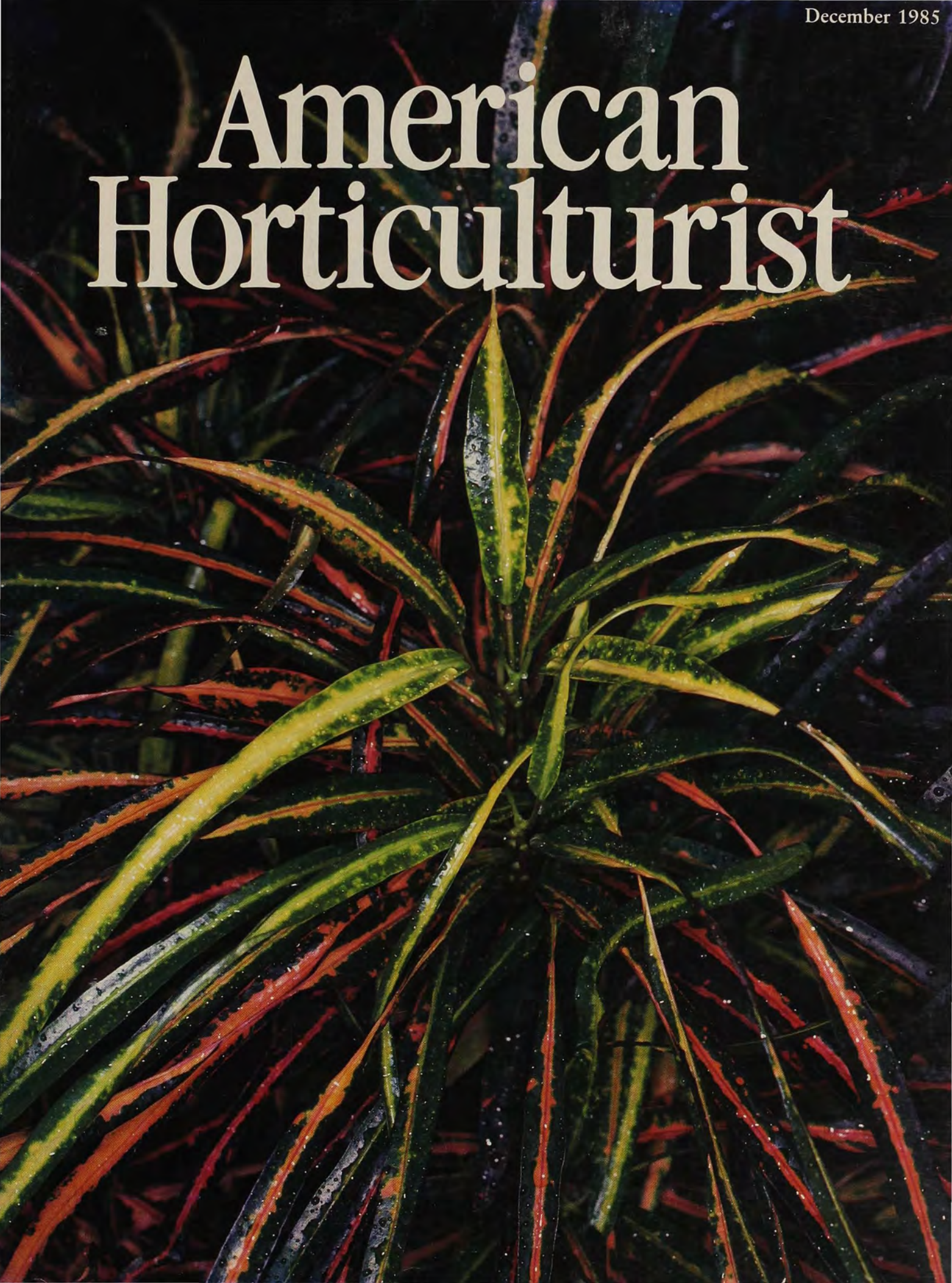


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# American Horticulturist





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# Contents



Bartram's Garden, which lies along the banks of the Schuylkill River in Philadelphia, Pennsylvania, was America's first botanic garden. It was also home to both John and William Bartram, two of this country's most well-known botanists. To join Marcia Bonta for a tour of this historic garden, turn to page 24. Photograph courtesy of the John Bartram Association.

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**On the Cover:** This stunning variegated croton, *Codiaeum* sp., would make an unforgettable accent in any southern garden. To learn more about variegated evergreens for both northern and southern gardens, turn to page 15. Photograph by Dick Keen.

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# *Help Save America's Endangered Wildflowers*



*Marvin W. Poulson*

*Many of America's most treasured wildflowers—including the spectacular spineless hedgehog cactus, *Echinocereus triglochidiatus* var. *inermis* (above)—are threatened with extinction. In fact, experts estimate that one-tenth of the species and varieties native to the United States are in jeopardy. Over 50 taxa have already disappeared.*

*Help save our endangered wildflowers by purchasing the American Horticultural Society's 1986 Endangered Wildflowers Calendar. Funds raised from sales will be used to support conservative projects. To order your calendar, turn to page 40.*

# National Garden Week

Gardening is America's most popular outdoor leisure activity, far surpassing athletics, travel or any other avocation. In fact, 43 million Americans have flower or vegetable gardens each year. According to the National Gardening Survey, conducted by Gallup, Inc., for the National Gardening Association, the total acreage in home and community gardens is 1.3 million. These gardens produce 13.5 million pounds of vegetables worth an estimated \$12 billion.

The time has come to recognize the many contributions of the American gardener. I am pleased that the American Horticultural Society has joined forces with 16 other national organizations who are working to establish a National Garden Week. National Garden Week would be celebrated during the third week of April each year, beginning April 13, 1986. It would become the focal point for activities designed to increase the public's interest in the many benefits of gardening. Demonstrations, community beautification projects and other garden-related events would bring gardening to the attention of all Americans. A National Garden Week would recognize the efforts of the millions of Americans who garden, and also would attract the attention of those who need encouragement to garden.

I know all of us who are members of the American Horticultural Society are familiar with the many benefits gardening provides. Home gardens bring families together, and community gardens provide the opportunity for many families to share a piece of land and strengthen community bonds. Gardening can benefit the disabled through horticultural therapy programs. It also instills an appreciation for nature and the beauty of this country that in turn create a respect for the environment.

As reported in the September 1985 issue of *American Horticulturist* News Edition, the United States Senate has passed the National Garden Week Resolution, which would authorize President Reagan to proclaim a National Garden Week. Before it can become law, however, the Resolution must be passed by the House of Representatives. At the time of this writing, the Resolution is still in House Committee, and it must have 215 sponsoring congressmen before it can be introduced for a vote.

With your help, we will all have a National Garden Week to celebrate in 1986. I urge all Society members who are in favor of the establishment of a National Garden Week to write their congressmen. Let your representatives know that, as a Society member, you want to see the establishment of a week celebrating the importance of gardening in America. Tell them about the benefits of gardening and its significance in your life. In short, urge your congressmen to contact the office of Congressman Thomas A. Luken (Ohio) and to cosponsor the National Garden Week Resolution.

With your help, we will not only have a National Garden Week to celebrate in 1986, but we will be able to look forward to such celebrations for years to come.

—Edward N. Dane

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# Succulent Geraniums



*Sarcocaulon salmoniflorum*

Michael Vassar

“I heard you just got a new geranium. How soon can I have a cutting?” I cannot imagine refusing any request from this very dear friend. But a piece of my new geranium!

The object of my devotion is a small, 1½-inch, Y-shaped, brown object—a thin fork of wood with four rows of little outcroppings that look as though a surgeon had done a bit of sewing and forgotten to trim the edges of the stitches. I gaze starry-eyed at *Sarcocaulon inerme*, my new geranium. *Sarcocaulon* is Greek for fleshy-stemmed; the specific epithet indicates that this species is spineless, unlike many other closely related species whose spines can pierce deeply into the flesh.

Few people would suspect that such an austere-looking plant is a relative of the

showy zonal or bedding geraniums that are known and loved throughout the world. In fact, my *Sarcocaulon inerme* and the red-, white- or pink-flowered zonal geraniums (*Pelargonium* × *hortorum*) that are a feature of many a summer garden are both members of the geranium family, Geraniaceae. Despite the fact that both species are commonly called by the name geranium, neither of them technically is a “true” geranium, meaning a member of the genus *Geranium*.

Ironically, *Geranium* species are often called by another common name, cranesbills. These plants are members of a genus of wildflowers native to woods and shady places in Europe. Herbalists used *Geranium* spp. for their astringent and diuretic properties. Potions for sore throats and

ulcerated mouths frequently contained powdered bits of dried geranium rhizomes. The roots and leaves of the plants supplied important ingredients used in the tanning of hides.

Unlike the true geraniums, both *Pelargonium* spp. and *Sarcocaulon* spp. are native to southern Africa, where water is scarce, and heat and blazing sun are facts of life. European botanists first discovered the pelargoniums in the 1630’s. Since the flowers of these newly discovered plants resembled those of the native European *Geranium* spp., they were given the name African geraniums. In his *Species Plantarum*, published in 1753, Linnaeus included all geraniums in one genus. It was not until some 40 years later that the botanist Charles Louis L’Heritier (counting

stamens and comparing other floral parts) determined that the African species, though members of the geranium family, actually belonged in a separate genus, which he named *Pelargonium*. However, the name had already been accepted, and pelargoniums are commonly called geraniums to this day.

Dutch traders brought the ancestors of zonal (*Pelargonium* × *hortorum*) and Lady Washington (*P.* × *domesticum*) geraniums from Africa to Holland and England in the 1650's. In the early 1800's, the English and Dutch succumbed to a geranium (or, more accurately, *Pelargonium*) craze similar to the "Tulipomania" that swept through Holland in the 1630's. As a result, a vast number of *Pelargonium* spp. were hybridized, crossed and recrossed. Today, there are some 5,000 to 6,000 cultivars of "geraniums" from which to choose.

Thus, it is the zonal geranium's South African heritage that gives it such a remarkable tolerance for heat and drought. Many gardeners would be surprised to know that although Lady Washington and zonal geraniums are often treated as annuals, they will grow and flower for years if they are properly cared for, for they are actually perennials. In southern areas (USDA Zone 9 southward), these plants can be grown outdoors, where they become shrublets or shrubs.

Obviously, almost any gardener in this country would recognize a common bedding geranium, or even one of the ivy-leaved cultivars or a showy Lady Washington. There are, however, a number of species in the geranium family that many gardeners would not know. These are the succulent species (members of both *Pelargonium* and the less-well-known *Sarcocaulon*)—that is, those that have developed in the harsh, dry climates of South Africa. All of them are interesting because of the adaptations that enable them to survive in their native habitats.

Members of the genus *Sarcocaulon* are native to very arid areas in South and Central Africa, where the average yearly rainfall is 2½ inches, although some years it does not rain at all. Like other small plants that eke out a minimal existence under harsh conditions, they are found growing in the shelter of larger shrubbery or under overhanging rocks where there is some protection from the elements.

*Sarcocaulon* species are most interesting because of their "stripped-down" appearance and their Spartan lifestyle, which make

life in their homeland possible. Like our native cacti, *Sarcocaulon* spp. tend to have developed unusual shapes. Generally, the plant's stem is rounded, because it is used for storage of liquid. There are no superfluous plant parts from which vital moisture could be lost. Leaves, which are usually small, thin and highly serrated, appear when the rain comes, then drop off. The same is true for roots, which quickly generate in the presence of moisture. Like the leaves, they grow when water is available, persist for awhile, then—if no water is available—slough off, leaving only the taproot. In the dry season, these plants go dormant in order to conserve water.

*Sarcocaulon* spp. are covered with a waxy or resinous skin that ranges in color from light tan-gray to brown, with reddish or green undertones. This coating is actually bark consisting of densely packed cork cells that are heavily impregnated with wax, whose function (among others) is to prevent transpiration. Each year a new layer of cork cells is added. As the waxy layer thickens, the plant develops a hard, glassy shell that protects it from moisture loss. This layer is translucent, however, and underneath lies a dark green layer of cortex, which is rich in chlorophyll. This layer is responsible for food production, and acts as a substitute for the leaves that are absent during much of the year.

In cultivation, some *Sarcocaulon* specimens produce leaves and undergo a noticeable seasonal change, while others do not. Although we are accustomed to thinking of leaf production as a prelude to flowering, some of these plants may flower, produce fruit and set viable seed without ever producing leaves. Plants that do not have leaves should not be watered. In the plant's native habitat, both dew and ocean mists provide much of the water the plants need to survive throughout the year. As the moisture condenses and seeps slowly through the mineral-rich soil, shallow surface roots retrieve the precious droplets of water. Cultivated plants should be misted weekly, instead of watered, to approximate the moisture sources that are available in the plants' native habitat.

*Sarcocaulon* species may be grown in a windowsill, under lights, in a greenhouse or outdoors (if protected from rain or prolonged, heavy mist as well as cold temperatures). Some species flower regularly, even under fluorescent lights, if the tops of the plants are kept four inches from the tubes. Long periods of dormancy (even as

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long as a year) are not unusual. Be sure to water only when the plants have leaves. To avoid plant desiccation at other times, mist the soil surface weekly during the summer, and less frequently the rest of the year. Be frugal with fertilizer, but do not completely withhold it.

Tip cuttings of *Sarcocaulon* species root without too much difficulty. Fresh seed germinates quickly, and even old seed retains its viability. Seed is occasionally available, but few owners are willing to take cuttings of their plants. It is easier and less complicated to simply buy a plant; a few suppliers have a limited number of them. (See "Sources" on page 40.)

There are about 14 species of *Sarcocaulon*, all of which are succulent, rather low-growing, spiny shrublets. The half-inch-long, sharply tipped spines of *S. patersonii* (formerly *S. rigidum*) earn the species the common name hellthorn. The spines, as in other plants of this genus, are the hardened petioles that remain after the leaf blades drop. The longer the original petiole, the longer the spine. *S. patersonii* has pale gray to almost golden bark. Its fleshy stem branches are prostrate to semi-upright. *S. peniculinum*, on the other hand, could be mistaken for a tuber or a small Idaho potato lying on the surface of the soil. This prostrate shrublet is about 3½ inches tall and eight inches in diameter. Its grayish-white branches rest on the ground and often bear short, fleshy shoots on the upper surfaces. This odd-looking species bears lovely rose-pink blossoms that last for days.

Gray-skinned *S. multifidum* bears a few horizontal branches and flaunts woolly hairs in addition to spines. *S. vanderietiae* (also listed as *S. spinosum* and *S. burmannii*) is distinguished by its thorns, which jut out at right angles from the stem. *S. inerme* is another species that has very few branches. When the leaves drop, the remaining petioles are blunt instead of spiny.

Equally interesting, but less demanding and easier to obtain, are the succulent species of *Pelargonium*. Like the *Sarcocaulon* spp., the succulent pelargoniums are found growing wild in South Africa, though in areas where the climate is less severe. In structure and growth habit, the succulent pelargoniums more closely resemble the kinds of plants we are accustomed to growing, even though many of these plants have underground tubers or caudex bases, which serve to store moisture. Most species have a thin, woody stem whose gray-tan exterior gives way to green at the



*Pelargonium klinghardtense*

Michael Vassar

growing tips. The highly serrated, leafy topknots resemble the unfurling leaves of carrots or parsley. The surface layer or bark of the stem of many of the succulent pelargoniums is covered with grayish scales that help prevent water loss and act as a kind of sun screen. A green, chlorophyll-rich cortex lies under the outer skin layer. The petioles of some species, such as *P. vanderietiae* and *P. echinatum*, develop into sharp spines. In other species, including *P. alternans* and *P. dasphyllum*, the short stubs of dead petioles jut out from the stems and are blunt and easily broken off. The leaves of many of these species are hairy; these hairs not only serve as a sun barrier by protecting the underlying skin layer from burning, but also direct droplets of water to the roots below.

The size of succulent pelargoniums varies with age and cultural practice. My three-year-old cutting of *P. alternans* resides in a 1½-inch plastic vial. The five-year-old plant from which the cutting was taken lives in a 2½-inch pot. My *P. carnosum*, which I started from seed 2½ years ago, now dwells in a 2½-inch plastic container, where it is slowly developing a woody caudex beneath a twisted green stem. My plants are grown under fluorescent light. Under greenhouse conditions, succulent pelargoniums grow sturdier and larger. Furthermore, they tend to exhibit a seasonal growth cycle when grown in a greenhouse—growing in spring and summer,

producing new shoots toward the end of October or November, flowering and then going dormant. In more spacious quarters, the plants would grow larger and spread more. In any case, as plants age, they become more interesting in shape; they tend to grow straight initially, then to meander, twist, branch and recurve. Although it is not general practice, plants can be shaped with a bit of judicious clipping. Such plants would undoubtedly have an interesting bonsai-type appearance.

Succulent pelargoniums are easy to grow from seed. Germinate the seed in a sterile medium, in a covered container that has a drainage hole. Place the container in a spot where it will receive some bottom heat or in a sunny window; bottom heat and warm temperatures aid germination. Cuttings also root easily.

These plants can be grown in a sunny window, under fluorescent light, in a greenhouse or outdoors in warm, frost-free areas. Succulent pelargoniums are tuberous or rhizomatous plants, and they usually have a dormant period. Water plants while they have leaves, but not over-generously. During the dormant periods, either withhold water completely or water very sparingly.

Since growing conditions vary widely and dormancy periods seem to vary from species to species, the best advice is to study your plants each week. You will soon learn to recognize when a dormant period starts and when it ends.

The potting medium for both succulent pelargoniums and *Sarcocaulon* spp. must contain a sufficient amount of minerals and humus or peat, but should also be well drained. *Sarcocaulon* require more drainage than do the succulent pelargoniums. Use coarse sand, pumice, granite, gravel or whatever is locally available. Frequent repotting is unnecessary, since these plants are slow growers.

There are far too many succulent pelargoniums to describe individually. Some species to look for include *Pelargonium carnosum*, *P. crithmifolium*, *P. dasycaule*, *P. ferulaceum* and *P. tetragonum*. Each presents an interesting appearance and has its own distinctive habit. Grow one for fun! ☼

—Helene S. Berg

Helene Berg is a writer and gardener whose column "The Garden Bench" has appeared regularly in the *Scarsdale Inquirer*. She is now a resident of Potomac, Maryland.



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# Book Reviews

## COLLECTING AND PRESERVING PLANTS FOR SCIENCE AND PLEASURE.

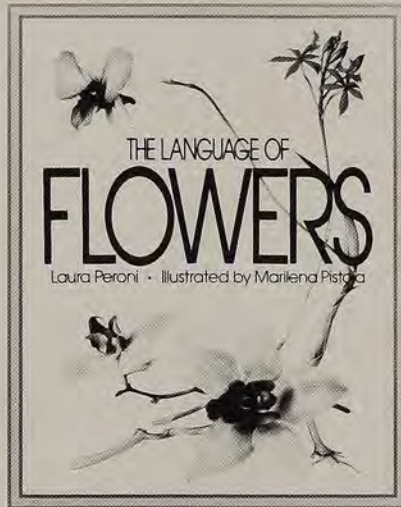
Ruth B. (Alford) MacFarlane. Arco Publishing, Inc. New York, New York. 1985. 184 pages; hardcover, \$13.95; softcover, \$8.95. AHS member price, \$11.15 (hardcover), \$7.15 (softcover).

Plants are collected and preserved for many different purposes and in many different ways. For example, the botanist generally prepares pressed herbarium specimens, which have detailed labels that provide collection data. Bulky specimens are often preserved in fluid. Artists and amateur naturalists also use pressed plants, but for other purposes.

*Collecting and Preserving Plants for Science and Pleasure* is an excellent introductory text for individuals interested in this fascinating topic. The author not only covers the essentials of collecting plants, she also explains how to preserve plants in a variety of ways, including pressing in a plant press, preserving in fluid, air drying, using drying agents and preserving with glycerin. Also included is information on how to skeletonize leaves and on how to handle fungi as well as algae and other water plants, which can be difficult to preserve. The chapters on labeling, mounting, storage and display, and herbariums are equally informative. Finally, artists and craftsmen will appreciate the many ideas for projects using both pressed plants and three-dimensional dried ones. In short, this little book is a treasure-trove of information that will open a whole host of possibilities for anyone interested in plants.

**THE PELARGONIUM FAMILY: THE SPECIES OF PELARGONIUM, MONSONIA AND SARCOCAULON.**  
William J. Webb. Croom Helm. London, England. 1984. 104 pages; hardcover, \$34.50. AHS member price, \$27.60.

*The Pelargonium Family* is a book written for the specialist who is interested in all those plants we commonly refer to as geraniums, as well as members of two related genera, *Monsonia* and *Sarcocaulon*. The author devotes the majority of the text to discussions of the individual species in these



genera. In addition to clear, concise, and not overly technical descriptions of species, the book includes chapters on early literature, history, taxonomy and propagation. Excellent color plates and many line drawings serve to illustrate the text.

Although this is a British publication, American gardeners with a passion for this group of plants will find *The Pelargonium Family* to be a useful addition to their library.

**THE LANGUAGE OF FLOWERS.**  
Laura Peroni, text. Marilena Pistoia, illustrations. Crown Publishers. New York, New York. 1985. 207 pages; hardcover, \$40.00. AHS member price, \$30.00.

Anyone well-versed in the language of flowers knows that daisies symbolize purity, freshness and simplicity. Furthermore, a branch of holly signifies strength, immortality and aggressiveness; lotus blossoms express great admiration; petunias are the symbol of love that cannot be hidden; and asters denote unpredictability.

*The Language of Flowers* is a sumptuous, oversized book that contains all these tidbits and more. The book includes 80 full-color paintings of flowers, trees and shrubs by Marilena Pistoia, all of which are lovely and accurately detailed. Each full-page painting is accompanied by an interesting, if brief, discussion of the plant depicted. In addition to the "meaning" of

each flower, the text explores many of the ancient traditions, uses or folklore pertaining to the plant. First published in Italy, *The Language of Flowers* is an English translation, and includes discussions of such diverse plants as acacia, amaranth, calendula, trumpet vine, fuchsia, tulip tree, pomegranate, African violet and zinnia.

Unfortunately, the designers of this lovely and fascinating book chose not to set off the paragraphs in the text in any way. (One wonders how paragraph indents or extra spacing between paragraphs could be thought to spoil design.) For this reason, even the briefest discussions are rather tiring to read. Despite this problem, however, *The Language of Flowers* would make a stupendous gift to a gardening friend or relative, or an interesting addition to almost any garden library.

**GREEN INHERITANCE.**  
Anthony Huxley. Anchor Press/Doubleday. Garden City, New York. 1985. 193 pages; hardcover, \$19.95. AHS member price, \$14.95.

**OUR GREEN AND LIVING WORLD: THE WISDOM TO SAVE IT.**

Eduard S. Ayensu, Vernon H. Heywood, Greenville L. Lucas and Robert A. Defilippis. Anchor Press/Doubleday. Garden City, New York. 1985. 253 pages; hardcover, \$25.00. AHS member price, \$22.50.

As the two titles suggest, both of these books focus on the many fascinating and surprising ways that mankind is dependent on plants. In both cases, the combination of lavish photographs, illustrations and informative text provides an excellent overview of the relationships between plants and man.

*Green Inheritance* begins with a description of the ways in which plants control the environment—from the essential role they play in the carbon dioxide cycle to their role in controlling soil erosion. One chapter is devoted to the many plants that serve as staple foods throughout the world, while other chapters cover the many ways plants influence the cuisines of the world, including their use in or as spices, bever-

ages and delicacies. Medicinal, industrial and building, and other uses are also discussed, as are ways mankind uses plants for ornamental purposes. Finally, the book concludes with chapters on improving our plant resources and saving the world's dwindling plant heritage.

*Our Green and Living World* begins with a "global mosaic" that briefly examines the many different types of plant communities found in the world. About one-half of the book is devoted to discussions of these various communities, and includes a look at the plant communities and the factors that play an important role in their ecology (periodic fires are a characteristic of grassland habitats, for example), as well as a discussion of the major ways in which each region is being used and misused by man today. The regions covered include deserts, grasslands, tropical rain forests, wetlands, oceans and islands. The authors of *Our Green and Living World* devote the remainder of the book to a discussion of the ways in which plants are used by man—for example, for food, weaving, spices and medicines. Of particular importance are the uses that remain undiscovered or that have just recently been discovered, for these are the main reasons the world's flora is so precious to man and deserves his concern and care.

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Barbara Ellis is Editor of *American Horticulturist* and Publications Director for the American Horticultural Society.



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# Plant Galls

Club roots. Witches-brooms. Oak apples. Root knots. Crown warts. As the names of some of the more infamous imply, plant galls can be sinister and, frequently, downright bizarre. Some are harmful. For example, uncontrolled explosions of the *Phylloxera* gall that appears on grapes and of the Hessian fly stem gall found on wheat have rocked the economic stability of nations. Other galls are amusing. Wasp-caused galls on *Quercus robur*, for example, resemble toadstools perched on twigs, and seem otherworldly. Our emotions are mixed on the subject; we consider galls disastrous, benign, bothersome, beneficial—but rarely dull.

## What Are Galls?

Galls are abnormal plant swellings usually caused by an organism other than the plant itself. The organism, called the gall-former, lives part of its life in the gall and feeds on the contents of the surrounding plant cells. While the gall-former feeds, it injects growth-inducing chemicals into the plant's formative tissues. The chemicals cause these plant cells to abandon their normal coordinated growth pattern. As a result, the affected cells enlarge and divide until an abundance of reorganized tissue envelops the gall-former.

Undoubtedly, different gall-formers control plant development in different ways. Some may directly disrupt the plant's hormonal balance, while others may alter the cells' DNA. Gall development is under the gall-former's strict control; although the plant participates by providing the raw materials and energy, the gall-former directs construction with a surprising degree of finesse. The gall-former's efforts usually result in a structure so distinctive that we often use the gall to identify the gall-former. In most cases, gall growth stops if the gall-former is removed or killed.

Perhaps the single most important advantage to living in a gall is the rather special menu provided by the host plant. While in the gall, many gall-formers feed on plant cells that are richer in protein, carbohydrates and fats than are most cells in the rest of the plant. Although this enriched diet is provided by the plant, the



Oak apples on leaves of *Quercus garryana* caused by the asexual generation of the wasp, *Besbicus mirabilis*.

gall-former causes this diversion of nutrients, which would otherwise be sent to other parts of the plant. The implications of this ability of gall-formers are intriguing, and not merely of academic interest. Perhaps in the not-too-distant future, carefully selected types of galls will be grown and harvested as "protein pellets" suitable for livestock or human consumption. A fungus gall on corn, for example, is currently considered a delicacy in parts of Mexico.

## The Cast of Characters

Everything from viruses and wasps to mistletoe and rotifers can cause galls on plants. However, the most common galls are caused by bacteria, fungi, nematodes, mites and insects. Gall-forming insects include beetles, wasps, moths, flies, midges, sawflies, thrips, scales and aphids. The ability to form galls has proven to be a successful adaptation that has developed independently in a variety of groups.

Members of almost every plant group, from algae to woody plants, are known to host some sort of gall-former. On a worldwide basis, however, five genera—*Quercus*, *Populus*, *Salix*, *Eucalyptus* and *Ficus*—are known to be most frequently and

extensively attacked.

Often, a single plant species hosts several very different types of gall-formers. Wasp, midge and fungal galls, for example, are often found on adjacent oak leaves. On the other hand, the preference of a gall-forming species for its host plant is frequently so strict that galls may be used as taxonomic characteristics, just as are petal shape or leaf venation, to identify plant species.

Although shared by many types of organisms and considered one of the more specialized lifestyles in nature, the gall-forming habit does have its drawbacks. Once established by the gall-former, the cozy environment is attractive to unwanted visitors and is not as protective as one might imagine. The term "gall communities" is used to describe the parasites of gall-formers, parasites of parasites, guests and other invaders that set up quarters in a gall. In fact, it is often difficult to rear gall-forming wasps in their galls because of parasite-caused mortality. Although galls can protect the gall-former from some climatic factors as well as some general enemies, they are not an ultimate form of protection.

All plant parts—even roots and seeds—

can harbor galls. Acorn galls, for example, have been the subject of several studies. In many parts of the world, the unusual flowers of edible figs are pollinated, and at the same time "galled," by a small wasp. And, surprisingly, there are even galls formed on galls.

Different groups of gall-forming insects are prevalent in different regions of the world. In North America and much of Eurasia, for example, stingless wasps in the family Cynipidae, as well as midges (small versions of mosquitoes) in the family Cecidomyiidae, form an abundance of galls. In Australia, however, gall-forming scale insects (relatives of the common pests of our *Camellia* and *Euonymus*) abound and are responsible for the formation of some of the world's most unusually shaped galls, many of which are found on eucalypts. In India, gall-forming thrips are prevalent. North American scales and thrips are often serious pests but rarely, if ever, form galls.

#### Detrimental and Beneficial Galls

Several galls are agricultural headaches. Nematode galls (also known as root knots), the most notorious of which are caused by members of the genus *Meloidogyne*, annually cause multi-million-dollar yield losses of tomatoes, potatoes and many other crops. Female nematodes cause plant roots to swell as they feed, and the swelling causes the root vascular system to be disrupted. As is the case with all galls, root knots are a drain on the plant's energies because photosynthates are preferentially shunted to the galls. Fortunately, nematode-resistant tomatoes are available.

Other bothersome galls include club root of cabbage, crown wart of alfalfa, and corn smut gall, all of which are caused by fungi. Crown galls, which are also harmful, are caused by a bacterium.

With few exceptions, detrimental galls are found on roots, crowns or seeds, and are caused by nematodes, bacteria or fungi. Thus, galls on leaves or stems are generally of little concern to farmers. Also, farmers are generally not troubled by galls caused by mites and insects. An important exception is the Hessian fly, a midge that causes galls to form on the stems of wheat. This gall-former, which was of concern to Thomas Jefferson nearly two centuries ago, is still a problem today because it causes stem stunting or lodging. A related midge is considered a serious pest on rice in the Orient. In both cases, breeding for plant resistance to the pest has provided the best

*Continued on page 34*

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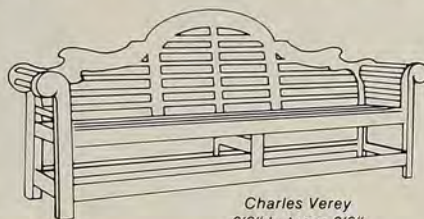
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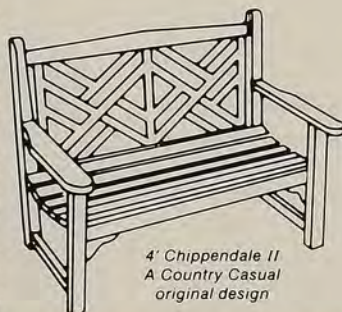
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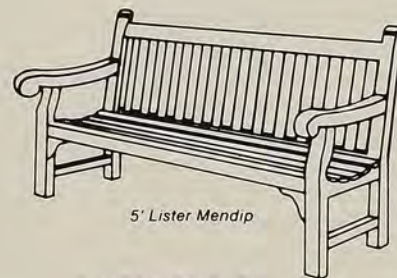


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# Keeping Track in the Garden

**M**an's memory fades with the passage of time. Record-keeping can be helpful to preserve fleeting moments, watch growth, learn, remind and remember. Keeping track of things in writing is often a necessity, but it can also be a pleasant and rewarding experience.

The usefulness of keeping records is obvious to many professionals, especially those who work with plants on a large scale. However, the need for notes may not be so evident to the small-scale gardener.

In gardening, record-keeping can be very useful indeed. For one thing, a garden cycle spans several seasons, and many a new moon may appear between planting and harvest time. Good intentions can easily fall by the wayside.

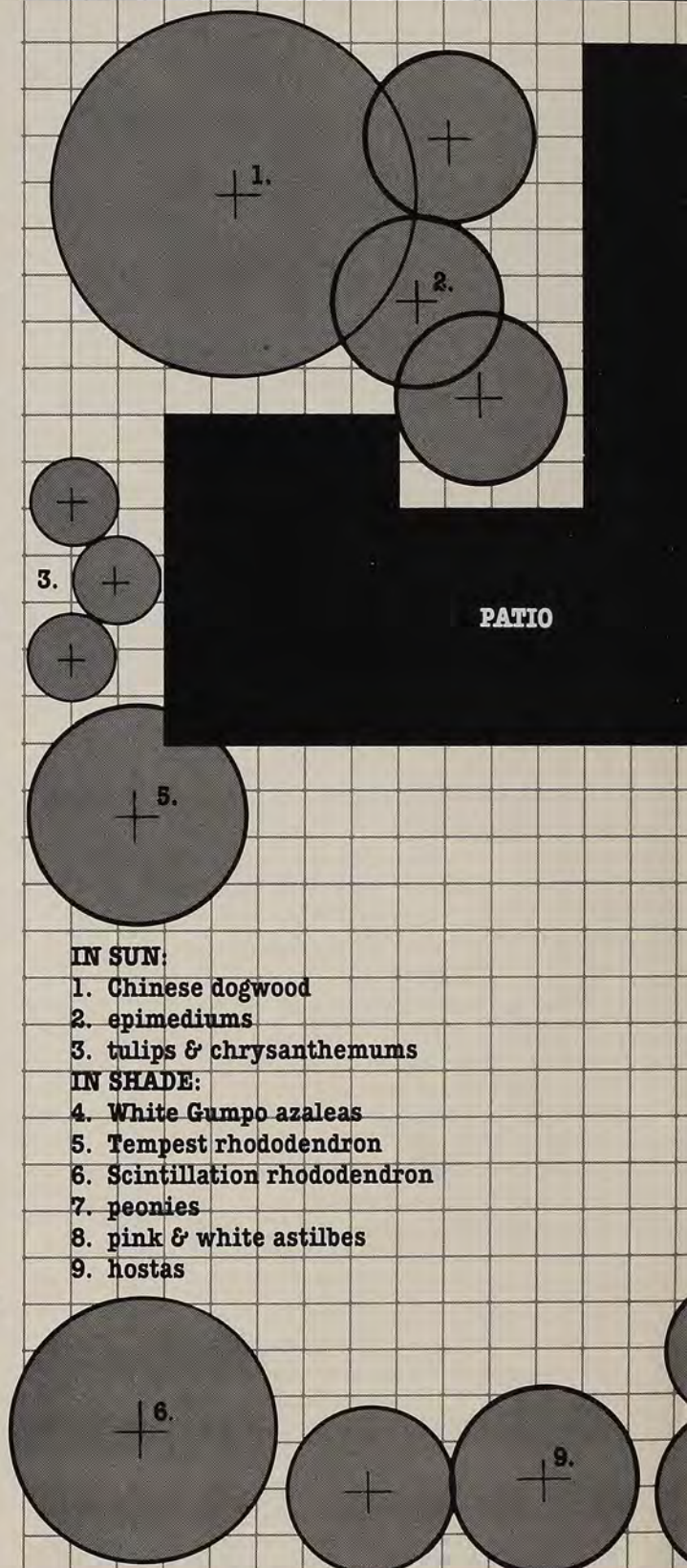
Walking through one's garden looking for plants about to emerge from the soil is always a joy. However, this activity can be even more pleasurable if one takes along a notebook. In springtime, when all the bulbs are blooming in profusion, I jot down such reminders as "Put five more lily-white tulips on the left, two feet in, near the peonies," or "Spray hollyhocks with Maneb," or "Order more black tulips for behind the white *Iberis*." The deficiencies in the spring garden are now noticeable, and I can remedy them in the next cycle. Thanks to my notes, my bulb order for fall is ready in the spring, and my planting intentions and needs are clearly written out. There is no need to wonder in July why I wanted to order three *Camassia* bulbs and 20 'King Alfred' daffodils. Nor do I need to wonder in October where I had intended to plant them. When the large order of little bags with bulbs arrives, I

check everything off against my original order and notes, mark the destination on the bags, and arrange the bulbs by location. I put the ones intended for the farthest bed in the wheelbarrow first and cart them to their location. (I know that my planting fervor may decrease and that I may run out of steam if I have to go out to the "far-west-40" bed last.) Then I finish up my bulb-planting spree by planting the bulbs I enjoy most, that is, the ones nearest the house.

After planting the bulbs, I use the empty bags as a reference. I mark the final location of the plants or bulbs on my main map, noting the species or cultivar, quantity and date of planting. I also make a note of when the bulbs bloomed—or didn't—on the same map seven months later. This method is helpful in many ways. For example, if blooms of several different cultivars do not appear, I can suspect a soil disease that otherwise might have gone unnoticed. Also, if some bulbs were not of top quality (and I had recorded these at planting time as "doubtful"), I feel justified in writing the supplier. (I have received a satisfactory response the few times I did.) If a few bulbs do not produce, I can suspect a mismatch or theft by a rodent.

As my records accumulate through the years, patterns—for example, the blooming season of the different cultivars, as well as their idiosyncrasies—become clearly visible. This kind of information is helpful when planning a garden party or a special flower arrangement, as well as future planting sprees.

What started me on this recording habit? Years ago, my mother, my sister or a friend would send me bulbs from the



## IN SUN:

1. Chinese dogwood
2. epimediums
3. tulips & chrysanthemums

## IN SHADE:

4. White Gumpo azaleas
5. Tempest rhododendron
6. Scintillation rhododendron
7. peonies
8. pink & white astilbes
9. hostas

Netherlands, my place of birth. I felt obliged to write down where I had planted those bulbs, knowing that I would reap the joy of my labors and their gifts several months later. I also knew that I would want to send a second thank-you note when the plants bloomed, mentioning the bulbs by name. The records helped me distinguish the different species and cultivars. I also became aware of which plants multiplied and which died off quickly.

The need to record became more obvious when my husband, suffering from yearly spring fever, kept digging up freshly sprouted seeds, tender seedlings, bulbs or carefully tended young plants that looked like weeds to him. A chart helped steer him on the right path, and eventually the vegetable garden was added to the flower bed layouts. I, too, had injured bulbs with summer plantings, but with a spring map in hand, I could plant the perennials and annuals, and avoid injury to the multitude of bulbs. Using written plans, I was able to plot at leisure and to visualize the 85-foot-long flower bed and other beds as a whole, thus preventing spotty planting, incorrect arrangement of plant heights, clashing colors or bunching. In short, my notes became invaluable to me.

Once I knew the location and habits of certain species, I found I could over-plant successfully. For example, I learned that mums can be planted over tulips. After the tulips have bloomed, their foliage needs time to die off to replenish the bulbs for the blooming period next spring. The mums start growing vigorously and eventually cover the unsightly tulip leaves. (Alyssum and ajuga obscure the leaves of the small bulbs, such

as *Scilla*, *Ornithogalum*, *Puschkinia* and *Chionodoxa*, which grace the edge of the border earlier in the season. Hosta leaves are also a marvelous cover.) When over-planting, I keep track on paper of what I am planting and where.

It is not always easy to stick with the recording habit, but neglecting one's records can result in surprises. For example, I have always dug in all the bulbs I force during the winter months. Throwing them out seems sinful, especially after they have provided me with so much beauty. On occasion, with a handful of bone meal, I have put them to rest in an odd spot, only to be surprised a year or two later with a small version of the original. How did it get there? I wonder. Did a squirrel do the planting? No, I just neglected to record it.

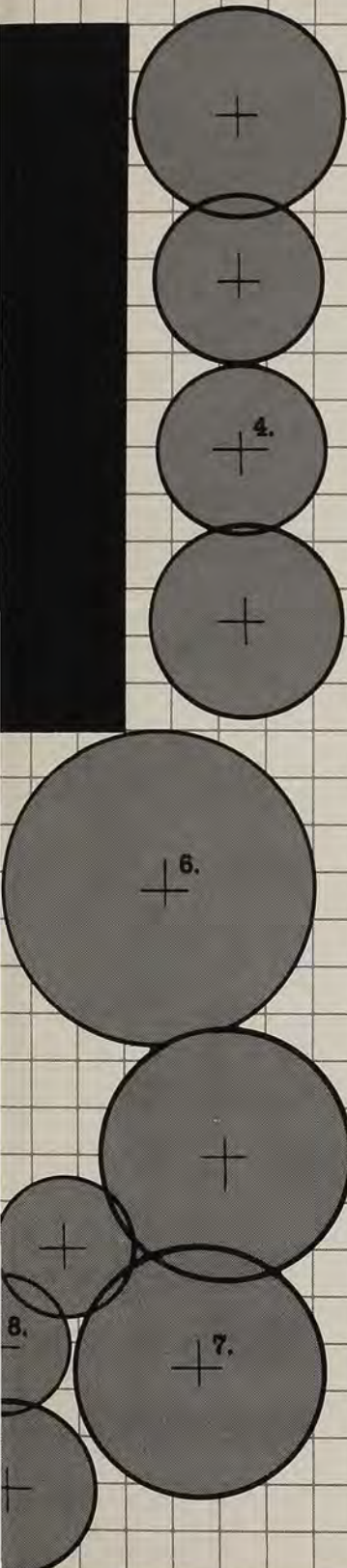
When I first began to keep records, I used a large sketch pad as well as a large sheet of tracing paper, which I used for overlays to record summer plantings. However, the wind wreaked havoc with the fragile paper, which I kept in place on top of the spring chart with heavy clips. Now the whole map is laid out on large, sturdy sheets of poster board that can be weighed down with heavy clips on windy days. These sheets have less of a tendency to blow away, and can rest on the top of the wheelbarrow like a desk. Aside from the maps on poster board, I also keep track in a notebook, which accompanies me when I go on an "inspection" walk. Some notes are reminders, and are valid every year: "Do not cut back mums near stone two," or "Cut mums in porch bed in July, root them and plant," or "Dormant spray before May." Others are just hints, ideas or dreams. This book also

contains all the bulb and plant orders I have received through the years. It lists the place of origin, and the giver of each plant or bulb, as well as the supplier, quantities and species or cultivar. Even though some acquisitions die off or are lost or eaten, this record gives an account of the hundreds of bulbs and plants that I have planted through the years.

I tried several different media and methods for the markings on my map. One year I recorded the flowers in their respective colors, but I ended up using one color for every planting year. I named all of the separate flower beds, and recorded them in the lower right-hand corner of the map, just as one would on an architectural drawing. Then I developed a scale. I measured the front bed by its sidewalk divisions; the other beds I measured with a yardstick. Such landmarks as "old lilac bush," "Thea's forsythia" and "*Cornus mas*" were also helpful in locating plantings.

Start your own garden layout by purchasing a large sketchbook with heavy-weight paper, or pieces of poster board, depending on the size of your garden. Take time to consider long-term and large-scale planning. Get out the watercolors and work out color schemes. Plan the timing and heights of the flowers that will appear in your garden. One can even buy a garden diary in the bookstore to use instead of a notebook. Whatever methods you choose, you can increase the joy of gardening by keeping records. 🍀

Maya Moran is a part-time artist and teacher. Her last article in *American Horticulturist*, "Planning a Low-Maintenance Garden," appeared in the October 1981 issue.









# Variations on an Evergreen Theme

BY JOSEPH HUDAK

**W**e are all familiar with the green foliage of pines, hollies and privets. Their basic, natural coloring is well known. Yet the more advanced we gardeners become, the more we think about other foliage options for a change of pace in the landscape. Variations on a theme—in this case, an evergreen theme—are no less intriguing in the world of horticulture than in music, theater, literature or art; they awaken our jaded sensitivities to new possibilities.

The familiar foliage of blue spruce or yellow arborvitae can provide solid color accents for gardens over a wide geographic range. However, plants with variegated foliage can offer a more subtle variation in the landscape palette. Evergreen trees and shrubs are especially useful because they add interest to the garden and can be enjoyed all year long.

The dictionary defines “variegated” as “having discrete markings of different colors”; it is these muted blotches, spots, threads or edgings of differing hues that add sophisticated foliage appeal to variegated evergreens. Such gradations can be subtle, however, so these lovely plants are probably best appreciated when planted close at hand. A site next to a summer terrace, outside a picture window or along an entrance walkway would provide many opportunities to admire their foliage. Variegated evergreens can also serve as foreground plants. Plant them near a plain backdrop hedge of hemlock, yew or privet to highlight the contrast between plain and variegated foliages.

**V**ariegated evergreens, with their colorful foliage, are especially useful in spaces where other plants might only provide scant or seasonally brief bloom. The attractive leaves persist longer than any flowers, and can provide a full year of color in what might otherwise be a dull spot in the garden.

Although mottled leaves can be eye-catching, variegated evergreens do have their drawbacks. Generally, they cannot tolerate too much sun or wind, and they require regular watering to perform at their best. Because the white or cream portions of variegated leaves either lack or have reduced amounts of chlorophyll, the rate of photosynthesis is slowed, and the plants tend to be less vigorous than their all-green relatives. The leaves of some variegated plants have less substance, and thus tend to windburn more easily or to dry out along the leaf margins more quickly during dry spells. Although variegated evergreens need not be coddled, it is important to keep their reduced stamina in mind when selecting an appropriate site.

Needle evergreens generally require ample sunlight to hold their color variations well. A unique member of this group is *Pinus densiflora* 'Oculus-draconis', often sold as dragon's-eye pine. This slow-growing cultivar of Japanese red pine grows to 30 feet, and bears rich green needles accented with two creamy-yellow bands. Hardy from USDA Zones 5 to 9, this cultivar prefers dappled sunlight, a location protected from the wind, and well-drained, average soil.

*Taxus baccata* 'Fastigiata Aureo-marginata', a form of Irish yew, can be grown in Zones 7 and 8. Its leaves have gold margins and a central shaft of deep green. By late autumn, the two-toned effect fades, although some of the outer foliage retains traces of gold through the winter. This shrub is especially attractive as a specimen grown in a tub, and it also makes an effective hedge.

Both *Chamaecyparis lawsoniana* 'Albovariegata' and *C. lawsoniana* 'Albospica' are small-growing cultivars of the species commonly known as Lawson cypress. These arrestingly beautiful plants are useful as either rock garden specimens or low-growing hedges. Both are dome-shaped and have white-to-cream patches of new growth intermixed with older, green needles. These cultivars are suitable for gardens in Zones 6 through 9, although 'Albovariegata' is less frost-resistant than 'Albospica' if grown on an exposed site.

Another ball-shaped, slow-growing dwarf is *Chamaecyparis pisifera* 'Com-



PREVIOUS PAGE: *Taxus baccata* 'Fastigiata Aureo-marginata' is a cultivar of yew with two-toned leaves. ABOVE: A dazzling cultivar of garden croton, *Codiaeum* sp.

pacta Variegata'. This cultivar of Sawara cypress exhibits creamy-yellow blotches of new growth against the deep green of the background foliage. Suitable for gardens in Zones 5 through 9, this shrub boasts bright variegation that fades very little during the winter. (The one I have in my own dwarf conifer collection here in the

Boston area grew slowly for three years, but is now about 15 inches tall and 15 inches wide. Since most cypresses take dry conditions in stride, I had no qualms about planting this specimen in sandy soil, in a location shielded from winter winds. I seem to have pleased it, as it is behaving well.)

Somewhat less hardy (Zones 6 to 9) is



LEFT: *Euonymus fortunei* 'Emerald 'N Gold' and *Elaeagnus pungens* 'Maculata' growing side by side. RIGHT: Little-known *Pinus densiflora* 'Oculus-draconis', commonly called dragon's-eye pine, displays wisps of silvery green, variegated needles.

another Sawara cypress midget called *Chamaecyparis pisifera* 'Snow'. As the name suggests, the plant looks like it has been dusted with snow, an effect that is due to the uniform white tip growth contrasting against a gray-green background. 'Snow' needs protection from the elements, however, and is easily damaged by strong winds or prolonged ice cover, both of which tend to brown the topmost growth. If grown under the right conditions, however, this shrub can be an attractive addition to any garden.

Broad-leaved evergreens are among the showiest of variegated plants. Large leaves—as opposed to needles—display variegated patterns quite effectively, and many broad-leaved evergreens also have attractive, glossy surfaces. *Leucothoe fontanesiana* 'Girard's Rainbow' is a fascinating plant with a drooping habit and pink, cream and copper-red marbling on its leaves. Slower in growth than the species and far more susceptible to wind damage, it prefers full sun to maintain its unique color combinations. It is hardy from Zone 6 through 8. Similar but less vivid in color is *L. fontanesiana* 'Trivar', whose foliage

boasts light streaks of pink and cream. It, too, grows slowly and is easily damaged by wind. Because of their three- to four-inch leaves and low habits of growth, both shrubs can be used as bold ground covers.

Both the wax-leaf or Japanese privet (*Ligustrum japonicum*) and the glossy or Chinese privet (*L. lucidum*) are popular broad-leaved evergreens from Zones 7 to 10, especially as screening hedges and potted specimens. Variegated cultivars are also appropriate for similar uses. *L. japonicum* 'Variegatum', the only variegated Japanese privet in cultivation, has leaves with creamy streaks and margins bordered in white. There are at least three cultivars of *L. lucidum* that are of interest: 'Aureo-marginatum', with leaves edged in yellow; 'Excelsum Superbum', whose leaves display prominent, deep yellow and cream mottlings combined with rich yellow margins; and 'Tricolor', whose narrower foliage is pink when it emerges and turns to green variegated with yellow as it matures. As is the case with most privets, these cultivars adjust easily to a wide variety of soil and light conditions.

*Pieris japonica* 'Variegata' is a tender,

slow-growing shrub that requires partial shade and reaches only three feet at maturity. The new growth is pink-toned, and as the leaves mature they develop handsome, creamy-white leaf margins. If kept out of strong wind, this shrub can be grown from Zones 6 through 9. It prefers a moist, humusy location with acid soil and good air circulation. The flowers of *P. japonica* 'Variegata' are not as pungently scented as those of the species, nor are they borne as abundantly; however, the delicate tracery of the margined foliage more than makes up for these slight drawbacks. This cultivar is an excellent plant for a shady nook.

*Pittosporum crassifolium* 'Variegatum', commonly known as variegated karo, is usually planted as a hedge, wind shelter or specimen plant—particularly in a tub as a special accent. A tall plant with enticingly fragrant flowers, *P. crassifolium* 'Variegatum' is hardy from Zones 8 through 10. Its foliage is neatly margined with creamy-white, red-toned bloom. This cultivar is indifferent to soil conditions as long as it has enough sunlight. *P. tobira* 'Variegata', variegated Japanese pittosporum, has pleasantly scented, white-to-yellowish



Hollen Johnson

*Ilex* 'Silver Edge' is one of the many cultivars of variegated holly.

flowers as well as foliage that is clustered at the twig ends. Like *P. crassifolium* 'Variegatum', it prefers full sun; however, it matures at less than half the height—six to 12 feet.

Almost all of the cultivars of *Aucuba japonica* are distinguished by heavy yellow or silver dotting over large, broad leaves. This vigorous shrub, which is suitable for gardens in Zones 8 and 9, readily adapts to adverse conditions and neglect. Not only can it take drought, smog and diminished light in stride, it can also tolerate full shade. The most dependable and popular of the variegated cultivars is *A. japonica* 'Variegata', which was introduced from Japan in 1783. Its deep green, serrated leaves are brightly speckled all over with yellow dots. A compact grower (to about 10 feet), it can be heavily pruned and used as a hedge or topiary accent.

Although rarely sold by American nurseries, the variegated cultivars of *Buxus sempervirens*, common box, are often seen abroad. Suitable for sunny to partially shaded spots in Zones 6 to 9, they can provide subtle excitement when used as hedges, specimen plants or topiary extravaganzas. There is a wide range of cultivars to choose from. For example, 'Albo-mar-

ginata' has white-edged leaves, while 'Argentea' sports foliage that is either variegated with white or completely gray-toned. 'Argenteo-variegata' is a slow-growing cultivar with leaves mottled in white. 'Aureo-variegata' is a large shrub whose foliage is splashed, striped or streaked in creamy-yellow. 'Elegantissima' is considered the most striking silver-leaved box because of its irregular, cream-white leaf margins. 'Marginata' presents a large, erect silhouette and puckered, misshapen foliage that is randomly spotted and margined in yellow. 'Variegata' produces either white- or yellow-variegated leaves.

The brilliant foliage of *Codiaeum variegatum*, garden croton, can only be described as dazzling. Hardy in Zones 9 and 10, this easy-to-grow tropical shrub tolerates both sun and partial shade. More than 100 named cultivars are available from nurseries and catalogues. Marvelously diverse in leaf outline, they come in shades of yellow, green and red, with secondary accents—streaks, blotches, lines and speckles—in orange, pink, ivory, brown and gold. All of these plants benefit from fertilizing three times yearly, and any will grow in seaside locations if protected from salt water spray. In colder climes, crotons

make highly desirable indoor pot plants, since they grow slowly and can be kept small.

*Elaeagnus pungens*, thorny elaeagnus, is deservedly popular for its vigorous, dense habit and captivating flower scent. Hardy from Zones 7 to 9, it can be heavily pruned to serve as a screen, barrier or hedge. It can also be successfully trained as an espalier. *E. pungens* is virtually immune to drought, and prefers full sun and average, well-drained soil. Its several variegated cultivars have the same cultural requirements and offer striking foliage contrasts: 'Aurea', with leaves edged in yellow; 'Fredrici', whose narrower foliage shows pale yellow centers; the popular 'Maculata', which produces leaves with large, bright golden-yellow centers; 'Marginata', whose leaves develop silvery margins; and 'Variegata', which contributes a lush, vigorous habit along with foliage edged with thin, creamy-yellow lines.

The evergreen species of *Euonymus* also have variegated kin. Probably the oldest known cultivar is *E. fortunei* 'Carrierei', a non-climbing form with glossy, two-inch foliage and occasional shoots that have conspicuous, creamy variegations. Today, the Emerald Strain cultivars are common.



Vigorous *Aucuba japonica* 'Sulphurea' thrives even under the worst of conditions.

'Emerald Gaiety' is a green and white cultivar developed decades ago by an Ipswich, Massachusetts nursery. It is hardy from Zones 5 to 9, and will grow in full sun or partial shade. Its foliage has a pinkish cast during winter dormancy in cold areas. Also popular is the sun-loving 'Emerald 'N Gold', a fascinating yellow- to chartreuse-toned cultivar that turns pink, red, gold and deep green during dormancy. Both cultivars can be trained as upright, three- to four-foot shrubs that are useful as colorful specimens or hedges. Ground cover forms are equally as prevalent in the marketplace. I have found that plants with nearly round leaves usually grow to become erect shrubs; those plants with narrow, lanceolate foliage tend to creep.

The more tender *Euonymus japonica*, Japanese spindle tree, is popular in the southern United States (Zones 7 to 10) for its tolerance of heat and varying light—from full sun to full shade. The variegated cultivars are just as accommodating; they are tolerant of drought, cool temperatures, salt spray, and both acid and alkaline soils. Because mildew is a common problem, they should not be planted in spots where there is little air circulation. Once established, these slow-growing shrubs mature at about

10 feet, a useful height for trimmed hedges and tub-grown specimens. If pruned consistently, they can also be shaped into small trees.

There are many variegated cultivars of *E. japonica*: 'Albomarginata', a slow-growing cultivar with narrow, white-banded leaves; 'Argenteo-variegata', which sports foliage margined and streaked in white; 'Aureo-marginata', a slow-growing cultivar whose leaves are leathery and edged in gold; the very popular 'Aureo-variegata', with large blotches of deep yellow on its leaves; 'Mediopicta', which has large, central yellow streaks; 'Microphylla Pulchella', a densely compact cultivar, with one-inch leaves mottled in gold, that is suitable for edging; and 'Viridi-variegata', which produces large, bright green foliage striped in both yellow and pale green. The cut branches of many of these cultivars are also striking as indoor decorations.

*Ilex aquifolium*, English holly, is probably the most variable of all the hollies. It is consistently admired for its glossy foliage, ease of maintenance and tolerance of shearing. Hardy in Zones 7 through 9, this species develops its most compact growth in full sun. It does not, however, tolerate the dry conditions of the lower midwestern

and southwestern United States. The collection of variegated cultivars of *I. aquifolium* is particularly large and includes many variations. 'Argenteo-marginata', for example, has leaves with silvery edges, while 'Argenteo-marginata Pendula' produces foliage with bold, creamy-white margins, and has weeping twigs. 'Aurea Regina' displays deep gold stripes on its leaves. The foliage of 'Ferox Argentea' has silver-white spines and edges. 'Muricata' produces leaves that are heavily streaked with greenish-yellow or silver-gray.

The variegated evergreens from which we can choose are many and varied, as this brief list suggests. Adventurous gardeners could spend a lifetime experimenting with these plants and the ways in which they can be used in the garden. The fascinating patterns of variegated evergreens—especially combined and contrasted with the many shapes, sizes, shades and textures of green-leaved plants—can provide a wealth of diversity in any garden.

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# Calanthe ORCHIDS

## Aristocrats for Bouquets

BY RICHARD M. ADAMS, II AND DONALD CLAYTON

Orchids—members of the most evolutionarily advanced plant family, the Orchidaceae—sometimes seem like snobs. They are seldom seen with other flowers in bouquets or arrangements. You might see a *Cattleya* or *Cymbidium* in a corsage by itself (or with others of its kind), or a moth orchid (*Phalaenopsis*) gracing an Oriental arrangement in which it is the only flower. Most orchid flowers, though, are really too distinctive to mix easily with commoner flowers.

One group of orchids that mingles easily and is even suitable for bouquets is the deciduous species of *Calanthe*, a subtropical or tropical Asian genus of some 120 species and several named hybrid cultivars. *Calanthe* spp. bear long racemes of petite, one- to two-inch flowers, which are white or cream with pink centers or rosy-pink. The attractive stalks of flowers look both festive and formal, and provide just the right touch for social affairs or dainty corsages.

*Calanthe* flowers once attracted the attention of many wealthy and horticulturally sophisticated residents of the Delaware Valley, including Henry Francis duPont, whose former estate is now Winterthur Museum and Gardens near Philadelphia. At one time, Mr. duPont's greenhouses probably contained several hundred *Calanthe* plants, all of which supplied cut flowers for floral displays in the 200-room mansion. After H. F. duPont died in 1969, many of his *Calanthe* plants were transferred to a relative's estate known as Mt. Cuba. Today, about 240 plants of six cultivars remain from the original collection

LEFT: Spectacular *Calanthe* arrangement with 'Revertan', 'Baron Schroeder' and 'William Murray'.

and are thriving in the greenhouses at Mt. Cuba.

The various cultivars—derived from the white-flowered *Calanthe vestita*, the red-flowered *C. rosea* and the hybrid of these two species, *C. × veitchii*—bloom from December through February, in colors ranging from pure white to deep pink. They provide cheery flowers for arrangements for the Mt. Cuba mansion during most of the winter. Sometimes the resident florist mixes them with other flowers; at other times, she arranges several dozen *Calanthe* spikes by themselves in a big silver bowl. The horticulturists at Mt. Cuba consistently produce such superb floral displays of *Calanthe* that they have won several ribbons at the Philadelphia Flower Show.

Although specimens of *Calanthe* are rare in orchid collections today, calanthes were the first orchids to be hybridized successfully. In 1852, John Dominy, manager of the famous Veitch Royal Exotic Nursery in Chelsea, England, crossed *Calanthe triplicata* (formerly *C. furcata*) with *C. masuca*. The creation of this hybrid was significant because it was the first time a horticulturist had ever figured out the unusual sexual structure of the orchid flower and applied this knowledge to hybridization. Although breeders in Dominy's time knew that hybrids could be made by placing pollen from one flower on the stigma of another, they had difficulty recognizing these structures in orchids, since the anthers and pistil are highly reduced and are united in a single organ called the column. With the help of his friend Dr. John Harris, who had studied botany in medical school and knew the anatomy of the orchid column, Dominy located the pollen and stigmatic surface in *Calanthe*. The year after

he crossed the two species, a seedpod ripened. Two years later, the first of the progeny bloomed.

Upon first seeing the hybrid flowers, Dr. John Lindley, the great orchidologist, exclaimed, "You'll drive the botanists mad!" He knew that it would be difficult for an unsuspecting botanist to identify a plant with characteristics intermediate between those of the parent species. Actually, botanists had already begun to realize that hybrids can occur in nature, and that artificial hybridization could help determine how closely related two species or genera might be.

John Dominy went on to produce 25 other orchid hybrids. By the time he retired from the Veitch Nursery 24 years later, he had achieved fame for his work and launched the field of orchid breeding.

### Culture

The deciduous hybrids and cultivars of *Calanthe*, such as the ones grown at Mt. Cuba, are adapted to the monsoon climate of Southeast Asia, which is characterized by summer rains and winter drought. Leaves sprout at the beginning of the rainy season, when water is plentiful. They grow long and luxuriant, producing food that will be stored in the new pseudobulbs and made available for winter's flowers. Then, before the dry season, the leaves begin to turn yellow. Later, they wither and fall off, thereby allowing the plant to conserve water during the winter dry season.

During the active summer growth period, the plants need abundant light, water and fertilizer. Bright but diffuse light (about 3,000 foot-candles' worth; direct summer sun is about 10,000 foot-candles) is ideal. *Calanthe* orchids will generally receive the

# Calanthe Care Calendar

## Plant Growth Stages

## Seasonal Care

Plant Growth Stages	Seasonal Care
	JANUARY
	FEBRUARY
Blooming ends in the latest-flowering cultivars.	MARCH
	APRIL
New growth begins.	MAY
Active growth period.	JUNE
	JULY
Foliage begins to yellow.	AUGUST
Foliage withers and falls off.	SEPTEMBER
Flower spikes appear.	OCTOBER
	NOVEMBER
Flowers begin to open in the earliest-flowering cultivars.	DECEMBER





proper amount of light in an unshaded fiber glass greenhouse or in a glass greenhouse lightly shaded with saran cloth.

The large, thin leaves transpire considerable amounts of water, so soil should be kept continually moist but not soggy. Plants at Mt. Cuba are watered as often as every other day if necessary.

A continuous supply of fertilizer nutrients encourages growth and helps the plants produce spectacular flowers. Add a slow-release fertilizer to the medium when repotting, then supplement this application during the active growth period with a balanced liquid fertilizer, fish emulsion and liquid seaweed.

After the leaves fall off, reduce watering to initiate flower spikes. Once the spikes have formed, resume regular watering, perhaps twice weekly. As the spikes develop, the plant consumes more water; watering every other day may again be necessary.

Depending upon the cultivar, plants bloom between Thanksgiving and late February. The flowers will last up to four weeks on the plant, or up to two weeks if cut for a bouquet. After flowering, the naked, leafless pseudobulbs go dormant for a couple of months. At Mt. Cuba, the pots are placed under the greenhouse benches and turned on their sides to keep the plants dry during this dormant period.

TOP: *Calanthe* × *veitchii*, a hybrid of *C. vestita* and *C. rosea*. ABOVE: Potted *Calanthe* orchids from Mt. Cuba.

The deciduous calanthes must be repotted every year for best flowering. Sometime during the dormant period—in March or April—remove the plant from its pot and separate the pseudobulbs. Old pseudobulbs will sprout new growth from dormant buds, while younger ones will flower the next fall. If you intend to use the orchids as cut flowers, plant one pseudobulb per five- or six-inch pot for maximum spike size. Planting several pseudobulbs to a pot will produce a fuller-looking potted specimen. After repotting, place the pots under greenhouse benches until the dormant period is over.

After dormancy (around the beginning of May), new leaves sprout from the pseudobulbs. Leave the plants under the greenhouse benches for about three weeks, or until the new growth adapts to the bright, diffuse light that is necessary to encourage next year's flowers.

Calanthes are terrestrial orchids that grow in well-drained sites; their growing medium must be both well-drained and moisture retentive. As ground-dwelling orchids, calanthes receive more moisture than do some of their epiphytic relatives, which grow on tree branches and dry out soon after rain. Epiphytic species require loose potting media such as fir bark or osmunda fiber, while most *Calanthe* species are found growing in well-drained leaf mold, in sandy or rocky soil, or on rock outcroppings where drainage is good.

A mixture of one-third soil, one-third peat moss or compost, and one-third perlite will both retain moisture and drain quickly. Add slow-release fertilizer and trace elements according to manufacturers' instructions for convenient feeding. ☼

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# John Bartram & His Garden

BY MARCIA BONTA



Courtesy of the John Bartram Association

ABOVE: A banner hanging above the stable door welcomes visitors to America's first botanic garden. RIGHT: Goldenrod, phlox, marigolds and a host of other plants decorate the lawn on the river side of the historic Bartram house. The unique stone facade was designed and built by John Bartram.

"I do believe I can challenge any garden in America for variety," Quaker botanist John Bartram wrote to his friend and patron, Peter Collinson, in England. This garden, which he started along the Schuylkill River near Philadelphia, was the first botanical garden in America. In it, Bartram grew as many species of native American plants as he could collect. By the mid-eighteenth century, it was justly famous not only for its variety of native species but also for the hybridization experiments he carried out there in his spare time.

John Bartram was primarily a prosperous, self-educated farmer with a wife and nine children to support. Only after the farm work was done did he have time to collect plants and work in his botanical garden. Because he was sensitive about his lack of formal education, he never published scholarly articles about his work with plants. He did, however, keep journals of his botanical collecting trips, and, like most literate people in the eighteenth century, he left a rich legacy of correspondence.

His botanical wanderings took him as far north as Lake Ontario, west to Pittsburgh and the Ohio River, and south into Florida, Georgia and South Carolina in search of plants for his own garden as well as the gardens of his powerful patrons in Europe. In time, his patrons included Sir Hans Sloane, whose collections formed the nucleus of the British Museum; Philip Miller, curator of the Chelsea Physic Garden; Queen Ulrica of Sweden; and Peter Kalm, the Swedish plant explorer whose *Travels into North America* includes a charming account of his visit to Bartram's Garden.

Collecting, preserving and shipping plants abroad was no easy task in Bartram's time. Bartram traveled by horseback and, because of the French and Indian Wars, found the South safer to explore than the West.



He took the advice of “Friend Collinson,” and used the bladders of oxen and cows to store his plants as he went along. Collinson’s explicit instructions were to “cut off the neck [of the bladder] high and when the plant is found take it up with a little earth to the roots. Put this into the bladder to cover the roots then tie up the neck of the bladder close round the stalk of the plant leaving the leaves and flowers without.” In this way, an amazing variety of plants made their way safely back to Philadelphia, where Bartram packed them up in his seed house to send to Europe.

He quickly found he had more patrons than plants, and so he experimented with ways to propagate the plants he collected. Often, he grew the plants in large wooden boxes for several years before sending them abroad. But no matter how many he sent, his patrons’ appetites for new American plants were insatiable. Collinson was particularly fond of *Rhododendron maximum* (“for all plants it is my favorite. . . . One can never have too many”) and mountain laurel (*Kalmia latifolia*), which Collinson called “certainly one of the finest evergreen shrubs.”

Altogether, John Bartram has been credited with introducing over 200 American plants to the gardens of Europe, including cucumber magnolia (*Magnolia acuminata*), white cedar (*Chamaecyparis thyoides*), pawpaw (*Asimina triloba*), witch hazel (*Hamamelis virginiana*) and hackberry (*Celtis occidentalis*). His most famous discovery, though, is *Franklinia alatamaha*, named for his close friend, Ben Franklin. He and his son William (who later became even more famous than his father as an explorer, botanist and artist) discovered the rare plant on a trip to the South in 1765, shortly after John was appointed the King’s Botanist.

With the 50 pounds John had received as his first year’s salary, he and William had traveled to Charleston, South Carolina and set off on horseback through Georgia and East Florida. It was along the Altamaha River in Georgia that father and son first noticed the attractive tree with its pure-white, camellia-like flowers. Apparently, they only noted the location of the trees on that trip—“two or three acres of ground where it grows plentifully.” However, on a later trip, William was able to find the grove again and collect either seeds or cuttings, which were subsequently propagated in Bartram’s Garden. Other botanical explorers also found the spot, until 1803, when the tree vanished from the wild. Only the Bartrams’ propagation efforts had saved *Franklinia* from extinction. Today, this lovely tree graces many gardens in both Europe and North America.

John Bartram was 66 years old when he discovered *Franklinia*, but he continued to collect, experiment and supply his patrons with plants until the outbreak of the Revolutionary War. Divided by loyalties to English friends and American patriots, he spent his last months agonizing over the fate of his garden after the English won the Battle of the Brandywine and began moving toward Philadelphia and his beloved garden. He died before learning its fate, but he need not have worried. Although British soldiers camped on the property, General Howe made certain that no damage was done to it. John Bartram, Jr., who had inherited the house, garden and botanical business from his father, went right on with his father’s work. William, who remained a bachelor, returned from his five-year exploration of the South, and lived at Bartram’s Garden with his brother, John, Jr., and his family. It was at the Garden where William wrote and illustrated his highly acclaimed *Travels Through North and South Carolina, Georgia, East and West Florida etc.*, which made him a celebrity of sorts in England and America.



Michael Selig

ABOVE: A fig tree grows in front of a window on the river side of the house. Above it, the Quaker botanist carved “Tis God alone, Almighty Lord, the Holy One by me Ador’d—John Bartram 1770. RIGHT: John Bartram is perhaps best known for his discovery of *Franklinia alatamaha*.



Dick Keen

But this gentle botanist—who made Bartram's Garden a peaceful refuge for visitors like Thomas Jefferson, Alexander Hamilton and George Washington—was content to spend the rest of his life at home.

Dr. Alexander Garden once described Bartram's Garden as "a perfect portraiture" of John Bartram himself. "Here," he said, "you meet with a row of rare plants almost covered over with weeds, here with a Beautiful Shrub even Luxuriant amongst Briars, and in another corner an Elegant and Lofty tree lost in a common thicket." And so it remained for over 200 years in

what had become southwestern Philadelphia. Bartram's unique seventeenth-century Swedish stone farmhouse, his seed house and the barn his son John, Jr. had built in 1775 also remained intact over the years. When John, Jr. died, the house and grounds were willed to his childless daughter, Ann, and her husband, Edwin Carr. They, in turn, sold the property to Mr. Andrew Eastwick, a successful businessman who had invented the equalizing beam for the locomotive, and spent the 1840's in Russia building the rolling stock for the Russian railroad from Moscow to St.

Petersburg. As a poor boy growing up in Philadelphia, Eastwick had made a pilgrimage to see Bartram's Garden and had thought it an earthly "paradise." Later, after he returned to Philadelphia a wealthy man, he learned that the "paradise" was for sale, and promptly purchased it. His head gardener, Thomas Meehan, took solicitous care of the garden. In 1853, Meehan even published a *Handbook of Ornamental Trees* in which he described the trees in Bartram's Garden.

By the time Eastwick died in 1891, Meehan was an important Philadelphia nurseryman and politician, and a member of the City Council. He was also considered the "Father of Philadelphia City Parks," since he had persuaded the city to preserve green places just when Philadelphia began swallowing up its rural environs. With his help and foresight, the Bartram property became both a historical site and a city park.

Two years later, John Bartram's descendants formed an association to work closely with the city to preserve the site. After the turn of the century, the John Bartram Association incorporated, and the site was placed under the jurisdiction of the Fairmount Park Commission. Since then, the city has owned the property, the park has maintained it, and the association has operated it. This has proved to be a happy arrangement—"an excellent example of public and private organizations working together," according to the present director, D. Roger Mower, Jr.

The historic house was completely renovated in the late 1970's, after having been almost "forgotten," and Bartram's descendants have returned many of the original furnishings. To restore the home to its former austere beauty, the walls and woodwork have been painted to resemble the original colors, which researchers determined by paint analysis. The bare, dark, wide-planked, wooden floors and fine mahogany and walnut furniture present a stark contrast to the white ceilings, walls and linens. Bartram's study—with its potpourri of old botanical books, birds' nests, seed pods and wild bird feathers—is especially attractive, and still commands a view of the garden and the Schuylkill River beyond. The large kitchen with its walk-in fireplace was added to the house by Bartram in 1731; today, it is often the setting for afternoon tea during the colder months of the year. An attractive plant room, added to the house by Ann Bartram Carr in 1820, is now a museum gift shop.

An outstanding architectural feature of the house's exterior is the unique stone facade, which faces the river toward the



Courtesy of the John Bartram Association



Dick Keen

ABOVE: Bartram's Garden has a variety of programs for visiting schoolchildren that teach about botany and colonial life.

BELOW: A cider press, located on the banks of the Schuylkill, is one example of the archaeological treasures at the garden.



The seed house at Bartram's Garden.

east and was designed and built by John Bartram when he extended the house by the depth of one room. Below the second-story window, the Quaker botanist affirmed his faith by carving, *'Tis God alone, Almighty Lord, the Holy One by me Ador'd—John Bartram 1770.*

The Common Flower Garden below the house is filled with a colorful array of herbs and flowers, and looks much like a kitchen garden of colonial times. Two tree-lined paths lead down to the river, where the remains of the cider mill, hand-hewn from rock by John Bartram, are still evident. Despite the presence of oil refineries and factories on the far side of the river, the Schuylkill attracts a wide range of water birds, especially during migration. The Garden's full-time naturalist, Peter Kurtz, also recently discovered a stand of seaside goldenrod (*Solidago sempervirens*) growing along the riverbank. Although it is a common species along the Atlantic seashore, it is listed as a species of special concern in Pennsylvania by the Pennsylvania Rare Plant Committee.

A fine specimen of Bartram oak, *Quercus × heterophylla*, still thrives on the lawn near the entrance to the house. Ironically, the Bartram oak is one tree that John Bar-

tram did not collect. Instead, he found this naturally occurring hybrid of red oak and willow oak growing on his farm.

Many descendants of the trees and shrubs planted by Bartram still grow along the paths. The yellowwood (*Cladrastis lutea*), mentioned in garden accounts of the 1850's, is probably the oldest tree on the grounds. Like most wild trees and shrubs, it does not bloom every year. However, when it does bloom in late spring, its fragrant, white, sweet-pea-like blossoms are a magnificent sight. Fraser magnolia (*Magnolia fraseri*), discovered by William Bartram in 1775 while he was exploring the area around what is now the Great Smoky Mountains National Park, also has lovely flowers, but its large "ears" at the base of each leaf (it is also called ear-leaved umbrella tree) and its bright red fruits are its showiest features.

Bald cypress (*Taxodium distichum*), another native of the South, was collected in Delaware by John Bartram in 1735. A specimen growing in the garden reached a height of 160 feet before dying in 1900. Today, a younger cypress has taken its place in Bartram's Garden. In addition, pawpaw (*Asimina triloba*), northern prickly ash (*Zanthoxylum americanum*), moun-

tain laurel (*Kalmia latifolia*), cucumber magnolia (*Magnolia acuminata*) and hackberry (*Celtis occidentalis*) are prominently labeled in the garden. The focal point for most horticulturally inclined visitors, though, is the rare *Franklinia* tree, which flowers from August until frost. Its seed capsules, striped bark and bright red autumn foliage make it an attractive plant the rest of the year as well.

Bartram's Garden continues to evolve as plans to restore the historic botanic garden proceed. A master plan for the site, based on research about the historical botanical garden and Bartram's correspondence, has been developed. There will also be garden exhibits designed to demonstrate the work the Bartrams conducted. But Bartram's Garden will always be, as George Washington once commented, "stored with many curious plants, shrubs and trees and many of which are exotic"—a wonderful place to learn about the horticultural and botanical history of North America. ☼

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Marcia Bonta, a weekly columnist for the *Altoona Mirror*, has written for the *Conservationist*, *Bird Watcher's Digest* and *Pennsylvania Heritage*.

# Logee's Greenhouses

BY PETER LOEWER

**E**arly in 1980 I wrote an article for *Woman's Day* entitled "And Now for Something Different: Showy Houseplants." The piece was for the September issue, which was scheduled to appear on newsstands in late July and had to be written and edited by early May.

Late that May, the Art Department decided that the 10 plants mentioned in the article should be photographed in full bloom in a real indoor garden. I was asked to drive to New York City with all the necessary plants, on the assumption that I had them all at home. In fact, my collection varied according to available space, and I could supply only a cymbidium orchid (*Cymbidium* sp.), a black bamboo (*Phyllostachys nigra*), a wax plant (*Hoya carnososa*) and a ti tree (*Cordyline australis*). (My orchid cactus had just dropped its last flower, and the passionflower had spider mites.) They asked me where they could get the other six plants. I thought for just a moment, then replied, "Try Logee's Greenhouses in Danielson, Connecticut."

They left Manhattan the next day in a sleek station wagon, drove to Connecticut and arrived back that night with a four-foot-high flowering maple (*Abutilon* sp.), a Kaffir lily (*Clivia miniata*), a formidable orchid cactus (*Epiphyllum* sp.), a huge clump of star jasmine (*Trachelospermum jasminoides*), a lush lipstick plant (*Aeschynanthus pulcher*) and a healthy passionflower—all covered with flowers. The



Peter Loewer

The oldest horticultural business in Connecticut under continuous operation by one family



Peter Loewer





Peter Loewer



Tovah Martin

LEFT ABOVE: *Passiflora vitifolia* growing at Logee's. LEFT BELOW: Mrs. Logee guiding a visitor through her family's greenhouse. ABOVE LEFT: The tremendous trumpets of *Brugmansia floreplena*. ABOVE RIGHT: A giant staghorn fern, *Platycerium bifurcatum*, contributes to the fern house "jungle" at Logee's.

following day, the plants were photographed in the elegant setting of a Manhattan townhouse; the collection of plants from Logee's had literally saved the day. The clivia presented the only problem; it started to drop its flowers shortly after it was unloaded. We carefully found each fallen bloom, and with toothpicks, epoxy and the patience of Job, glued them back into place. That particular plant looked so good it made the cover.

I have often ordered plants from Logee's over the past 10 years. Whenever I get an itch to try something new, I'll pick up their catalogue and choose something like honeybells (*Hermannia verticillata*), which bears masses of honey-sweet flowers; a parachute plant (*Ceropegia sandersonii*), a succulent climber boasting truly strange blooms; or the first specimen of lemon-grass (*Cymbopogon citratus*) that I ever owned.

Last fall my wife and I decided to drive over to Logee's, the oldest horticultural business in Connecticut under continuous operation by one family. We drove up the Connecticut Turnpike, and just before New London, took the left fork (the right leads to the beaches of Rhode Island), arriving in Danielson at about 11:30 a.m.

Passing the local high school, then a small shopping plaza, we turned left on Mechanic Street, turned right on North Street and pulled up on a semi-circular gravel drive at number 55, in front of the main office at Logee's.

The building was small, made of wood, and old. The front was shaded by tall trees. On the left side was a bed of blooming annuals—mallows (*Lavatera trimestris*) and love-in-a-mist (*Nigella damascena* 'Miss

Jekyll') predominated—and toward the rear you could just see the sparkle of the myriad panes of glass that make up the seven working greenhouses.

Inside the building was a large room lit from the ceiling with old-fashioned porcelain sockets, each holding one bare light bulb. On the wooden walls were old maps of Danielson, newspaper clippings, an empty wrought-iron string holder and some prize ribbons (including a pink one from the American Begonia Society and a red one for an entry in "Begonias at the Big Apple" in 1979). Bunches of dried herbs hung from the ceiling. Crates of clay pots sat in one corner. Tables—each piled high with boxes, papers, paper cups and trays of plants ready for shipment—filled most of the floor. There was nothing fancy here; no '80's chrome or plastic marred this work place.

Two women were busy wrapping plants; one came over to introduce herself as Tovah Martin. She directs all the shipping and is one of the guiding lights at Logee's. In addition, she is a garden writer and photographer.

Introductions were made in the midst of a rustle of paper, although Tovah said they weren't too busy that day. During the spring rush of orders, however, Logee's packs and ships from 200 to 300 packages a week, and each order averages about 12 plants.

There were still plants to pack, so Tovah introduced us to Mrs. Joy Logee Martin, a charming lady dressed in a light lavender sweater, and a small straw hat to shade her eyes from the glare. Mrs. Martin directed us to a small door with steps leading down to an aisle running through a jungle of green. As we walked, she gave us a short

history of the business.

"My father, William D. Logee, wanted to be a florist right from the start. He visualized having a half-acre of roses on this spot. He served an apprenticeship at the J. J. Montgomery Rose Conservatory in Boston. In 1892 he started work in the first greenhouse, a wooden structure that was built by my step-grandfather when this was all a homestead. And my brother, Ernest Kimble Logee, worked right alongside of Father."

We passed through another door into a smaller wooden greenhouse. "It froze that winter," Mrs. Martin continued, "but he persevered. These sash bars are the originals, made of cypress. Here is our Ponderosa lemon tree (*Citrus limon* 'Ponderosa') that we've had 80 years." It was 20 years old when it arrived. The tree stretched up to the eaves and was hung with lemons the size of grapefruits.

She walked ahead and opened another door into a larger greenhouse that stretched ahead some 100 feet and was a blaze of color shimmering in the warm air.

"The business really began in 1894, and that one greenhouse led to five more, plus one pithouse and the new solar model that's under construction in the back of our seven acres.

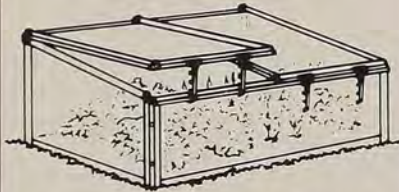
"There's color in the first persimmons, so it must be about September 17," she said as we stopped to look at the flowers that surrounded us.

The giant trumpets of an orange-colored angel's-trumpet (*Brugmansia × insignis*) hung overhead, gently swaying in the warm air. Nearby, a passionflower (*Passiflora vitifolia*) laden with brilliant red flowers saturated the already heavy air with a sweet perfume. Not to be outdone by this display, a large pot of chenille plant (*Acalypha hispida*) waved its long, textured, reddish fingers toward the dampened floor.

At the far end of the greenhouse a pelican flower (*Aristolochia grandiflora*), the Caribbean cousin of our familiar Dutchman's-pipe, twined about an invisible support.

Along the aisle, and occupying every space in between, grew a bewildering variety of tropical plants that created a kaleidoscope of color. A Chinese hibiscus cultivar with jarring pink flowers (*Hibiscus rosa-sinensis* 'Double Pink') fought for breathing space with the yellow flowers of the allamanda vine (*Allamanda cathartica* 'Williamsii'), while a blue trumpet vine (*Thunbergia grandiflora*) glowed in the shade of a giant bush of fairy rose (*Rosa chinensis* 'Minima'). Occasionally, a heavily laden bee would fly by looking for a way out of paradise.

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**LOGEE'S GREENHOUSES**

At this point, Tovah rejoined us and introduced us to Mrs. Martin's son, Byron, who continues in the family tradition as the manager of Logee's. He stopped to examine the yellow flowers of a new epiphytic rhododendron, *Rhododendron lochae*, which belongs to the *Vireya* section of the genus.

"This plant promises to be one of the new stars on the plant horizon, especially as a house plant," he said. "They were very popular in Victorian times, but with the hardships of World War I, they passed from view when the big conservatories and greenhouses were abandoned. But in 1961, the American Rhododendron Society sponsored an expedition into the forests of Malaysia, and they're back in commerce again."

We asked him how many plants currently were in the collection at Logee's.

"Roughly something over 2,000 varieties, including the largest gathering of begonias in the East. Some of the plants have been in cultivation for over 50 years."

"And visitors are always welcome," said Mrs. Martin.

Byron was called away to supervise some construction in the new solar greenhouse, and the rest of us stopped for a much-needed rest and some lunch. We sat down beneath an umbrella at a small table surrounded by a developing perennial garden. As wasps and bees traded insults among the flowers, we continued to talk with Mrs. Martin.

"That oak tree over there," she said, "was damaged in the hurricane of 1938. I can remember when it was much smaller. It was planted sometime in 1850. I hope that it won't shade the new solar house too much, as we've already cut one down to make room. Our big greenhouse came from the wreckage of that storm. The salt spray from the winds ruined the roses at Bud Long's. He was a Rhode Island rose grower. My brothers went and moved his 100-by-40-foot greenhouse over here, piece by piece. That same storm picked one of our greenhouses up and moved it to a nearby field.

"And," she added, "greenhouses must run in the family. My sister, Mary Ellen, married Ervin Ross in 1946 and started Merry Gardens up in Camden, Maine."

We headed for the new solar greenhouse, which was then under construction. Inside, its 80-foot length seemed to stretch toward a distant horizon. Most of its 18-foot width was gleaming plastic and con-

crete, with pipes, recessed fans and wires everywhere. The light from the two-o'clock sun was intense.

"There are 170 tons of rock from the Connecticut River in the bottom," said Byron. "The rock is just the perfect size for retaining the day's heat, and with the help of fans, the heat can be recycled at night."

We walked toward the fern house, where giant staghorn ferns (*Platycerium bifurcatum*) shared space with the lush growth of sword ferns (*Nephrolepis exaltata*) and some seven cultivars of maidenhair fern (*Adiantum* spp.). The collection also contained endless pots of over 50 species and cultivars of ferns.

We walked to the sun-heated pit, where the herbs—some 180 different species and cultivars—nestled in the late-afternoon sun. We smelled the sweet, anise-like odor of angelica (*Angelica archangelica*) and the tiny Corsican mint or creme-de-menthe (*Mentha requienii*), a delicate, moss-like plant with tiny lavender flowers. We also pinched the leaves of *Cinnamomum camphora* in order to sniff the scent of camphor, and marveled at the 10 different cultivars of rosemary (*Rosmarinus* spp.), including 'Arp', which has a faint lemon fragrance, and a creeping form called 'Lockwood de Forest', which has small leaves and bright blue flowers.

Finally, we passed a small group of potted fig trees and the fading blooms of a huge Dutchman's-pipe cactus (*Epiphyllum oxypetalum*), which is also commonly called night-blooming cereus. Although we were back where we had started, we were convinced we had missed over half of the plants on view.

As we said good-bye, Mrs. Martin gave us some seeds of a cultivar of love-in-amist that had pure, soft blue flowers and had been developed in one of Gertrude Jekyll's gardens. It's blooming in our garden this summer. Right next to it, in a large clay pot, is part of that original lemongrass from Logee's. ☺

Logee's Greenhouses is located one mile north of Danielson center; North Street is off Connecticut Route 12. The greenhouses are open daily from 9:00 a.m. to 4:00 p.m. Garden clubs and other large groups are asked to make an appointment. For more information, or to order a copy of their catalogue (cost, \$3.00), write Logee's Greenhouses, 55 North Street, Danielson, CT 06239, (203) 774-8038.

Peter Loewer is a botanical artist and scientific illustrator who writes and illustrates his own books. He is the author of *Peter Loewer's Month-by-Month Garden Almanac*.



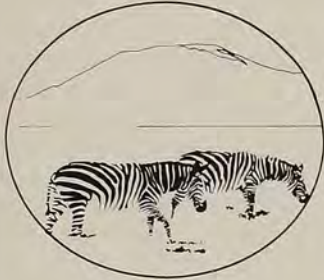
## The American Horticultural Society



### *Caribbean Garden Symposium*

January 17-31, 1986

Our two-week cruise, highlighted by a 180-mile journey up the Orinoco River through the jungles of Venezuela, offers the pleasure of sailing with a compatible group of AHS members aboard the gracious and comfortable *Stella Oceanis*, a ship small enough to gain access to secluded island harbors inaccessible to larger vessels. Everitt Miller, former Director of Longwood Gardens, will lecture during our trip and escort us on visits to exquisite private homes and gardens in such lovely ports of call as Barbados, Tobago, Grenada and Martinique.



### *Kenya and East Africa*

March 5-24, 1986

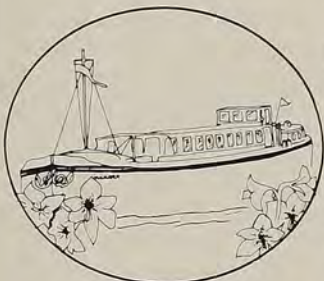
Led by Dr. Gilbert Daniels, past president of the AHS, this trip to one of the world's most evocative countries includes visits to private gardens, arboreta, great tea estates, lakes, mountains, rain forests and moorlands throughout Kenya. The country offers an incredible spectrum of botanical wonders. Areas of great scenic beauty also provide ample opportunity to view the vast array of East Africa's extraordinary wildlife.



### *China, Horticulture and History*

April 9-29, 1986

Share with us an unforgettable three weeks studying the flora, art and history of China. Under the tutelage of Andrew Lauener, an authority on Chinese plants and recently retired from the Royal Botanic Garden of Edinburgh, and of Dr. William Wu, a Chinese scholar of art history and archaeology, born in Shanghai and now living in San Francisco, we will travel from Hong Kong to Kunming, Xian, Shanghai and Beijing. Richard Hutton, president of Conard-Pyle/Star Roses and current board member of the AHS will also accompany our group.



### *Dutch Treat, Holland at Tulip Time*

April 27-May 11, 1986

This year's trip is a variation on last year's highly acclaimed tour following paths to the country's thriving horticultural centers. We spend the first week in Amsterdam visiting the gardens of Mien Ruys, the Palais Het Loo, Haarlem and more. The second week we cruise Holland's canals aboard the luxurious hotel barge 'Juliana.' Our tour leader will be Mary Mattison van Schaik. Mrs. van Schaik, now a Vermonter, lived in Holland for 18 years and has owned a bulb importing business for 30 years. A member of the AHS, she is a popular lecturer and has been a Regional Director of the American Daffodil Society.



### *Scotland, Unspoiled and Unknown*

May 25-June 8, 1986

Scotland is unquestionably romantic in legend and history and the landscape beautiful and unspoiled. We will visit private homes and gardens in the Western Highlands of Argyll, renowned for its rhododendrons and flowering shrubs. Traveling through remote and breathtaking scenery, we will tour the Isle of Gigha, Crarae Woodland Gardens, Inverewe and Inverness. We will be entertained in private homes and castle gardens. In Edinburgh we have the opportunity to explore the city at our own pace and to be entertained by some of Scotland's most enthusiastic and privileged horticulturists. We are again fortunate to have Everitt Miller, former director of Longwood Gardens, as our leader.

*These trips are sponsored by the American Horticultural Society.*

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SEASONABLE REMINDERS: PLANT GALLS

Continued from page 11  
method of control.

A few galls are blessings. The nodule-forming *Rhizobium* bacteria, for example, are responsible for the ability of legumes to fix atmospheric nitrogen in the soil. Gardeners frequently "sow" these bacteria with legumes to increase nodulation.

Gall-forming mites, insects and fungi are also being used in biological control efforts against a variety of weeds. Gall mites attack both the leaves and flowers of poison ivy and poison oak. Weeds such as false dandelion and knapweed are also attacked by various gall-formers. Perhaps one day we will depend as heavily on certain gall-formers for effective weed control as we do on synthetic chemicals today.

Surprisingly, the bacterium that causes crown gall, which is the bane of orchardists, is the focus of the hopes of plant genetic engineers for the future of crop improvement. In this case, the gall-forming bacterium, *Agrobacterium tumefaciens*, remains outside the plant cell and injects part of its genetic material (a segment called a plasmid) into the plant cell. The plasmid contains all of the instructions required for crown gall development. In fact, once the plasmid has moved from the bacterium into a plant cell and is operating, the bacterium does not need to be present for continued gall development. This bacterium's "remote control" method of gall formation is the cause of considerable excitement and intensive study; potentially, a human-designed plasmid could carry our tailor-made messages into plant cells and thus allow us—rather than the bacterium or the plant—to direct or genetically engineer plant development. Recent progress confirms these hopes. In fact, crown gall plasmids have already been engineered so that they no longer cause galls. These re-designed plasmids function normally in all other respects, and should be useful in carrying directions to the plants without causing disease. The future of horticultural crop improvement may depend on our ability to mimic and usurp age-old methods used by gall-forming bacteria.

In the Lawn and Garden

Home gardeners encounter several insect and mite galls. Native oaks, for example, are often veritable treasure-troves of galls caused by cynipid wasps. These insects have an unexplained affinity for the oaks, and there are many closely related species of cynipid wasps found on oak trees.

Even the short-lived catkins can have galls.

The life cycle of these wasps is often complex, and involves an alternation between generations of sexual and asexual individuals. Galls of the two generations may differ in appearance and may be found on different parts of the plant. Thus, a single species of wasp can contain members that cause two distinctly different types of galls, a fact that once caused confusion in attempts to sort out the many types of galls on oaks.

Other ornamentals attacked by gall-forming insects and mites include dogwoods, spruce, boxwoods, witch hazel, elms, black gums, wild and cultivated roses, bearberry, holly, filbert, linden, sagebrush and snowberry, as well as kalanchoe, willows, serviceberry, poplars, chrysanthemums and firs. Mite-caused witches-brooms, which are dense clumps of many short twigs on a larger branch, are common on ash. Like many twig galls, these are easily seen once the leaves have fallen.

To rid your yard of galls on shrubs or trees, prune out and dispose of as many of the galls as possible as soon as they are visible, that is, while the gall-former is still in the gall. If carefully timed, contact pesticides can be used against the life stages of the gall-former that take place outside of the gall. Once the gall is formed, however, only systemic pesticides can reach the gall-former. Keep in mind that many galls on trees cause little apparent reduction in plant vigor. Depending on your perspective, some may actually increase the aesthetic quality of the plant. Goldenrod stems that have galls, for instance, have been used effectively in flower arrangements.

Controlling the more serious soil-dwelling gall-formers, such as some nematodes, fungi and bacteria, is often difficult. Resistant cultivars of the host plant, if available, are the best protection. Soil sterilization before planting, either with heat or with chemicals, will also help. Many gardeners practice companion planting; that is, they use one crop such as marigolds to minimize infestations by gall-formers and other pests on the roots of neighboring plants such as tomatoes.

Detrimental, beneficial, ugly or ornamental, galls are found on everything from tomatoes to poison ivy. They are certainly among nature's most curious structures. ☼

—Hiram Larew

Hiram Larew is a research entomologist at the Florist and Nursery Crops Laboratory in Beltsville, Maryland.

# AHS 1986 Study/ Travel Program

The American Horticultural Society is sponsoring an exciting program of horticultural explorations for the 1986 season. Plan to join fellow AHS members on one or more of these interesting garden-related tours. Use the coupon below to request more information.

**Caribbean Garden Symposium** (January 17-31) Sail from Barbados through the Grenadines and down Venezuela's Orinoco River. Tour gardens and natural areas on Grenada, Martinique and Tobago. Leader: Everitt Miller.

**Gardens of Costa Rica** (February 16-March 1) Tour private and public gardens, commercial nurseries and natural areas. See tropical plants in their native habitats. Leader: Mildred Mathias.

**Kenya & East Africa** (March 5-24) Visit private gardens, arboreta, great tea estates and natural areas. Learn about the botanical wonders and view the vast array of wild-life. Leader: Gilbert Daniels.

**China Exploration** (April 9-29) Learn about the plants, gardens, art and history of China on a visit to the country's coastal, mountain, sub-tropical and temperate areas. Leaders: William Wu and Andrew Lauener.

**Aegean & Adriatic Cruise** (April 19-May 5) Join our spring wildflower, garden and flower-arranging symposium. Cruise to Greece, Yugoslavia and Italy. Leaders: Dorothy Temple and Martin J. S. Sands.

**Holland at Tulip Time** (April 27-May 11) Admire spectacular Dutch flowers in Amsterdam and Aalsmeer on tours to bulb fields, private gardens and nurseries. Spend one week on a luxury canal barge cruise. Leader: Mary Mattison van Schaik.

**Spring England & Chelsea** (May 8-23) Visit public and private British gardens at the peak of spring bloom. Tours of Ny-mans, Wakehurst Place and the Chelsea Flower Show are planned. Leaders: Sue McDonald and Helen Clapp.

**Scotland** (May 25-June 8) Tour Scotland's finest gardens, nurseries, historic homes and castles. Leader: Everitt Miller.

**Island World of Britain & Ireland** (June 5-20) Sail to gardens, manor houses and castles in England, Wales, Ireland, Scotland, and the Isles of Scilly and the Hebrides. Leader: Pamela Harper.

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**Pacific Northwest** (August 19-24) Join our post-annual-meeting tour to botanical gardens, arboreta, nurseries, parks and private gardens, from San Francisco to Seattle and British Columbia.

**Fall England** (September 10-25) Travel through the East Anglia counties of Essex, Suffolk, Norfolk and Cambridgeshire. Visit private gardens and nurseries, as well as such public gardens as Harlow Car and Sandringham.

**Nantucket & Martha's Vineyard** (September 14-20) Learn about the native plants of these islands by visiting natural areas and private gardens. Leader: Polly Pierce, President, New England Wild Flower Society.

**Wildflowers of Western Australia** (September 24-October 12) Join AHS and Virginia Wildflower Preservation Society members on a tour of natural areas and gardens featuring wild plants of Australia.

**Autumn Tour of Japan** (October 19-November 6) Explore unique private gardens, as well as state and temple gardens not open to the general public. Autumn foliage and chrysanthemum festivals are special features.

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YES! Please send me more information on the tours I have checked below.

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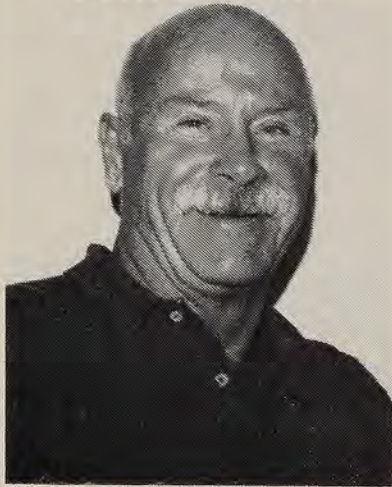
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# AHS

## Travel Program

The American Horticultural Society is sponsoring an exciting program of horticultural explorations for the 1986 season. Plan to join fellow AHS members on one or more of these exciting garden-related tours.

**Gardens of Costa Rica** (February 16-March 1) Visit private and public gardens, and tour commercial nurseries and natural areas in a horticultural paradise. See mature collections of orchids, aroids and bromeliads at Lankester Garden, and stay at an Organization for Tropical Studies field station near the Panamanian border. Tour Leader: Mildred E. Mathias, Emeritus Professor of Botany, UCLA.

**China Exploration:** (April 9-29) Learn about the plants, gardens, art, architecture and history of China on an exploration through the coastal, mountain, subtropical and temperate areas of the country. AHS board member Richard Hutton will lead a good-will delegation to strengthen horticultural ties between China and America. William Wu, Co-Chairman of the Shanghai-San Francisco Friendship City Cultural Committee, and Andrew Lauener, an authority on Chinese plants, recently retired from the Royal Botanic Garden, Edinburgh, will lead the tour.

**Kenya and East Africa** (March 5-24) Visit private gardens, arboreta and great tea estates in this exotic part of the world. Learn about the botanical wonders of the lake, mountain, rain forest and moorland habitats throughout Kenya. There will also be many opportunities to view the vast array of African wildlife. Tour Leader: Dr. Gilbert Daniels, Past President of AHS.

YES! Please send me more information on the tours I have checked below.

- Gardens of Costa Rica  
 China Exploration  
 Kenya and East Africa

Name \_\_\_\_\_

Address \_\_\_\_\_

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# Pronunciation Guide

*Abutilon* ah-BEW-ti-lon  
*Acalypha hispida*  
 ack-ah-LIFF-ah HISS-pid-ah  
*Aeschynanthus pulcher*  
 ess-kin-AN-thuss PULL-ker  
*Allamanda cathartica*  
 all-ah-MAND-ah cath-ARE-ti-kah  
*Angelica archangelica*  
 an-JELL-i-kah ark-an-JELL-i-kah  
*Aralia spinosa* ah-RAIL-yah spin-OH-sah  
*Aristolochia grandiflora*  
 air-riss-toe-LOW-kee-ah grand-i-FLOR-ah  
*Asimina triloba* ah-SIM-i-nah try-LOW-bah  
*Astilbe* ah-STILL-bee  
*Aucuba japonica* aw-KOO-bah  
 jah-PON-i-kah  
*Brugmansia* × *insignis*  
 brewg-MAN-see-ah in-SIG-niss  
*Buxus sempervirens*  
 BUCK-sus sem-per-VIE-renz  
*Calanthe furcata*  
 kal-AN-thee fur-KAH-tah  
*C. masuca* c. mah-SUE-kah  
*C. rosea* c. ROSE-ee-ah  
*C. triplicata* c. trip-li-KAY-tah  
*C. veitchii* c. VEECH-ee-eye  
*C. vestita* c. vess-TIE-tah  
*Camassia* kah-MASS-ee-ah  
*Camellia* kah-MEAL-yah  
*Catalpa* kah-TAL-pah  
*Cattleya* cat-LAY-ah  
*Celtis occidentalis*  
 SELL-tiss ock-si-den-TAY-liss  
*Ceropegia sandersonii*  
 sair-oh-PEDGE-ee-ah san-der-SON-ee-eye  
*Chamaecyparis lawsoniana*  
 kam-ee-SIP-er-us law-son-ee-AY-nah  
*C. pisifera* c. pi-SIFF-er-ah  
*C. thyoides* c. thigh-OY-dees  
*Chionodoxa* ky-on-oh-DOCK-sah  
*Cinnamomum camphora*  
 sin-ah-MOE-mum camp-FOR-ah  
*Citrus limon* SIT-rus LIE-mon  
*Cladrastis lutea*  
 klah-DRASS-tiss LOO-tee-ah  
*Clivia miniata* CLIV-ee-ah min-ee-AY-tah  
*Codiaeum variegatum*  
 co-DEE-ee-um var-ee-eh-GAY-tum  
*Cordyline australis*  
 CORE-di-line os-TRAIL-iss  
*Cornus mas* CORE-nus MAS  
*Cymbidium* sim-BID-ee-um  
*Cymbopogon citratus*  
 sim-boe-POE-gon sit-RAH-tuss  
*Elaeagnus pungens*  
 el-ee-AG-nus PUN-jinz  
*Epiphyllum oxypetalum*  
 ep-i-FILL-um ocks-ee-PET-al-um  
*Eucalyptus* you-kah-LIP-tus  
*Euonymus fortunei*  
 yew-ON-i-mus FOR-tune-eye

*E. japonica* e. jah-PON-i-kah  
*Ficus elastica* FIE-kus ee-LAS-ti-kah  
*Franklinia alatamaha*  
 frank-LIN-ee-ah ah-lah-tah-MAH-hah  
*Geranium* jer-AY-nee-um  
*Gymnocladus dioica*  
 jim-no-CLAD-us dy-OY-kah  
*Hamamelis virginiana*  
 ham-ah-MAY-liss ver-jin-ee-AY-nah  
*Hermannia verticillata*  
 her-MAN-ee-ah ver-tiss-ill-AY-tah  
*Hibiscus rosa-sinensis*  
 high-BISS-kus ROW-sah sin-EN-siss  
*Hoya carnososa* HOY-ah car-NO-sah  
*Ilex aquifolium* EYE-lex ak-qui-FOE-lee-um  
*Kalmia latifolia*  
 KAL-mee-ah lat-i-FOE-lee-ah  
*Lavatera trimestris*  
 lav-ah-TAIR-ah try-MESS-triss  
*Leucothoe fontanesiana*  
 lew-KOE-thoe-ee fon-tayne-see-AY-nah  
*Ligustrum japonicum*  
 li-GUS-trum ja-PON-i-kum  
*L. lucidum* l. LOO-si-dum  
*Magnolia acuminata*  
 mag-NOL-yah ah-kew-min-AY-tah  
*M. fraseri* m. FRAY-ser-eye  
*M. grandiflora* m. grand-i-FLOR-ah  
*Mentha requienii*  
 MEN-thah re-quee-EN-ee-eye  
*Nephrolepis exaltata*  
 neff-row-LEP-iss ex-all-TAH-tah  
*Nigella damascena*  
 ny-JELL-ah dam-ah-SEEN-ah  
*Ornithogalum* or-ni-THOG-ah-lum  
*Passiflora vitifolia*  
 pass-i-FLOR-ah vit-i-FOE-lee-ah  
*Pelargonium alternans*  
 pell-ar-GO-nee-um all-TER-nans  
*P. carnosum* p. car-NO-sum  
*P. crithmifolium*  
 p. crith-mi-FOE-lee-um  
*P. dasycaule* p. day-see-CALL-ee  
*P. dasyphyllum* p. day-see-FILL-um  
*P. × domesticum* p. doe-MESS-ti-kum  
*P. echinatum* p. eck-in-AY-tum  
*P. ferulaceum* p. fer-you-LAY-see-um  
*P. × hortorum* p. hor-TOR-um  
*P. spinosum* p. spin-OH-sum  
*P. tetragonum* p. tet-rah-GO-num  
*Phalaenopsis* fail-ee-NOP-siss  
*Phyllostachys nigra*  
 fill-oh-STACK-iss NY-grah  
*Pieris japonica*  
 pie-AIR-iss jah-PON-i-kah  
*Pinus densiflora* PIE-nus den-si-FLOR-ah  
*Pittosporum crassifolium*  
 pit-toe-SPORE-um crass-i-FOE-lee-um  
*P. tobira* p. tow-BY-rah  
*Platyterium bifurcatum*  
 plat-ee-SEAR-ee-um by-fur-KAY-tum

*Populus* POP-yew-lus  
*Puschkinia* push-KIN-ee-ah  
*Quercus heterophylla*  
 QUER-kus het-er-oh-FILL-ah  
*Q. robur* q. ROW-bur  
*Rhododendron lochae*  
 row-doe-DEN-dron LOCK-ee  
*R. maximum* r. MAX-i-mum  
*Rhus typhina* ROOS ty-FINE-nah  
*Rosa chinensis* ROW-sah chi-NEN-siss  
*Rosmarinus* rows-mare-EYE-nus  
*Salix* SAY-licks  
*Sarcocaulon burmannii*  
 sar-koc-CALL-on burr-MAN-ee-eye  
*S. inerme* s. in-ER-me  
*S. multifidum* s. mull-TIFF-id-um  
*S. patersonii* s. pat-er-SOE-nee-eye  
*S. peniculinum* s. pen-ick-you-LINE-num  
*S. rigidum* s. RIDGE-i-dum  
*S. spinosum* s. spin-OH-sum  
*S. vanderietiae* s. van-der-EE-tye-ee  
*Scilla* SILL-ah  
*Solidago sempervirens*  
 sol-i-DAY-go sem-per-VIE-renz  
*Tamarix* TAM-ah-ricks  
*Taxodium distichum*  
 tacks-OH-dee-um diss-TY-kum  
*Taxus baccata* TACKS-us back-AY-tah  
*Thunbergia grandiflora*  
 thun-BERGE-ee-ah grand-i-FLOR-ah  
*Trachelospermum jasminoides*  
 tray-kell-oh-SPER-mum jazz-min-OY-deez  
*Zanthoxylum americanum*  
 zan-tho-ZIE-lum ah-mer-i-KAY-num

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# Sources

## SUCCULENT GERANIUMS

*Pelargonium* spp. and *Sarcocaulon* spp. are available from the following mail-order sources.

The Abbey Garden, Box AHS, 4620 Carpinteria Avenue, Carpinteria, CA 93013, Catalogue \$2.00.

Altman Specialty Plants, Box AH, 553 Buena Creek Rd., San Marcos, CA 92069, Catalogue \$1.00.

Grigsby Cactus Gardens, Box AH, 2354 Bella Vista Drive, Vista, CA 92082, Catalogue \$2.00.

Highland Succulents, Box AH, Eureka Star Route, Gallipolis, OH 45631, Catalogue \$2.00.

Singers' Growing Things, Box AH, 17806 Plummer Street, Northridge, CA 91324, Catalogue \$1.50.

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The AHS *Garden Diary* usually retails for \$14.95 (\$11.95 for AHS members). This month the Society is offering it at a special discount price: \$10.95 retail (\$9.95 for AHS members), including postage and handling. To order a copy, write Jeanne Eggeman, American Horticultural Society, PO Box 0105, Mount Vernon, VA 22121.

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An annual index to articles appearing in *American Horticulturist* magazine is printed in each December issue. A separate cumulative index has also been published for the years 1922-1971 and is available in paperback for \$10. Address inquiries to Jeanne Eggeman in care of the Society. Although no index for the years 1972-85 has yet been published, these back issues have been catalogued by the editorial staff. Back issues (if available) are \$2.50 each and may be obtained by writing to Norma Westwood in care of the Society.

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# Texture

Page through any reference book on landscape design, and you will inevitably come across the term texture. Why, you ask, should the texture of a plant matter in a garden? It matters a great deal—perhaps more than a plant's other features, such as flowers or fruit, which we gardeners are often led to believe are the major reason to plant a tree or perennial.

Unlike flowers and fruit, which remain on a plant for a relatively short portion of the year, texture is always an integral part of the plant. Simply put, texture is the *feeling* you get from a plant—not through touch but through sight. Texture makes us react to a plant, just as color and form do.

Some plants are considered “fine” in texture. For example, tamarisk (*Tamarix* sp.) features lacy foliage made up of very small, individual leaves. Honey locust and maidenhair fern also have fine-textured foliage, with small leaflets arranged in compound leaves. Japanese maple displays finely cut, or dissected, leaves that create a delicate effect. In each case, the leaves give an impression of airiness or delicacy.

On the other hand, *Catalpa*, Southern magnolia (*Magnolia grandiflora*), hostas or rubber plants (*Ficus elastica*) all bear relatively large leaves with plain, simple margins. These plants look heavier, harder and more somber than their finer counterparts, and are considered “coarse” in texture. Of course, a plant's texture is rarely either simply fine or coarse; most plants fall somewhere in the middle.

Other factors can also contribute to a plant's texture. For example, long, tapering leaves such as those of willows or many mature *Eucalyptus* species look much finer than the broad, bolder leaves of a sycamore or tulip tree. Long petioles not only project leaf blades away from the twigs into space but also allow leaves to flutter in breezes, as is the case with aspens and cottonwoods. In general, plants whose leaves move easily appear lighter and finer than those with rigid, firmly fixed leaves.

Leaves with contrasting colors can also make a plant appear finer than can uniformly colored leaves. If you compare any plain green leaf with its white-variegated



The coarse foliage of *Rodgersia* provides a striking contrast against the airy leaves of Japanese maple.

counterpart, you will notice how the variegated leaf looks lighter and finer.

Even the time of day can influence texture. For example, a clump of pampas grass looks rather bold and coarse in the harsh midday sun. However, as the setting sun shines through it, the leaves are individually silhouetted, and the plummy flower heads almost glow with silvery light.

Few plants retain the same texture throughout their lives, or even throughout a single year. A sapling often lacks the grace of an older tree, and the texture of a deciduous plant changes completely when it loses its leaves in autumn. The texture of Kentucky coffee tree (*Gymnocladus dioica*), devil's-walking stick (*Aralia spinosa*) and cutleaf staghorn sumac (*Rhus typhina* 'Laciniata'), for example, appears relatively fine in summer; in winter, the large, thick and sparse twigs make the plants almost too coarse for many landscapes. The delicate tracery of the small branches and twigs of an elm, on the other hand, lends a delicate touch to the winter landscape.

When designing your garden, try to avoid using too much of any one texture. Most people prefer a mix of colors, and the same should be true for different textures. A large number of fine-leaved plants such as larkspur, baby's-breath and *Astilbe* can be

as monotonous as a collection of all-yellow daisies or irises. It is also important to avoid sharp contrasts between radically different textures. Let your eye move gradually from one texture to another—coarsest to finest and back again—through a planting. If well planned, however, a sharp texture contrast can create an eye-catching focal point. For example, one large-leaved blue or green hosta in a bed of sweet woodruff or maidenhair ferns can be as strong visually as a sculpture or a birdbath.

Apartment dwellers with no outdoor space can apply these same principles to a collection of house plants in a window. Moreover, the texture of house plants can make an apartment look bigger or smaller. Finer-textured plants such as asparagus ferns, ming aralias or cycads make corners seem larger, while rubber plants, single-stemmed cacti and other coarse plants make corners and small areas look even smaller.

Heavy and light, complex and simple, thin and thick, kinetic and static, fine and coarse—all these terms may be used to describe texture. How you use texture in your garden will ultimately affect the feelings and moods of your green spaces. ☼

—Raymond J. Rogers

Ray Rogers is Education Supervisor/  
Horticulturist at the American Horticultural Society.

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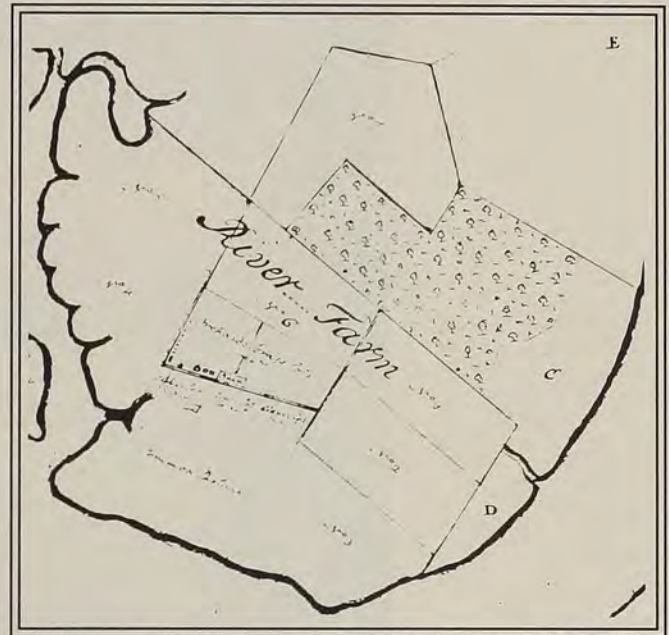
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Bleeding-heart (*Dicentra spectabilis*)  
Crown-imperial (*Fritillaria imperialis*)  
Christmas Fern (*Polystichum acrostichoides*)



River Farm map drawn by George Washington in 1793.

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Tamarisk (*Tamarix parviflora*)  
Chaste Tree (*Vitex agnus-castus*)  
Tree Box (*Buxus sempervirens* 'Arborescens')  
Bridal-Wreath Spirea (*Spiraea prunifolia*)  
Tree Peony (*Paeonia suffruticosa* cvs.)  
Black Walnut (*Juglans nigra*)  
Tulip Tree (*Liriodendron tulipifera*)  
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