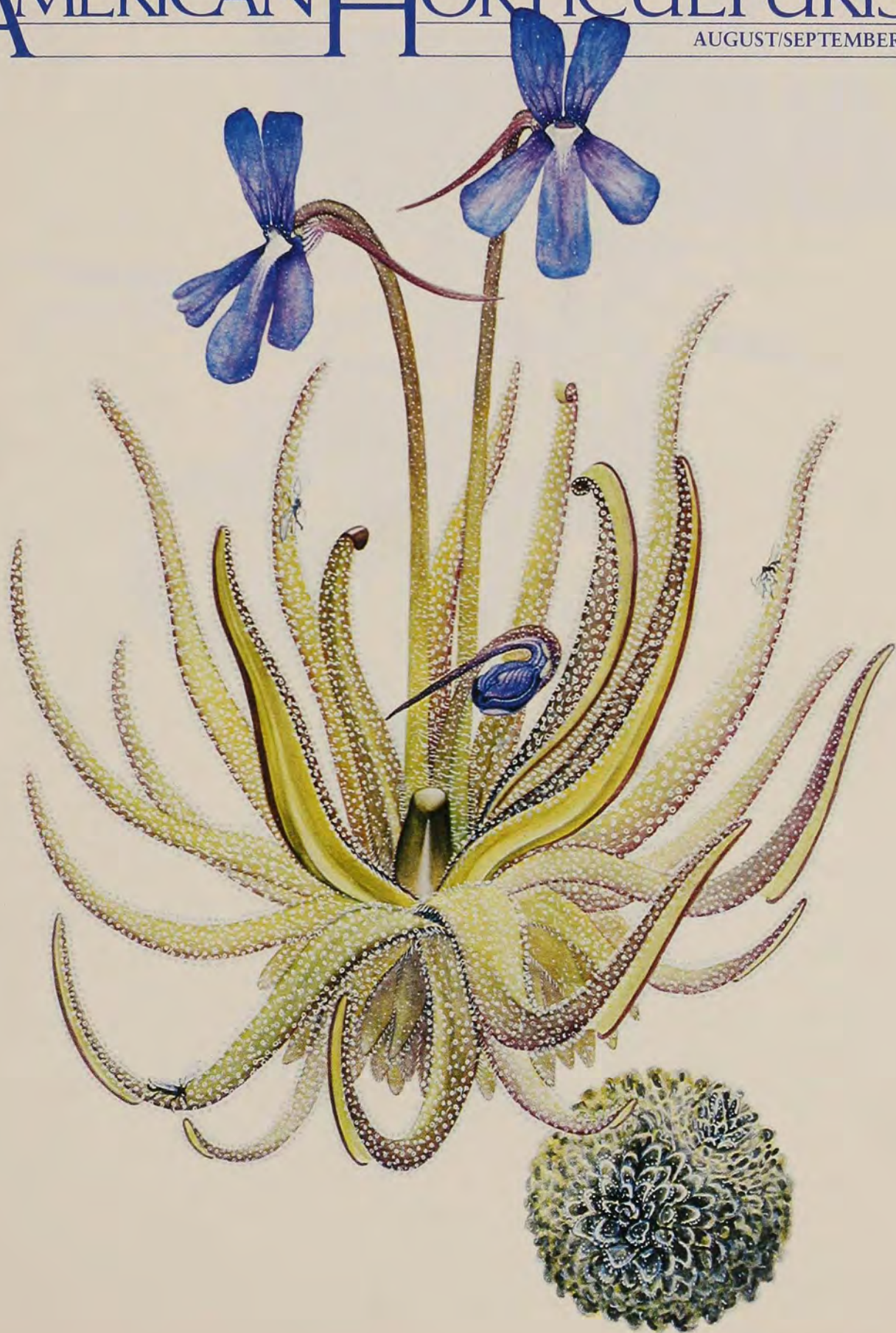


AMERICAN HORTICULTURIST

AUGUST/SEPTEMBER 1979





COMING IN THE NEXT ISSUE

Our lovely native orchids are in danger of becoming extinct, but some scientists believe tissue culture propagation can save them. Author David S. Soucy reports on work being done in this field to preserve native wildflowers like the lady's slipper for future generations. Find out which propagating methods seem to work and which ones don't. Also in the October/November issue: Martha Prince on "Bright Berries for Fall" and Elizabeth Pullar on "Old Herbals."

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ON THE COVER: *Pinguicula gypsicola* is a carnivorous plant, one of six species native to Mexico, all of which are commonly called orchid-flowered butterworts. Illustration by R. Scott Bennett. For more information about these lovely plants, turn to our story on page 29.

Celebrate the Year of the Rose in the City of Roses.



Carol Schmeidel

The American Horticultural Society Visits Portland, Oregon October 3-7, 1979

Breathtaking vistas, the snowcapped peaks of the Cascade Mountains, lush waterfalls, the sparkling reflection of sunlight on fresh, cold streams feeding into the Columbia River, lush, green countryside. This is the Willamette Valley of the Northwest. And at its center is Portland.

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Mark the dates October 3-7 on your calendar and drop us a note. We will send you details about the tour shortly. Inquiries should be addressed to Portland Congress, American Horticultural Society, Mount Vernon, Virginia 22121.



One of the things which has always fascinated me in horticulture is the variety of experiences which are open to the gardener. No matter how broad your knowledge, there is always some facet of gardening which can open new vistas. There is always some new plant to try and, with only a relatively small portion of the world's plants even known to science, not to mention the constant addition of new plants introduced into cultivation, the possibilities are practically endless.

Changes in your style of gardening are another approach. If you have had a vegetable garden, try adding a few flowers among the peas and carrots for a bright spot of color both in the garden and as potential cut flower material for the house. If your gardening is normally limited to only a few annual flowers purchased from your local garden center each spring, try adding a tomato plant or a pepper plant to the border planting. Not only will these vegetables be completely compatible, but they will add a note of interest, not to mention the joy of the harvest later in the season.

If you have had success with particular flowers or vegetables in the past, by all means repeat your successes, but try at least one new species or variety every year. Sometimes the results will be disappointing, but when you are successful and have personally made a new discovery for your garden, the resulting satisfaction is really what gardening is all about. And don't neglect house plants in the summer just because you have lots to do outside. A well grown house plant on the windowsill helps

to bring the outdoor garden into the house.

When you try something new and have either success or failure, you can go one step further and share your experience with your gardening friends—not just the people next door, but that wider group of friends who are your fellow members of the American Horticultural Society. Let them all know about your successes and your failures by dropping us a line or writing an article for *News & Views* or the *American Horticulturist*. We can't promise to publish everything, but you can be certain that your successes and failures will be read with interest and will, at the very least, guide us in giving you the kind of information you need in your society's publications. After all, this is *your* society. Take an active part in it.

You may have noticed something different about this issue. After several years with the same design format, we decided to make a few changes. We've added some columns, designed a new cover logo, and will continue to experiment, under the new editorship of Judy Powell and the art directorship of Rebecca McClimans, with even more exciting visual presentations of feature articles. In addition, we've decided to tell you a little more about our contributors than their name and address, and we will continue to include a listing of our officers and board members so that you will always be kept up-to-date about the members in leadership roles within the Society.

Our ultimate goal is to increase the size of the magazine so that we can bring you even more information about horticulture every other month. But that will take some time—and some help from you. Please send your thoughts and comments about articles which appear in the magazine to the editorial office. We may even print them—another of our objectives is to begin a regular Letters to the Editor column.

—Gilbert S. Daniels
President

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-  **Peacock Tulips** 10 for \$1.25
#5013—Showy full-open tulips. Bright colors and bold markings, striped foliage. Unusual.
-  **Giant Dutch Crocus** 12 for \$1.25
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A STEP-BY-STEP GUIDE TO FORCING BULBS INDOORS

A colorful and welcome display of bulbs is within everyone's reach. Hardy bulbs are delivered ready to flower. All they ask is proper planting, a period of winter storage and gentle forcing.

Planning for an abundance of winter color begins during the summer when the bulb catalogs begin to arrive. Consider forcing the hyacinth, narcissus and tulip, and minor bulbs like *Chionodoxa*, muscari and crocus. Order early; the first orders in are the first to be filled, resulting in delivery at the proper time in the fall. Try to place your order no later than early August so that you will receive bulbs in late September or early October.

Some time after Labor Day, begin counting pots, assembling the necessary soil ingredients and making out the labels. Then, on Columbus Day (this year it will be observed on Monday, October 8), celebrate the holiday by planting bulbs for winter bloom. By making it a habit always to plant your bulbs on Columbus Day, you will not only be assured of having plenty of time for the planting process, but you will also be able to begin the forcing process early enough to enjoy a long succession of blooms during the winter.

One qualifier is in order, however: if you live in a warm climate (Zones 8-10), order bulbs which have been specially pre-cooled for forcing. Ideally, bulbs should go through about three to four weeks of 50° F temperatures, followed by successively cooler temperatures that drop to near freezing in order to develop flower buds properly. Pre-cooled bulbs do not need this treatment. Depending on the autumn temperatures in your area, adjust your potting schedule accordingly, and follow these easy steps to enjoy colorful spring blooms all winter long.

Choose suitable containers in which to plant the bulbs. Clay containers seem preferable to plastic ones and bulb pans seem to work better than standard pots, although single hyacinths in four-inch pots do make nice gifts. A six-inch clay pan will hold five or six tulip bulbs, five or six crocuses, or three hyacinths. An eight-inch

pan will hold five narcissi or five hyacinths.

Begin by placing a curved pottery shard over the drainage hole of each pot, then add a layer of pebbles to promote better drainage. A base layer of soil comes next. A good soil mixture consists of one part soil, one part builder's sand and one part peat moss. One pint of bone meal also can be added to each bushel of soil mixture. Bone meal is slow acting and will be available to the bulbs during the forcing period later on. Moisten the soil mixture slightly to make it easier to handle.

Set the bulbs firmly in place in this base soil mixture. When planting hyacinths, be sure to place the bulbs at the outside edge of the pot with the shoulder of each bulb one-half inch below the rim of the pot. Add a center hyacinth, but plant it on a slightly raised cushion of soil. In this way, it can properly develop even though it will be growing in shade cast by its neighbors in the pot.

Plant tulip bulbs so that the flat side of the bulb faces the edge of the pot. This flat side always throws a leaf and will thus give a pretty effect to the planting. The top of the bulbs should be even with the soil level. Narcissi are planted in the same manner, with the noses of the bulbs just above the soil level, but below the pot rim. Place the bulbs about one inch apart in the pans. The soil level should never be even with the top of the pot. Unless you leave some space (about one-half inch will do), you will have no room in which to water, since the roots will grow and raise the soil level as the bulbs develop.

Thorough watering comes next. Stand the containers in several inches of water in a long tray, or a tub or sink. Leave the pans there until they are completely soaked. Do not neglect this time-consuming step, especially if you use plastic instead of clay pots. This is the last chance you will have to ensure that the bulbs get plenty of water

HOW TO FORCE BULBS



LEFT: Place bulbs in pots filled with a soil mixture consisting of one part soil, one part builder's sand and one part peat moss. Add one pint of bone meal to every bushel of soil mixture. The soil level should be one-half inch below the rim of the pot. RIGHT: Pots should be placed in trenches dug about 1½ feet deep. Line the trench with pebbles to promote drainage, then cover the pots placed on the pebble floor with builder's sand. Keep adding sand until it extends several inches above the rim of the pots. Cover the sand with soil and then add mulch after first frost.



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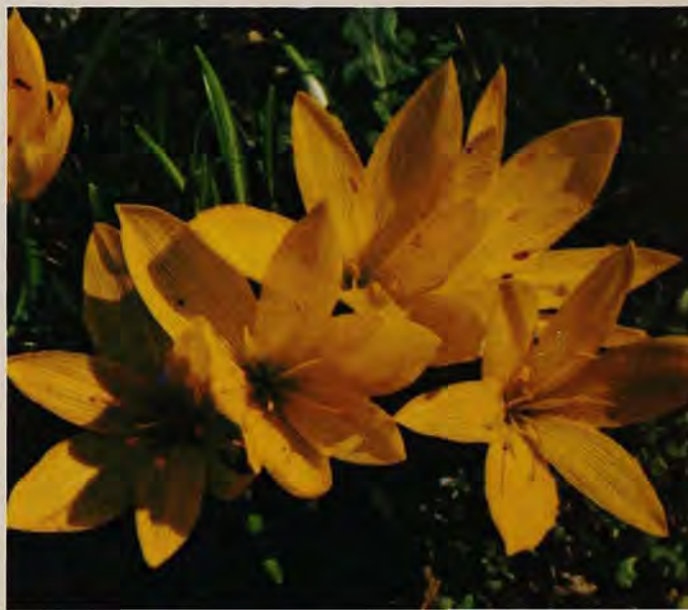
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before they are put in storage.

Next, prepare a winter storage spot. There are many methods for storing pots of bulbs, but this is the procedure I have found to be best: since I force between 30 and 35 pots each winter, I dig a trench outside in my garden 12 feet long, 18 inches deep and 2 feet wide to properly accommodate the bulb pans. Adjust the size of your trench according to the number of pots of bulbs you wish to force. Line the bottom of the trench with gravel or cinders for drainage and carefully place each pot inside the trench so that it is level. At this point, I then take a minute to draw a diagram of each pot's location in the trench so that I will be able to find the right pot quickly when I bring the bulbs back indoors during the cold of winter.

To be sure you get a succession of blooms from early February to the end of March, divide your pots into three groups, each group containing several different kinds of bulbs. Bring in one group at a time, every three weeks, beginning in January. Divide the pots into these groups as you store them and separate the groups with tall stakes extending well above ground level. Next, cover the bulbs with coarse builder's sand to a height of three to four inches over each pot. The sand serves as protective insulation and as a good indicator to go easy when digging through the other soil and mulch layers so that you will not damage a growing bulb.

Finally, add soil up to within four inches of the top of the trench. Just before the onset of cold weather, add leaves, hay, pine needles or some other suitable protective mulch, so that you can prevent the frost from going too deep into the trench soil.

If you think you might have trouble with mice eating your bulbs while they are in storage, put fine-gauge wire mesh over the sand level in the trench and delay adding mulch to the soil until the last possible moment to discourage mice from making their winter home there.

The storage period is crucial. Hardy bulbs must have a minimum of 10 to 12 weeks to root under cool conditions. The time period simulates the "winter" they would receive had the bulbs been planted in the garden outdoors in the fall to bloom in April or May.

Bring the first group of bulbs indoors during early January. Care should be taken not to disturb the sand around the foliage on top of the pot, particularly if the sand is

frozen. Allow any frost to thaw, then gently work the sand out from between the emerging shoots. Next, clean out the sand down to the surface of the soil and water the bulbs.

When the bulbs are first uncovered, the growth will be white to very pale green in color. This growth must be allowed to turn green before bringing the bulbs into full light. The comparative warmth of a cool

Plant tulip bulbs so that the flat side of the bulb faces the edge of the pot. This flat side always throws a leaf and will thus give a pretty effect to the planting.

cellar or dark, unheated hallway is a good place to begin the greening process. I put my bulbs under the cellar steps or under a greenhouse bench and leave them there for about a week after removing them from the trench. I check them daily to make sure they have plenty of moisture; at no time during this week should the bulb pans be allowed to dry out, for this will check the growth process.

When the foliage is green, bring the pans into full, but not direct, sunlight, still maintaining a cool temperature (an unheated bedroom window is an excellent choice). Also continue to keep them well watered. By keeping the plants cool and out of direct sun or artificial light once the buds begin to open, you will prolong the blooming period.

Staking will be necessary for larger narcissus cultivars like 'King Alfred'. Smaller types like 'February Gold' won't need support. All staking should be as subtle as possible, and the process should be started before the plants get too big.

You may have trouble getting the hyacinth flower stalk to elongate; the bulb may show signs of trying to open deep within the foliage. This problem can be remedied by inserting a four-inch-long cylinder of construction paper down between the leaves and over the flower bud. The bud will reach up for the light above, thus forcing the stalk to grow.

After the plants have finished blooming, the tulips and hyacinths should be dis-

carded. Although the hardy narcissus cannot be forced again, the bulbs are worth saving. Remove the seed pods and allow the foliage to ripen. Then in April or May, take the bulbs from the pot and plant the whole bulb mass outside. Scratch in a small handful of bone meal at the bottom of the hole before setting the bulbs inside. The foliage should be left attached to the bulbs until it drops off by itself. You may get some bloom the following spring, but in subsequent years the bulbs will naturalize themselves nicely.

Many bulb catalogs mark the bulb varieties most suitable for forcing, and it is best to buy only those bulbs so marked. The bulbs listed below have all been satisfactory for me.

'L'Innocence' (white), 'Delft Blue' (porcelain blue), 'Jan Bos' (crimson), 'Ann Mary' (pink) are all good hyacinth choices. Choose "second" size hyacinth bulbs. "Exhibition" or "first" size bulbs are apt to be too large for most homes.

Early tulips can come in for forcing in early January, mid-season tulips can be forced starting in mid-January and late tulips should not be forced before February 1. Among the early tulips that I have grown successfully are 'De Wet' (orange, fragrant), 'Bellona' (yellow) and 'Dr. Plesman' (red).

Mid-season tulips include 'Golden Age' (yellow), 'Paul Richter' (red), 'Rose Copeland' (pink) and 'Apricot Beauty' (salmon). Reliable late tulips include 'Charles Needham' (red), 'Corona' (yellow) and 'Princess Elizabeth' (pink).

'February Gold' is usually the first narcissus to bloom indoors for me. It is small enough not to need staking. Larger narcissi include 'King Alfred' (yellow), 'Unsurpassable' (yellow), 'Mt. Hood' (white), 'Queen of Bicolors' (yellow and white) and 'Scarlet Elegance' (yellow with an orange trumpet).

It is possible to time your blooms so that your pots will be in flower on specific dates. Allow four to five weeks for tulips to bloom if you bring the bulbs inside in January. Hyacinths and narcissi will bloom four to six weeks after they are brought inside, depending on the variety. Remember, the longer the bulbs are left in the trench, the quicker the blooming date once they are brought indoors. In bright spring weather, flowers can be expected to appear indoors in two to three weeks. ●

—Susan W. Plimpton

BOTANICAL PRONUNCIATION

Botanical names are of Latin derivation or are Latin adaptations of Greek. These names should, in the opinion of purists, be pronounced like the classical Latin of 2,000 years ago. To do so, however, is just not practical today. About 96 percent of the botanists in the United States and all other English-speaking countries of the world use the traditional English method of Latin botanical pronunciation. The English method corresponds to Latin spoken in the *third* century rather than that of the classical period (the Ciceronian and Augustan Ages, 83 B.C. to 14 A.D.).

A typical example of the clash between pronunciation using the classical method and the English method is evident in the word *dracaena*. Using the classical method, *dracaena* would be pronounced dra-KYN-uh (KYN as in *kind*). At that time, the rule was that the C was always hard (as in *come*) and the diphthong AE was pronounced AI (as in *aisle*). The English method, however, makes the C soft (as in *city*) when followed by E, I, Y, AE and OE, and the AE is pronounced EE (as in *seen*). *Dracaena* would therefore be pronounced dra-SEEN-uh.

Until recently, I held out for classical Latin pronunciation rather than pronunciation using the English method. The majority rules, however, and I have reversed my opinion. Nevertheless, I think it imperative to establish, once and for all, rules of uniformity and accuracy for pronunciation of botanical names. The American Horticultural Society is about to consider taking on this responsibility. A good first step will be to educate members. What follows are the rules of pronunciation for Latin botanical names using the traditional English method.

Consonants

C—Where C is followed by E, I, Y, AE and OE, the C is soft (as in *city*). Where C is followed by A, O, U, AU and OI, the C is hard (as in *come*).

Examples

CYCAS—first C soft (followed by Y); second C hard (followed by A); SIGH-kus. **COCCINEA**—first C hard (followed by O); third C soft (followed by I); kok-SIN-ee-uh. **COCCULUS**—first C hard (fol-

lowed by O); third C also hard (followed by U); kok-KOO-lus.

G—Where G is followed by E, I, Y, AE and OE, the G is soft (as in *gem*). Where G is



Coriandrum sativum
Cor-i-AN-drum sa-TEE-vum

followed by A, O, U, AU, and OI, the G is hard (as in *go*).

Example

GINKGO—first G soft (followed by I); second G hard (followed by O); JINK-go. **CH**—CH is always sounded like K (as in *chemist*), unless a proper name is involved.

Examples

CHAMAEDOREA—kam-ee-DOR-ee-uh or kam-ee-dor-EE-uh, but never sham-ee-DOR-ee-uh. **PACHYSANDRA**—pack-ih-SAND-ruh, never patch-ih-SAND-ruh. **SCHEFFLERA**—shef-LEER-uh. CH is soft because it pertains to a man's name, *Scheffler*.

Vowels

In classical Latin, vowels given a long sound are so indicated by the addition of a macron (a line over the vowel) and when unmarked, they are given a short sound. In botanical Latin, however, there are no macrons. Therefore, the choice of using long or short sounds is guided by the *derivation* of the botanical name.

A (long) either as in *play* or as in *plant* (depending on derivation). **A (short)** as in *vanilla*. **E (long)** as in *be* or **(short)** as in *bell*. **I (long)** as in *side* or *machine* (depending on derivation). **I (short)** as in *sit*. In species names ending with double i (second declension genitive), the first i is pronounced like the i-sound in *machine* and the second i is pronounced like the i in *side*. **O (long)** as in *note* and **O (short)** as in *not*. **U (long)** as in *rule* and **U (short)** as in *put*. **Y (long)** as in *type* and **Y (short)** as in *symbol*.

When should one use long or short sounds? To oversimplify, the rules are as follows: **Use long sounds for vowels**

- in final syllables ending with a vowel.
- in all syllables, before a vowel or diphthong.
- in penultimate (next to last) syllables before a single consonant.
- in unaccented syllables (not final) before a single consonant.

Use short sounds for vowels

- in ultima (final syllables ending in a consonant).
- in all syllables before X or any two consonants.
- in all accented, non-penultimate syllables before one or more consonants.

Diphthongs

AE (as in *Caesar*)—DRACAENA (dra-SEEN-uh).

OE (as in *foetus*)—AMOENA (a-MEEN-uh).

AU (as in *author*)—CENTAUREA (cen-TAW-ree-uh).

EU (as in *neuter*)—LEUCOTHOE (leu-COTH-oh-ee).

OI (as in *coin*)—DELTOIDES (del-TOYD-ees).

Note: OI is seldom a diphthong and is sometimes pronounced as two separate vowels.

Accents

Place the accent on the next to last syllable (the penult syllable) if the word contains three or more syllables; place the accent on the syllable which comes before the next to last syllable (the antepenult syllable) when the next to last syllable is short. Never place the accent on the last syllable. Naturally, there are some exceptions to these rules, due to common usage. Correct:

“Correctness of pronunciation must be a flexible term. It is perhaps as accurate a definition as can be made, to say that a pronunciation is correct when it is in actual use by a sufficient number of cultivated speakers.”

—Webster

sen-TAW-ree-uh (centaurea) Wrong: sen-taw-REE-uh. Correct: pitt-o-SPOR-um (pittosporum) Wrong: pit-TOS-por-um. Correct: gyp-so-PHIL-uh (gypsophila) Wrong: gyp-SOPH-il-uh.

Pronunciation—A Few Samples

- CORDYLINE TERMINALIS—(kor-dih-LINE-ee term-in-AYL-iss).
- CRASSULA ARGENTEA—(kras-SOO-la ar-JEN-tee-uh).
- GERBERA JAMESONII—(JER-ber-a jame-eh-SON-ee-eye).
- KALANCHOE BLOSSFELDIANA—(kal-an-KO-ee bloss-feld-ee-AYN-uh).
- LIRIOPE MUSCARI—(lih-RYE-oh-pee mus-KAR-eye).
- LIVISTONA CHINENSIS—(liv-is-TONE-uh chy-NEN-sis).
- PACHYSTACHYS LUTEA—(pak-ee-STAY-kiss loo-TEE-uh).
- PHOENIX ROEBELII—(FEE-nix roh-bel-EN-ee-eye).
- POLYSCIAS BALFOURIANA—(po-LISS-ee-us bal-for-ee-AYN-uh).
- SEDUM ACRE—(SEE-dum AK-ree).
- SENECIO MIKANOIDES—(seh-NEE-see-oh my-kan-ee-OYD-ees).
- VEITCHIA MERRILLII—(VEETCH-ee-uh mer-ril-EE-eye).

—Everett Conklin

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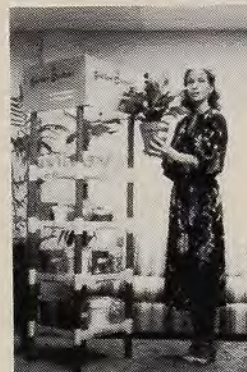
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TIPS FOR AUTUMN LAWN CARE

Autumn is the best time of year to build basic strength into a lawn that contains lawngrasses that are more efficient in cool weather rather than hot. I am talking, of course, about the so-called "cool-season" grasses, of which Kentucky bluegrass (*Poa pratensis*), perennial ryegrass (*Lolium perenne*), fine fescue (*Festuca rubra*, in several varieties) and bentgrass (*Agrostis spp.*) are the principal types. But "warm-season" lawngrasses used in the South can also benefit from judicious fertilization and weed control during the fall. These grasses include bermuda, zoysia, centipede, st. augustine and bahia.

The map on this page indicates roughly where the break between the cool-weather and warm-weather lawngrasses occurs, although local factors obviously extend any grass' zone of feasibility. For example, some portions of a southern lawn may be cool enough, due to a shady location on a north-facing slope, to be suitable for northern grass cultivars. Similarly, many homeowners in the transition region where North and South meet often settle for tall

fescue as a compromise. Tall fescue is coarse and scarcely elegant, but it is relatively maintenance free and durable in middle latitudes.

Within cool or warm zones, regional differences may also occur. In northern climates the more tender ryegrass cultivars may not survive winters in the extreme North unless they are amply protected by a snow blanket (and the snow cover can bring on its own problems—matting and snowmold). Winter comes quickly in the North, and at mountainous elevations "autumn" measures must really be undertaken before the end of summer. However, so far south as Tennessee, such measures may not be appropriate until after late September rains. But no matter where you live, the end of summer is a great time for fertilizing established lawns, starting new ones or bolstering those that are thin and in need of upgrading. Measures taken at this time of year assure good cover through winter and more rewarding turf in the year ahead. Here are a few guidelines for lawn care you can undertake in the autumn.

Planting New Grass

The least expensive way to start new grass is to plant seed, but the tedium of overseeing seedlings through their juvenile stages is avoided if you purchase sod. Southern lawngrasses, for the most part, don't come true-to-type from seed, so it's usually necessary to plant live starts from sod, plugs or sprigs if you want improved cultivars.

Whether you seed your lawn or have it sodded, a remarkable assortment of new lawngrass cultivars is available today. A number are described in more detail in the accompanying sidebar. Several together provide genetic diversification, good insurance for the non-expert. Blends (of cultivars) and mixtures (of species) are less susceptible to disease and are more adaptable to the many lawn microenvironments. Most sod growers sow bluegrass blends, while lawn seed for home use is generally a bluegrass mixture that includes some perennial ryegrass for establishing the stand quickly, and usually a bit of fine fescue for better growth in shady spots where the soil may be poor.

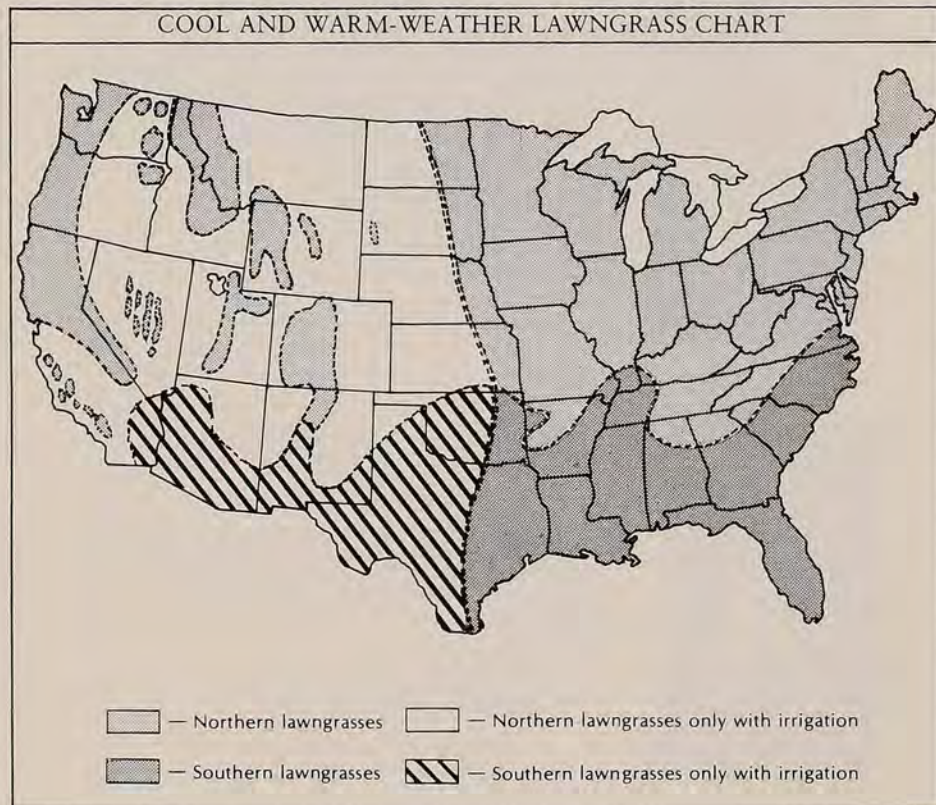
Preparing the Soil

The best soilbed is a cultivated one, whether for seed or for topping with sod. If you are plowing down an old lawn, rake out clumps of grass. It will be difficult to prepare a uniform soilbed with chunks of turf protruding, and the resulting lawn will be of erratic genetic quality. Even heavy soils cultivate nicely in autumn, dried out as they may have become from summer weather.

Whether you use a spade, rotary tiller or disc, don't overwork the soil. Grinding it to dust destroys its structure and will impede bedding-in of the seed and the intake of rain. A good soilbed should be chunky, containing aggregates about as big as one's finger tip. In this way, seeds can settle into moist crevices between chunks, nicely situated for sprouting. If you must seed in pulverized soil, rake or drag the soil after seeding so that most seed is buried at least a millimeter deep.

Almost all soilbeds benefit from a dose of fertilizer during cultivation. A complete fertilizer is generally best (phosphorus is

COOL AND WARM-WEATHER LAWN GRASS CHART



especially important for encouraging seedlings to root well). Acid soils may need liming, although lime is usually not applied at the same time as fertilizer because it may react with certain compounds to volatilize nitrogen.

Seed is most accurately distributed with a spreader. For the typical bluegrass mixture, sow two to three pounds for every 1,000 square feet of seedbed. A mulch such as clean straw, chopped twigs, evergreen boughs or woven netting helps keep the seedbed moist, and it prevents soil wash during a rain.

You don't always have to remake a "tired" lawn entirely. Improvement often can be made simply by scratching pedigreed seed into the old turf. However, fresh seed stands little chance of growing where old grass and weeds thrive, so get rid of as much old vegetation as you can before you renovate. Herbicides such as glyphosate can be used to kill old sod. Glyphosate is inactivated by soil and will not interfere with the growth of new grass. Whether or not you use a herbicide, you can mow your old lawn short before overseeding it. Scratch the then better-exposed surface with a sharp-tined rake or a powered scarifier, and sow the seed lightly in the same manner as for a cultivated seedbed. Scarification must reach mineral soil in order to provide a suitable rooting place for seedlings. Mulching may not be necessary if much old stubble remains.

Fertilizing

Equally as fundamental to the season with northern lawns is autumn fertilization. Growing conditions will be good in the months ahead. Crisp, sunny weather builds up food reserves in the absence of catabolic losses which so weaken northern grasses in the heat of summer. Moreover, because of photoperiodic response to shorter day length, grass won't grow lanky, thus easing the mowing burden in spite of fertilizer stimulation.

Choosing the right fertilizer depends upon where you live and your soil's specific needs. Grass responds strikingly to nitrogen, and nitrogen may be all you need if a soil test indicates that phosphorus and potassium levels are high. Turfgrass fertilizers are rich in nitrogen, the N-P-K (nitrogen-phosphorus-potassium) ratio typically being on the order of 3-1-1, 5-1-2 or something similar.

Potassium is reputed to improve winter hardiness and often helps repulse disease. Without a soil test indicating otherwise, it

COOL SEASON LAWN GRASSES

Dozens of new lawn grasses have been selected or bred in recent years. The sampling given is of horticultural varieties which have sought acceptance from the Lawn Institute's Variety Review Board. Included are a few older cultivars because they are especially well-adapted to a particular region, helpful for extending other more expensive cultivars in short supply, or have a time-tested image. Any such list is ephemeral, with newer selections becoming available as others drop out. Only "cool-season" cultivars from seed are listed here.

Kentucky bluegrass

This grass makes excellent sod from spreading rhizomes. It is a bit slow to establish, but it is persistent and easily maintained. Newer cultivars have been bred for resistance to commonplace diseases, low stature (much foliage remains below normal mowing height) and singular beauty (rich color, density that fights weeds, etc.). Proprietary cultivars are more costly than common grass, but the seed is of high quality, genetically certain and essentially free from contaminants. Under favorable warmth and moisture, bluegrass seed sprouts in as little as 10 days, but the seedlings take some weeks to form a tight cover. 'Adelphi', 'Bonnieblue', 'Majestic'—hybrids from select bloodlines at Rutgers University. 'Glade', 'Plush', 'Ram I', 'Touchdown'—natural standouts screened at Rutgers. 'Arboretum', 'Merion', 'Nugget'—regional specialties ('Arboretum' durable southward; 'Nugget' glamorous northward; 'Merion' the traditional standard of excellence where fusarium and stripe smut are not prevalent). 'Baron', 'Birka', 'Enmundi', 'Fylking', 'Sydsport'—meritorious European selections—vigorous, tolerant, elegant.

Perennial ryegrass

Ryegrass sprouts and establishes quickly, but does not spread by rhizomes. The newer cultivars are hardy, but they have limits of adaptability not quite so extensive as Kentucky bluegrass. Perennial ryegrass grows rapidly (it may need slightly more frequent mowing), and unselected types do not mow so neatly as does bluegrass. It is

generally best to add less than 20 percent perennial ryegrass to bluegrass seeding mixtures because ryegrasses are aggressive as seedlings. All of these select cultivars are polycrosses (seed from the interplanting of three or more clones). They are as good-looking as bluegrass. 'Blazer', 'Citation', 'Derby', 'Dasher', 'Diplomat', 'Fiesta', 'Manhattan', 'NK-200', 'Omega', 'Pennfine', 'Regal', 'Yorktown II'.

Fine fescues

Fescues are well-adapted to dry, infertile soils and shade, but on heavy soils in summer, solid stands may become patchy. Chewings types are very dense, beautiful in lawns, but spread little; creeping and spreading varieties are more rhizomatous and may be preferred for commonplace uses such as on slopes or ledges. Fescue tissues decay rather slowly, so the species tends to thatch. Fescues are most frequently used in mixture with bluegrass. Most of the noteworthy cultivars are polycrosses. 'Banner', 'Highlight', 'Koket'—attractive Chewings types; 'Ensylva', 'Ruby'—useful spreaders.

Bentgrasses

Turf bentgrasses include several species of *Agrostis*, ranging from the very fine textured velvet bent, *A. canina*, to coarse types such as redtop, *A. alba*. Most used for lawns are colonial bentgrasses, *A. tenuis*, of which 'Highland', a natural eco-type from Oregon, is the dominant cultivar. The elegant creeping bentgrasses, *A. palustris*, require more care than do the colonial types, and are mostly used for golf greens. 'Emerald' and 'Prominent' are two examples. Bents are well adapted to low mowing, moist climates and acid soils.

Rough bluegrass

Poa trivialis does well in moist shade. The species is elegant but is not durable under heavy wear. 'Sabre', a Rutgers selection, is about the only improved cultivar available.



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SEASONABLE REMINDERS CONT'D

is well to use a complete fertilizer containing all three nutrients. In some locations, the addition of sulphur, gypsum or dolomitic lime will help. The ultimate aim is nutrient balance, with special emphasis on nitrogen in order to grow a leafy crop like grass.

Bluegrass lawns are usually fertilized from late September into early November. It is the usual practice to apply no more than one pound of nitrogen per 1,000 square feet of turf at a time. However, at the Lawn Institute, we have had no difficulty from a single application at double rate. Some advisories emphasizing autumn feeding call for two separate applications a few weeks apart at a one-pound rate, and only a half-rate booster application in late spring.

General fertilization in hot weather *does* encourage certain diseases on common grass, but the newer cultivars are selected for their disease tolerance and probably will not be affected by heavy feeding. A lawn's need for fertilizer usually depends on such factors as: the natural fertility of the soil, whether or not the lawn is irrigated, whether or not clippings are collected, and whether or not the homeowner wants a deeply-colored, ever-growing turf.

Weed Control

While crabgrass, knotweed and milky spurge may be finishing up in autumn, other dicots such as dandelion and chickweed are just beginning their annual cycle. They form tiny rosettes that go all but unnoticed until they expand and flower in spring. I have had good luck getting rid of dandelions as late as early December in Ohio by spraying the lawn with selective broadleaf weed killers such as 2,4-D amplified with dicamba. October treatments might be more practical and seem to fare better than ones begun in September (apparently some dandelions still sprout after treatment that early). Other pesty winter annuals like veronica and various crucifers, and perennials such as heal-all, wild carrot, rushes or even plantains and ground ivy, can also be eliminated with proper treatment.

Thatch

Thatch has become something of a cause célèbre. Actually, for home lawns, the threat is exaggerated. The reasons for excessive thatch are involved, but they add up to topgrowth accumulating faster than it decomposes. Lignified tissues build up (often centimeters thick) and may prevent fertilizer, even water, from uniformly

reaching the grass rootzone. This can intensify if "friendly" organisms which cause decay are stifled by insecticides and fungicides, or if conditions conducive to decay are lacking. Then mechanical removal of thatch may be advisable, and autumn is a good time to carry it out since the scars of the operation heal quickly and weed incursion is limited. Thatch won't disappear simply by removal of clippings when you mow. Clippings are succulent and decompose quickly, in the process recycling the nutrients they contain.

In lieu of a strong right arm on the handle of a sharp rake, dethatching machines—variously called power rakes, scarifiers, thinners, etc.—are usually used to remove thatch. Unbelievable amounts of thatch can be combed out of even a mildly thatched lawn. But remember that relief is only temporary unless conditions causing thatch accumulation are corrected. Be wary of the biological products promising to dethatch a lawn. Tests in various parts of the country show these additives to be only occasionally effective.

Soil Grubs

Soil grubs (larvae of several beetles and chafers) are sometimes a problem peculiar to autumn. By then they have grown large enough and voracious enough to consume grass roots quite close to the surface. During dry weather, the sod, unanchored by deep roots, peels back easily and often hordes of the grubs are exposed. Soon the grubs will bury more deeply to escape the cold. If the grass is kept moist, it will usually reroot and survive. Grubs usually can be killed by soaking the sod with an *approved* insecticide (longer-lasting insecticides especially suitable for soil treatments have been banned because they are not sufficiently biodegradable). If the turf is of dubious value, this may be the time to rake the loose sod aside, apply insecticide (a watering can suffices), and reseed as if you are sowing a new lawn. Include some fast-establishing perennial ryegrasses in the seed mixture to ensure quick growth, since grub damage is often not apparent until seeding season is well advanced.

Mowing

I see no reason to reset the lawn mower to a lower height in autumn; grass mowed three to seven cm. tall is not likely to flop over and mat under snow. Also, the more green foliage retained, the better will be the grass' food-making capability and resistance to weeds.

—Dr. Robert Schery

CONTRIBUTORS

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Everett Conklin is President of the Everett Conklin Companies International, Interior Landscape Contractors and Flower Show Producers. He is past president of the New Jersey State Florists' Association, is a member of the board of the American Horticultural Society and is Program Advisor to the United States Department of Agriculture. He also is currently serving as a horticultural advisor to the 1980 Winter Olympics.

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Dr. Robert W. Schery is the Director of the Lawn Institute and is a nationally recognized turf authority, lecturer and consultant. He is the author or co-author of such books as *A Perfect Lawn*, *The Lawn Book* and *Lawn Keeping* (Prentice-Hall, \$5.95 paperback), which contains a more complete discussion of lawn care tips mentioned in his article on page 00. Dr. Schery is a member of the American Association for the Advancement of Science, the American Horticultural Society and other professional organizations. He has been an officer and on the Board of Governors of the Nature Conservancy.

The Editorial Staff of *American Horticulturist* welcomes your questions and comments about articles which appear in this issue. Please send letters to The Editor, *American Horticulturist*, The American Horticultural Society, Mount Vernon, Virginia 22121.



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Grandmother's Garden

BY MARTHA PRINCE

Though many of the plants and flowers are gone, the memories never fade.

The old house still sits comfortably on its Georgia hilltop, dreaming of times past. It is huge and grey and boxlike, surrounded by porches to hide it from the high southern sun. I wish I could photograph a memory and show you Grandmother's garden as it used to be. I own the place now, but a few short visits each year scarcely allow time for gardening. A caretaker clips the hedges and mows the lawns; that's all. Long years ago the flower gardens vanished. I'd love to revive the past someday. Enough remains for me to remember the way it used to be—and try.

As a little girl I knew the woodland sheltering us from the street as an open slope, carpeted with violets. Now it is a jungle. No trace remains of the rose garden or of the vegetable garden. The "skeleton," or framework, still exists, of course. A long, winding drive sweeps up the hill and makes a formal circle before the house and its twin curves of English box (*Buxus sempervirens* 'Suffruticosa'). Brick paths are buried under bermuda grass. The tennis court (a clay one) is now a mowed rectangle of weeds. The huge oaks (*Quercus prinus*) are still there, even the one which held my tree-house. So, too, is the quarter-circle of crape myrtle which gives a foreground to the blue of "our mountain." If you are a southerner, you know this lovely shrub-tree—a multi-trunked plant with beautiful exfoliating bark and showy flower heads of crushed crepe paper pink. (Ours are not named forms; the circle is of "watermelon pink," and one lone plant near the house is white.) Botanically, it is *Lagerstroemia indica*, and, though of Chinese origin, it is as "Southern" as cornbread. The house has 10 acres of land, with beautiful views of the Blue Ridge, and I feel that there is enough space for me to both renew the dearly remembered past and build our own wildflower and rhododendron garden.



Come join me in a once-upon-a-time garden tour, through childish eyes. Colonial gardens, such as those in Williamsburg, exist in restorations, but perhaps your memories, like mine, are of the in-between time, which is just “old-fashioned” and not fashionable.

First, I must introduce you to Grandmother. She was a charming, intellectual, white-haired woman with a soft voice and a firm but gentle sense of discipline. Her grandchildren all adored her. I remember her most clearly in a wide-brimmed straw gardening hat, flower basket on one arm and clippers in hand. The design of the garden was entirely hers (as was most of the work, although she had one rather inept gardener). She began her beautiful project at about the turn of the century. It was a happy garden, with flowers to pick, even for small hands. I never *once* remember seeing the dining table without a lovingly-arranged centerpiece. We had room to play hide-and-seek, trees to climb and space for chasing “lightning bugs” (fireflies to you) in the summer evenings. I imagine the songs of mockingbirds and whip-poor-wills when I think of “home.” Katydid and their nightly conversations, here on Long Island, send me back in time.

I'll begin our flower tour with the porch. On the lower floor it wrapped the house completely, 25 times around equalling a mile (an important childhood statistic). On the upper floor, it only crossed the front. Southern porches are for shade, and that means vines. In May the east side of the house was a fragrant waterfall of lavender wisteria (some nameless form of *Wisteria floribunda*, the Japanese wisteria). It may be against all architectural advice, but the vines twist and twine among the Victorian gingerbread and spill flowers to the ground. For two other areas the shade is provided by trumpet vines (*Campsis radicans*). The brilliant orange tubes are a guarantee of ruby-throated hummingbirds all summer long. Even when I was a child the vine trunks were huge—I'd guess six inches in diameter—and probably help today to hold up the house. They were certainly sturdy enough for climbing on; I remember one summer night when a whole troop of my cousins and I “escaped” down the trumpet vine ladder and went looking for ghosts in the cemetery. The other vine is clematis, the wild virgin's bower (*Clematis virginiana*). Somewhere there is a snapshot of my sister and me, ages three and five, standing before the white cascade. If you want to guess how long ago that was, I'll tell you we were wearing “rompers.” Remember those? Grandmother probably gave her most

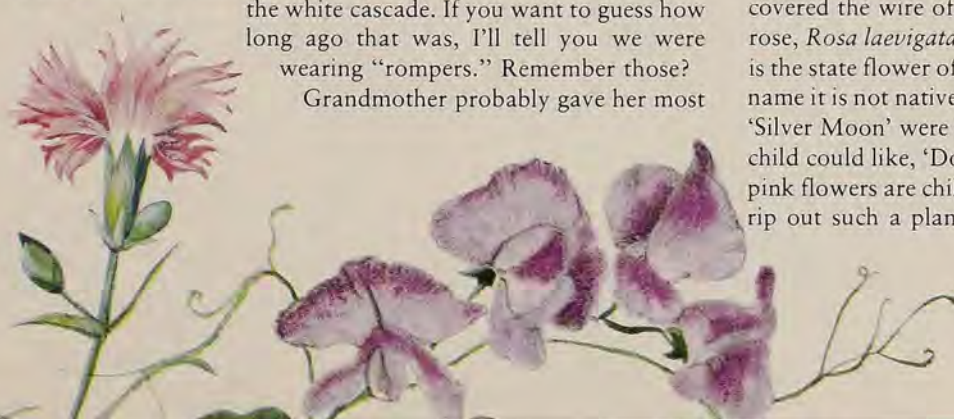
tender care to her roses. I know exactly where the rose bed was, but I can only estimate its size. Perhaps it was a quarter of an acre altogether, in a long, ten-foot-wide curve fronting the pink crape myrtles. I remember so well the round, fat and fragrant cabbage roses (*Rosa centifolia*, or rose-of-a-hundred-petals). The variety *R. muscosa* is the moss rose, because of the strange mossy covering of the calyx and the pedicels (the glands became elongated). I liked that best. There were damask roses, too (*R. damascena*), for centuries the source of attar of roses. Among others she had the variety ‘Versicolor’, which is known as the York-and-Lancaster Rose, being red *and* white (I'd call it pink and white). Redouté, the greatest painter of roses who ever lived, labels his painting of it *Rosa variegata*.

I may sound too knowledgeable for a little girl; it was Grandmother's caring, much more than mine. She had been a high school teacher in Atlanta in the 1870's, and she mixed Latin, poetry and history with the colors and fragrances of her garden. *Rosa gallica* ‘Officinalis’ was the Red Rose of Lancaster, and *R. X alba* ‘Simplena’ the White Rose of York. I remember the words from Shakespeare's *Henry VI Part I*, Act II, Scene IV: WARWICK: “*Shall send, between the red rose and the white, A thousand souls to death and deadly night.*”

Do you think “talking to flowers” is rather new? Grandmother talked to roses. One area of the rose garden was solely for the favorite roses of old friends (gifts from them, usually). The names were changed to those of the friends who donated them. Here were the Tea Roses, the Noisettes, the Hybrid Perpetuals. I often did not know the original names; for instance, ‘Prince Camille de Rohan’, a lovely deep red, masqueraded as *Miss Pond*! The white form of ‘Maman Cochet’ became Annie Camak. The garden was not all of the great “old” roses. The “new” ones she grew may be out-of-fashion, but *now*, not then. ‘American Beauty’, in name at least, is such a part of our daily vocabulary that I was surprised to find it no longer listed in any catalogue I have. I did not know it as ‘American Beauty’, anyway; it went by the improbable name of Mr. Billups Phinzy. That could be from a page of Dickens, but Mr. Phinzy was some dear old gentleman who died before I was born. I also feel nostalgic when I see ‘Pink Radiance’ (alias Mrs. Davant).

A few roses were not in the rose garden; ramblers or climbers covered the wire of the tennis court's backstop. The single white rose, *Rosa laevigata*, is so common in old southern gardens that it is the state flower of Georgia (as the Cherokee Rose). In spite of its name it is not native; it is Chinese. The species itself and its hybrid ‘Silver Moon’ were intertwined with an old rambler no one but a child could like, ‘Dorothy Perkins’. The clusters of small, double-pink flowers are child size. I loved them. I'm sure a rosarian would rip out such a plant today. To me, age six or so, a bouquet of ‘Dorothy Perkins’ and field daisies, stuck clumsily into a paper-lace doily, seemed *the* perfect tribute to my dear Grandmother.

Illustration by Author



One area of the rose garden was solely for the favorite roses of old friends (gifts from them, usually). The names were changed to those of the friends who donated them; for instance, 'Prince Camille de Rohan', a lovely deep red, masqueraded as Miss Pond!

The rose garden was more to us than its temporary beauty and fragrance each summer. The children (well, the girls, anyway) would take the sweetest of the roses and carefully spread the petals on old newspapers to dry in the sun. One end of the upstairs porch was reserved for this. After drying they went into Mason jars, in alternate layers with salt (a dessicant, I presume). At summer's end we cut saucer-sized circles of organdy or batiste, piled petals in the center and made small be-ribboned bundles, as sachet (great for giving aunts and teachers at Christmas).

The most delicious one of all the uses for the rose was a marvelous specialty of Grandmother's. She made a white cake (flavored with rose water) for anniversaries and birthdays. Real roses, crystallized and edible, topped the ethereal confection. The recipe called for 14 egg whites, and it is still spoken of with awe.

I will move on to some of the shrubs which intrigued a little girl. Snow is not a rarity in our part of Georgia, but the high sun melts it quickly. I only remember one snowman. Perhaps the name snowball bush helped endear *Viburnum macrocephalum* to me. A whole bush-full of snowballs could only be a child's pleasure. Then, bridalwreath (*Spiraea prunifolia*). I do indeed have a small photograph of me wearing a wreath of the pretty white blossoms in my hair and grinning mischievously. A little boy named Edward had just formally asked my father for my hand in marriage.

Near the east porch was a circular bed of pink hibiscus. Knowing the climate, they cannot have been the exotic hibiscus. I must assume they were *Hibiscus moscheutos* or *H. grandiflorus*, or at least one of our native rose mallows. However, the location seems improbable. A sunny hillside at 1,800 feet is not a marsh! Also, they were not as tall as the listed height of either of these (three to four feet). They were waist-high to a little girl. Perhaps a reader can suggest the species?

Very early spring meant daffodils. I have a snapshot of me (age four or five) seated before a mass of them, holding my pet rabbit, Woozle, and wearing a sunbonnet. Grandmother's daffodils were *Narcissus pseudonarcissus*. This is the native European daffodil, small, bright and early. It is the daffodil of England's beautiful Lake Country, and of Wordsworth's poem. A "host of golden daffodils" scarcely describes the profusion! There are thousands upon thousands of them, scattered along the old paths, intruding into the lawns and sprinkled gaily through the woodlands.



Other small flowers appealed to the child in me. Clove pinks (*Dianthus caryophyllus*, the same species from which evolved the florist's carnation) were especially "mine." They are the gillyflower of Elizabethan England. I would lie on my tummy with my nose in the fragrant, shaggy flowers. Somehow I mixed up my spices (not being much of a cook, except of mud pies). I called them cinnamon pinks . . . and, I'm afraid, I still do. It was sufficient to me that the aroma had to do with spice cake.

Another favorite was four-o'clocks (*Mirabilis jalapa*). These are really perennials, but cannot be treated so in non-tropical climates (unless you treat them as you would dahlias—lift the tuberous roots in autumn and store). Obeying their name, four-o'clocks open in the late afternoon and are worth sitting and watching. Bright tubular blossoms in white, yellow or red "awake" before your eyes.

The other "small" flowers I must mention are sweet peas (*Lathyrus odoratus*). My memory of them is not so much in the garden (they were in Grandmother's cutting bed) but in vases in the house. Sweet peas everywhere! Dining room, parlor, library, front hall.

I could write for weeks! There were so many plants to love, so much botanical exploring to do. Though Grandmother died years ago, she left a legacy to all who knew her. I was only 10 when she died, but my joy in her flowers lives on. It would be my only hope to convey some of the charm of her long-ago garden to others. She would have liked that. ❶



DAYLILIES

TEXT BY LORRAINE MARSHALL BURGESS

PHOTOGRAPHS BY GUY BURGESS

The stalwart daylily, *Hemerocallis*, has finally come into its own. Once considered little more than a durable, weedlike plant, this robust perennial has been carefully developed by hybridizers and is now available in new shapes and hues that can bring excitement to your garden. The lemon lily, *H. flava*, is a colonial import still loved by many for its small but crisp yellow blooms and sweet fragrance. The tawny lily, *H. fulva*, has long since escaped from home gardens to grow wild on roadsides in our eastern states.

The excitement in daylilies today springs from hybrids achieved by cross-pollination from *H. flava* and *H. fulva* and four or five other species. *Hemerocallis* is now truly as beautiful, daily, as its scientific name implies.

Daylilies, which have a blooming sequence of four to six weeks, are special because they produce a new flower each day, on each flower scape. Now, with the development of early and late, and tall and dwarf varieties, the flowering period has been expanded from July and part of August, to a May-to-September display.

Fortunately, daylilies are easy to care for and can be cultivated in every state in the union. As a side benefit, they can be set in the

ground in any season, whenever the soil is warm enough to be worked. By the second year, new plants establish themselves and give profuse bloom.

If you provide sandy loam soil and normal moisture, the plants will multiply quickly, enabling you to increase your stock by propagation at no cost. Increase is by three methods: root division, cultivation of side shoot cuttings, or by seed. A fourth method, a bit unusual, involves lifting an entire clump of lilies, slicing off the old, bottom roots under new growth and returning the clump to its original location. Then the clipped roots are propagated in moist sand and peat.

Brilliant varieties of red and near-purple can be grown with sweet William, pink geraniums and boldly-marked coleus. Paler pink and golden-yellow strains will look well in the company of iris, peonies, baby's breath (*Gypsophila*) and sweet rocket (*Hesperis*). With its extended blooming range, the daylily can be accented by rudbeckia, achillea and veronica in midsummer and mums, physostegia and

RIGHT: 'Dorothy McDade' daylilies with monarda, pink and magenta phlox and golden groundsel. FOLLOWING PAGE: 'Raspberry Ribbon', a delightful combination of exciting color, stripes and ruffles.









hardy asters in the fall.

While the daylilies are young and small, add marigolds, snapdragons and cleome seedlings to assure fullness. But aim for a self-sustaining perennial display. The yearly addition of annuals is costly and requires extra care.

Locate light-colored daylilies where the sun will reach them most of the day. However, strongly-hued hybrids will be less likely to fade if given afternoon shade. Dramatize their silhouettes by planting daylilies in graceful clusters against an evergreen backdrop or against the blue sky on a hillside slope.

Because of their vigorous growth, daylilies need to be divided every three or four years. Lift and separate after blooming. Use two spading forks, pushing outward, to undo a large clump. If roots are deeply tangled, flush the roots apart with a garden hose.

Replant daylilies in rich, freshly dug soil, spreading the roots over small mounds of earth. Then cover all the plants to one inch above the crown. Plant dwarf varieties 18 inches apart, medium and tall strains 24 inches apart. Later, if growth lags, top-dress the area with rotted manure and bone meal.

Fortunately, daylilies are almost disease-free. Their strong stems need no staking. Their graceful foliage remains bright green through summer, and then it dries to golden brown to serve as an attractive cushion mulch for winter root protection.

Other *Hemerocallis* species include *H. dumortieri*, dwarf, in spring; *H. altissima*, tall yellow in May and June; *H. aurantiaca*, orange in June and

July; *H. middendorffii*, dwarf, lemon-scented in July; *H. citrina*, citron in June and July; and *H. thunbergii*, Japanese. The last two are night-blooming and fragrant.

When shopping for the new varieties, look for wide, overlapping petals, frilled and crinkled edging, ruffled petals and flaring, chalice or bell-like forms.

Daylily colors range from ivory through yellow and pink, to red, maroon and deep purple. Some flowers are striped, others bicolor with golden throats. To keep hybrids true to color, don't let them go to seed. Some varieties are day and night bloomers. Others do not fade until well into evening.

To create your own hybrids, brush the pollen from the stamens of one of your favorite flowers against the stigma of another. Work early in the day while the pollen is fresh. Then remove the stamens from the flower you just pollinated and cover the flower with a plastic bag so bees and other insects will not contaminate your cross. Tag each attempt with the names or colors of the flowers involved.

Harvest the ripened seed capsules as soon as they begin to open and plant the seeds directly in loose, porous soil for best germination. Feed with liquid fertilizer during the early growing period. Transplant to a permanent location the second year and await your first hybrid creations.

Buy daylilies from local nursery centers or from reputable mail-order houses. Look for 'Applause', a cardinal red with a greenish throat; 'Big World', a very large apricot; 'Baronii', a night-blooming citron, and 'Pink Damask' from England; 'Tijuana', a rose-red with yellow center; 'Venetian Sun', a deep



tangerine; 'Enchanted Hour', a melon pink; 'Evelyn Claar', a salmon-pink; 'Temple Bells', pale pink to orange-gold throat, and 'Royal Clipper', a huge rose-pink. Recommended suppliers are: Wayside Gardens, Hodges, SC 29695; White Flower Farm, Litchfield, CT 06759; Jackson and Perkins, Medford, OR 97501; W. Atlee Burpee Co., Warminster, PA 18991, Clinton, IA 52732, and Riverside, CA 92502; George W. Park Seed Co., Inc., P.O. Box 31, Greenwood, SC 29647; Gilbert H. Wild & Son, Inc., Sarcouxie, MO 64862. ●

ABOVE: Old-fashioned lemon lily, *Hemerocallis flava*. RIGHT: 'Missouri Miss' in peach and orange-gold has desirable daylily attributes: ruffled and overlapping petals highlighted by a center stripe.



Gerberas For the Window Garden

BY GAIL GIBSON

The gerbera, or African daisy, has long been popular with gardeners in warm regions of this country. It is an excellent plant for gardeners living anywhere in the mid-South, but Californians just as enthusiastically grow and hybridize it.

A native of Transvaal and Natal, there are perhaps as many as 70 *Gerbera* species, but only *Gerbera jamesonii* is cultivated.

Hybrids of this species are prized everywhere they are grown for their exquisite, long-lasting flowers, available today in a subtle range of colors from white to pink, rose to red, yellow-orange to scarlet and even lavender. There are single forms, elegant in their simplicity; duplex forms, with a double layer of petals, still single in appearance; florist singles with shorter, wider petals; light and wispy double forms; and "crested" doubles with shorter, many-layered petals in the center.

Florists in the North sell these subtly-colored, long-stemmed "daisies" at a high price, and because gerberas will last a week after cutting, flower arrangers have been willing to pay dearly for them.

I live in the North, but I cannot content myself merely with buying the cut blossoms. Unfortunately, I do not have a proper greenhouse in which to nurture the frost-tender plants during harsh winters, so I have a collection of gerbera plants growing in eight-inch pots in my window.

Gerberas require full sun (a southern or southwestern exposure is best) and a cool winter temperature of around 50°F. The crown of their rosette of leaves must be placed above soil level to prevent rotting. Otherwise, gerberas are not temperamental. Provide a deep pot to accommodate the vigorous roots and a rich and porous soil that is neutral to alkaline (I mix equal parts commercial potting soil, sand and milled sphagnum moss with one tablespoon of



Photographs by Carol Schmeidel



bone meal per pot). Give them ample water to prevent wilting, but do not let water stand near the rosette base.

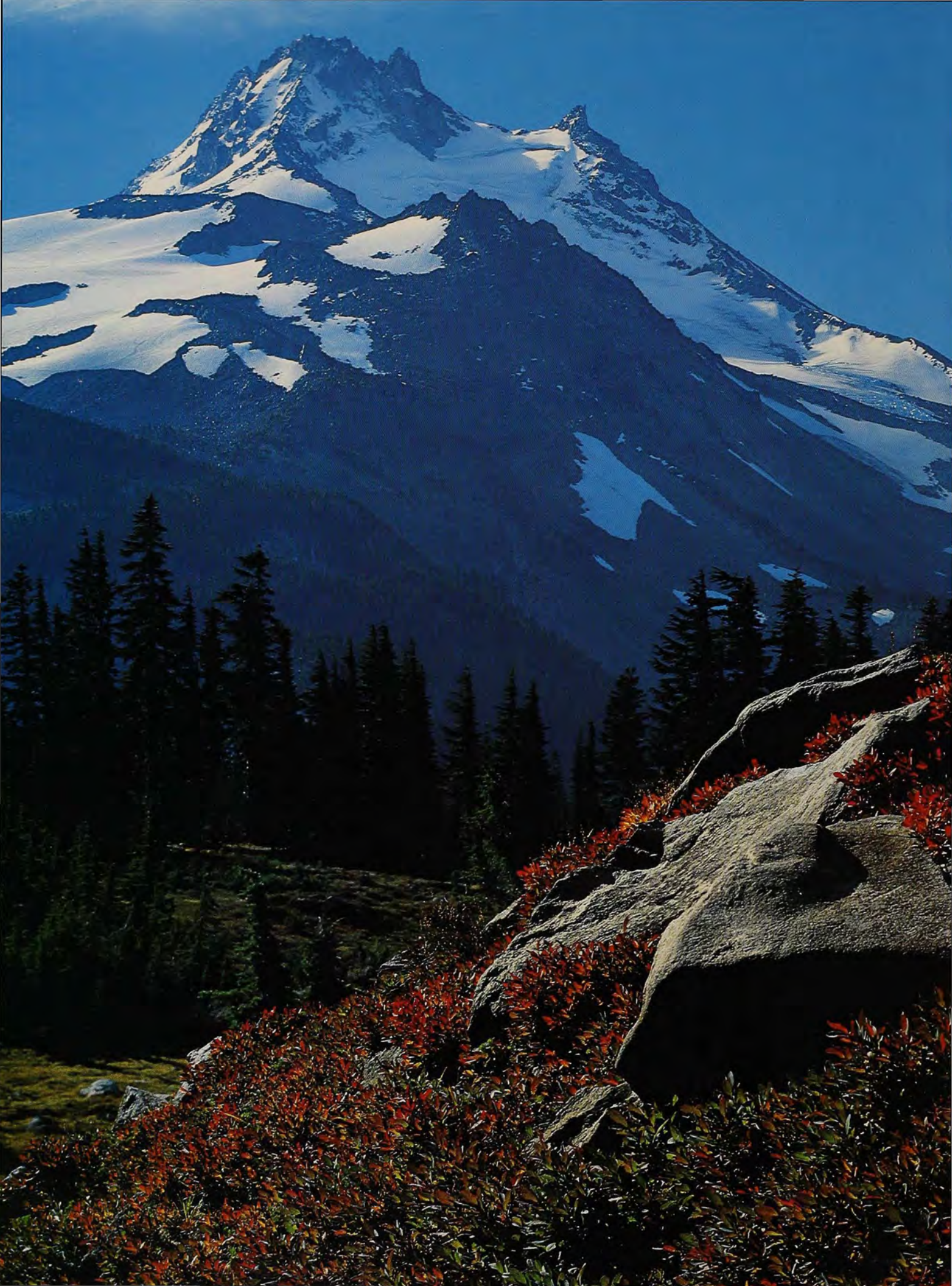
Healthy, year-old plants will bloom continually throughout the summer and early fall. Of course, they can be set outside during these warm months, but they are subject to aphid infestation out-of-doors. As temperatures begin to fall in autumn and winter, they will require less water, but, because gerberas will never go completely dormant, provide enough moisture to maintain leaf turgor.

During winter, when temperatures are lower, buds are set for the next season. During this fairly short period, the graceful lance-shaped leaves with their grey-green, woolly undersides can be appreciated. Soon bud after swelling bud emerges from the base of the rosette of leaves, and the succession of blooms begins again.

Just as these new buds are forming in the spring, I apply a granular, timed-release


(Continued on page 41)

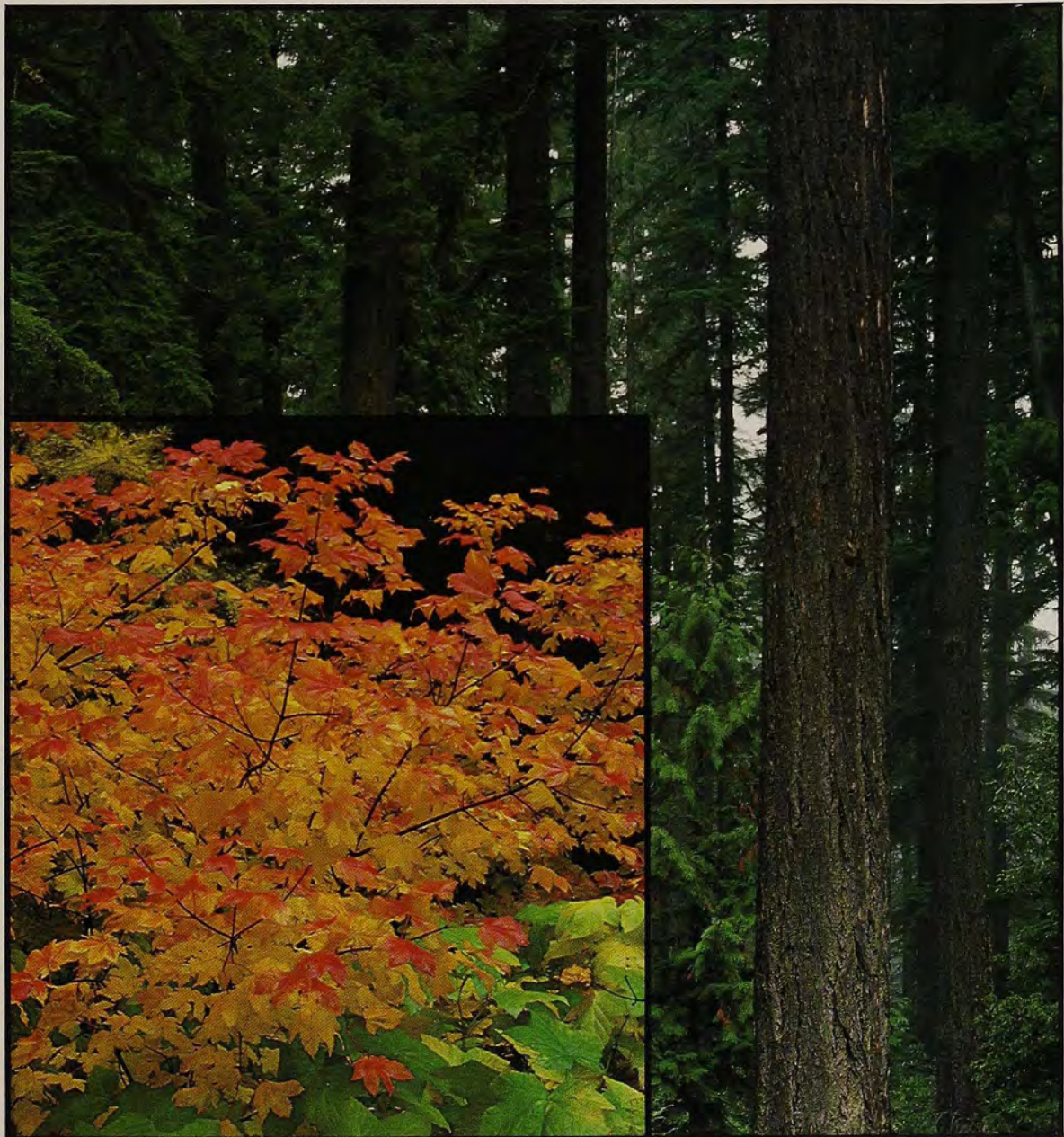
Gerbera jamesonii is the only species of *Gerbera* cultivated. African daisies, as these flowers are commonly called, are sold at a high price by florists, but they can be grown easily by the home gardener indoors.

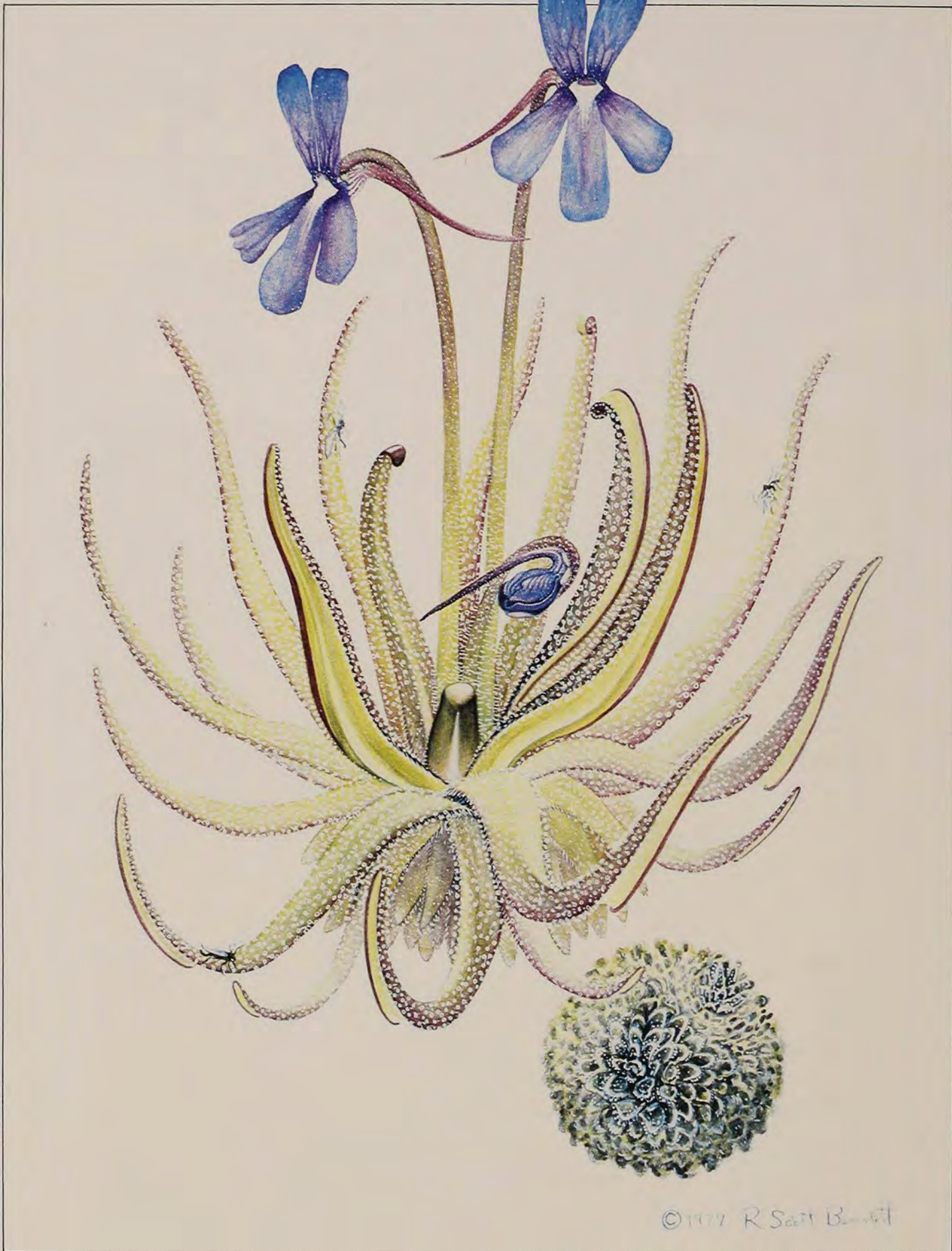


Autumn in the Northwest

PHOTOGRAPHS BY PAT O'HARA

The Pacific Northwest is alive with color during the autumn. Stately evergreens provide a backdrop of green against which many deciduous trees show off their fall foliage. Set against the even larger backdrop of the Cascade Mountains, the Northwest's autumn flora is breathtaking. Many dedicated wilderness areas straddle the region's mountains. The Mount Jefferson Wilderness area of Oregon, pictured at left, is an example. Here, dwarf huckleberry turns brilliant golden-orange and covers the ground in this park. Vine maples (*Acer circinatum*) like the one pictured below, also come alive with color. These trees are found in the lowlands extending to the Pacific Ocean as well, and are often used as garden ornamentals. Quaking aspens (*Populus tremuloides*), big-leaf maples (*Acer macrophyllum*), red-osier dogwood (*Cornus stolonifera*), Pacific dogwood (*Cornus nuttallii*) and, of course, the large evergreens for which the region is famous, are other colorful highlights of a fall visit to the Northwest. Pictured here are evergreens of the Willamette National Forest. Members of the Society who plan to attend our Congress in Portland October 3-7 are certain to see the first hints of this beautiful display of color. 





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Forbidding Beauty Orchid-flowered Butterworts

BY KATSUHIKO KONDO AND RICHARD M. ADAMS, II

ILLUSTRATIONS BY R. SCOTT BENNETT

As if sculpted in porcelain, a delicate, amethystine flower stands daintily above shimmering, velvety green leaves, belying the pragmatic side of the *Pinguicula* plant.

Its supple foliage, seen in microscopic view, is lined with vast expanses of stalked appendages. Hence its velveteen appearance, thence its practical utility: each imperceptible filament, with its glandular tip, secretes a crystalline drop of gummy, viscid adhesive.

The butterwort is a carnivorous plant, a living sort of flypaper. It extracts nutriment not only from the earth, but from the air, in the form of gnats, mosquitoes, and other minutiae which may carelessly cross its path. Once a victim is stuck, the leaf edges flex and slowly envelop it, covering it with the sticky secretion and digesting it with enzymes contained in the secretion. When the victim is digested, the leaf absorbs it, deriving nutriment from the nitrogenous compounds it contains, a form of "foliar fertilization," if you will.

This absorption process has been traced step-by-step with autoradiography. Radioactive chemical elements can "label" a compound, the radioactivity revealing its whereabouts when exposed to a photographic plate. In this case, investigators³ labeled insects' nitrogen-containing proteins with radioactive carbon-14, which was then followed on its path into a *Pinguicula* leaf. Not two hours had passed when digestion products began entering the leaf and moving through its vascular system toward the leaf margin. Within 12 hours, movement out of the leaf and into the plant body had begun. Thus, the butterwort's digestive process might in some ways be likened to that of animals. The digestive enzyme is, in fact, an acid-protease similar to pepsin.

The Latin *pinguis*, meaning "grease," lends itself to the genus name *Pinguicula*, and explains the common name "butterwort." *Pinguicula* is placed taxonomically in the family Lentibulariaceae, along with the closely related carnivores *Utricularia* and *Genlisea*.

The genus consists of 48 species distributed in the Northern Hemisphere, with a few in the South American Andes.

The Orchid-Flowered Butterworts

Among the species of *Pinguicula*, there is a group of six native to the highlands of Mexico: the "orchid-flowered butterworts." Collectively they form the section *Orcheosanthus* of the genus *Pinguicula*² (Greek, *orchis*—orchid, *anthos*—flower: "orchid-flowered," referring to the shape and color of the flower). Of these six species, five are presently in cultivation, having been admired as indoor and greenhouse ornamentals for over a century. They are listed in the accompanying table, along with identifying characteristics.

Habitat

Pinguiculas of the section *Orcheosanthus* are adapted to the climate of the Mexican Highlands (elevation, 5,000-6,500 ft.). Summers are warm and moist; and although it's not far from the equator, the high altitude makes winters cool and dry. In summer, the plants form rosettes of spreading, supple leaves. Later on, the leaves get smaller—thick and succulent—as the plant retracts into a dense rosette to face the chilly, arid winter. Warm spring rains again bring forth the luxuriant foliage; but flower buds are produced among the winter leaves before summer growth begins. A few weeks later, the plants are in full bloom.

LEFT: *Pinguicula gypsicola*, showing seasonal differences in leaf form: winter leaves are short and succulent; summer leaves are long and curl-edged. Size of plants in winter is approximately 2 cm; in summer, 7 cm. FOLLOWING PAGE, LEFT: Three cultivars of *Pinguicula moranensis*, the most popular orchid-flowered butterwort: (lower left) a wild clone, 8 cm; (above center) *P. moranensis* cv. 'Kewensis', 11 cm. This cultivar is a cross between two clones previously designated *P. bakeriana* and *P. rosei*, but now considered the same species, *P. moranensis*; (right) *P. moranensis* cv. 'Superba', 15 cm, believed to be an autotetraploid. RIGHT: *P. colimensis*, 8 cm.



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The ease with which butterworts can be propagated obviates any need to collect them from the wild. In fact, new plants produced under cultivation are often much stronger than their wild parents.

Cultural Recommendations

Knowing something of their habitat will help you grow these plants. Some adapt easily, others do not. All do best in artificial environments approximating their original, natural ones.

Temperature—Mexican pinguiculas are basically warm-growers, preferring a minimum night temperature of 60-70°F (15-21°C) in summer, with a maximum of 85°F (30°C). If strong summer sun pushes the temperature above 85°F, poor growth may result, so provide ventilation and shading adequate to avoid excessive heat. During the winter, they can stand temperatures down to 45-50°F (7-10°C), but will not survive frost.

Light—For carnivorous plants growing in open areas, full sun is commonly prescribed. But pinguiculas are low-growing, and thus prefer a partially shaded environment as in a shaded greenhouse, fluorescent light garden, or north-, east-, or west-facing window. The leaves—reddish in bright light, light green in shade—are soft and beautiful; and even if no flowers are produced, the foliage itself is stunning.

Soil and Water—*Pinguicula moranensis* and *P. colimensis* are best planted in small pots, three to four inches in diameter. Water them with care, as the large summer leaves may overlap and cover the top, diverting water outside the pot so that not enough moisture reaches the soil. Capillary mat or wick watering systems circumvent this problem and maintain ideal moisture levels.

The leaves may shelter insects, myriapods and other critters, some of which may munch on the soft air roots and foliage. Check under the leaves periodically to see if any damage is being done; and at the same time, make sure the plants are well-seated in the medium. Sometimes the plant bodies become propped up by the air roots, in which case it's time to repot—otherwise the plants might not survive. Repotting is necessary about once a year.

Pinguicula gypsicola, *P. oblongiloba*, and *P. macrophylla* are

small compared to the above two species, and several of them may be planted together in a large, flat pot.

The best growing medium is fresh, long-fibered sphagnum moss. It supports the plants firmly and maintains the high moisture level they require. A 1:1 mixture of sphagnum: perlite may be used to achieve greater aeration, if desired.

Sphagnum moss is quite acidic, generally pH 3.5-5.0. But Mexican pinguiculas are most often found on calcareous, limestone substrates, so it's best to raise the pH with lime water. Joe Mazrimas of California recommends a solution of a thimbleful of hydrated agricultural lime in one pint of distilled or deionized water. He waters his plants with the well-shaken solution (avoiding wetting the leaves) about twice a year and has reported outstanding results.

Water the plants well during the summer—they prefer to be continually moist without standing in water. Reduce watering in late fall and during the winter when the plants become dormant. *Pinguicula oblongiloba* and *P. macrophylla* produce winter bulbs in the ground. Excessive water at this stage may induce an inopportune flush of growth, wasting energy stored for the next season. If the medium becomes too dry, on the other hand, the bulbs may shrivel from dehydration. The dormant bulbs are also susceptible to fungal rot, which can be reduced by soaking in fungicide.

Humidity—Butterworts prefer a moist atmosphere, from 60-90 percent relative humidity, but will tolerate dry indoor air if the substrate is moist. Higher humidity may be provided by a terrarium or high-humidity chamber (i.e. a terrarium lined with moist gravel, in which the individually potted plants are kept).

Propagation—Orchid-flowered pinguiculas can be propagated sexually or asexually. Sexual reproduction is useful for breeding purposes, while asexual propagation maintains desirable clones.

Sexual reproduction—Pollination of the five species is performed in nature by insects but must be done by hand indoors.

The petals of these species are fused into a tube with one spur and five large lobes. Inside this tubular corolla is a single ovary, its stigma extending to the corolla mouth. A pair of anthers are located just below the ovary.

A couple of days after the flower opens, pollination must be accomplished as follows: tear open the corolla tube, scoop up the pollen grains from the anthers with a tweezer, and smear them over the stigma. Fertilization will soon take place, and the ovaries will start to enlarge in about a week. Fruit capsules ripen after a month, dispensing the seeds from their pores.

Sow the seeds on the surface of moist peat or milled sphagnum moss, cover the container with glass or plastic to retain humidity, and place it in bright light to speed germination (full sun may create excessive heat). The seeds will germinate in two to three weeks: they're very small and need protection from nibblers and fungal diseases.

Asexual reproduction—The thick, succulent winter leaves are more useful for propagation than the thin, wide summer leaves. Gently remove leaves from the winter bulb, being careful not to injure them, and place them on the surface of moist peat or milled sphagnum. In three to four weeks, buds will appear where

the veins emerge at the cut leaf end; in one or two more months, they'll be mature plants.

Pinguicula oblongiloba and *P. macrophylla* also propagate by runners.

The ease with which these plants can be propagated obviates any need to collect them from the wild. In fact, new plants produced under cultivation are often much stronger than their wild parents. To help introduce these species, their mass propagation by tissue culture is being studied at Cornell.¹ Not only are they thought-provoking as carnivorous plants, they're exquisite ornamentals as well.

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IDENTIFYING CHARACTERISTICS SPECIES OF *PINGUICULA* SECTION *ORCHEOSANTHUS*

SPECIES	LEAF (s = summer leaf, w = winter leaf)	FLOWER
<i>P. moranensis</i> H.B.K. (synonyms: <i>P. bakeriana</i> Sander, <i>P. caudata</i> Schlecht., <i>P. rosei</i> Watson)	s: egg-shaped or rounded in outline w: spatula-shaped and succulent	color: white to pale-, pinkish-, or reddish-purple, violet, or lilac corolla lobes: wedge-shaped to egg-shaped spur: incurves toward front of flower size: 3.0-6.0 cm. long
<i>P. colimensis</i> McVaugh & Mickel	s: broadly egg-shaped in outline w: similar to summer leaves, but thicker	color: always pinkish-purple corolla lobes: broadly rounded, wider and longer than in <i>P.</i> <i>moranensis</i>
<i>P. gypsicola</i> Brandigee	s: narrow: straight, or tapering to each end; margins conspic- uously curled under w: awl-shaped or narrow and tapering	color: deep purple size: 3.0-5.0 cm. long
<i>P. oblongiloba</i> A. DC.	s: oblong to spatula-shaped in outline fringed with hairs at the base, margins bent inward w: (summer leaves dry out, covering the winter bulb)	color: dark purple corolla lobes: egg-shaped to oblong, narrowing to a tip size: 4.0-5.0 cm. long
<i>P. macrophylla</i> H.B.K.	s: oblong to circular in outline w: egg-shaped and pointed	color: white or purple spur: long size: 3.5-5.5 cm. long



LANDSCAPING With Spring Bulbs

BY SUSAN GILBERT



It's fall and you are ready to plant tulip, daffodil, hyacinth, crocus and other bulbs. Exciting swirls of blue, splashes of the hottest red and expansive fields of gold dance in your mind as you anticipate a landscape enlivened by the vibrancy of spring bulb flowers. If you take some tips from the Dutch who, after all, are the masters of bulb gardening, next spring will indeed be your Dutch treat!

Photographs by Malak

Bulbs belong where people are. Borders along driveways, paths and steps are choice spots for scented flowers.

The gardens around Dutch homes are, on the average, smaller than ours. But Hollanders manage to make their plantings seem more spacious. You, too, can create the illusion of spaciousness by avoiding a hodgepodge. Rather than crowd as many types, varieties and colors of bulbs as will fit, be selective. A sweeping carpet of 12 gold daffodils, or six daffodils and 12 purple muscaris, is more dynamic than, say, two tulips, two hyacinths, two daffodils and two muscaris. The latter looks more like a child's finger painting than a work of art.

Dutch gardeners would never think of planting their bulbs singly or in rows like wooden soldiers. They plant in drifts. Groups of 20 to 25 bulbs in each bed are staggered back and forth so that their col-

ors flow into each other. The soft rose color of a Darwin tulip like 'Pink Supreme' could be woven into the intense maroon black of Darwin 'Queen of the Night'. For another kind of effect, masses of small, daisy-like *Anemone blanda* as ground cover make early tulips such as Kaufmannianas appear to be floating. Make sure the bulbs you plant together bloom at the same time.

You can get other landscaping ideas simply by looking out the window at your foundation shrubs. Evergreens, flowering bushes and trees are neutral backdrops that make colorful bulb flowers stand out. Besides, by planting bulbs where they can be seen from a window you can enjoy their beauty in warm comfort indoors during the chilly first days of spring.

Areas between shrubs and trees are choice places for naturalizing bulbs. The hardiest ones for naturalizing are daffodils, crocuses, anemones, muscaris, scillas and certain varieties of tulips such as Greigii, Kaufmanniana and Fosterana. All rules for spacing are abandoned. Simply scatter a bunch of one variety of bulb. Beside them scatter several bulbs of another variety. Plant them where they happen to fall. Next spring, they will appear to have sprouted purely by chance, just like wildflowers. While you're at it, scatter some daffodils and crocuses in the grass. Your lawn will take on the charm of a flower-dotted meadow.

Bulbs belong where people are. Borders along driveways, paths and steps are choice spots for scented flowers. Their



aromas will greet you when you get out of the car, walk upstairs to the front door and stroll into the backyard to admire your other spring plantings. Stout, sturdy hyacinths form tidy borders. Other scented bulb flowers that make excellent borders are 'Cheerfulness', a double daffodil, *Narcissus jonquilla* 'Golden Sceptre' and several tulips including 'Bellona' and 'Prince Carnival', two early-flowering varieties.

No garden-loving Dutchman would dream of planting only bulbs that bloom at the same time. Like the spring season, spring gardens last three months with bulbs that bloom from March through June. When one group of flowers is open to its fullest, another group is budded, just days away from revealing its colors. By interplanting bulbs that flower at different times you can have successive crops of glorious bulb flowers in one bed. Interplanting is possible because bulbs need only a small growing space and have a short growth cycle.

The earliest spring flower is *Galanthus*, aptly nicknamed snowdrop. Its tiny, nodding blooms are followed closely by winter aconite, crocus, *Scilla siberica*, *Iris reticulata* and *Chionodoxa* (glory of the snow). Species tulips also bloom very early. These are tiny Kaufmannianas, Fosteranas and variegated Greigiis.

Unfurling in early spring (as distinguished from very early spring) are mus-

caris, hyacinths, single and double early tulips and trumpet daffodils.

Mid spring salutes large-cupped and short-cupped daffodils, triumph tulips, Darwin hybrid tulips, poeticus narcissi and *Fritillaria imperialis*.

The spring flower brigade comes to a flourishing end with double late daffodils (also called peony-flowered), lily-flowered tulips, Darwin tulips, parrot tulips, *Scilla campanulata* and alliums.

Interplant bulbs whose foliage doesn't take up much room. Daffodils, muscaris, crocuses and *Iris reticulata* are relatively compact. Tulips, which have longer, more sprawling leaves, fare better segregated in their own beds. Within the tulip garden, though, you can plant assorted classes.

Annuals, perennials and wildflowers planted among bulbs add a lushness to the spring garden. As the bulb flowers fade, marigolds, petunias and zinnias will take over and camouflage unsightly ripening bulb foliage. Wildflowers native to the Northeast, such as tiny white foam flowers that bloom in mid to late spring, maidenhair and Christmas ferns, make lovely ground covers. The lacy texture of the ferns provides interesting contrast with the smooth bulb flowers and their shiny foliage. When interplanting with perennials, beware of certain types with extensive root systems that may choke out bulbs.

Spring flowering bulbs are hardy and

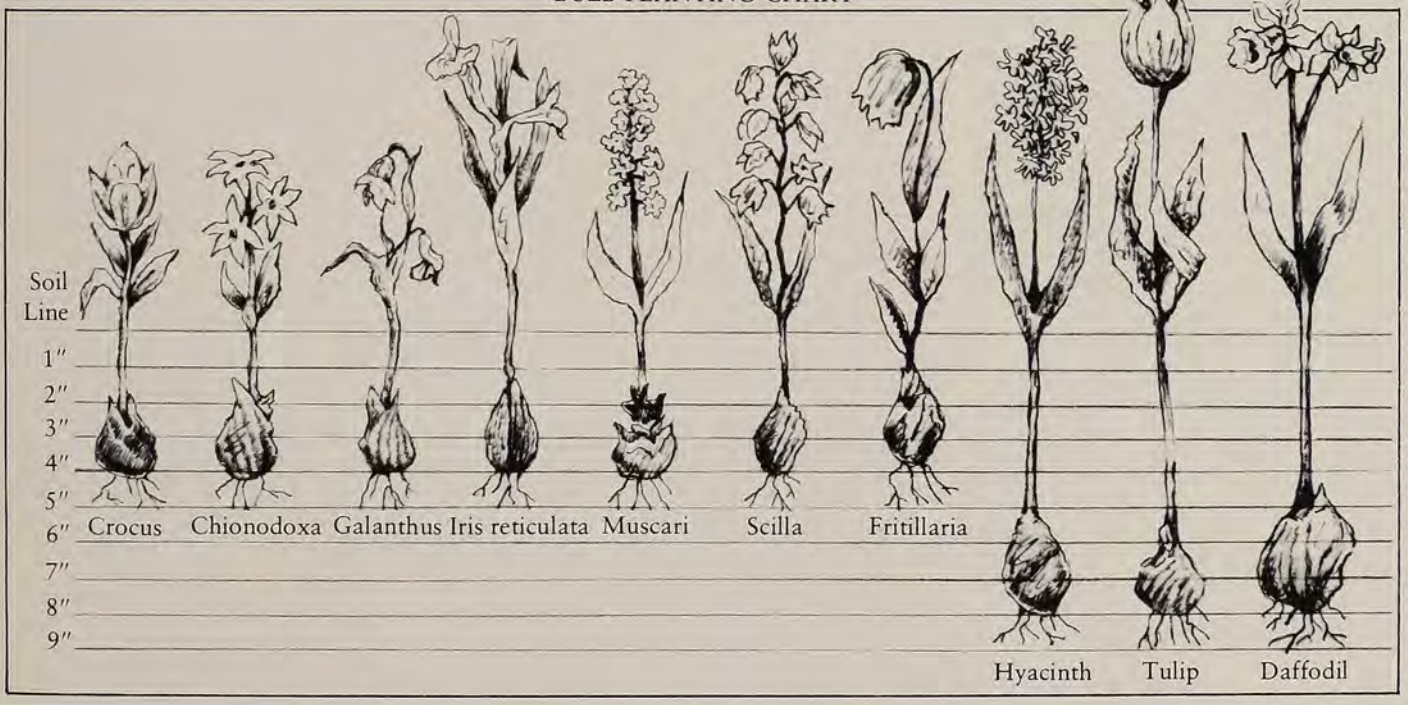
diversified enough for most garden settings. Tubs of tulips, daffodils and hyacinths brighten up a patio and round off hard edges to give it a cozy, intimate feeling. Small, miscellaneous bulbs such as crocuses, anemones and scillas, as well as small varieties of daffodils and tulips, look charming in rockeries. Tall bulbs—Darwin hybrids, Darwin tulips and trumpet daffodils, for instance—make eye-catching displays seen from afar against the house or planted along walkways.

After conditioning the soil by loosening it to a depth of 10 inches and mixing in bonemeal, dig a trench wide enough for your mass bulb planting. Bulbs should be planted at a depth four times their diameter. Set large bulbs eight inches deep and six inches apart. Bulbs smaller than one-quarter of an inch, such as crocuses, scillas and muscaris, go four inches deep and three inches apart. In warm climate zones, planting is shallower—six inches for large bulbs, three inches for small ones.

In spring when shoots appear, feed bulbs with 12-12-12 fertilizer.

Between cleanups and planning vegetable and summer flower gardens, spring is just about the busiest time for gardeners. What a pleasure it is to be outdoors, even if you're doing chores, just to be surrounded by the graceful sweeps, colors and wonderful springtime perfumes of a landscape that has gone Dutch!

BULB PLANTING CHART



NARCISSUS

BY SUSAN GILBERT

According to myth, each sunny narcissus bears the taint of unrequited love. When Echo, a sweet mountain nymph, spied the handsome demi-god Narcissus, she immediately fell in love with him. Little did she know that he had no time for or interest in women. Hopelessly in love with himself, he spent his days down at the river admiring his stunning reflection. Consequently, poor, neglected Echo faded to nothing but a voice.

Angered over Echo's fate and the young man's vanity, Nemesis, the Goddess of Vengeance, transformed Narcissus into a flower doomed to stand for eternity looking down at its image.

In the reality of the spring garden, however, your love of this nodding flower will be profusely required. If you are devoted enough to plant narcissus bulbs in the fall before the first frost, they will beam lovingly come spring in yellow, gold and white

and occasionally blush in a shy pink. Lawns of narcissus blooms will spread and thicken each spring, evidence that their love does, in fact, grow.

There are other myths about the narcissus, too. But these are not nearly so romantic and often cause confusion. First, the names "narcissus," "daffodil" and "jonquil" all refer to the same type of flower. Technically, *Narcissus* is the botanical name for all the classes, daffodil is



TOP LEFT: A profusion of 'Inglescombe', a type of double daffodil. ABOVE: *Narcissus tazetta* 'Geranium'. RIGHT: 'Mrs. R. O. Backhouse', a large-cupped daffodil with a shell-pink trumpet. OPPOSITE: Blossoms of 'Carbineer' narcissi bend over on their stems, lending credence to the ancient myth that the narcissus is actually the demi-god Narcissus transformed. According to the legend, he was punished by Nemesis and was doomed to remain for eternity gazing at his own image.



Photographs by Malak



their common name and jonquilla is a hybrid class of narcissus.

Another myth is that their flowers are either gold, or gold and white. Not true. 'Mrs. R. O. Backhouse', a large-cupped daffodil, has ivory petals and a shell-pink trumpet. The jonquilla narcissus 'Cherie' is a white, small-cupped flower flushed pale shell-pink. Both of these varieties are widely available.

Myth number three: The narcissus has no scent. Wrong. One whiff of 'Trevithian', a jonquilla narcissus, and *N. tazetta* 'Geranium', and you will immediately distinguish that myth from reality.

Finally, not all narcissus flowers nod singularly and vainly from tall stems. There are many miniature varieties, and ones that are multiflowering, such as *N. tazetta* 'Geranium' and 'Cragford', *N. triandrus* 'Thalia' and the rose-like double daffodils.

Thousands of narcissus varieties and species are available and will bloom in assorted shapes, sizes and colors and at various times throughout spring. The large-flowering family is broken down into 11 divisions, or classes. Here are the major classes, with emphasis on the rich bicolors, showy doubles and unusual varieties.

Double daffodils have two or more rows of petals, in some cases in contrasting colors. 'Yellow Cheerfulness' is a uniform soft yellow that produces three or four sweetly scented blooms on each stem. 'Texas' is yellow with an orange center, and 'Mary Copeland' is an exquisite beauty with petals of creamy white and a center of interspersed lemon-yellow and red-orange.

Many *N. triandrus* hybrids bear up to six flowers on a stem. Most varieties are white. Some have small cups, others long cups. Petals usually are reflexed. 'Thalia' is white. 'Silver Chimes' has a touch of pale yellow in the cup. *N. triandrus*, a species narcissus, produces three to nine drooping white flowers on each stem. At a distance their reflexed petals resemble tear drops and, hence, sometimes are called angel's tear drops.

N. cyclamineus hybrids are characterized by their drooping cups. 'February Gold' has a golden-yellow trumpet and lighter yellow petals. 'Peeping Tom', a miniature variety, is uniformly deep yellow with a long trumpet.

Appreciated for their fragrance, jonquilla hybrids have rush-like foliage, and most varieties produce several flowers on each stem. In addition to 'Trevithian' and 'Cherie' mentioned earlier, there are the multiflowering 'Golden Perfection' and 'Sweetness', a gold flower with a goblet-shaped cup, which multiplies the most rapidly of all narcissi.

Among the *N. tazetta* cultivars are many varieties with two rows of petals, lovely bicolors and varieties that are multiflowering. With their white petals and cups of various intensities of orange, they are particularly attractive in rock gardens. Multiflowering 'Martha Washington' is pure white with orange cups. Its flowers are much larger than those of any other *N. tazetta* cultivar. In addition, there are the fragrant 'Geranium' (orange cups), 'Laurens Koster' (yellow cups), 'Early Splendour' (orange cup) and 'Scarlet Gem'

(beautiful orange-scarlet cup).

The distinguishing mark of poeticus daffodils is the red edge around each cup. 'Actaea' has yellow petals with a very large yellow cup broadly fringed dark red. It flowers in early spring. 'Cantabile' is frosty-white with a large emerald green eye rimmed ruby red. 'Winifred Van Graven' is scented with large blooms of leathery texture and a large eye of lemon-yellow, edged scarlet.

The flowers most people think of as narcissi are trumpet daffodils which have long, golden cups. Most familiar are 'Unsurpassable', with huge flowers, and the two-foot 'King Alfred'. Bicolored trumpets include 'Goblet', 'Magnes' and 'Music Hall', all white with yellow trumpets.

The name large-cupped daffodils is deceiving. Their cups actually are shorter than those of the trumpet daffodils, but are still long in relation to the petals. 'Carlton' is a uniform yellow and 'Ice Follies' is all white. Among the bicolors are 'Armada', yellow with an orange cup, 'Flower Record', with yellow cup edged orange, and the delicate pink 'Mrs. R. O. Backhouse'.

The cups on the small-cupped daffodils are less than one-third the length of the petals. 'Barrett Browning' is white with an orange-red cup. 'Verger' is white with a deep red cup. The vibrant 'Birma' has yellow petals and a red cup.

Because narcissi are among the most adaptable and hardy spring-flowering bulbs, they lend themselves to many landscape settings. They look best in mass plantings of 12 or more. One of the best spring bulb garden combinations is yellow narcissi and purple or blue hyacinths. They bloom at the same time in mid spring.

Narcissi, hyacinths and early flowering tulips such as Fosterana, tiny Kaufmanniana, Greigii and single and double early tulips are perfect coordinates. Tall Fosteranas go in the background, Kaufmannianas provide a foreground edging and narcissi fill in the middle.

Imagine sunshine cascading like a carpet across the earth and you will realize the breathtaking splendor of golden narcissi naturalized, springing up freely in lawns, woods and fields. The technique is simple. Take a pailful of 12 or more narcissus bulbs in the fall and scatter them on the ground. Plant them wherever they happen to fall. Some will be very close together, some far apart. Come spring, they will seem to be growing randomly like wildflowers. Each spring they will multiply until finally they become fully acclimated to their non-native home.



(Continued from page 25)

fertilizer—one tablespoon of 14-14-14 per pot. Repeat applications of this fertilizer should be scheduled quarterly until the winter period of rest begins.

Because gerberas are subject to attack both by red spider mites and whitefly, I apply a systemic granular pesticide once every month. Scratch the granules into the surface of the soil with a disposable stick

Florists in the North sell these subtly-colored "daisies" at a high price, and because gerberas will last a week after cutting, flower arrangers have been willing to pay dearly for them.

and water thoroughly. The systemic is taken into the tissue of the plant and the sucking insects then ingest killing doses of it. (Be cautious when using a systemic pesticide: it is rapidly absorbed through the skin. Read directions on the label carefully.) Spraying the leaves with a miticide such as Kelthane is an effective means of controlling red spider as well, and a commercial garden spray can be used to kill whitefly if it is applied as often as new eggs hatch.

If the leaves turn yellow with dark green veins, then the gerbera's only other potential problem, chlorosis, has developed. This deficiency can be corrected simply by applying chelated iron (iron sulfate) to the soil. Soon normal leaf color will reappear.

As the blooming season progresses, new plantlets will appear at the base of the rosette of leaves. When the plantlets are large enough, sporting five or six leaves, cut them off with a sharp knife leaving a heel at the base, moisten the base, dip it in a rooting hormone and root it as a cutting under polyethylene cover. This is perhaps the best method of propagating gerberas.

New plants can be started from seed with great care. The seeds must be planted as soon as they are received because a decrease in viability can begin as soon as 10 days after harvest. I use a commercial, sterile, seed-starting for-

mula, at least 1½ inches deep. Place the seeds with their blunt ends pressed into the moistened soil surface. Do not cover them because they need light for germination. Water with a fine, tepid mist and place the seed container in a polyethylene bag about 12 inches from a fluorescent light source. Maintain a temperature of 70°F. Or place the seed container in a bright, but not sunny, window.

If these conditions are carefully maintained, gerberas will sprout one week to 30 days after sowing. When the seedlings emerge, keep the temperature constant and continue to provide light. Fluorescent lights should be four inches from the leaf tips and should be left on 14 hours a day.

The young plants can be potted in four-inch pots when two to three true leaves are established. As the roots and leaves develop, move the plants to successively larger pots until you reach the eight-inch pot size, at which point repotting is no longer necessary. Spring is the best time to transplant gerberas. Six to seven months after sowing, the first eagerly awaited flowers will appear. Because gerberas can be relied upon to be repeat bloomers, the flowers can be cut without reservation. They are lovely in arrangements combined with the silver-green foliage of variegated pittosporum.

Gerbera seeds and plants are available from many established mail-order suppliers. Through hybridization, new forms and colors continue to appear on the market. A local nurseryman near my home recently offered for sale attractive bicolored plants: one bright rose in color with petals edged in white; another a crested double orange, with paler orange petals forming the crest; and a "florist" single with broad petals, brick-red edged with bright yellow. In any color or form the gerbera merits consideration as a "must" for all gardeners.

Possible Gerbera Sources

W. Atlee Burpee Company, Warminster, PA 18991: Seeds.

H. G. Hastings Co., Box 4088, Atlanta, GA 30302: Seeds.

George W. Park Seed Co., Inc., P.O. Box 31, Greenwood, SC 29647: Seeds and Plants.

Thompson and Morgan, 401 Kennedy Blvd., Somerdale, NJ 08083: Seeds.

Wayside Gardens, Hodges, SC 29695: Plants.



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- 6th Day**—Transfer to Kobe to board the Aquamarine. Sail at Noon. Afternoon cruise the Inland Sea.
- 7th Day**—At sea.
- 8th Day**—At sea.
- 9th Day**—Arrive Hsinking (Peking).
- 10th Day**—Tiensin.
- 11th Day**—Peking.
- 12th Day**—At sea.
- 13th Day**—At sea.
- 14th Day**—Arrive Shanghai
- 15th Day**—Soochow and Wuxi
- 16th Day**—Sail from Shanghai.
- 17th Day**—At sea.
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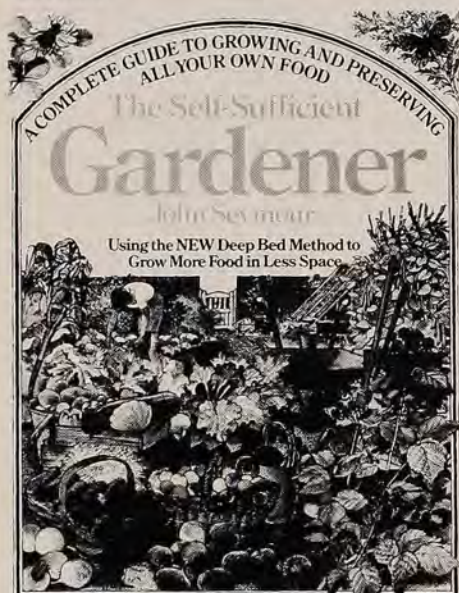
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THE SELF-SUFFICIENT GARDENER. John Seymour. Dolphin Books—Doubleday and Company Inc., Garden City, New York. 1978. 256 pages, \$15.95 hardcover, \$7.95 paperback. Available to members of the American Horticultural Society at a 10 percent discount.



This English import has avoided most of the pitfalls of offering English advice to American gardeners. In fact, the cultural descriptions given for a remarkably broad selection of fruits, vegetables and herbs give the American reader the benefit of the extensive English experience in gardening. Special attention is paid to the "new deep-bed method" of cultivation, which allows for denser planting and more produce from a smaller area of garden. This "new" method is really just the old French method of double digging, a lot of work, but worth it if you have only a limited space to devote to a vegetable garden. Plans for a complete garden, as well as good instructions for preserving your produce through the winter months, make this a useful book for both the beginning and the advanced gardener. For the more adventurous there is also a chapter on poultry and rabbits for home consumption. The delightful illustrations are reminiscent of hand-colored

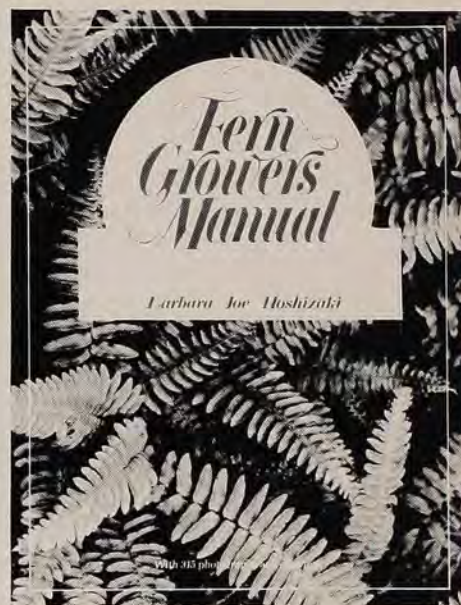
engravings from an old herbal. The one shortcoming of this otherwise complete "how-to" book is the lack of any reference to recommended varieties of fruits and vegetables. An interesting bit of misinformation, which explains something that has always puzzled me—why can't the English grow sweet corn?—is very likely explained in the following quote: "Sweet corn, which is basically field corn picked very young . . ."

PRINCIPLES OF HORTICULTURE (2nd ED.), Ervin L. Denisen. Macmillan Publishing Co., New York, New York. 1979. 483 pages, hardcover, \$14.95.

HORTICULTURAL SCIENCE (3RD ED.), Jules Janick. W. H. Freeman and Co., San Francisco, California. 1979. 608 pages, hardcover, \$17.50. Both available to members of the American Horticultural Society at a 10 percent discount.

For really good results the gardener should know a little more about growing plants than what can be learned from the instructions given on the back of a packet of seeds. Both of these textbooks are intended for use in an introductory college course in horticulture. As such they cover a broad spectrum of subjects from plant physiology and genetics to planning the home landscape. Although much of the discussion of specific crops is aimed at commercial production for the market, the individual gardener will still find that the broad general background to horticultural science given in both of these books will contain much valuable information that can be applied to everyday problems. While the content is quite similar in both works, the Janick book would perhaps be easier to use for the average gardener since it is organized with the small garden information gathered together in the latter third of the work under an overall section on "Horticulture for the Home." For up-to-date background information, both of these books are recommended for the serious gardener who wants to understand what is happening in the garden.

FERN GROWER'S MANUAL. Barbara Joe Hoshizaki. Alfred A. Knopf Inc., New York, New York. 1979 (1975). 269 pages, paperback, \$7.95. Available to members of the American Horticultural Society at a 10 percent discount.



When originally published in 1975, the *Fern Grower's Manual* was unsurpassed as a guide to growing ferns for house and garden. Now available at a much reduced price in paperback, it is a bargain and still the authoritative work in the field. The paperback edition has been produced in the same size and quality as the original hardback edition. Only the cover and the price are different.

PLANTS ON STAMPS. Doris Patterson, Anne Delfield and Alice Sents. American Topical Association, Milwaukee, Wisconsin. 1979. 168 pages, spiral bound, \$10.00.

For many gardeners, collecting stamps with botanical subjects is a pleasant way to extend their gardening interests. For the serious collector, a guide to such stamps is essential. Replacing the long out-of-print *Flowers and Botanical Subjects on Stamps* published in 1960, *Plants on Stamps* is the first of three planned volumes covering all postage stamps with any representation of plant material, no matter how slight. The book is arranged both by issuing country and by botanical subject. An appendix lists those stamps with unidentifiable plant designs. The present volume covers the period from 1840 to 1959. The later volumes will bring the coverage up-to-date. All stamps are listed with Scott number, and while the subject matter of the stamps is plants, the subject matter of the book is stamps. Available from the American Topical Association, 3308 N. 50th St., Milwaukee, WI 53216.

FLOWERING PLANTS OF MASSACHUSETTS. *Vernon Ahmadjian. University of Massachusetts Press, Amherst, Massachusetts. 1979. 608 pages, hardcover, \$12.95.*

As a guide to the wild flowering trees, shrubs and herbaceous plants of Massachusetts, this book may be somewhat frustrating to the user. A simple key provides identification only to the level of plant family. From there the reader must depend on the lovely, but perhaps overly artistic (for identification purposes), drawings of Barry Moser for species identification. Information on habitat and time of blooming for the included species will help a little, but the reader cannot help but be disappointed by coverage restricted to only the most common species in each genus. While a very enjoyable book for browsing, this is not recommended as a field guide.

BROMELIADS FOR HOME, GARDEN AND GREENHOUSE. *Werner Raub. Blandford Press Ltd., England (Sterling Publishing Co., New York.), 1979. 431 pages, hardcover, \$45.00. Available to members of the American Horticultural Society at a 20 percent discount.*



Bromeliads are often considered the perfect house plants because of their combination of beauty and sturdiness. As a consequence, the interest in growing them has increased tremendously in recent years; but unfortunately there has been little

popular literature available to support the hobbyist in this specialized plant area. Professor Raub's excellent two-volume treatment of this plant family was first published in Germany in 1970 and 1973. While many bromeliad lovers were aware of this work, the language barrier still rendered it unavailable to them. The two volumes have now been published in one in an English translation, however, and the long wait is over. The first 79 pages are devoted to an excellent introductory section on the biology and cultivation of bromeliads. The remainder of the book is given over to clear English descriptions of nearly 1,000 species. These descriptions and the 449 beautiful photographs and 90 line drawings finally provide the guide for which the bromeliad fancier in this country has so long been waiting. Although an expensive book, it is well worth the money for anyone seriously interested in collecting and growing these fascinating and beautiful relatives of the common pineapple.

LANDSCAPING WITH NATIVE PLANTS. *Elizabeth N. DuPont. Brandywine Conservancy, Chadds Ford, Pennsylvania. 1978. 84 pages, spiral bound, \$6.95.*

Half of this book is devoted to a rehash of the usual principles of climate modification and home landscaping. While well presented, it is nothing all that new. The latter half of the book, however, has a great deal to offer. The 39 pages of appendices and bibliography provide a wealth of information for the use in the garden of Mid-Atlantic native trees, shrubs and wildflowers. Not only is good data provided on a plant-by-plant basis, but lists of plants for special garden situations increase the utility of this work. Definitely recommended for the gardener who wants to include native plants in his landscape. Available from Brandywine Conservancy, Box 141, Chadds Ford, PA 19317. \$6.95 plus \$1.00 postage and Pennsylvania sales tax where applicable.

THE LAGERSTROEMIA HANDBOOK/CHECKLIST. *Donald R. Egolf and Anne O. Andrick. American Association of Botanical Gardens and Arboreta, Los Angeles, California. 1978. 72 pages, paperback, \$3.00 (members) or \$5.00 (non-members AABGA).* Both a cultural guide and an up-to-date listing of cultivars, this little book is the

first of a new series of single genus handbooks planned by the AABGA. While crape myrtles are usually considered suitable for outdoor growing only in the South or in California, the record of successfully surviving plants as far north as Cape Cod and Allentown, Pennsylvania is a note of encouragement for the gardener who wants to try one of these very showy flowering trees from tropical Asia. Available from Dr. Mildred Mathias, Executive Director AABGA, Department of Biology, 124 Botany Building, UCLA, Los Angeles, CA 90024.

ESPALIERS AND VINES FOR THE HOME GARDENER. *Harold O. Perkins. Iowa State University Press, Ames, Iowa. 1979 (1964). 200 pages, hardcover, \$9.95.*

Espaliers and Vines for the Home Gardener

By Harold O. Perkins



This reprinting of an older standard work is an excellent introduction and reference for the gardener interested in plants for vertical surfaces. The how-to treatment in the section on espaliers gives clear instructions on the ancient art of growing trees and shrubs against a wall. Lengthy sections on recommended vines and plants suitable for espaliers are rendered even more valuable by the inclusion of many lists of plants suitable for special situations and applications. Plant material recommended is mostly limited to growth in the north-central and northeastern portions of the country, but special consideration given to plants suitable for the home garden makes this book particularly useful.

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