

AMERICAN HORTICULTURIST

AUGUST 1982



Cincinnati



A very exciting and interesting program is planned for our AHS 37th Annual Meeting in Cincinnati, from September 29th to October 3rd, 1982. There will be tours of public and private gardens, interesting lectures, private dinner parties, a rare plant auction, visits to Cincinnati historic sites, a riverboat cruise and as a finale, a special President's and Awards Banquet. You may then elect to continue your horticultural holiday by joining the Post Meeting Tour of Kentucky, Tennessee and North Carolina from October 3-13. To register, see the July 1982 newsletter or write Dorothy Sowerby at the Society. Please join us!



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BELOW: Biltmore House, Asheville, North Carolina

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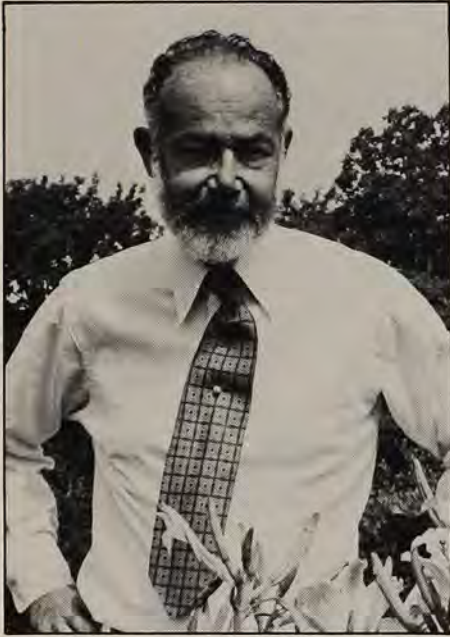


Miscanthus sinensis 'Zebrinus', *Miscanthus sinensis* 'Gracillimus' and *Cortaderia selloana* are three types of ornamental grasses Peter Loewer discusses in his article on page 16. Illustrations by Peter Loewer.

President's Page	2
Public Gardens: Adopt-A-Plot Gardens by Mary Taylor	4
Strange Relatives: The Loosestrife Family by Jane Steffey	8
Book Reviews by Gilbert S. Daniels	11
Goldenrod by Margaret Hensel	14
Ornamental Grasses by Peter Loewer	16
Achillea by Joy Foraker	20
Hidcote Manor by Ursula Buchan	23
Pressed Flower Designs by Janet C. Thierfelder	29
Seasonable Reminders: Sidewalk Weeds by Claire Sawyers and Dr. Jules Janick	32
Pronunciation Guide	38
Seasonable Reminders: Assessing Lawn Problems by Dr. Robert Schery	40
Source List	43
Gardener's Marketplace	44

ON THE COVER: *Achillea millefolium* self-sown in the wild. Photograph by Pamela Harper. For more information on *Achillea*, turn to page 20.

PRESIDENT'S PAGE



After four years as the President of our Society, my term has now come to an end, and this will be my last editorial. During my tenure, I've tried to bring interesting or controversial topics to your attention. From the letters I have received over the years, I can safely say that the membership has both agreed and disagreed with the viewpoints presented here. These editorials have always been the opinion of an individual and not the consensus of the membership. On the whole, however, whether in agreement or disagreement, members who have responded to my editorials have been constructive in their comments. I've enjoyed communicating with you, and I hope you have enjoyed reading this column.

Now I'd like to take the opportunity to wrap up a few miscellaneous subjects and respond to a few recent letters. On the subject of such things as the Endangered Species Act and the preservation of genetic material represented in plant cultivars, I have definite personal opinions. I've always viewed myself as a moderate in such matters, and I had hoped that my criticisms of these two subjects represented a rational compromise between the extremes. There are both good and bad things that can be said about both efforts. On the whole, I believe the good far outweighs the bad,

but that is no reason for not commenting upon matters of practicality or portions of legislation that are not working as they are intended to do.

As a professional botanist, I am very aware of the differences between plants and animals. I have also been aware since my university days that a surprising number of people are not aware of these differences. In particular, plants have developed the ability to reproduce in many ways, both sexually and asexually. Animals are generally limited to only one way in nature. Plants can often reproduce readily from a small piece broken off from the main growth. This neither harms nor reduces the vigor of the main plant. Plants produce large numbers of seed to ensure replacement in nature by an inefficient system that is fraught with dangers. A plant that lives for many years may produce literally billions of seeds in an effort to establish one seedling to replace the parent plant. In the garden or the greenhouse such seed may have a germination rate of 90 or 99 percent, and every seedling produced will live to maturity. Thus under cultivation it is possible to raise large numbers of individual plants in a short time without upsetting the natural balance of even the most endangered plant, if only a cutting or a small portion of one year's seed production is used.

Obviously this method is different from animal reproduction, but current legislation to protect plants and animals seems not to recognize the difference. Saving plants for the future, whether they be wild species or cultivars developed by man, takes organization, effort and facilities. All of these have practical limits, and I have always felt that you can do a better job of anything if you are aware of your limits. But enough of all this! I've tried to tell you about programs that are working, those that are not working and some of the practical limits as I see them.

Now for another subject entirely. As many of you know, the Society has been involved in a joint publishing effort with the Franklin Library and Ortho Books to prepare a gardening encyclopedia based on the original material published by Ortho. A lot of effort has gone into updating this information and presenting it in an im-

proved format. We have gotten some criticism from advanced gardeners because the editorial content of these books is aimed at the beginner or less expert gardener. Just remember that one of the prime aims of the American Horticultural Society is horticultural education—and there are a lot more beginners who need our help than there are experts. Many of the volumes contain climatic maps. Some readers have questioned why we haven't stuck to the U.S.D.A. plant hardiness map. The answer is quite simple. It is a hardiness map. It doesn't show length of growing season, last frosts, summer heat, rainfall and first frosts. All of these and other factors are of importance in growing different kinds of plants. We have tried to use a map that will explain the growing problems for the particular type of plant covered in each of the encyclopedia volumes. And we have also tried to fine tune the maps more than can be done in the large-scale effort that the plant hardiness map represents. Santa Monica, California is different from Azusa, and New York City is different from Philadelphia. Hardiness isn't the whole story.

Finally, I'd like to remind all of you that while we are a national organization with a diverse membership in all 50 states and many foreign countries, we are also fortunate to have a headquarters facility in Mt Vernon, Virginia, only a few minutes from Washington, D.C. Washington is certainly not representative of all of the United States from a gardener's point of view, but just as our federal government tries to represent all of us from this same headquarters region, so we in the American Horticultural Society headquarters try to represent gardeners and members throughout the nation. If you are in the Washington area, we would welcome your visit to River Farm. If you can't come personally, we will try to stay in touch by telephone or letter. Remember, it is your Society. I hope you will continue to let us know what you need and what your opinions are in matters of gardening and horticulture.

Gilbert S. Daniels

—Gilbert S. Daniels
President

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ADOPT-A-PLOT GARDENS



What happens to park gardens a city can no longer maintain? Those who attend the American Horticultural Society Annual Meeting in Cincinnati this fall will see an imaginative and beautiful answer—the Adopt-A-Plot Gardens in Ault Park, a 224-acre park in eastern Cincinnati.

The unique project, now in its third year, began in early 1980 when the Cincinnati Park Board Volunteers, at the request of the Cincinnati Park Board, agreed to coordinate the creation of an educational garden sampler to replace a formal rose garden the Park Board could no longer afford to maintain.

Mrs. Kent (Marlene) Holwadel, director of Volunteers, asked horticultural groups, garden clubs, high school horticultural classes and individuals interested in gardening to sponsor, design and/or plant flower beds ranging in size from six by 12 feet to six by 40 feet in rectangles as well as unusual shapes. All 35 beds in the 1.2 acre site were adopted by March 1980.

Attesting to the project's success is the fact that almost all original participants were enthusiastic repeaters in 1981 and 1982, joined by new groups and individuals who were anxious to be involved in what has become a magnificent and unusual show place for gardening ideas.

The Cincinnati Park Board serves as advisors for the project and prepares the beds for planting. The sponsor of each garden



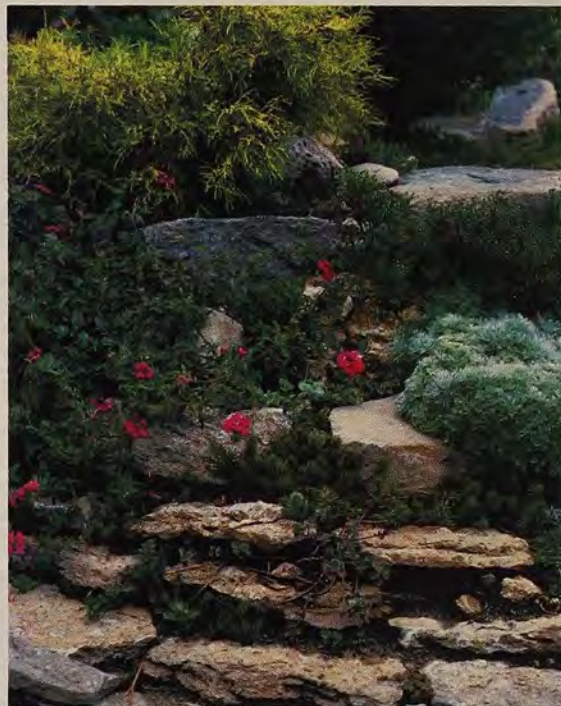
designs, plants and pays for the original plantings while the Park Board Volunteer organization finances garden maintenance with profits from their gift shop at the Irwin M. Krohn Conservatory and from donations. Commercial landscape gardeners donate time, talent and materials for low maintenance gardens. Volunteer weeders work in the gardens on scheduled mornings, and participants stop by frequently to provide any special care their plantings require.

The beds, which have now been increased to 37, include a demonstration planting of groundcovers, a Japanese garden, French intensive vegetable garden, collection of ferns, hardy succulents, exotic plants, roses, ornamental foliage,

kitchen herb garden, perennials and annuals.

Among the beds in the 1980 garden was an extraordinary dahlia collection, specifically proportioned for the small garden and including some of the rare, tiny Holland Top Mix strain grown from tubers. A few in the plot were the typical taller dahlias, but most were medium to small flowers, some no more than one inch in diameter. Although not among the 1981 beds, the dahlia plot is included in the 1982 garden and should be at its best for American Horticultural Society visitors. (An Official Trial Grounds of the American Dahlia Society is located in Ault Park near the Adopt-A-Plot Gardens).

A kidney-shaped rock garden occupies



ABOVE LEFT: Volunteers in the Adopt-A-Plot program gather to receive instructions from Marlene Holwadel, director of the project, who is wearing the green T-shirt. ABOVE: Rock Garden. LEFT: Foliage Garden.

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PUBLIC GARDENS CONT'D

an area about 25 feet long and 12 feet wide. Planned so that there is color all year, foliage, flower shapes, textures and colors are intermixed for added interest. The garden, sponsored by the Cincinnati Hills Garden Club, was designed and planted by Mrs. Samson Crew.

Described by Lee Cain, garden writer

The sponsors of each garden design, plant and pay for the original plantings; the Park Board Volunteer organization finances garden maintenance.

for the *Cincinnati Post* as a "perfect example of a rock garden," the six-foot-high rockscape tapers to a sloping, irregularly-shaped elevation. Huge boulders were brought from gravel pits and hillsides. Rocks were carefully selected to be both attractive and similar. The first layer of rocks was placed, and top soil was sifted between the crevices to accommodate various plants. The plants—almost 200 kinds—are miniature versions of larger varieties and were chosen to illustrate the vast number of cultivars available for use in a rock garden.

Included are over 20 kinds of sedums, four types of thyme, two kinds of *Mazus*, dwarf columbines, dozens of varieties of pinks and carnations, prostrate asters, shasta daisies, anthemis, a violet collection, and dwarf forms of bleeding hearts, baby's breath, alyssum and ajuga.

The Dwarf and Miniature plot is of particular interest to visitors because it demonstrates the many kinds of plants that can be used in a limited space. Small urban lot size, as well as increased popularity of patio and deck gardening in apartment and condominium developments, has resulted in a greater demand for a knowledge of these plants and their cultural requirements. The garden is designed and planted by Mr. and Mrs. Harry Raibourne, amateur horticulturists, who have a large plant collection at their home in eastern Cincinnati where they propagate many miniature varieties.

Twenty seven kinds of dwarfs and miniatures are represented in their Adopt-A-Plot Garden, including *Thuja occidentalis* 'Pumila Sudworthii', *Chamaecyparis pisifera* 'Squarrosa Nana', dwarf pussy wil-

low (*Salix tristis*), dwarf Korean boxwood (*Buxus microphylla* var. *koreana* 'Pumila'), dwarf Japanese quince (*Chaenomeles japonica* 'Pumila') and five types of miniature roses.

A favorite garden with Adopt-A-Plot visitors is the six- by 12-foot Colonial Kitchen Herb Garden, featuring about two dozen varieties of popular herbs. The garden is sponsored by the Cincinnati Herb Society and is planted and tended by Mrs. John C. (Helen) Kovach, former president of the Herb Society. Mint, parsley, thyme, basil, chamomile, dill, sages, tarragon, hoarhound, bee balm, scented geraniums, yarrow, salad burnet, lavender, rosemary, artemisia—are among the many plants represented. Most Saturday mornings during the summer, Norma Kovach performs two jobs at the site—tending her garden and answering questions of the many visitors about the various herbs and their use.

She shares recipes and ideas—for example, a delicious apple sponge cake prepared with rose geranium leaves as a lining for the baking pan, a fragrant and delightful sugar for tea created by combining a sprig of lemon balm or costmary in a jar with sugar, the interest the yellow flower of the yarrow plant gives to dried arrangements, and the many herbs that can be used to give vinegar a special flavor.

The garden shows how to develop a handy herb collection in a small yard area or window box and is designed to be aesthetically pleasing with perennials in key spots, rocks for a path and the framing of existing boxwood on the perimeter.

As with all the Adopt-A-Plot Gardens, the purpose is to combine useful ideas with beauty for a park visitor to enjoy. The goals of the project—to restore a deteriorating park area and to promote new community pride in the park—have been met. The gardens attracted more visitors, especially families, and have increased special functions such as outdoor weddings and an annual ice cream social.

The Ault Park Adopt-A-Plot Gardens will be included on an American Horticultural Society Annual Meeting tour on Saturday afternoon, October 2. Marlene Holwadel, Director of the Park Board Volunteers, will give a presentation on the project during an educational session on Saturday morning. ☉

—Mary Taylor

Mary Taylor is an administrative assistant with the City of Cincinnati Board of Park Commissioners.



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STRANGE RELATIVES

THE LOOSESTRIFE FAMILY

My beloved is to me as a cluster of camphire in the vineyards of Engedi.

Song of Solomon 1:14

Thus was King Solomon, centuries ago, telling us something of the loveliness of the blossoms of a small shrub that is a member of the Lythraceae, the subject of "Strange Relatives" this month. We will come back to King Solomon's camphire presently, but let us look first at its family tree.

The Lythraceae or loosestrife family is comprised of about 22 different kinds of herbs, shrubs and trees widely distributed in tropical and temperate zones of the world. The family is known chiefly as the source of certain dyes, a few medicinal products, valuable timber and cultivated ornamental plants.

Typically, loosestrife flowers have four or six petals, four or six sepals united in a tube, and twice as many stamens; the petals are usually crumpled in bud. The fruit is a dry capsule containing many seeds. Simple leaves grow opposite, whorled or spirally on the stem.

King Solomon was referring to the sweet fragrance of camphire blossoms. Camphire is *Lawsonia inermis*, called mignonette tree for its fragrance. The small white, pink or red flowers, from which a perfume can be made, grow in clusters. But *Lawsonia* has another more commercially significant renown. It is the source of the dye henna. The word camphire is derived from the Hebrew word *Copher*, which becomes *Al Khanna* in Arabic; from the Arabic the word henna enters our language. Various modern translations of the Bible substitute henna or henna-flowers where the word camphire is used in the King James version. This small shrub with heavily-scented blossoms comes from Asia and Egypt and has a long history in commerce.

Among the dyes obtained from plants of the loosestrife family, henna is the most famous. The dye is made from the powdered leaves of *Lawsonia inermis*. The use of henna in cosmetic arts has been practiced for 5,000 years. The first recorded user of henna as a hair dye was an Egyptian queen in about 3,000 B.C. Henna was also used for fingernails and for other beauty

spots. The New York Botanical Garden encyclopedia records that "the beard and hair of the prophet Mohammed were reddened with henna and at one time horses' tails and manes were colored with it." Henna is used also to dye fabrics and leather. The dye is very color fast.

Apart from dyeing ladies' tresses and fingernails through the centuries, the antiseptic properties of the leaves were used against smallpox and many severe skin complaints.

Lawsonia is commonly used as an ornamental in tropical and subtropical parts of the world and is sometimes cultivated in the greenhouse. Linnaeus named this plant for his friend and patron, Dr. Isaac Lawson.

From the horticultural point of view crape myrtle, *Lagerstroemia indica*, is the outstanding member of the loosestrife family. About 50 different species of deciduous or evergreen *lagerstroemias* are natives of the Old World tropics. The name commemorates Magnus von Lagerstroem, naturalist friend of Linnaeus and director of the Swedish East Indies Company.

L. indica was introduced from China (not from India as might be inferred from its name) in 1752. In America it is sometimes spoken of as the "lilac of the South," where it is a special favorite for avenue planting and for use in the landscape and home gardens in the way that lilac is used in northern states. Crape myrtle is hardy as far north as Baltimore, Maryland.

Beginning in July, large trusses of crinkle-crapey red, pink, lavender or white flowers are the glory of the crape myrtle. As a tree, crape myrtle may reach 20 feet in height, but it can be maintained as a shrub with several stems. The four- to nine-inch flower clusters are produced in summer on the new growth of the season, which makes it possible to prune in late winter or spring to control the size of the plant.

Another attractive feature of crape myrtle is the exfoliating (or shreddy) bark resulting in color contrasts on the trunk. The foliage is tinged with bronze as it leafs out,



Lagerstroemia indica

turns green in summer and exhibits bright autumn coloration.

L. indica is adaptable to container cultivation too so that in the North it can be grown in the greenhouse and set out on the patio for summer bloom.

There are about 25 varieties or named cultivars of crape myrtle in commerce, many of which have resulted from hybridization conducted at the U. S. National Arboretum in Washington, D. C. *L. indica* is certainly one of the choice flowering shrubs of warm sections of the Eastern Seaboard. But ask nearly anyone about it, and the reaction is almost immediately in terms of their experience with mildew-infested leaves just when the flowers are or should be at their peak. A few years of mildew will kill a plant. Do not despair! Help has arrived!

Hybridization in the Arboretum's ongoing program has resulted in both mildew resistant and mildew-tolerant forms of crape myrtle. The mildew tolerant cultivars previously released by the Arboretum, all with names of American Indian tribes, are 'Catawba', 'Cherokee', 'Conestoga', 'Potomac', 'Powhatan', 'Seminole', 'Muskogee', and 'Natchez'.

A noteworthy advance in the breeding of mildew-free *Lagerstroemia* cultivars was recently reported by the Arboretum. The new seedling, named 'Tuscarora', boasts a dark-coral flower color, distinct from the usual red, pink, lavender or white of most cultivars. In addition, it gives a profusion of bloom over a long period and exhibits the desired mildew resistance. Stock of this new plant has been distributed to various

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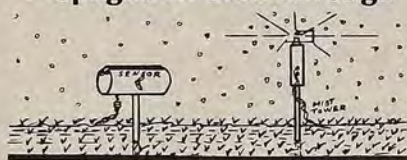
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STRANGE RELATIVES CONT'D

commercial nurseries for stock increase. [Editor's note: for more information on the new mildew-resistant cultivars, see the July, 1982 issue of *American Horticulturist* news.]

Crape myrtlettes are the product of work of other specialists. These dwarf plants are suitable for pot culture or for planting in beds. They begin blooming in July when only 12 inches high. They can be grown from seed by the home gardener or obtained as plants from nurseries. Their maximum height may be three or four feet. Flower colors range from red through rose, pink and lavender. Because of the compact size, crape myrtlettes are often grown as small blooming plants in indoor light gardens.

Lagerstroemia speciosa, pride-of-India or queen's crape myrtle, produces extremely showy purplish flowers, three inches broad, centered with yellow stamens. This native of India may grow to be 80 feet tall. Less hardy than *L. indica*, it has become popular in southern Florida, southern California and Hawaii. As a timber tree, its wood is usable for general construction.

A herbaceous plant familiar in gardens of temperate regions is *Lythrum salicaria*, the purple loosestrife or willow herb. This perennial European weed is naturalized in North America from Quebec west to Michigan and south to Maryland along lakesides and riverbanks. Red-purple flowers on wandlike spikes bloom from June to September.

Among other *Lythrum* species is *L. alatum*, an American native of swamps and meadows from Ontario to Georgia and into the Midwest. This winged lythrum bears solitary, deep-rose, tubular flowers on angled stems with winglike appendages. A number of improved garden varieties have been developed from *L. virgatum*, another European species, with flowers in groups of three in leaf axils. It has been hybridized with *L. alatum* to produce selected garden forms. A trailing species is *L. flexuosum* from Asia.

The lythrams, 30 species of annuals or perennials, are vigorous and hardy plants, all good garden subjects in moist situations or for waterside planting. Named hybrids among the species are attractive perennials for the summer-flowering border where they contribute height and their special rose-red hues.

A few small herbaceous or shrubby plants of garden interest are found among the 200 species of *Cuphea* from Mexico and Gua-

temala. These tender species are used as greenhouse pot plants and for bedding and edging in warm climates or in summer in the North.

Best known is the firecracker or cigar plant, *Cuphea ignea* (formerly *C. platycentra*). It is an annual shrublet eight to

From the horticultural point of view, crape myrtle, Lagerstroemia indica, is the outstanding member of the loosestrife family.

15 inches high, sometimes seen as an edging plant, more often in pots. It was well known in generations past and has come again into its own as a house plant. Solitary flowers arise in the leaf axils; each consists of a three-quarter-inch-long tubular calyx, which is red with a dark ring near the tip, and a bit of white at the mouth like a cigar ash; there are no petals.

The quarter-inch, bell-like blossoms of elfin herb, *C. hyssopifolia*, cover the foot-high plant with violet or white among needle-like leaves. It is a much branched, neat, densely leafy plant attractive for the indoor garden and under fluorescent lights.

C. llavea is a hairy, two-foot shrub, bearing clusters of red flowers with flaring petals. It is cultivated as a garden plant in southern California.

C. micropetala is a four-foot shrub producing long, leafy terminal clusters of blossoms displaying red stamens and a scarlet calyx longer than its minute petals.

Other *Cuphea* species include: *C. X purpurea*, a hybrid between *C. llavea* and *C. procumbens*, a sprawling annual, its flowers purple tipped with green; *C. hookerana*, with red or green and red calyx and purple petals; *C. cyanea*, having a yellow and red calyx and violet-blue petals.

All told, about a dozen Lythraceae genera are listed as cultivated plants. Although most may not have such historic or literary connections as the exotic henna, the continued breeding of selected species and production of worthy cultivars by dedicated plantmen is evidence of the horticultural durability of some of these family members. ☉

—Jane Steffey

Jane Steffey is the horticultural advisor to the American Horticultural Society.

BOOK REVIEWS

THE BULB BOOK.

Martyn Rix and Roger Phillips. Pan Books Ltd. London, England. (Distributed by Mad River Press, Inc., Eureka, California). 1981. 192 pages; softcover, \$16.45. AHS discount price, \$14.50 including postage and handling.

The sub-title to this book tells most of the story—*A Photographic Guide to Over 800 Hardy Bulbs*. Ten pages of generalities and cultural instructions are followed by a collection of unique colored photographs of hardy bulbous plants. Each plant is photographed in its entirety with the bulb and roots removed from the ground. The scale is given for each photograph, and plants flowering together are photographed together. The date of each photograph is also provided, and the arrangement of the book is roughly chronological. Although the dates refer to flowering time in England, the information is translatable to the United States by considering a proportionately compressed flowering season. The sequence of flowering holds true independent of the absolute flowering date. A brief text accompanies each species, giving the countries of origin, a description of the general habitat and cultural notes and other pertinent comments. This book is a most unusual approach to its subject and of use to anyone interested in bulbous plants.

HILLIER'S MANUAL OF TREES AND SHRUBS.

(5th edition). David and Charles Ltd. Hawton Abbot. Devon, England. 1981. 576 pages; hardcover, \$23.95. AHS discount price, \$20.50 including postage and handling.

Originally published as a nursery catalogue in 1972, *Hillier's Manual* is an invaluable reference work for anyone growing woody plants. It is organized with separate sections for trees and shrubs, vines, conifers and bamboos. In addition to descriptions of species, many cultivars are also included. More than 8,000 taxa in 700 genera are discussed. Cultural references are for the British Isles, but they are general enough to be of use to the American gardener. Nomenclature is generally correct and up-to-date with more common synonyms listed.



HUXLEY'S ENCYCLOPEDIA OF GARDENING.

Anthony Huxley. Universe Books. New York, New York. 1982. 373 pages; hardcover, \$17.50. AHS discount price, \$16.10 including postage and handling.

This book is really a dictionary of gardening terminology. It contains no information on specific plants, but it offers good explanations of the language and practices of gardening both in Great Britain and the United States. Some of the more commonly used botanical terms are also defined.

THE LIFE AND TRAVELS OF JOHN BARTRAM.

Edmund Berkeley and Dorothy Smith Berkeley. University Presses of Florida. Tallahassee, Florida. 1982. 376 pages; hardcover, \$25.00. AHS discount price, \$22.50 including postage and handling.

John Bartram was an intelligent and observant man who had a farm near Philadelphia in the early 18th century. In the 1830's he began to collect seeds and plants for friends in England and was soon supplying large quantities of previously unknown plants to an enthusiastic group of English gardeners. The travels in search of plants took him to most parts of the eastern United States, and his collections had a profound influence not only on the gar-

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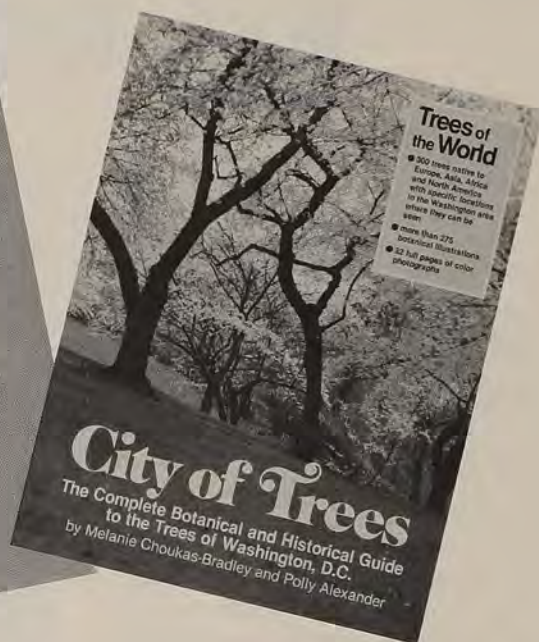
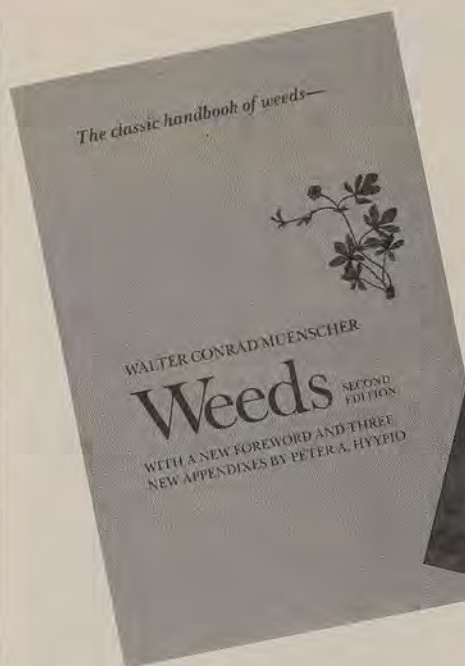
John Diekelmann and Robert Schuster. McGraw-Hill Book Company. New York, New York. 1982. 277 pages; hardcover, \$24.95. AHS discount price, \$21.20 including postage and handling.

In an attempt to save energy and effort many people are considering natural landscaping. This term does not mean simply turning the land over to the weeds but instead planting an area with native species suited to the site, which will in a few seasons become established as a low maintenance planting. This book describes the natural plant communities of the Northeast from Minnesota to Missouri and east to Maine and Virginia. It then goes on to clearly show how you can analyze your own site and establish an appropriate natural plant community. For the reader interested in more detail, a bibliography is given at the end of each chapter. Examples of landscape plans are given for both residential and institutional sites. An appendix gives lists of suitable species for each plant community, and a second appendix lists places to visit where you can see an already established natural landscape scheme.

CITY OF TREES—THE COMPLETE BOTANICAL AND HISTORICAL GUIDE TO THE TREES OF WASHINGTON, D.C.

Melanie Choukas-Bradley and Polly Alexander. Acropolis Books Ltd. Washington, D.C. 1981. 283 pages; hardcover, \$24.95.

Over the years many communities have published lists of cultivated trees of the area together with locations of outstanding specimens. Usually such publications are little more than checklists, but they are useful to local residents and to others who are interested in what grows well in a particular area. All of the utility of such a work is present in this text, but *City of Trees* is a much more ambitious work than most books on a similar subject. The first 60 pages are devoted to colored photographs of many of the more important flowering trees in Washington and to historical reviews of plantings in areas such as the White House, the Mall and the Capital grounds. The rest of the book, which



is illustrated with line drawings, gives descriptions of species and locations of individual specimens. This is an excellent guide to trees in Washington, D.C., but it is also a good model of what such a local guidebook should be.

WEEDS.

(2nd edition). Walter Conrad Muenscher. Cornell University Press. Ithaca, New York. 1980. 586 pages; hardcover, \$32.50. AHS discount price, \$27.50 including postage and handling.

This work is an old standard reference (1st edition 1935), which has been updated with

current correct botanical names but is otherwise unchanged. It is illustrated with line drawings, and the text offers clear descriptions with a minimum of specialized botanical terms. Those special words which are used are defined in the glossary. Since this work predates the use of chemical herbicides, the control methods given for each weed should be of particular interest to organic gardeners who would rather not use chemicals in their gardens. ☉

—Gilbert S. Daniels

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

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Goldenrod

BY MARGARET HENSEL

Late summer heralds goldenrod time throughout much of the eastern and central parts of the United States. In August our roadsides glow with Joe-pye-weeds (*Eupatorium* species), red clover and fading umber grasses, while great stretches of goldenrod (*Solidago* species) sweep the landscape. Across drying fields and meadows the incessant cricket chorus has assumed a slightly melancholy tone, and winds, once zephyr-like, take on a penetrating edge. Through the sweet reprieve of Indian summer, goldenrod bloom continues until the cool nights of October announce its seasonal farewell.

Perhaps better than any native wildflower, goldenrod evokes the special mood that attunes our senses to the ephemeral quality of time and nature. As a child it was never a favorite topic for my reveries. Each year in mid-August, that first golden bloom filled me with a sense of impending doom. Those innocent flowers spelled the inevitable end to adventure; no more jaunts through marshes in search of elusive wildflowers; no more running barefoot down the dusty beach road perfumed with honeysuckle and bayberry. All too soon that magical sense of summer time, marked only by meals and nightfall, would be over. As sure as any clock, three weeks after the first appearance of *Solidago*, I would again

The horticulturally cognizant may regard goldenrod as an innocent enough plant, but there are many for whom the myth of “the goldenrod hay fever threat” looms large.

enter a world run by adults, with schedules and classes, in the prison of a small wooden desk.

For others that first bloom is also viewed with a certain amount of apprehension, but for a different reason. The horticulturally cognizant may regard goldenrod as an innocent enough plant, but there are many for whom the myth of “the goldenrod hay fever threat” looms large. Over 100 species of *Solidago* are found across the United States. This statistic might be cause for alarm were it not for the fact that goldenrod does not cause hay fever. Unlike ragweed, grasses and sedges, goldenrod pollen is not carried by the wind. Instead, its rather weighty grains are distributed from plant to plant by a variety of pollinators, including butterflies, birds and bees.

The appreciation of this native plant is well tempered by the rampant hay fever mythology and by its presence in fields and meadows everywhere. Nothing as common as goldenrod will do for the cultivated garden, some say. Still, with so much of this plant staring us in the face, it is surprising that more American gardeners have not begun to explore the wealth of potential garden material this lovely wildflower has to offer.

English gardeners have been using goldenrod species in their garden schemes for well over a hundred years. Europeans in general, and the English and Germans in particular, have selected and hybridized a number of species. Virtually free from major insect and disease problems, goldenrods have many attributes to recommend

them, not the least of which are their hardiness and sturdy stems that don't require staking. Ranging in height from six inches to eight feet, goldenrod has numerous forms, including the graceful, plume-like branching of Canada goldenrod (*S. canadensis*), the flat-topped clusters of lance-leaved goldenrod (*S. graminifolia*), and the slender, wandlike stems of downy goldenrod (*S. puberula*). Season of bloom extends from summer through fall and sometimes into November, depending upon species and locale. Hardiness zones range from a rigorous Zone 3 to Zone 10.

Goldenrod hybrids may in many cases be better suited to the formal garden setting than the native species I will list later. Noted for their more restrained and predictable growth habits, cultivars are also becoming more readily available through nurseries. In natural areas there are a number of native species of goldenrod that are particularly valuable. As natives, these plants have adapted themselves to diverse and sometimes challenging conditions, including shady woods, dry or sterile soil and sand and salt marshes. By selecting goldenrod species to match troublesome garden areas, your plants will respond to care and feeding by growing even more luxuriantly than in their wild homes.

There are many native goldenrods to choose from in the Northeast and Central United States (roughly 62-69 species, depending upon which source you refer to). If all these species weren't enough, there are also certain regional varieties in form, plus goldenrods have an ability to hybridize on their own. All of these factors add up to a tricky bit of business when it comes to accurate identification, which leaves even experts confused. I have walked through the woods and meadows on my own and with a friend who is a horticulturist and wildflower propagator, but even equipped with a small library of identification books, we were still not absolutely sure of some species.

Fortunately within this morass of iden-



The showy clusters of goldenrods come in many forms. On the left are the flat-topped clusters of slender fragrant goldenrod, *Solidago tenuifolia*. RIGHT: The more wandlike, blue-stemmed goldenrod, *S. caesia*.

tification problems there are a few species that are not only easy to identify but are also common and make excellent subjects for various types of garden settings. When selecting goldenrod for any garden, cultural requirements and growth habits are important. The method by which roots spread, and to what extent, season of bloom, plant form and height should all be taken into consideration. Although full sun is generally preferred, there are species that will thrive in shade and for some, their requirements for sun and shade may overlap. As for color, this is obviously not a major hurdle in the selection process, because except for *Solidago bicolor*, which has a creamy-white form and is often commonly called silverrod or white goldenrod, goldenrod comes only in varying shades of yellow ranging from clear to deep golden.

Hybridizing of our native species has produced a number of cultivars. The following are a selection of those most readily available.

- 'Cloth of Gold'—Primrose yellow flowers appear from mid-August through September in large clusters, on plants 18-20 inches high.
- 'Golden Dwarf'—A dwarf hybrid 12 inches high, this plant blooms in full sun from late summer to fall.
- 'Golden Mosa'—An English favorite, the sprays of dark- or lemon-yellow blooms resemble mimosa, on a plant not over three feet tall. August through September is bloom time.
- 'Leraft'—Bright-yellow blooms appear on plants three feet high in August.
- 'Peter Pan'—Canary-yellow blossoms appear on 2-½-foot plants in August.
- 'Plume O' Gold'—This is a particularly valuable species for late flowering because frost doesn't harm the golden blooms.

When selecting goldenrod species for a naturalized area such as along a stone wall, rail fence or at the edge of a wooded area, first analyze the existing conditions of the

Continued on page 34



Margaret A. Hensel

Ornamental Grasses

TEXT AND ILLUSTRATIONS

BY PETER LOEWER



Our collecting of ornamental grasses began in the spring of 1975 when we purchased two plants of purple moor grass (*Molinia caerulea* 'Variegata') from a local nursery. At that time the garden consisted of a worn and tangled bank of tawny daylilies (*Hemerocallis fulva*); a mass of goutweed (*Aegopodium podagraria* 'Variegatum')—surely one of the most vicious plants ever to attack a homestead; two pre-World War I peonies; and a fine collection of broken bottles and burnt-out fuses tossed aside by the owners of our farm over the previous 100 years.

The soil that surrounded our newly remodeled country home made the typical subdivision's scorched earth look like a golf course: the last owners had scraped the little top soil there was and sold it during the hard times of the 30's, leaving us a base of hard-pan and red shale.

But the purple moor grass flourished (it's still there), and my interest in the ornamental grasses grew. Not only did they have the power to break up poor soil on their own but most were also able to resist the hot summer sun and unpredictable rains that we in the Catskill Mountains endure.

Unlike their lowly cousins of the lawn, the ornamental grasses are grown for their fountain-like habits of growth (few spread by runners like the hated crabgrass), their endless color variations and variegations, and—especially with the annuals—the magnificent and fascinating seed heads that make them so perfect for winter bouquets.

For even after the heat of summer has passed and killing frosts have laid low the more tender plants of the garden, the ornamental grasses still give a show of foliage tinted with light browns and bronzes or with the reds and golds of autumn. Finally, most species disappear under our winter's snow, but even then the Japanese eulalia

LEFT AND CENTER: *Miscanthus sinensis* 'Gracillimus'. RIGHT: *Miscanthus sinensis* 'Variegatus'.



grass, *Miscanthus sacchariflorus*, thrusts its seven- to eight-foot stems above the worst that our winter usually has to offer.

THE ANNUAL GRASSES

The annual ornamental grasses are rarely grown for their foliage, which exhibits a singular sameness, but for the flowers and seeds that offer so many fascinating varieties of form and color. A few even demand a position in the garden bed and border as the plants are small and the flower heads large, but most should be confined to that old-fashioned standby—the cutting garden—where they can be gathered at the peak of bloom and dried for winter bouquets (and some seed saved from each plant for the following year).

As a general rule the annual grasses require full summer sun for adequate growth and flowering, and they are not too fussy about soil conditions. To ensure a se-

quence of bloom throughout the summer, I start seeds indoors in early spring using any of the popular pre-mixed sowing mediums and allowing plenty of light to prevent leggy growth. Then every three or four weeks I start more plants.

If you plant annual grass seeds directly out-of-doors, prepare and mark the seed bed with care: the new little plants all look like more common grassy weeds, leading to ultimate dismay and confusion. One year I was careless and crabgrass squeezed out my seedlings of hare's-tail grass before I knew what was happening.

When seedlings are one- to two-inches tall, thin them out to six or 12 inches between each plant, depending on the ultimate height of the plant. Sources for annual grass seeds are listed in the Sources section of this issue, and all the seed companies give complete directions for planting and harvesting on each pack.



LEFT: Switch grass, *Panicum virgatum*. TOP: A variety of grasses planted together make an attractive border. CENTER: Zebra grass in late fall. BELOW: *Molinia caerulea* 'Variegata'. RIGHT: 1. Cut grass, *Leersia oryzoides*; 2. Green foxtail, *Setaria viridis*; 3. Wild chess, *Bromus secalinus*; 4. Orchard grass, *Dactylis glomerata*; 5. Velvet grass, *Holcus lanatus*.



Left, top and center photos by Peter Loewer

Pamela Harper

My two favorite members of the annual ornamental grasses are hare's-tail grass and foxtail millet. Hare's-tail grass, *Lagurus ovatus*, is a hardy annual that reaches a height of 18 to 24 inches. Originally from the Mediterranean region and in cultivation for so many years in England that it has now naturalized, this grass is the only member of its genus. The name in Greek means *lagos*, a hare, and *oura*, a tail. It's a lovely and fragile plant that will produce a great many terminal spikes before the time of a killing frost up north.

Besides being attractive in the border, the flower heads do not shatter with age. Unfortunately, it is also mistreated by a large number of people who feel the absolute necessity to continually improve on nature and dye the seed heads liver green, electric pink or frostbite blue, then place them in plastic vases for sale along the highways of North America.

Foxtail millet, *Setaria italica*, is a striking annual that grows up to four feet in height with dense panicles of seeds that resemble the foxtails that trailed behind the rumble seats of old Chevies during the 30's. Well-sited plants often produce pan-

icles over a foot in length that bow toward the earth under the weight of the seeds. While the plants are tolerant of some lack of water, they perish quickly under drought conditions. First grown in China about 2700 B.C., foxtail reached Europe during the Middle Ages and in 1849 it entered the U.S. where it has become an important fodder crop. The seed is harvested for bird seed and is often found growing around old dumps and land fills where generations of bird lovers have emptied the cage.

To dry grasses for winter bouquets, gather the grasses in mid-afternoon on a dry and sunny day, after the dews of morning have evaporated and before the afternoon damp sets in.

Pick stems with blossoms that are not yet completely open, and cut the stems as long as you can; it's much easier to trim stems for a shorter arrangement than glue stems back together for length. Strip any excess leaves from the stem and then tie small bunches together with a firm hand as the stems lose volume as they dry, hanging them upside down in a cool and airy place.

Most of the straight grasses should be dried in this manner. Those like the foxtails, which benefit from a curved stem, should be staked in a dry vase or container and kept upright while being stored with the others.

Many of the leaves of grasses, especially the reeds and the *Miscanthus* species, are excellent additions to dried arrangements. With very delicate seedheads like cloud grass and champagne grass, a very light spray with a liquid hair net is often beneficial in holding them together.

THE PERENNIAL GRASSES

Many of the rarer perennial ornamental grasses may be grown from seed, and most of the garden societies in America and England include a number of species in their seed lists published for members every year. But it's often faster (sometimes by two or three years) to buy established plants from the many nurseries that now offer grass perennials. Grasses survive shipping with ease, and United Parcel can deliver from California to New York in three days.

The biggest concern of the gardener in planting ornamental grasses is the final size of the plants. A mature clump of zebra grass, *Miscanthus sinensis* 'Zebrinus', is truly large. That young plant you bought in 1982 and placed under the kitchen win-

Continued on page 36



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Achillea

TEXT BY JOY FORAKER
PHOTOGRAPHY BY PAMELA HARPER



ABOVE: A pink cultivar of *Achillea millefolium*, sometimes sold as 'Rosea'. RIGHT: *Achillea millefolium* 'Red Beauty'.

The ornamental herb *Achillea* was named for Achilles because it was said this Greek hero first discovered its medicinal properties. He was supposed to have stanching the wounds of soldiers with it.

Throughout history, *Achillea*, particularly the field-weed yarrow, has been sought for its curative powers. "Yarrow" translates literally as "healer," coming from the Anglo-Saxon *gaeruwe*. Besides being used to stop bleeding, yarrow has been an important ingredient in astringents, liniments, toothache remedies—and beer. As a child, I read wild yarrow would reduce or help prevent bruising. To this day, I place yarrow-leaf poultices on bruises.

A plant as common and well-known as

Achillea is the recipient of many nicknames. Woundwort (weed for wounds) is one. Sneezewort and old man's pepper likely refer to its usually pungent odor. Thousand-leaf and milfoil describe the ferny leaves of some species. Angel flower and bunch of daisies are names complimenting a plant as beautiful as it is useful. It is well suited to borders and to rock gardens.

I originally purchased *Achillea filipendulina* and *A. ptarmica* plants because wild yarrow was such an old friend. Also, I wanted a perennial that would be easy to grow. *A. filipendulina* turned out to be a stunning addition to the border. Long, flat, yellow clusters float over tall stems. Not only is it an eye-catcher, but it is also phenomenally long lasting. As a cut flower it

lends its unusual form to both summer and winter bouquets. Although the flowers seem immortal, the leaves dry and shrivel. I break them off to slip inside pillow covers or to brew for tea. It isn't the tea's taste that evokes pleasure, but rather its scent—reminiscent of crisp, yellow flowers and azure skies.

The time to cut *Achillea* for bouquets is before the colored disk flowers have fallen out of the brown heads, for when these tiny flowers drop, they take their color with them, and the entire clusterhead becomes brown.

Achillea's flowering period extends from early summer to hard frost. Easy in any soil and full sun, it will stand some shade. This plant is tough—where conditions are

poor, *Achillea* will surpass other perennials. Wild yarrow is sometimes the only visible flower growing on barren, exposed sites amid sagebrush, rocks and clay, and along dry roadsides during the hottest days of summer.

Achillea prefers dryness, but if in a well-drained site it survives over-watering. It grows anywhere in the nation. Most kinds resist drought and are winter hardy.

I planted mine at the base of fruit trees along the driveway and also on bare, clay-loam exposed to wind. Those that aren't cut for bouquets but remain in the garden all winter stand erect even after being buried in the snow. Their strong stems, the yarrow sticks of *I Ching*, seem to weaken only if they receive too much shade.

Achillea is a member of the Compositae. There are as many as 60 to 100 species, but only about 20 are of horticultural significance. Flowers in this genus bloom in white, yellow to gold, rosy-pink, red and a range of lavender and blue-rose shades.

A. millefolium is milfoil or common yarrow. A native of Europe and western Asia that has spread to this country, its flowers are usually white, but there are several cultivars with pink to dark-pink ray flowers. From ½ to three feet tall, it always has fernlike foliage that is soft to the touch. Selected, improved plants coming from the same stock as wild yarrow include 'Red Beauty', 'Crimson Beauty' and 'Fire King'. Other cultivars are 'Cerise Queen', which is cherry red and 18 inches tall, and 'Rubra', which is a deep-pink cultivar. *A. millefolium* 'Rosea' bears dense heads of rosy-pink flowers from July to late fall. 'Rose Beauty' is a 25-inch-tall rose-pink. Don't permit these improved plants to go to seed or common varieties will result.

A. filipendulina, from Asia Minor and the Caucasus, is the tallest, growing to five feet. Its leaves are gray-green and flowers are a showy yellow from June to hard frost. 'Cloth of Gold', 'Golden Plate', 'Midas Touch' and 'Coronation Gold' are cultivars of this species offered by nurseries. The species withstands hot and dry growing conditions. Its leaves, though fernlike, are coarser than *A. millefolium*. It looks well in a border behind Shasta daisies in midsummer and red chrysanthemums in fall. Viewed through a lens, *A. filipendulina* is a tight cluster of brown heads inside which bloom tiny disk flowers. Each head is like a bouquet of several of the fertile tubular flowers.

A. ptarmica is sneezewort. The most commonly available cultivar of this species is 'The Pearl', and it bears heads filled with

disk flowers, which are encircled by a double row of white ray flowers. Leaves are dark-green and willow-shaped. This species is native to Eurasia and has naturalized itself in North America. It is two-feet high and blooms from spring to frost. *A. ptarmica*, like feverfew or baby's breath, is used by florists to enhance cut flower bouquets. It looks most attractive in the garden when several are planted together and is different enough from other perennials that friends ask its name. Although it can be invasive, *A. ptarmica* makes a valuable cut flower and is attractive in the sunny border.

Another *Achillea* species you might wish to plant is *A. ageratum*, sweet yarrow. From southern Europe, this is the species that has pleasantly scented blossoms. The 1½-inch flower heads are borne on compact, 18-inch plants. Other common names are silver yarrow and sweet Nancy.

Another favorite is *A. tomentosa*, woolly yarrow, from Europe and the Orient. Yellow flowers bloom in July, accented by low-growing mats of woolly foliage. *A. tomentosa* 'Aurea' is a dwarf cultivar, reaching a height of about seven inches as compared to the species, which is from 10 to 12 inches tall. An even smaller cultivar with primrose-yellow flowers is 'King Edward', reaching a height of about six inches. Both plants form dense mats of gray-green foliage, withstand heat and are ideal for rock gardens.

It is very easy to start new yarrow plants from seed. In March or early April I sow seeds on top of a mix of ordinary garden soil lightened with sand. I sift sphagnum moss over the seeds to help prevent damping off and set the seed container in a sunny window. *Achillea* sprouts five to 15 days after sowing, and 70° F is ideal for germination. Set the new plants outdoors early in May; they will bloom the first season. If seeds are sown outdoors in May, blossoms will not appear until the following year.

I planted a packet of mixed *Achillea* seeds—many *A. ptarmica* and *A. filipendulina* plants resulted, duplicating the plants I had purchased at considerably more cost. Most were *A. millefolium*—soft, finely dissected leaves topped by clusters of every shade of rose-blue from light lavender to dark wine-purple. I asked Dr. Amy Jean Gilmartin, Director of the Marion Ownbey Herbarium of the Department of Botany, Washington State University, if these were cultivated or native forms. She replied, "They are simply showing some of the vast range of variation which is in-

herent in even the cultivated varieties."

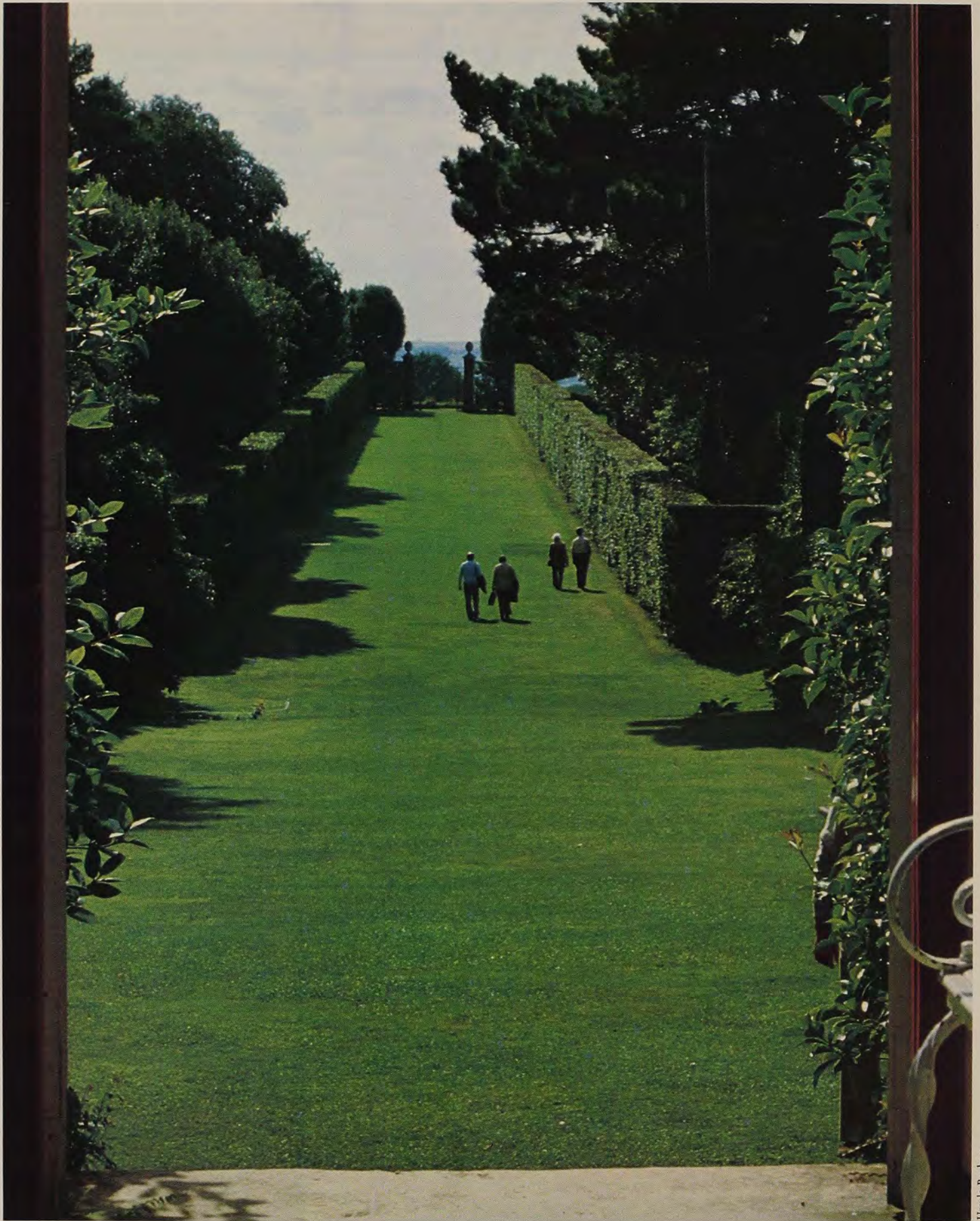
Achillea grows vigorously and has to be divided every few years to maintain maximum bloom. Division is best done in spring. Another means of propagating is by taking midsummer cuttings. Like chrysanthemums, they can be transplanted anytime the ground is warm. By keeping the plant moist until it takes hold, I've moved *A. filipendulina* in full bloom without its going into shock.

It is said *Achillea* plants are subject to attack by rust and by powdery mildew, both of which are controlled by sulphur dust. Any plants showing signs of stem-rot, a fungus-caused decay in the base of the stem, should be destroyed.

When you plant *Achillea* from a mixed packet of seeds, plants of various heights result. You'll want to transplant taller ones to the back of the border. By all means, try seeding *Achillea*. Perhaps you'll be the first to discover an orange or a cream color. Botanist Gilmartin says, "The prospects for *Achillea* seem to be almost without end as species cross and as people cultivate the original species and permit the hidden variation (in the natural populations) to be revealed." ♣

Joy Foraker is a professional orchardist and amateur gardener. Her articles have appeared in *American Horticulturist*, *House Beautiful* and *Western Fruit Grower*.





Ursula Buchan

Hidcote Manor

BY URSULA BUCHAN

The English are proud of Hidcote Manor near Chipping Campden, Gloucestershire. It is considered to be one of the three great gardens developed in England in this century. In truth, the creator of Hidcote was an American by parentage. His name was Lawrence Waterbury Johnston, the son of Elliott Johnston, a native of Baltimore, and of Gertrude Cleveland. His upbringing was cosmopolitan; he was one of those Americans who seem more European than the Europeans. Educated first privately by a tutor and then later at Trinity College, Cambridge, Johnston finally became a naturalized British subject in 1900 at the age of 29. He even went off to fight for the British in the Boer War and the First World War.

At about the same time Johnston became a British subject, he also became interested in farming. His mother, then the widowed Mrs. Winthrop, having lost two husbands by this time, bought 280 acres of farmland, a village and an unpretentious stone farmhouse at Hidcote Bartrim, a remote village in Gloucestershire. All there was to the "garden" was a large cedar-of-Lebanon and two groups of beeches. It was a lonely, windswept place, on unappealing, heavy clay, with only breathtaking views across the Vale of Evesham to recommend it. On this seemingly inauspicious site Johnston was to develop a garden that was to become famous in his own lifetime and is now a jewel in the crown of the National Trust gardens.

Johnston set about to improve the property, adding a wing on the house for his mother, tidying the farmyard into a courtyard and turning a barn next to the house into a chapel where mass was sometimes said. Then he settled down to create the



Ursula Buchan

The long walk at left, viewed here from inside a gazebo, epitomizes Lawrence Johnston's capacity for conceiving interesting ideas and his courage in carrying out those ideas. The walk slopes gently upward for more than a hundred yards so that the visitor must walk all the way to see the view beyond. Facing the gazebo above, two watering cans, reputed to have belonged to Marie Antoinette, stand sentinel.

garden out of 10 acres of agricultural land.

Years passed, and much progress was made. Unfortunately, the Second World War, like the first, took its toll on Hidcote. Finding the garden too much to cope with, Johnston gave it over to the National Trust in 1948. It was the first garden accepted by the Trust under its gardens scheme. Johnston said rather sadly at the time, "Hidcote is not my baby anymore," which was true, but at least the future of the garden was secure, for so often gardens do not long outlive their owners.

Johnston died 10 years later at Mentone, his home in France, and was buried near his mother close to Hidcote at Mickleton. The epitaph on his grave reads simply, "Deeply loved by all his friends."

He was an artistic and cultivated man, being very fond of painting and a keen collector of books. He was shy and unostentatious and liked his privacy. He never married but had many friends, among them famous gardeners such as Vita Sackville-West, Norah Lindsay and Mark Fenwick. Above all, he was a highly original man with tremendous vision.

It is difficult now to realize how original many of Johnston's ideas were, since they have become common practice among sophisticated gardeners. Hidcote is, in the words of Vita Sackville-West, "a cottage garden on the most glorified scale." It is a series of enclosed, informal, almost secret gardens within a large whole, intersected and surrounded by tall hedges so that the visitor is drawn ever onwards, exploring little nooks full of choice plants, or rounding a corner to be met with a spreading vista. Johnston was an enthusiastic plantsman who allied a love of a plant's rarity to an unerring aesthetic judgment upon it. He coupled restraint and self-discipline with

an excellent color sense. The result at Hidcote is a constant visual feast for the visitor, be he gardener or not.

Johnston's desire was always to plant the very best variety or strain; nothing at Hidcote is second best, as we all too often put up with in our own gardens. Schemes that did not please were abandoned at once. Like all the most successful garden owners, he was a practical man who could be seen many times on his hands and knees weeding the flower borders.

He was, no doubt, influenced by earlier gardeners. Gertrude Jekyll's ideas, for example, can be detected in some of the color schemes, but his garden design was quite novel. It most certainly influenced his contemporaries and later generations of garden owners. The idea of small "cottage" gardens full of interesting plants within a larger garden must have influenced Vita Sackville-West when she began to lay out the gardens at Sissinghurst Castle in Kent in the 1930's. Johnston's use of shrubs and small trees rather than solely herbaceous perennials was innovative, too.

His love of rarities led him enthusiastically to embark on two plant expeditions, one in 1927 from Cape Town, South Africa, to Victoria Falls through the Drakensberg mountains, and in 1931 to Yunnan in China, with George Forrest, the famous Scot plant hunter. Their collections included *Jasminum polyanthum* and *Mahonia lomariifolia*.

Johnston took full advantage of England's temperate climate—fairly high rainfall and little snow—and made a garden that is worth seeing during any season.

As the visitor wanders through these cottage rooms on my narrative journey, I shall point out plants flowering not only in high summer, when the garden is at its best, but also in the spring and fall. Space precludes the mention of more than a small number of the hundreds of species grown at Hidcote, but I hope the following description will serve at least to whet the appetite.

Let the visitor start in the courtyard facing the stone house, dating partly from the 17th century, with Mrs. Winthrop's wing added. Major Johnston called the house a



Pamela Harper

From the bathing pool garden above, rimmed by whimsical topiary, the visitor leaves the formal gardens and plunges into the controlled wilderness of Westonbirt. Within the series of cottage gardens at right, imaginative perennial plantings abound. Prominent at right is *Hydrangea arborescens* 'Sterile'.

Manor when he added the wing and placed a false coat of arms above the door. To the right is a collection of barns, now the tea room and gift shop. Against the wall grows a large specimen of *Magnolia delavayi*, which has large, dull-green leaves. Normally a shy flowerer in England, it enjoys this warm spot. Nearby the Glasnevin form of *Solanum crispum* clammers up the wall of the barn. This form has larger, mauve potato flowers than the species. Next to this specimen is planted one of the best of the pink climbing roses for a north or east wall, 'Madame Grégoire Staechlin'. On the left side of the courtyard is a shrub border with two large and handsome specimens of the fragrant *Viburnum X burkwoodii*, a useful shrub that flowers sometimes as early as January and is at its best in May. Nearby is the large-flowered *Hypericum* 'Hidcote'. No one knows if this is a garden hybrid or form, or whether Johnston collected it, but most would agree that it has the largest and freshest yellow flowers of any hypericum.

On the chapel wall, the hydrangea-like climber, *Schizophragma integrifolium*, is underplanted with the deep-blue 'Hidcote' lavender. The house is clothed with climbers—notably in May and June, *Clematis montana* 'Rubens', whose flowers fall in cascades of pale-pink stars.

From the courtyard the visitor passes into the Garden Yard, where pride of place belongs to the handkerchief or dove tree, *Davidia involucreta* var. *vilmoriniana*. A tree of western China, it was discovered by Pere David in 1869 and was introduced into cultivation by another French missionary, Farges, who sent back seed to France in 1897. Its astonishing beauty lies not in its flowers, which are insignificant, but in the two magnificent, creamy-white bracts, of different lengths, which are borne with the flowers in May.

In the Garden Yard tubs are displayed bedded up with half-hardy plants, notably *Fuchsia* 'Hidcote', with a cream and pink flower, raised here in the 1950's. In another tub, there is a pretty group of the fuchsia-like *Abutilon megapotamicum*, the semi-double vermilion-red *Pelargonium* 'Gustav Emich', and the yellow-green and



Pamela Harper



Lorraine Burgess

furry-leaved *Helichrysum petiolatum* 'Variegatum'.

Striking when it flowers in July is the golden yellow flowered Chinese woodbine, *Lonicera tragophylla*, over the door of one of the barns. The marvelous feature of this plant is that it is only happy in shade.

From this vantage point the visitor turns left and comes upon one of the most dramatic garden sights in England, the Theatre Lawn. This is a large expanse of green, enclosed by high hedges, the focus of which is a solitary, ancient beech on a small, raised lawn, towards the back and reached by steps.

To the left is the little Laundry Shelter, where once the washing was hung out to dry. Here Johnston planted rhododendrons in made-up peat and acid soil beds, for the garden soil as a whole is alkaline. Against one wall is a huge specimen of

Hydrangea integerrima, a self-clinging climber that bears great, white tennis balls of flowers in July.

From here the visitor enters what is essentially the center of the garden, the Old Garden, dominated by the ancient cedar-of-Lebanon, the White Garden and the Maple Garden.

The Old Garden was probably the vegetable garden of the farmhouse in the days before Johnston took over the property. It is surrounded by walls and consists of rectangular beds, bisected by paths. Here pastel shades—blues, pinks and whites—predominate, and Johnston's love of profusion is evident.

In the shade of the old cedar, Welsh poppies and bluebells flower in the spring, and in the autumn, *Cyclamen hederifolium* shows its pink and white flowers above green and white marbled leaves.

The Old Garden starts flowering prop-

erly in May and goes on well into October, because annual bedding plants and remontant roses are widely used. Against the south-facing wall flowers *Rosa* 'Lawrence Johnston', which may very well be the original plant raised by the French rose grower Pernet-Ducher in 1923 and named after the owner of Hidcote. It is a cross between 'Madame Eugene Verdier' and *Rosa foetida* 'Persiana' and has intensely yellow, fragrant, semi-double flowers.

The fine tree "abutilons," *Corynabutilon vitifolium* (formerly *Abutilon vitifolium*) and the cultivar 'Album', flower in June in the wall border, as do white phlox, the tall *Chrysanthemum parthenium* 'White Bonnet' with pure white, double flowers, and *Viburnum macrocephalum*, the so-called Chinese snowball, with loose heads of white flowers.

Across the path *Geranium ibericum* flowers profusely, as does *Rosa* 'Nevada',

one of the best of the modern shrub roses, with its ivory-white, single flowers and prominent, yellow stamens.

The two central borders are mainly pinks and mauves, and are a good example of the fashion that Johnston helped to promote: the mixed border—a structure of permanent shrubs with perennials to add color in the summer, and half-hardy annuals, in this case *Dimorphotheca*, *Felicia amoena* and *Felicia amelloides*, the blue daisy or blue marguerite, to fill in the gaps.

The roses are mainly pink and include hybrid musks such as 'Vanity', the fleeting *Rosa rubrifolia*, whose attractive, glaucous leaves more than make up for the short season of its pink flowers, *Rosa* 'Natalie Nypels' and the tall, sturdy and ever-popular 'Queen Elizabeth'.

Johnston always strove for good color and plant associations, and the National Trust has tried diligently to remain true to his ideas. One very successful grouping consists of *Rosa* 'Natalie Nypels', a compact, bushy rose, with lustrous green leaves and semi-double rose-pink flowers, next to the old-fashioned *Dianthus* 'Whiteladies', and the clear-pink flowers of *Geranium endressii* 'Wargrave'. Another grouping is formed with *Potentilla vilmoriniana*, a deciduous shrub with silvery leaves and cream flowers behind *Salvia guaranitica*, a small shrub with racemes of deep-blue flowers in late summer, and *Chrysanthemum frutescens* 'Mary Wootton'. In the front of the borders are dibbled *Viola cornuta* 'Lilacina' and 'Alba', with dainty, fresh-faced flowers all summer.

The north-facing border is made up with peat and acid soil so that the lovely and fugitive *Meconopsis* (pale-yellow *Meconopsis dhowjii*, the rich-blue *M. grandis* and its offspring *M. X sheldonii*) may be grown. Here also flowers the orchid-like *Roscoea cauleoides*, plump, fleshy and deep-purple *Orchis maderensis* and the best of the bergenias, to my mind, because of its large and intensely hairy leaves, *Bergenia ciliata*.

Next to the Old Garden lies the White Garden, planted principally with the pinkish-white *Rosa* 'Grüss an Aachen', introduced in 1909, soon after Johnston moved to Hidcote. Permanence is given to the setting by topiary birds in box at the corners



Pamela Harper

The Stilt Garden at left is unique in Britain and consists of two lines of clipped hornbeam trees with bare stems on each side of the path. The effect is of two long, rectangular green boxes on legs. In a north-facing border above, supplemented with acid and peat soil, blue poppies, *Meconopsis X sheldonii*, find a happy home.

of the square beds. *Anthemis cupaniana*, a white daisy up to a foot high, romps at the back, and the loveliest of the fragile bindweeds, *Convolvulus cneorum*, couples beautiful, pink-tinged, white trumpets all through the summer with attractive silky, gray leaves. This plant dislikes the wet English winters, being a native of the Mediterranean region.

Leading from the White Garden is a charming Japanese maple garden, where specimens of *Acer japonicum* and *Acer palmatum* 'Dissectum' are planted. In deference to the startling tints these turn in autumn, the color scheme here tends to be dark: *Fuchsia magellanica* var. *macrostema*, 'Cherry Pie' heliotrope and *Helleborus foetidus*. In a large yew a waterfall of Paul's Himalayan rambler, (*Rosa brunonii*), with its whitey-pink flowers, cascades downward.

If the visitor stands beneath the spreading cedar-of-Lebanon, with his back to the house, he looks along the grass path between mixed borders in the Old Garden, then beyond through the hedged Circle to the long Red Borders, planted mainly for summer display, then up stone steps flanked on each side by a brick gazebo, and beyond to the Stilt Garden. At the end is a large wrought-iron gate, which marks the boundary of the garden, and from which can be glimpsed in the hazy distance the Vale of Evesham and the Malvern Hills.

The Circle, which connects the Old Garden and the Red Borders, is at its best in the spring when the Rouen lilac (*Syringa X chinensis*) flowers in scented, purple plumes above a carpet of blue *Omphalodes verna* (creeping forget-me-not), bluebells and the Lenten hellebore.

The double borders, known as the Red Borders, start to flower in April and only begin to fade when the frosts come in October. The colors are orange and red, with a back-cloth of copper and purple foliage provided by the purple-leaved *Prunus spinosa* 'Purpurea', *Acer platanoides* 'Crimson King', the purple hazel and *Berberis thunbergii* 'Atropurpurea'. The roses are mostly the floribunda 'Frensham', which has deep-crimson flowers and shiny, green foliage, and for contrast in shape, *Rosa*

Continued on page 35



How to Make

Pressed Flower Designs

BY JANET C. THIERFELDER

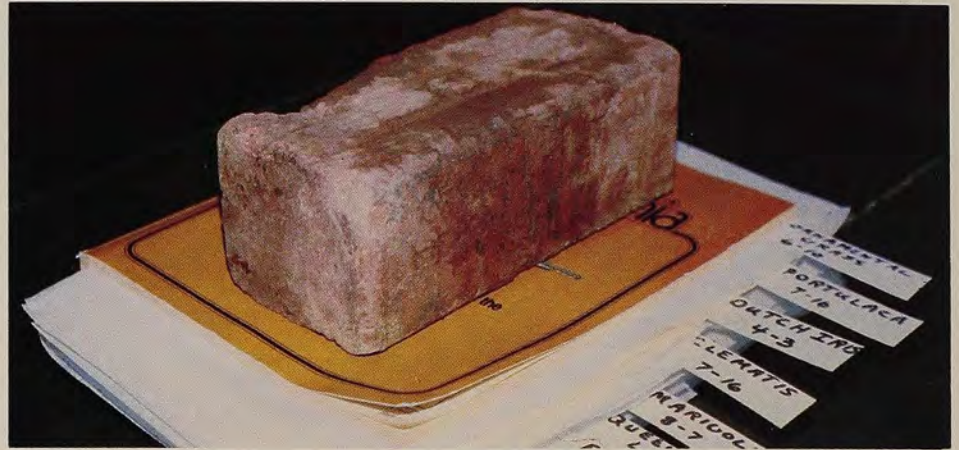
As March approaches, I know that spring is only a few weeks away, but it's a little difficult to believe when I look out my window and see the thermometer reading 28°. I keep thinking how lovely it will be when the crocus and daffodils finally poke through the soil and unfold their cheerful blossoms.

Happily, I've found an easy and creative way to avoid the winter doldrums from now on and keep my home alive with the colors of spring and summer all year long. This spring, when the earth bursts forth again in all her glory, I will begin gathering the bounty from my garden and preserving it through "pressing."

All kinds of plant material—petals, foliage, grasses and ferns—can be preserved for use in pressed flower designs. I like to frame them and hang them for display. Since the plant material is covered with glass, the design can last indefinitely. However, there are many other imaginative uses for pressed plants such as decorations on stationery, bookmarks and placemats, or in scrapbooks as memorabilia from trips and special events. Another beautiful way to display designs is on tabletops under glass. There is no end to the delightful creations you can produce if you use a bit of imagination.

This pressed flower design by Sunny O'Neil was inspired by a Flemish painting and was made with more than a dozen varieties of flowers. The simulated bunches of grapes are verbena blossoms, the vase is wood-grained contact paper rubbed with gold and the background is black felt. Ms. O'Neil has lectured and taught the art of making pressed flower pictures, dried flower arrangements and Christmas decorations for many years in Washington, D.C. She will be lecturing at the 1983 Williamsburg Garden Symposium on "White House Flowers Yesterday and Today," bringing to life stories of the past occupants of the White House and their interest in the flowers and gardens of the Executive Mansion.

A brick makes a good weight for pressing. Petals should be flat and can be removed from their flower source for better pressing results. Tab notations make finding the flower or plant part you want to work with easier. A simple design is best for beginners, and tweezers are a handy tool for arranging delicate flower parts in a design.



Photography by Janet C. Thierfelder

Any plant material that is fairly flat can be pressed successfully, provided a few simple rules are followed. You should gather your material mid-day when plants contain the least moisture. Pressing anything that is moist would result in a useless, mildewed product. Choose your material so that you have a variety of shapes, colors and textures, keeping in mind that your designs should follow the same principles as three-dimensional flower arrangements regarding variation and contrast.

Try as many different kinds of flowers and plants as you like, and with experience you will learn which ones are best suited to your purpose. You can even plan your flower garden to include your favorite "pressers." Yellow, orange and some blue flowers have good color retention, while most red and pink flowers have a tendency to turn cream-colored or brown. White petals and silver foliage such as that of dusty miller retain their light color and are especially attractive against a dark background.

It is best to start pressing as soon as possible after gathering your material so that the plants don't have a chance to wilt. However, you may want to let woody stems such as those of clematis wilt somewhat before pressing them so they are easier to manipulate into flowing, graceful lines.

The actual pressing of your plant material is a very simple process. You will need only a few supplies: blotting paper, a thick book such as an old telephone book or catalog and something fairly heavy such as a brick to provide weight. A good source of blotting paper is newspaper that has been creased to form a folder. You may wish to use toilet tissue to line the pages of your book, but avoid using the embossed type since the raised pattern will tend to mar the smoothness of petals. Paper with a matte finish, however, is essential to success. Avoid using glossy paper because it doesn't provide the needed absorbency.

Separate flowers into individual petals if possible, since large clumps and flower centers will not press successfully. You can always reconstruct a flower after it has been pressed or create fanciful new varieties of your own by combining parts of different flowers. Don't overlook the seeds contained in the centers of such flowers as marigolds. They can be used to create very interesting lines. Leaves can also be cut into imaginative shapes for use in abstract designs.

Close the plant material carefully into

the book so that everything remains flat and presses smoothly. Make sure that nothing overlaps or touches or it may be spoiled. I suggest using protruding tabs with the name of the plant contained in each group written on it so that you can see what you have later on without disturbing the pressing process. It takes from six to eight weeks for the pressing to be complete. Some types of plant material such as thin petals are dry and ready for decorative use before others such as thick leaves or woody stems, but they will not be harmed by leaving them in the press until the others are completely done. You won't be disturbing the ones that take longer this way.

Do the pressing in a warm, dry place so that moisture absorption into the material is avoided. You may become very curious to see the results of the pressing, but it is best to leave your material undisturbed for the full six- to eight-week period.

When the pressing is complete, you will be ready to start designing. I find it easiest to lay out the design completely on a piece of the background I have chosen before actually attaching any of it. It is important to realize how fragile the pressed material is. The plants will be quite brittle and lightweight and should be handled carefully. A camel hair brush and a pair of tweezers are handy as a means of moving the material about during the designing process. Be sure you work in a room which is free of drafts and insist on being undisturbed while you lay out your design.

You may have a hard time deciding how to use all the material you have pressed if your first attempt at pressing is as enthusiastic as mine was. But from experience I suggest you start simply and try to avoid overcrowding. You may want to try a small, simple, eight- by ten-inch, one-flower herbal print as a beginning project. If you choose to do something on a larger scale later on, remember to use line to direct the eye through the design. This is important as it lends interest to a flat, two-dimensional design. Observe the basic rules of balance by placing large, dark forms in the lower portion of the design and small, light-colored ones toward the top.

Matte board is a good background to use. It comes in a variety of colors and is rigid enough that no additional backing is necessary. Most fabrics can be used for backgrounds too but must be backed by a sturdy piece of cardboard. Cut the cardboard with a razor knife using the glass for the picture as a guide. Cut the fabric so that it overlaps the cardboard by an inch or so, and turn it under, making sure

it is stretched tightly over the cardboard. Clip the corners of the fabric to make it lie flat, and glue the edges to the board.

Applying the petals to the background can be a little tricky. You must use water-soluble, clear-drying white glue such as Elmer's. Use the glue sparingly and dilute it with water to make it less likely to show through delicate petals. A dab on one end of each petal is all that is needed, especially if you are making a picture, which will have glass over it to hold everything in place.

When your design is completed and ready for display, be sure to hang it in a place where it will not be exposed to direct sunlight, which causes fading.

It might be fun to try your hand at making greeting cards and notes with pressed flower designs. Since the plant material is fragile, a good way to protect it from being damaged in the mail is by covering the design with thin, plastic adhesive film. This film can be obtained in most hardware or home improvement stores. It comes on a roll with paper backing. Cut a piece slightly larger than the area you wish to cover and turn under the edge. Be sure to press it down firmly to eliminate air bubbles. A little practice may be needed before you get the knack of peeling the paper backing off while pressing down the plastic, so try it first on something you won't mind wrinkling a bit. You can purchase blank cards in gift shops or stationery stores or use any sturdy paper such as the type sold in art supply stores for ink and watercolor.

Bookmarks and placemats can be handled in much the same way. The backing can be of any material that is stiff. Yarn and ribbon can be added to the design for interest. Use the plastic film generously; don't worry about any overlap as it can easily be trimmed.

Although these items lack the permanence of pressed flower designs under glass, friends and relatives will enjoy receiving them as gifts simply because they are creative and unique.

Pressed flower designing can be very rewarding as a hobby and a great way to survive the dull days of winter. It might also become quite profitable for you, since many people would pay a generous price for an original, handmade pressed flower design. These creations also make beautiful, personalized gifts that will be cherished for years. Why not begin now? Summer blooms are at their peak. ☉

Janet C. Thierfelder is an avid gardener who is a recent graduate of Temple University's School of Horticulture.

SIDEWALK WEEDS

Plants are admired by gardeners and horticulturists for their striking appearance, their succulent fruits, their intoxicating perfumes or their exotic associations. To enjoy these qualities, plant lovers are willing to pamper, protect, train, prune, stake, nurture and pray. Plants of special horticultural interest can be compared to the Bachs and Bernhards of our society, but what about the Daniel Boones or John Waynes of the plant kingdom? Plants that endure, persist and show "true grit" are regarded as "pests." They are a major cause of gardener anxiety. On your next neighborhood stroll or morning jog admire some hardy plant pioneers that tolerate extremely harsh conditions—sidewalk weeds.

There is a handful of weedy species that not only tolerate but also thrive in the rigorous growing conditions of a sidewalk crack. Ironically, some cannot compete successfully with other plants in more amiable growing conditions, yet they are tough enough to survive and even prosper in heavily trafficked areas under the high surface heat characteristic of pavements. The growth habits of lawn and garden weeds that inhabit sidewalk cracks are generally modified to low spreading forms, and the plants may be so dwarfed that identification is difficult.

We first noticed sidewalk weeds on walks through the Purdue University campus and



Annie Lunsford

then sought out weedy sections of sidewalks in various residential areas for observation. After noticing the frequency, area and location of each weed, we collected samples for positive identification (see Table).

Three annual grasses that frequently inhabit sidewalk cracks are crabgrass, goosegrass and stinkgrass. We found the most ubiquitous to be crabgrass (*Digitaria* sp.), which, due to its ability to crowd out bluegrass, is regarded as one of the worst

lawn weeds. Goosegrass (*Eleusine indica*) is from India, as the scientific name implies, but it has made itself at home in North American farmyards, roadsides . . . and sidewalks. Stinkgrass (*Eragrostis cilianensis*) can be found in meadows, wastelands and sandy soils, and although it was not observed in the sections where we collected data, it was observed in other sidewalks. Stinkgrass, so named because of the unpleasant odor released when rubbing or breaking the stems, has flowers that appear from June to September and turn whitish with age.

Other members of the grass family struggling up through the sidewalks include foxtail grass (*Setaria* sp.), which may be normally over a foot tall in open areas but is usually dwarfed to a height of a few inches in sidewalk cracks, and fall panicum (*Panicum dichotomiflorum*), a coarse grass with a fine textured,

panicked inflorescence.

Knotweed (*Polygonum aviculare*), the second most frequently encountered sidewalk weed, is so named because of its swollen nodes—a useful identification characteristic. In sidewalks, mats spread up to 19 inches in diameter, leaves are less than one inch long, and flowers, which appear in leaf axils at the end of summer, are greenish pink. It is nicely described by Ada E. Georgia (1914, *Manual of Weeds*, Macmillan) as: "A social, almost domes-

ticated weed, seeming to thrive best where most trampled and abused, growing in thick mats along hard beaten farmyard paths, and intruding persistently in lawns and garden borders; it often fringes the stone flags of city sidewalks."

Other sidewalk weeds include purslane (*Portulaca oleracea*), a flat growing succulent with small, thick leaves; yellow wood sorrel and an occasional clover (*Trifolium* sp.). Wood sorrel, or *Oxalis*, can be differentiated from clover by distinct, heart-shaped leaves and lack of serration on the leaf margins. Plantain (*Plantago* sp.), generally regarded as a perennial lawn weed, is also occasionally encountered as a sidewalk weed. We observed one dwarfed lambsquarter (*Chenopodium album*) in a crack. Lambsquarter's young foliage can be eaten as a salad ingredient.

Creeping or prostrate spurge (*Euphorbia supina*), yet another weed associated with compacted pathways and sidewalks, resembles knotweed in its growth habit and appearance but has slightly larger leaves. It is distinguished from knotweed since it bleeds sticky white sap when stems are broken as do most members of the Euphorbiaceae. Although not found in our survey of sidewalk cracks, it was commonly observed at the edges of walks or on compacted footpaths of Purdue lawns.

Of course, the species you encounter will vary according to the area in which you look; its climate, soil and traffic patterns are just a few of the variables that will affect your findings.

Examples of persevering weeds outside of the United States include a species in

the daisy family (Compositae) that can grow between the cracks of granite blocks on walls of cathedrals and houses in Brittany. In late summer it softens the gray walls with dainty, pinkish-white flowers. The famous western wall of the Temple in Jerusalem (sometimes referred to as the "wailing wall") is also adorned with species that tolerate limited water and nutrients.

Wherever found, weeds occupy unique niches and play important ecological roles. As pioneers, weeds are the first to inhabit poor, worn out and abused soil. As they grow and die, these species provide a means by which organic matter and other nutrients can be incorporated into the upper layers of the soil. Soil aeration and structure are restored gradually through generations of habitation by weedy species, which allows other, less robust species to become established. Weeds thus are vital to the evolution of productive soil.

Like the pioneers who took root in the rough and rugged wilderness but withered in villages and towns, many weedy species can establish and even thrive in harsh growing conditions, yet they cannot compete in densely populated pastures, meadows and lawns. Perhaps an awareness of the adaptation of weeds to their environment and struggles can give us insights into our own situation. —Claire Sawyers
Dr. Jules Janick

Dr. Jules Janick is a Professor of Horticulture at Purdue University, and Claire Sawyers is a fellow in the Longwood Gardens Program in Ornamental Horticulture. She is also a free lance writer whose work has appeared in *Horticulture*.

Frequency and spread of 147 weeds observed in three stretches of pavement totalling about 500 square feet in West Lafayette, Indiana.

Common name	Scientific name	Frequency (% of total)	Average area per weed (square inches)
Crabgrass (large)	<i>Digitaria sanguinalis</i>	46.3	34.4
Knotweed	<i>Polygonum aviculare</i>	29.3	29.3
Fescue	<i>Festuca</i> sp.	6.1	30.7
Fall panicum	<i>Panicum dichotomiflorum</i>	4.1	99.8
Plantain	<i>Plantago</i> sp.	4.1	14.5
Foxtails	<i>Setaria</i> sp.	3.4	22.0
Clover	<i>Trifolium</i> sp.	2.7	6.8
Goosegrass	<i>Eleusine indica</i>	2.0	23.7
Yellow wood sorrel	<i>Oxalis europaea</i>	1.4	1.0
Lambsquarter	<i>Chenopodium album</i>	.7	28.0



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proposed site. Knowing the degree of soil moisture, soil type and shade, it is possible to select species that will thrive with little maintenance. Be aware of a goldenrod's growth habits, and select a species that will self-sow or spread without becoming a rampant pest. Planted with New England asters (*Aster novae-angliae*), goldenrod is a lovely foil to the aster's varied purple or blue blooms.

A number of desirable goldenrods can be grown from seed, but others, such as seaside goldenrod (*S. sempervirens*), can be grown from cuttings or small plants gathered in the wild. The practice of collecting plants from the wild is not something to be encouraged, yet the propagation of wild plant species is the trend for the future, so there are instances where collecting can be condoned. The most obvious instance is when construction threatens a plant's habitat and it would inevitably die. Roads, golf courses, swamp drainage and any number of other civilizing endeavors can provide the perfect opportunity for collecting species, once permission is granted.

When planning to divide plants in the wild, the optimum time to locate the species you want is, naturally, when the plants are in bloom. But even after the blooms have faded, it is possible to locate your subject with the aid of a plant guide. Once you've located your quarry, mark the name on a waterproof tag and tie this tag to the plant. After the tops have died down and the plant assumes dormancy, it can then be most safely transplanted. Should the ground freeze or the season look too short for proper root growth before winter sets in, divide in the spring before the dormancy is broken.

Although the distribution of goldenrod species will certainly vary in quantity from one area to the next, there are some cases in which sheer numbers can permit limited collecting. If this situation exists, collect the most common species with great care for the plants and their environment. If plants can be divided, leave part of the original plant in the ground. Another bit of collecting advice is, of course, to scatter your collecting efforts across an extended area so the impact is less felt.

The need for these precautions may seem unlikely, but one need only be reminded of the plight of the passenger pigeon and our American buffalo to be convinced that care is warranted.

Try one or more of the following plants

in your garden, depending upon your growing conditions.

MOIST CONDITIONS

Lance-leaved or grass-leaved goldenrod, *S. graminifolia*. From late July through September or October, the flat clusters of small flower heads appear on bushy, branching plants with long, slender leaves. Abundant along thickets and roadsides in full sun, the plants average three to four feet tall. Although lance-leaved goldenrod will thrive in dry, open soil, it seems to prefer moist, mildly acid soil. Naturalized with Joe-pye-weed and species of wild asters, it is a handsome addition to a wild garden with fertile to average soil.

Divide the mass of white roots when the plants are dormant, in spring or fall, and space roughly two feet apart with the eye at soil level. Since the slender rhizomes have a tendency to wander, with new growth shooting out at intervals along the roots, this species is an unlikely candidate for the perennial border. It self-sows sparingly and can be propagated by seed in spring.

POOR OR SANDY SOIL

Hard-leaved or prairie goldenrod, *S. rigida*. Large, flat-topped blooms appear from August to October frosts on plants one to five feet tall. With a preference for dry thickets, rocky pastures, poor meadows and sandy soil in full sun, these plants can be divided when dormant in the fall or spring. Once the fibrous root stalks are cut back, spread the roots on the soil and bury the crowns at soil level. Spaced two or more feet apart, these plants will form large clumps that can be divided every third year.

Gray or old field goldenrod, *S. nemoralis*. From July through October and sometimes into November, the slender, almost one-sided plumes of lemon- or primrose-yellow appear on one-half to two-foot-tall plants with soft, blue-gray or gray foliage. Found in dry fields and open woods, this is a common biennial that readily self-sows and is easily grown from seed.

Sweet goldenrod, *S. odora*. The small clusters of deep-gold or yellow flowers appear from July through September on slender, wandlike stems two to four feet tall. Found mainly near the coast in dry sand or sterile soil and dry open woods, the plant does not spread as rampantly as some species. Usually the scent of its crushed leaves resembles anise, a characteristic which makes identification simpler.

White or silverrod goldenrod, *S. bicolor*. The only white species of goldenrod, the small, whitish flower heads are arranged in long clusters on erect, unbranched plants one to three feet tall. From July to October, this plant blossoms in dry, open woods with acid soil. Propagated from seeds or division in the spring, this is a particularly desirable plant for any garden setting. Because it is often a biennial and moves around, an attractive stand can be a sometimes thing.

WOODLAND

Blue-stemmed goldenrod, *S. caesia*. In September, the one- to three-foot, purple-tinted stems of this plant are dotted with golden-yellow flowers in axillary clusters. Found in rich, open woodland, this graceful plant can be propagated by seed or division in spring. A useful plant for the woodland garden or wild setting, *S. caesia* prefers shade.

Stout goldenrod, *S. squarrosa*. From August through September this is one of the showiest of woodland goldenrods, with narrow clusters of yellow blooms on plants ranging from one to five feet tall. Found in clearings and rocky woodlands, it can be propagated by seed or spring division.

SEASIDE CONDITIONS

Seaside goldenrod, *S. sempervirens*. From July until frost, along marshes and in sandy soil mostly along the coast, this goldenrod grows two to five feet tall with deep-yellow flowers in large, flattened panicles. The slim, fleshy leaves are oblong and a pleasing blue-green. This is an extremely valuable species for any sunny garden, wild or cultivated. A long-lived plant with roots that don't spread, it can be propagated from seed (or small collected plants).

GENERAL CONDITIONS

Canada goldenrod, *S. canadensis*. Along roadsides, dry, open fields, damp meadows and thickets, from July through September, feathery, rich-yellow blooms appear on one- to four-foot plants. This is an adaptable, showy plant that can be divided in the spring or fall. Plant the strong, outer rhizomes about two feet apart and about one inch deep. Divide and transplant the clumps every third year for an even more spectacular show. It will self-sow in open areas. ☉

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

moyesii, with its single, deep-red flowers and scarlet, bottle-shaped hips in late summer.

Color in the spring is provided by tulips, daffodils, *Fritillaria imperialis*, double red wallflowers and the red-flowered form of the ornamental rhubarb.

Johnston took full advantage of England's temperate climate—fairly high rainfall and little snow—and made a garden that is worth seeing during any season.

Later come the flowers of herbaceous perennials, among them *Verbena* 'Lawrence Johnston' and the darker V. 'Huntsman', *Potentilla* 'Gibson's Scarlet' and *Geum* 'Mrs. Bradshaw'. Mingled with these are bedding dahlias of varying shades of red—'Bloodstone', 'Bishop of Llandaff', 'Grenadier' and 'Brigadier'.

At the top of the steps leading to the Stilt Garden are two gazebos, one on each side of the path. If the visitor looks through the left gazebo, he will face the Long Walk, a wide grass path flanked on both sides by massive hornbeam hedges. The Long Walk epitomizes Lawrence Johnston's capacity for conceiving interesting ideas and his courage in carrying out those ideas. What makes the Long Walk so effective is that it slopes gently upwards for more than a hundred yards, to a pair of gates at the garden's boundary, so that the visitor must walk all the way to see the view beyond.

Another most imaginative idea of Johnston's is the Stilt Garden itself, which stands just beyond the gazebos. It is unique in Britain and consists of two lines of clipped hornbeam trees with bare stems on each side of the path. The effect is of two long, rectangular green boxes on legs.

If the visitor turns to the left and returns toward the house, he will come across the Pillar Garden, so called because of the trim pillars of English yew, for all the world looking like accusing fingers pointing heavenward. This garden is best in early summer when the tree peonies, 'Madame Louis Henry' and 'L'Esperance', are flowering and also the delicate, clear-blue *Geranium* 'Johnston's Blue'.

Next to this garden is the nearest approximation at Hidcote of a rock garden,

the Rock Terrace, full of prostrate and creeping artemisias, acaenas and helianthemums, and for height, *Carpenteria californica*, commonly called tree anemone, and the beautiful, pineapple-scented broom, *Cytisus battandieri*.

Crossing the Long Walk the visitor comes to a cozy, sheltered garden known as Mrs. Winthrop's Garden. It must have been a pleasant spot for her to sit on sunny days, with its view of the stream and primula garden and Westonbirt woodland garden beyond. Here yellow flowers are prominent, including the lovely but unpronounceable *Paonia mlokosewitschii*. *Cordylina australis* 'Purpurea' grows in tubs in this garden in the summer.

Nearer the house are two small gardens, almost garden rooms. One is the Fuchsia Garden, where little box-edged beds house hardy fuchsias such as 'Tom Thumb', 'Lady Thumb' and *Fuchsia megellanica* 'Variegata'. This garden is surrounded by a tapestry hedge of yew, copper beech and hollies. Connected to this by brick steps is the Bathing Pool Garden, which contains a raised, circular, stone-edged pool with a fountain and a statue of a boy in the middle. From here the visitor leaves the collection of gardens that make up the formal and semi-formal garden and plunges into the controlled wilderness of the stream garden and Westonbirt.

The name Westonbirt derives from the name of a famous arboretum in south Gloucestershire. It is a woodland garden, especially picturesque in spring when *Prunus speciosa* is covered in creamy-white clouds of flowers, and in autumn, when the brooding, furry tree hydrangeas, *H. aspera* subspecies, come to the fore, and *Sorbus hupehensis* and *S. vilmorinii* bear their white and pink berries.

Down by the stream in September flowers the intriguing *Kirengeshoma palmata*. Intriguing because it is the only plant I know with a Japanese, not a Latin, name. *Ki* means yellow and *rengeshoma* is its native name. Yellow lantern flowers nod on purple-black stems over palmate leaves. Nearby *Lysichiton americanum*, more picturesquely known as skunk cabbage, flowers in the late spring.

In such a large and imaginatively designed garden not every idea can work. The placing of *Corylus maxima* 'Purpurea', *Cotinus coggygria* 'Notcutt's Variety', and *Prunus cerasifera* 'Atropurpurea', for example, close together on the steep bank of the stream, is perhaps a mis-

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DEALERS INVITED

take. Even different shades of purple can clash, and the whole strikes a discordant note. For those of us daunted by the seeming infallibility of Hidcote, the sight is a welcome one.

One tree that Johnston loved, now widely planted in England, must owe its popularity in large part to the impression gardeners have had of the stand at Hidcote. This is *Acer griseum*, a maple that doesn't mind a chalky soil. The sight of the brown, peeling bark and scarlet autumn leaves must have warmed the hearts of many visitors.

Another maple planted here, this time as a single specimen showing off the rounded dome shape that it achieves when planted singly, is *Acer pseudoplatanus* 'Brilliantissimum', with shell-pink leaves in the spring. Planted in some shade, the leaves do not scorch as they tend to do in an open, sunny position.

If the visitor follows the stream westward across the Long Walk, he will come upon the Spring Garden planted with bulbs, *Anemone blanda*, hellebores and periwinkle. From here he can reach the Rock Bank, which faces west towards the Vale of Evesham, and is given over primarily to groundcover shrubs such as *Salix lanata* 'Stuartii', *Cotoneaster adpressus* and *Juniperus chinensis* 'Pfitzeriana'.

If the visitor can still summon energy after such a bewilderment of sights and scents, he can retrace his steps and turn north of the house to the Pine Garden and Old Rose Walk. The center of the Pine Garden is a tall, stately Scots pine, around which is a border of plants that will tolerate the dry conditions—yellow helianthemums, the yellow gazania, 'Sir Francis', white *Arabis*, perennial wallflowers and *Hebe pinguifolia* 'Pagei', which has small, white flowers peeping out of sturdy, gray foliage.

Beyond is a walk of Old Roses, for Johnston had a passion for their sweet scent and fleeting, delicate flowers. Here are moss roses, Bourbons, damasks, the striped *Rosa mundi* and Rugosa roses such as 'Frau Dagmar Hastrup' and 'Blanc Double de Coubert', with their strongly fragrant flowers and rough-textured leaves. The roses are allowed to flop over the path and are underplanted with sages, santolinas and spring-flowering pulmonarias.

One of the most impressive features of Hidcote is Johnston's attention to detail. This is evident not just in the care taken in the choice and positioning of plants, but also in his choice of garden ornaments. On

the steps leading from the left-hand gazebo to the Long Walk, two lead watering cans, reputed to have belonged to Marie Antoinette, stand sentinel. On the steps to the "stage" on the Theatre lawn are two delightful stone baskets of fruit. Great care was taken also with brick paths and steps, so that the garden would have a finished, refined look.

Lawrence Johnston's philosophy of gardening was never formally articulated, and no records of planting plans remain. However, the observant visitor can make a guess as to what that philosophy was, for the garden is maintained faithfully in the Johnston spirit. It would seem to consist of this: always grow the best and strongest form and discard inferior plants; grow plants thickly so that weeds do not have a chance; keep a sharp eye out for good seedlings appearing in the garden; strive always to achieve an integrated color scheme, for plants dotted about haphazardly for the simple reason that they are beautiful are but sounding brass; never be afraid to try out new ideas, and discard them if they prove unsatisfactory; a garden is not a summer delicacy only, it is a solid joy and lasting treasure for the whole year, so use bulbs, evergreens, including topiary, winter-flowering shrubs and bedding plants, anything to add color and interest all through the year; above all, give the garden structure with hedges, walls, steps and paths—within the framework the planting can be as luxuriant and informal as you like; lastly, always give plants the best possible growing conditions and they will reward you for it.

Hidcote Bartrim lies four miles northeast of Chipping Campden and one mile east of the A46 and B4081. It is not easy to get to without a car. The garden is open from April until the end of October daily (except Tuesdays and Fridays) from 11 a.m. until 8 p.m. There is an admission fee. Next door is Kiftsgate Court, a garden famous for its old-fashioned and species roses, which is open from April until the end of September on Wednesdays, Thursdays, Sundays and Bank Holidays from 2 until 6 p.m. ☉

Ursula Buchan is a free lance writer who earned an honors degree from Cambridge University and received the Diploma of Horticulture from the Royal Botanic Gardens, Kew. Her work has been published in *Pacific Horticulture* and *The Garden*, the journal of the Royal Horticultural Society.

dow can completely block out daylight by 1985. Consider final size with care.

The only chore connected with the perennial grasses is the annual pruning of the larger types in early spring. Late March is a perfect time (here in lower New York State) to cut last year's growth to within six inches of the ground. The larger clump-forming grasses grow from the inside out and you may notice a dead area in the plant's center after a few years of growth. This is nothing to be upset about but merely a clue that the time to divide is at hand. If the grass roots are too entangled for breaking apart with a spade or fork after digging up the plant, then divide the clump with an ax. These plants are not fragile, and every spring one or more grasses in our collection must be parted with the aid of a few hefty swings with a garden ax kept solely for that purpose. This past spring my fountain grass, *Pennisetum alopecuroides*, took three swings before it split in two.

Most of the grasses prefer a fertile, well-drained soil in full sun; a few die back in the heat of summer only to start anew in early fall. They are so noted in the following descriptions.

Pampas grass, *Cortaderia selloana*, is the giant of ornamental grasses in the United States. The flowering plumes are really fantastic and have often been used as props in movies to decorate everything from Cleopatra's barge to Jean Harlow's hotel suite in those sophisticated movies of the 30's. Although they are limited to New York City and south, the northerner still can enjoy this plant by digging it up in the fall and storing it in the basement over the winter; never let the plant dry out completely. Outside the plants need full sun and a reasonably fertile soil.

Always try for the female plants as the flowers are much showier. The male flowers lack the covering of silky hairs that make the females glisten. Thompson & Morgan now offer seed of new named forms of pampas grass that have colors of pink, silvery-white and yellows.

Hakonechloa macra 'aureola' has no common name. It originally came from the mountains of Japan, and an argument still goes on as to whether it's a grass or a bamboo. It does well in a pot with adequate drainage, in a rock garden or in the well-drained soil of a garden border. Three different types of coloration are found depending on the source. They are listed by the Royal Horticultural Society's *Diction-*

ary of Gardening as *Hakonechloa macra* 'Aureola', a warm yellow with green stripes; *H. macra* 'Albo-Aurea', a white and golden-yellow variegation; *H. macra* 'Albo-Variegata', a green and white variegation. The weeping stems never reach any higher than a foot and, unfortunately for such a beautiful plant, growth is slow. In the trade these plants are listed under a variety of cultivar names.

northern winter. The individual leaves are not striped but dashed with horizontal bands of a light golden-brown. Massive clumps may be formed over the years with a true look of a dappled fountain. This particular cultivar will survive in very damp soil, making it an excellent choice for a poolside location. If any leaves sprout without the colored bands, be sure to remove them so only the variegated forms have a chance to grow.

Purple moor grass, *Molinia caerulea* 'Variegata', is a fine plant. The variegated form for gardens grows in a neat, compact mound that is useful both in the border or a large rock garden. It will accept some partial shade and a reasonable degree of dampness. The flower spikes are too small for bouquets, but on the plant they are a continuing source of interest. As the panicles unfold, they, too, are variegated and give the impression that the spikelets have been banded with a brush of light-yellow paint.

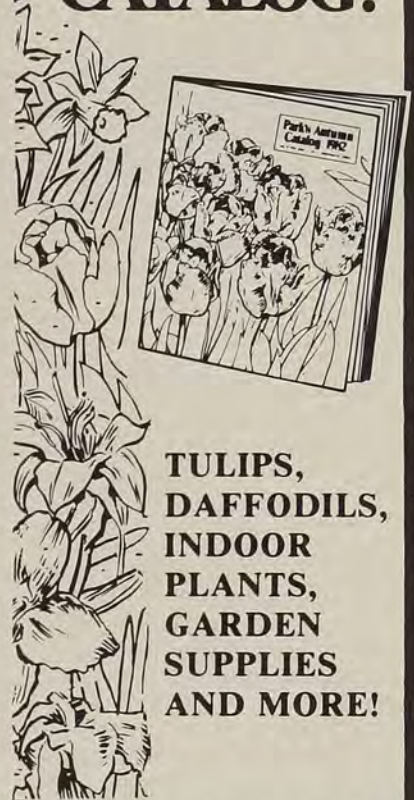
Fountain grass, *Pennisetum alopecuroides*, forms a literal fountain of leaves three to four feet in height. It is a form that shines whether set on a bank or as a specimen plant surrounded by lawn. The plant is spectacular in the morning when it sparkles with dew, and the flower spikes, like silver bottlebrushes, last well into the fall. It should be divided every three or four years when the center of the plant begins to die down.

The feather grasses, *Stipa* species, are represented by more than 100 species with long, narrow leaves and very long, single-flowered spikelets that twist and wave in the wind. A clump of *Stipa pennata* will generally be ignored by any garden visitor whether animal or human, but when the long, bearded awns unfold against an autumn sky, the sight is beautiful indeed. If grown from seed, the plant will not flower until the second year. The seed lists of the various garden societies list many different variations of this grass, because it can make its home either in the perennial border or the rock outcrop.

These are but a few of the different ornamental grasses available for gardens. Many more are just waiting to be discovered. ●

Peter Loewer is a botanical artist and scientific illustrator who writes and illustrates his own books. His latest book is *Evergreens, A Guide for Landscape, Lawn and Garden*. He is also the author of *Growing and Decorating with Grasses*.

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PRONUNCIATION GUIDE

Guide to Botanical Names in This Issue

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

i—short sound; sounds like i in “hit”
o—long sound; sounds like o in “snow”
a—long sound; sounds like a in “hay”.

Abutilon megapotamicum

ah-BEW-ti-lon meg-ah-po-TAME-i-kum

A. vitifolium a. vit-i-FO-lee-um

Acer griseum A-ser GRI-see-um

A. japonicum a. ja-PON-i-kum

A. palmatum a. pal-MAY-tum

A. platanoides a. plat-ah-no-EYE-deez

A. pseudoplatanus a. sue-do-PLAT-ah-nus

Achillea ageratum

a-KILL-ee-ah adge-er-A-tum

A. filipendulina a. fill-i-pen-dew-LINE-ah

A. millefolium a. mil-eh-FO-lee-um

A. ptarmica a. TAR-mi-ka

A. tomentosa a. toe-men-TOE-sa

Aegopodium podagraria

ee-go-PO-dee-um po-do-GRAR-ee-ah

Anemone blanda an-em-O-nee BLAN-da

Anthemis cupaniana

AN-them-is coo-pah-nee-A-na

Arabis AIR-ah-bis

Artemisia ar-tem-EEZ-ee-ah

Aster novae-angliae

ASS-ter NOV-ee ANG-glee

Berberis thunbergii

BER-ber-iss thun-BEAR-gee-eye

Bergenia ciliata

BER-gen-ee-ah sil-ee-AH-ta

Buxus microphylla var. *koreana*

BUCK-sus my-kro-FILL-ah kor-ee-A-na

Carpenteria californica

car-pen-TEAR-ee-ah kal-i-FORN-i-ka

Chaenomeles japonica

kee-NOM-el-eez ja-PON-i-ka

Chamaecyparis pisifera

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

Chenopodium album

kay-no-POE-dee-um AL-bum

Chrysanthemum frutescens

kris-AN-thee-mum fru-TESS-enz

C. parthenium c. par-THIN-ee-um

Clematis montana

CLEM-ah-tis/clem-AT-iss mon-TAN-ah

Convolvulus cneorum

con-VOL-vev-lus nee-O-rum

Cordyline australis

cor-dee-LY-nee os-TRAIL-iss

Cortaderia selloana

cor-ta-DARE-ee-ah sell-o-A-na

Corylus maxima COR-ee-lus MAX-i-ma

Corynabutilon vitifolium

cor-in-a-BEW-ti-lon vi-ti-FOL-ee-um

Cotinus coggygria ko-TY-nus ko-JY-gree-ah

Cotoneaster adpressus

ko-TOE-nee-ass-ter ad-PRESS-us

Cuphea cyanea KEW-fee-ah sy-AN-ee-ah

C. hookerana c. hook-er-A-na

C. hyssopifolia c. hiss-op-i-FO-lee-ah

C. ignea c. IG-nee-ah

C. llavea c. LAVE-ee-ah

C. micropetala c. my-cro-PET-ah-la

C. platycentra c. plat-ee-CEN-tra

C. procumbens c. pro-KUM-benz

C. X purpurea c. poor-poor-E-ah

Cyclamen hederifolium

SYKE-la-men/SICK-la-men

head-er-i-FOL-ee-um

Cytisus battandieri

si-TEE-sus ba-TAN-dee-air-ee

Davidia involucrata var. *vilmoriniana*

day-VID-ee-ah in-vol-yew-KRAY-ta vil-

more-in-i-A-na

Dianthus dy-AN-thuss

Digitaria di-ji-TAR-ee-ah

Dimorphotheca di-mor-fo-THEK-ah

Eleusine indica el-yew-SY-nee IN-di-ka

Eragrostis cilianensis

air-ah-GROSS-tiss sil-i-ah-NEN-sis

Eupatorium yew-pa-TOR-ee-um

Euphorbia supina

yew-FOR-bee-ah sue-PY-na

Felicia amelloides

fel-ISS-ee-ah ah-mell-o-EYE-deez

F. amoena f. ah-ME-na

Fritillaria imperialis

frit-ill-AY-ree-ah im-peer-ee-AYL-iss

Fuchsia magellanica var. *macrostema*

FEW-she-ah/FEW-sha madge-el-LAN-i-ka

mack-ro-STEM-ah

Geranium endressii

jer-A-nee-um en-DRESS-ee-eye

G. ibericum g. eye-BEAR-i-kum

Geum GEE-um

Hakonechloa macra

ha-ko-nee-KLO-ah MACK-ra

Hebe pinguifolia

HEE-bee pin-gui-FO-lee-ah

Helichrysum petiolatum

hell-i-CRY-sum pet-ee-o-LAY-tum

Helleborus foetidus

hell-eh-BORE-us FE-trid-us

Hemerocallis fulva

hem-er-o-KAL-iss/hem-er-OCK-a-liss

FUL-va

Hydrangea aspera

hy-DRAN-gee-ah AS-per-ah

H. integerrima h. in-teg-er-EEM-ah

Hypericum hy-PEAR-i-kum

Jasminum polyanthum

jazz-MY-num pol-ee-AN-thum

Juniperus chinensis

jew-NIP-er-us ky-NEN-sis

Kirengeshoma palmata

kir-eng-ah-SHOW-ma pall-MAY-ta

Lagerstroemia indica
la-ger-STROME-ee-ah IN-di-ka
L. speciosa l. spee-see-O-sa
Lagurus ovatus la-GUR-us o-VAY-tus
Lawsonia inermis LAW-son-ee-ah in-ER-mis
Lonicera tragophylla
lo-NISS-er-ah trag-o-FILL-ah
Lysichiton americanum
ly-si-KY-ton ah-mer-i-CAY-num
Lythrum alatum LITH-rum al-A-tum
L. flexuosum l. flex-you-O-sum
L. salicaria l. sal-i-CARE-ee-ah
L. virgatum l vir-GAY-tum
Magnolia delavayi
mag-NOL-ya del-a-VAY-eye
Mahonia lomariifolia
ma-HONE-ee-ah low-mare-ee-eye-FO-lee-ah
Mazus MAY-zus
Meconopsis dhwojii mek-i-NOP-sis DWO-ji
M. grandis m. GRAND-iss
M. X sheldonii m. SHELL-don-ee-eye
Miscanthus sacchariflorus
mis-CAN-thus sack-car-i-FLOR-us
M. sinensis m. sy-NEN-sis
Molinia caerulea
mo-LIN-ee-ah see-REW-lee-ah
Muhlenbergia schreberi
mew-len-BER-gee-ah SHREB-er-eye
Omphalodes verna om-fa-LOW-deez VER-na
Orchis maderensis OR-kiss mad-er-EN-sis

Oxalis ox-AL-iss
Paeonia mlokosewitschii
pee-OWN-ee-ah mlok-o-se-WITZ-kee-eye
Panicum dichotomiflorum
PAN-i-kum dy-ko-to-mi-FLOR-um
Pelargonium pell-ar-GO-nee-um
Pennisetum alopecuroides
pen-iss-SEE-tum al-o-pe-cure-o-EYE-deez
Plantago plan-TAY-go
Polygonum aviculare
po-LIG-o-num ah-vick-you-LAIR-ee
Portulaca oleracea
por-tew-LACK-ah o-ler-A-see-ah
Potentilla vilmoriniana
po-ten-TILL-ah vil-more-in-i-A-na
Prunus cerasifera
PRUNE-us ser-ah-SIFF-er-ah
P. speciosa p. spee-see-O-sa
P. spinosa p. spin-OSS-ah
Rosa brunonii RO-za BREW-non-ee-eye
Rosa foetida RO-za FE-tid-ah
R. moyesii r. MOYES-ee-eye
R. mundi r. MOON-dee
R. rubrifolia r. rew-bri-FO-lee-ah
Roscoea cauleoides
ROSS-co-ee-ah cawt-lee-o-EYE-deez
Salix lanata SAY-licks la-NAY-ta
S. tristis s. TRISS-tiss
Salvia guaranitica
SAL-vee-ah gar-an-i-TICK-ah

Schizophragma integrifolium
skiz-o-FRAG-ma in-teg-ri-FO-lee-um
Setaria italica
se-TEAR-ee-ah i-TAL-ka
Solanum crispum so-LAN-um KRISP-um
Solidago bicolor sol-i-DAY-go BY-col-or
S. caesia s. SEEZ-ee-ah
S. canadensis s. can-ah-DEN-sis
S. graminifolia s. gra-min-i-FO-lee-ah
S. nemoralis s. neem-o-RAY-liss
S. odora s. o-DOOR-ah
S. puberula s. pew-BEAR-yew-la
S. rigida s. RIDGE-i-da
S. sempervirens s. sem-per-VEER-enz
S. squarrosa s. squar-ROS-ah
Sorbus hupehensis
SOR-buss hew-pee-HEN-sis
S. vilmorinii s. vil-more-IN-ee-eye
Stipa pennata STY-pa pen-NAY-ta
Syringa x chinensis
sa-RING-ga chi-NEN-sis
Thuja occidentalis
THOO-ja ock-si-den-TAY-liss
Trifolium try-FO-lee-um
Verbena ver-BEE-na
Viburnum X burkwoodii
vy-BUR-num BURK-wood-ee-eye
V. macrocephalum v. mack-ro-SEFF-ah-lum
Viola cornuta
vy-O-la/vee-O-la kor-NEW-ta



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ASSESSING LAWN PROBLEMS

Lawn blemishes range from ephemeral and self-correcting to symptomatic of basic problems for which corrective help is needed. How does one judge these things?

Well, it's no "piece of cake" even for the highly trained. Indeed, should a lawn service specialist come to you confidently offering diagnosis, be a bit suspicious. A particular "disease" is often merely the *coup de grace* for lawngrass stressed by environmental factors or imbalances. Lawn pathologists are more and more coming to feel that many, if not most, of the diseases so bandied about are not the result of a pathogen alone but the interplay of many influences. During extra-curricular symposia on lawn disease during the Fourth International Turfgrass Conference in Guelph, Ontario, in 1981, it was speculated that the pathogen for which a disease has been named (such as "fusarium") might not even be involved in a particular outbreak. In the case of *Fusarium*, certainly there are as many "good" species and strains as "bad" ones, accomplishing such useful things as decomposition of thatch and maintenance of fungal balances. Microorganisms are constantly interacting within the lawn microcosm, following ecological bents still not intelligible to us. But enough for the moment about pathology.

Really, when one tries to decide what is upsetting a lawn, analysis generally becomes a matter of elimination. Obvious causes, such as physical damage from traffic, are not so hard to assess even though their subtle influences (such as lingering soil compaction) may persist for years. Key symptoms of physical injury are fairly familiar. But when a stage of "dead," brown grass is reached, causes and cures are apt to be far less evident. People generally associate browned turf with dried-out grass. More often than not, lack of water is not the problem. Additional moisture may even intensify the difficulties in certain instances.

DIAGNOSTIC SEQUENCE

Let's begin with some of the more easily diagnosed lawn afflictions. Physical scarring can be dismissed rather summarily. Familiar examples would be automobile runs onto the grass, turf scalped by the



The Japanese beetle, below, is a familiar insect pest damaging grass. The grass's water supply is cut off, above, when the beetles eat the roots. Attacked turf can usually be saved if kept from drying out. It will reroot as autumn progresses.

mower, pathways and play areas suffering repeated usage, inadvertent gouging and scuffing of any well-used yard, animal diggings, and so on. In most of these instances, a bit of sleuthing points up the culprit. The cure is obvious: restrain further incursion (as by blocking shortcuts with good landscaping and providing walk-ways), then scratch some good seed and fertilizer into the bare area or resod.

An influence that's not always appreciated is seasonal succession within the lawn community. Not everyone can achieve, nor wants, a perfect monoculture. As is characteristic of native prairies, grasses show up early in spring in most lawns, almost to the exclusion of other vegetation. They are followed as the season progresses with other species, much in the manner of summer forbs in the prairies. Bluegrass usually usurps all space in spring but retreats a bit as its normal seeding season peters out; then some broadleaf weeds and annual grasses put in an appearance. At the Lawn Institute much non-experimental turf is merely old pasture. Through the years it has been weeded enough so that broadleaf plants no longer present much of a problem. But various species are still represented. In autumn and early spring there seems to be little else than Kentucky bluegrass. Some timothy becomes obvious later in spring, and in summer nimblewil, *Muhlenbergia schreberi*, with perhaps some bentgrass patches and so on in autumn.

Not that I am advocating such a polyglot assortment over a monoculture; but it does point up that a lawn may seem to be deteriorating if one season is compared with a subsequent one, even though nothing more than seasonal progression is involved.

WEEDS ARE EASY

Because a weed looks different from a lawngrass (if it didn't you wouldn't care, and it wouldn't be a weed), it's a bother easily spotted and identified. Broadleaf weeds (dicotyledons) are generally distinguishable from grasses because the leaves are oval (at least not grass-like), with net-like rather than parallel venation. Almost all dicotyledons succumb selectively to phenoxy herbicides, gradually twisting and withering at a rate of chemical susceptibility that does not bother grass.

The phenoxy herbicides are based upon 2,4-D, but additives such as mecoprop and dicamba broaden their usefulness, helping control some species such as clover against which 2,4-D is weak. One must be a bit cautious with dicamba around ornamentals, since over-zealous application on light soil may lead to damaging pickup through the roots. All herbicides are thoroughly



tested to receive label clearance and are quite safe if applied *according to directions*. Phenoxies are biodegradable and don't accumulate residues in the soil. Indeed, no cumulative build-up has been noted with any lawn herbicides during 17 years of consistent application to the same test plots by Dr. John Jagschitz at the University of Rhode Island.

Weedy grasses that stand out in the midst of today's elegant lawn cultivars are a bit harder to control. Annual grasses such as crabgrass, goosegrass, foxtail and barnyardgrass can usually be eliminated with the preemergence preventers now so widely recommended (oeneffin, bensulide, DCPA, oxadiazon, siduron, etc.). They can also be restrained by good lawn culture—maintaining flourishing lawngrass mowed tall enough to shade and overwhelm them. If they escape preventive treatment it is still feasible to mop up most of them selectively with post-emergence chemicals such as MSMA (arsonates). Annual grass weeds are objectionable because of their abbreviated season; discoloration after frost is normal. Crabgrass and its ilk stand out as blemishes in autumn, as do some perennials such as nimblewill and southern lawngrass sprouts in northern lawns (e.g. zoysia, bermuda).

Unfortunately, it's not so easy to get rid of weedy perennial grasses. A remedy that kills the weed will likely also kill the lawngrass, so it becomes necessary to either "outgrow" the weed by encouraging the lawngrass in every way possible, or to kill back all vegetation non-selectively with a chemical such as glyphosate and then replant.

IF NOT WEAR, NOR WEEDS, WHAT THEN?

Having ruled out physical damage and weeds as cause for lawn blemishing, what remaining mishaps might be likely? Was the lawn recently fertilized, for example, and with a soluble fertilizer that could cause burn? If so, the discoloration should be in a characteristic pattern corresponding to the application. Or might spilled gasoline mark the turf, or salt or other materials be inadvertently spilled? Dog urine is chemically similar, and at certain seasons circular brown spots may show prominently where female pets have squatted. Fortunately, soluble materials are quickly dissipated by rain or by flushing with the hose. More lasting influences, from oil or a concentrated chemical, might require re-



Sod webworms are another cause for lawn blemishes during summer. Webworms live in silk-lined burrows deep in the sod and chew off grass culms at their base during the night.

placement of contaminated soil followed by reseeding. In most instances the grass revives from crowns and rhizomes, and after a few weeks damage is no longer evident.

THATCH AND WATER

Another possible cause for debilitation can be unduly heavy thatch. Thatch consists of undecomposed leaf sheaths, surface roots and other ligneous debris, as a layer just above the soil. Lawn clippings decay readily and are seldom of consequence in the build-up of thatch. Some siliceous grasses, such as zoysia and to a certain extent the fine fescues, decompose slowly. Enough thatch can accumulate to create a barrier that prevents fertilizer, even rainfall, from uniformly reaching the rootzone. Even bluegrass and perennial ryegrass thatch atop compacted soil may encourage most of the root system to grow into the thatch rather than into the ground. Should hot, dry weather then strike, the turf may brown quickly, even die out.

Normally thatch is not a problem. It is more apt to occur on intensively managed lawns where grasses grow aggressively, producing more foliage than can be recycled under prevailing conditions (decay is often slowed because microorganisms become restrained by pesticides, pH imbalances, etc.). Earthworms are noteworthy thatch consumers, and ordinarily they should not be discouraged by pesticides.

In those rare instances where thatch becomes so tight that it sheds water, mechanical thinning accompanied by irrigation is an obvious answer. Lawngrasses are usually able to survive without watering

in humid climates (i.e. most of the United States east of a line from east Texas to eastern North Dakota). With careful selection of grass and its management, it is even possible to maintain turf without irrigation in the high plains, although it will be dormant seasonally. In the arid Southwest some irrigation is essential, as it would be for conventional lawns wherever low rainfall combines with high evapotranspiration.

Drying out can turn a lawn brown with any grass anywhere. Seldom, however, is lack of water so critical as it's generally believed. In most cases a lawn established long enough to have rooted deeply will survive drought of reasonable proportions and revive again once the rains come. New, attractive, tall fescue cultivars, in the image of the famed Kentucky-31 pasture variety (which roots so deeply it withstands border state summers well), are now becoming available for the "transition zone." Built-in toughness of lawngrasses is fortunate, for most certainly water shortages and restrictions seem on the rise. In any event, applying more water is not necessarily *the* answer for a brown lawn; and unless watering is judicious it may invite further damage through waterlogging of the soil (inviting anaerobiosis, hydrophilic weeds and soil rutting or compaction).

THE MORE OBSCURE SYMPTOMS CAUSED BY PESTS

Often damage from insects or diseases looks very much like that resulting from drought. In fact, an insect could inflict "drought" when soil grubs sever the root system of lawngrasses causing irregular drying up in late summer. Here is one occasion where frequent watering may be worthwhile; with it the grass should reroot shortly and survive. In most instances, a homeowner will want to finish off soil grubs with an insecticide. Grub-infested turf lifts readily like a carpet, since there are few anchoring roots left. Fat, C-shaped larvae (of Junebugs, various chafers and Japanese beetles, particularly) can be seen writhing in the loose ground beneath dying sod. If you are quick with a sprinkling can of insecticide they should not be long for this world. New seed and a bit of fertilizer can then be easily raked into the damaged spots, incidently providing a chance to upgrade the lawngrass population with some of the new cultivars.

Sod webworm damage likewise shows up as irregular patches that might be con-

fused with drought or a disease such as fusarium. The caterpillar resides deep in the turf but can often be discovered by careful probing into severed grass foliage. The worms retreat into silk-lined tunnels far down in the sod when not active. Chinchbugs are another familiar hazard, damaging grass above-ground in open, sunny areas; the brown patches border irregularly upon adjacent green grass that is infested with the bugs. Chinchbugs are tiny sucking insects not even a quarter-inch long. They are black and white, with red spotting on the wingless nymphs.

These are only a few of the insect pests invading lawns these days; billbugs, greenbugs, *Ataenius* beetles, hyperodes weevils, scales, mites and many others are often found, too. By and large, insect blighting shows up as irregular browned patches, compared to a more definite pattern with spilled chemical or disease. In most cases natural control prevails in time, and though the grass is temporarily unsightly, it usually revives. An approved insecticide ap-

plied according to label directions should cut short an infestation. Insects are subject to predator-prey relationships. They reproduce so rapidly that they acquire immunity to certain insecticides quite quickly. So, insecticidal treatments are suggested only for serious outbreaks. One risk from insecticide use is possible elimination of predator species that could then release a population explosion of a reviving pest (or one that has acquired immunity).

The opening paragraphs of this article expressed some misgivings about lawn disease—more and more disease is thought to result from an accumulation of stresses. The average homeowner would find it impossible to use a fungicide very effectively, either to forestall or to cure turfgrass disease. Fungicides need to be applied with precision beyond his capability because he lacks sophisticated equipment. And treatment is needed more often than most homeowners are willing to undertake the task (applications every week or two for a protracted period).

Fortunately, although turfgrass diseases such as leafspot (*Helminthosporium* or *Drechslera*), dollarspot (*Sclerotinia homoeocarpa*), and fusarium (*Fusarium* spp.) are commonplace, lawns "live with" them rather well. As a matter of fact, by the time a disease is noticed a change of weather or seasonal progression has often terminated its spread. Many diseases have recognizable symptoms, for example the pinkish tone of redthread on fescue and ryegrass, the small blotches of dollarspot (which, however, can merge and devastate large areas if abundant), the sooty foliage lines of stripe smut, even the semicircles of affected grass and occasional mushrooms of fairy ring. The most practical defense against diseases is to plant lawn cultivars selected for disease tolerance. Best results come from blending or mixing several good cultivars together. ♣

—Dr. Robert Schery

Dr. Robert Schery is the Director of The Lawn Institute and is a nationally recognized turf authority, lecturer and consultant.



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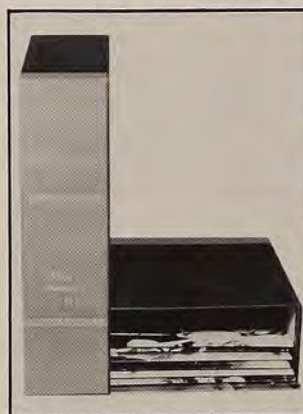


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Additional Reading—Sunny O'Neil is the author of a booklet entitled "Pressing Flowers for Lasting Beauty". To order send \$2.00 to Sunny O'Neil, 7106 River Road, Bethesda, Maryland 20034.

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