AMERICAN HORTICULTURIST

OCTOBER/NOVEMBER 1980

COMING IN THE NEXT ISSUE

In the December 1980/January 1981 issue of *American Horticulturist* we welcome the holidays with an article by George Taloumis on making apple-cone trees, lovely table decorations to use during the Christmas season. C. E. Lewis writes about branching and bark; Jane Guest Pepper describes a lovely garden in Pennsylvania; Darlene Conley tells you how to grow your own vanilla beans; Mary Baker describes the charms of a dwarf *Punica,* an easy-care indoor plant which doesn't mind cold temperatures; and Mrs. Ralph Cannon writes about the irresistible charm of hellebores. In addition, look for our regular features: President's Page; Book Reviews; Strange Relatives and the new Pronunciation Guide. All this and more coming up in December.

Illustration of *Punica granatum* by Alice R. Tangerini

VOLUME 59 NUMBER 5

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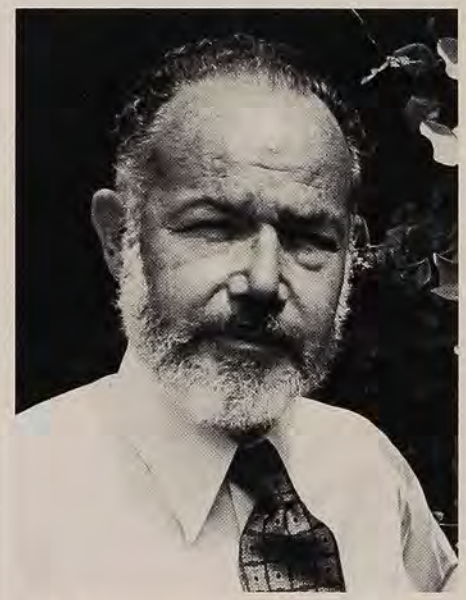
ON THE COVER: A sure sign of the change in seasons: this strawberry foliage takes on autumn color as the first frost draws near. Photograph by Pamela Harper.

PRESIDENT'S PAGE



The large number of gardening books which are published each month give ample evidence that gardeners are readers. Those new publications that are considered most worthwhile are reviewed in *American Horticulturist*. Both popular and more technical works are brought to your attention, and from the orders received, it is obvious that many of our members are interested in building their own reference libraries. Since many of the standard reference works in gardening have been around for a long time, I thought it would be worthwhile to use this President's Page to list some works which I regard as basic to a gardening reference library.

The two basic encyclopedias of gardening are surprisingly useful today in spite of the length of time they have been around. *The Standard Cyclopedia of Horticulture* by Liberty Hyde Bailey was first published in 1900 by the Macmillan Company. It was revised in 1914 and all subsequent editions, no matter what claim they may make, are essentially the same as the 1914 revision. It is found in both six- and three-volume forms, but any version published after 1914 is worth having. In spite of the obviously dated contents, the descriptions of plant species, the extensive cultural information for all parts of the United States and well written discussions of history and background make this a reference work which I still consult on an almost daily basis. Copies are often available from secondhand book dealers.

The Royal Horticultural Society Dictionary of Gardening was first published in 1951 and a second edition was issued in 1956. This four-volume work is obviously more up-to-date in its nomenclature and has many more species described than Bailey's *Clyclopedia*. Cultural information, while directed at the British Isles, is excellent and general enough to allow the American reader to easily adapt it to his own needs. For the greenhouse grower or the Sunbelt gardener, this is a particularly useful work as it includes all the exotic plants grown in British greenhouses as well as the hardier material grown outdoors. Two supplements have been published, the first in 1956 and a much larger second edition in 1969. Although the supplements were originally intended to provide current information on cultivars, which are covered extensively for the "principal kinds of cultivated plants," considerable updating on species descriptions for many other genera is also included. Available directly from the Royal Horticultural Society, it is offered at a discount to members, which makes it more than worthwhile to join this English counterpart to our own Society.

A third major encyclopedia has just been published (see the book review section in this issue) by the New York Botanical Garden. *The New York Botanical Garden Illustrated Encyclopedia of Horticulture* by Thomas H. Everett is a brand new 10-volume work which will be particularly welcomed by American gardeners. The first volume has just reached me and I understand that all 10 volumes will shortly be available.

A one-volume work which includes most of the hardy plant material and a great deal of the sub-tropical material grown in the United States is *Wyman's Gardening Encyclopedia* by Donald Wyman. Published by the Macmillan Company in 1971, I find it particularly useful as a quick reference work I can keep on my desk.

For Westerners and sub-tropical gardeners of the Southeast, *The New Western Garden Book* published by Lane Publishing Company in 1979 is a greatly expanded and updated version of the extremely useful first edition published in 1967. Available in paperback for under $10, it is one of the best buys in gardening books available today.

For quick identification of plant material with particular emphasis on house plants and greenhouse material (thus also of extreme value in the Sunbelt states), no book can compare to *Exotica* by Alfred

On June 24, 1980 David Burpee died at the age of 87. He was the son of W. Atlee Burpee, the founder of the firm that bears his name. For most of us that name is synonomous with gardening in the United States, and David Burpee was the personification of the seed industry. He took over his father's company in 1915 when the senior Burpee died. In the more than half a century which followed, he developed the company into the largest mail-order seed house in the United States. For me the Burpee Company has always meant something new and worthwhile to grow in the garden. Marigolds come first to mind, but snapdragons, zinnias and gloriosa daisies are not far behind. Vegetable gardeners, too, owe a great deal to David Burpee. Who hasn't grown the 'Big Boy' tomato? Many hybrid vegetables, including cultivars of squash, cantaloupe and cucumber were developed for use in the home garden under his leadership. In 1978 the American Horticultural Society awarded David Burpee the Liberty Hyde Bailey Medal in recognition of his achievements and contributions to gardening. While he led a full and active life, I'm sure that all gardeners will mourn his death.

In 1978 David Burpee accepted the Liberty Hyde Bailey Medal from the American Horticultural Society at its Congress in Nashville.

B. Graf. Essentially in its third edition, this immense volume of plant photographs is published by Roehrs Company. Its almost 2,000 pages makes for a heavy load on the lap, but there is no other book like it. The author's more recent publication, *Tropica*, is an all-color work which approaches *Exotica* in size but doesn't have nearly the scope of the earlier work.

One basic reference which supplements the above encyclopedias is J. C. Willis' *Dictionary of the Flowering Plants and Ferns*. Published by Cambridge University Press, this is more of a botanist's reference, for it consists entirely of the latest listings of the names of plant genera. Older generic names refer to the most recent name and for each genus the number of species and geographical distribution are given. Originally published in 1897, it is now in its eighth edition, which appeared in 1973.

Hortus III, by the staff of the Bailey Hortorium, and published by the Macmillan Company in 1976, is the most authoritative work available for names and descriptions of plants grown in the United States. Cultural information is minimal, but the species and cultivar descriptions are the most extensive and most current available.

Finally, *A Dictionary of Botany* by R. John Little and C. Eugene Jones gives definitions of all the specialized terminology of botany and horticulture. Published in 1980 by Van Nostrand Reinhold Company, the work provides the key to the sometimes unfamiliar technical language of the professional botanist or horticulturist.

These are all reference works of general use to the advanced gardener. Many other books exist for specific plant groups, specialized growing conditions or climatic regions of the country. If you have a problem in finding a book that answers your questions, write the Society and we will try to recommend an appropriate work which you can add to your own reference library.

Gilbert S. Daniels

—Gilbert S. Daniels
President

LETTERS

Getting Involved

I just sat down with a noon cup of coffee and your magazine, and after reading the "President's Page," I decided to write.

I've ordered other gardening magazines but no other is as nicely organized from beginning to end as *American Horticulturist.* I think my favorite feature is "Strange Relatives" because I am very much interested in learning about as many plant families as possible. Also, I love books, especially gardening books, and I think your "Book Review" section is a real good thing. There are few bookstores in my area, so this way I can order them from home.

The Society is great and very informative and I like that. And I'd love to get more involved. How can I do it?

—Mrs. Donna Housel
Buffalo Mills, Pennsylvania

Bush or Tree?

Jane Steffey began her article on the mulberry family (*American Horticulturist*, June/July 1980) with the words of the action rhyme, "Here we go round the mulberry bush." By a wonderful coincidence, as part of the same week's reading, we found George Ewart Evans (*Tools of Their Trades: An Oral History of Men at Work c. 1900*) quoting the same singing game.

Have you ever wondered why the song says "bush" instead of "tree"? George Ewart Evans offers a reason. After talking with a reed thatcher in East Anglia about the use of bramble stalks in thatching, he asked a Suffolk neighbor about the bramble.

" 'You mean a mulberry stalk.'

" 'Well, it looked like a bramble to me.'

" 'Yes, yes. We allus call blackberries mulberries. A bramble, I reckon, is the same as a mulberry.' "

Evans wonders why "people of the old culture called blackberries mulberries." He speaks, as Jane Steffey does, of King James's enthusiasm for mulberries, but here he parts company with Jane Steffey. The seeds were not given away for free but "at a cost of three farthings a plant or six shillings a hundred." Only people of substance, Evans says, "would have access to the mulberry fruit. The less favored had the bramble, and it was probable that they referred to this as the mulberry because it was the poor man's fruit, free for the taking. There are a number of analogies for this kind of irony in the dialect. In Suffolk, country people used to refer to the small pony or even the donkey they often used in ploughing their . . . allotments as 'the poor man's Punch,' that is, the modest counterpart of the heavy farmhorse, the Suffolk Punch. In south Wales, too, the ubiquitous elder was referred to as the Welsh Vine. This attempt at a derivation is pure conjecture, but we can be sure that 'mulberry' in the above sense has a long standing link with ordinary country people, for the action rhyme: Here we go round the mulberry bush, is real evidence. Genuine mulberries grow on trees, therefore the mulberry bush must have been a bramble."

I offer this at the risk of setting off the great mulberry-bramble controversy of the 1980's, because I hope it may interest you. It seems to me, too, that if in these times we cannot have miracles, we ought at least to share our coincidences.

Mrs. Earl H. Newcomer
Storrs, Connecticut

Kiwifruit Source

I have just subscribed to your magazine and understand that the February/March issue, which I have not seen, has an excellent article on kiwifruit. I thought your readers who are interested in growing this fruit would like to know about a new nursery which supplies the vines. It is the California Rare Fruit Nursery, Inc., 989 Poinsettia, Vista, CA 92083. The plants are shipped bareroot in season.

Claude Sweet
Escondido, California

Clematis from Seed

I just received the April/May issue of *American Horticulturist* and I was really thrilled with it, being as I am a new member and this issue being the first one I have received. By a most fortunate coincidence, it contains a very good article on clematis, which happens to be one of my favorite plants. I thought I would write a few lines about my experience with developing them from seed.

I put fluffy seeds from 'Nelly Moser,' as soon as I gathered them, into a box half filled with a mixture of dry sand, mulch and earth and closed the lid and shook the box well to get the seeds well distributed throughout the mixture. Then I spread

over the mixture, thinly and evenly, a ½-inch layer of sand and leaf mold in equal proportions. I watered the bed well and left the uncovered box in the open air on a patio all year. The clematis seed appear to likes this treatment—they have a dormant period, and they need exposure to the winter cold (of course, our winters are relatively mild, hardly reaching lower temperatures than -8°C). The next spring five tiny clematis plants emerged from the ground. Three were eaten by snails, but the remaining two I rescued and transplanted to a safer place. I did not water the box during the cold season and started watering it again after danger of frost was over.

Recently I obtained a new variety, *Clematis vitalba*, with tiny white flowers, which has proved to be very resistant, and even if the flowers are not as large and opulent as the large-flowered hybrids, it makes a beautiful green and white spot on the wall where I made it climb.

Perhaps my technique is already known to horticulturists with experience, but I thought I should let you know about it. I must say, before closing, how happy I am to belong to the Society, and how much I enjoyed reading my first issue of *American Horticulturist*.

Cayetano M. Pepe
La Plata, Argentina

Japanese Beetles

Recent observations of mine indicate that traps for Japanese beetles are commonly placed badly; that is, they are placed in the middle of what needs protection. Careful observations in my garden show that damage to roses, for example, is worst in the immediate vicinity of the beetle trap. To test this I selected an isolated patch of *multiflora* which I had seen several times a day for weeks, without any indication of the presence of beetles. A trap was placed on the edge of this patch. Within two hours beetles were present in the trap and feeding on the roses. The patch is big enough so that several days later the feeding was still concentrated in the vicinity of the trap and the far edges of the patch were virtually untouched. Evidently Japanese beetle traps should be placed at a distance from what needs protection to decoy beetles away from sensitive plants.

Charles H. Blake
Hillsborough, North Carolina

NEW APPLE VARIETIES

Photograph by Author

"The proof of a pudding is in the eating." This old adage is equally applicable to a new apple variety. The success of a new variety can be measured by how widely it is grown. Using this yardstick, the new 'Empire' apple, introduced from Geneva in 1966, can be rated eminently successful. It is being planted widely; in the spring of 1978 more 'Empire' trees were planted than any other apple variety in New York State, the nation's second most important apple-producing state.

Because of the long life of an apple orchard and because markets for standard varieties are firmly established, new introductions are usually very slow to become accepted. Apple growers are very conservative, resistant to change, resistant to trying new varieties. Apple buyers for the big chain food stores are even more resistant to change. They demand a large volume of a uniform product; they are not interested in a new apple variety. Thus, the success of 'Empire' is, indeed, a phenomenon and has been possible only because it is such a superior new kind.

When is a new apple variety *still* a new variety? It may require 50 years or more for a new variety to become established, during which time it can still be called new. For example, 'Granny Smith' was discovered in Australia before 1868. Now, more than a century later, planting it is just beginning in the United States and we can still call it new. 'McIntosh', number one in the Northeast, was discovered in 1790; 120 years later it was still a "new" variety.

Brooks and Olmo's 1972 *Register of New Fruit and Nut Varieties* gives brief descriptions of the origins and characteristics of new tree and fruit varieties introduced in the 50-year period, 1920-70. Seven hundred and eighty-four new apple varieties are described. Later, between 1971 and 1979, they described an additional 75 new apple varieties. Only a few of these 859 are being widely grown in 1980; most have failed. Yet every one of them, at one time, performed well enough that their originators thought them worthy of naming. In fact, nearly all of them would likely produce good, acceptable crops if enough trees were planted and grown carefully. But somehow, nearly all lacked that special something that made them acceptable to growers and so they are doomed to obscurity.

In addition to the 859 new apple varieties listed by Brooks and Olmo between 1920 and 1979, several score new varieties have been brought into this country from abroad by the Plant Introduction Division of the U.S. Department of Agriculture. 'Mutsu' is a good example of a new variety, now widely grown, which came in as a foreign introduction.

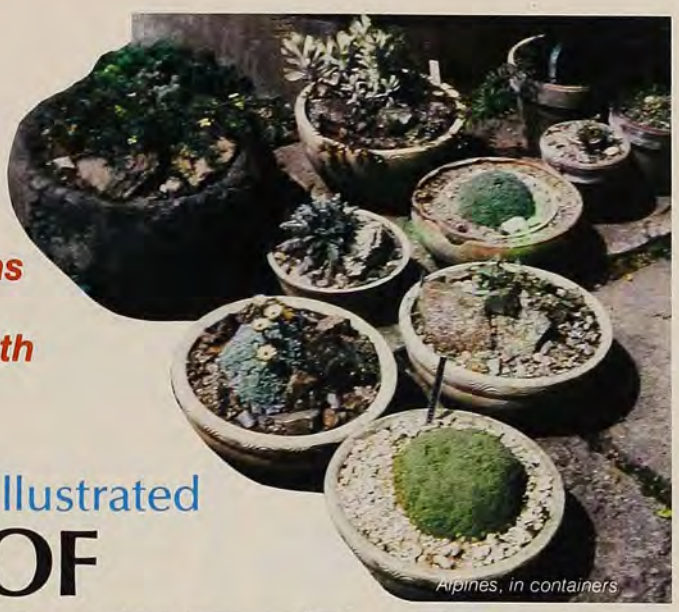
Yet in spite of these numbers, the trend in commercial apple growing is toward fewer and fewer varieties. In the 1890's every farm orchard grew nearly 50 varieties. Today, there are only 13 important varieties grown in the entire United States. In descending order, these 13 are 'Delicious' (about 2.5 billion pounds annually), 'Golden Delicious' (1.2 billion), 'McIntosh', 'Rome Beauty', 'Jonathan', 'York Imperial', 'Stayman', 'Winesap', 'Cortland', 'Yellow Newtown', 'R.I. Greening', 'Northern Spy' and 'Gravenstein'.

The most important variety, 'Delicious', accounts for 36 percent of all apples grown in the United States today. Furthermore, its relative importance is increasing every year. Someday, half our apples could be of this one variety. The entry of a new variety could become even more difficult. However, most people will agree that some of the new varieties are, indeed, superior and should be grown more widely.

Several of the top 13 listed above are "fence-row" discoveries and some are more than a century old. In recent years, there has been a great wave of nostalgia sweeping over the country. Many people claim that antique and heirloom varieties have the best eating quality. I have tasted most of those old ones; in my opinion, some of the new ones are better tasting. The eating

'Jonagold', a new apple variety in this country, is widely planted in England, Europe and Japan.

Announcing a totally new, amazingly comprehensive and authoritative reference work that has already been hailed as "the horticultural 'bible' for all gardeners,"* "a monumental work that eclipses all gardening encyclopedias of the twentieth century,"** and "an excellent quick-reference source for both students of horticulture and amateur gardeners."***


Alpines, in containers

The New York Botanical Garden Illustrated

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by Thomas H. Everett, *Senior Horticulture Specialist The New York Botanical Garden*

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Alcea rosea

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***Harold Davidson, *Ph.D., Department of Horticulture, Michigan State University*

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quality of the new 'Empire', 'Jonagold', 'Melrose', 'Gala' and 'Mutsu' are absolutely unsurpassed. Fortunately, those of you who like to grow apples in your home garden will have greater freedom to choose top quality than will commercial growers who must select varieties for long storage, eye appeal, long distance shipping, and above all, to please the chain store buyer.

The Geneva Experiment Station in New York has an extensive apple breeding program designed specifically to develop and introduce new and superior apple hybrids. Furthermore, this Station has a large apple variety testing program. Testing simply means growing and evaluating apple fruiting performances and making an estimate of their potential usefulness for home garden and commercial growers. We obtain new varieties from around the world, grow them and try to objectively assess their performance potentials. We have more than a thousand named varieties in our collection, one of the largest collections in the country. Additionally, we have 700 superior selections from our apple breeding program which are being re-evaluated; a few will eventually be introduced.

Although the Geneva Experiment Station has tested hundreds of new apple varieties, we have tested only a small portion of the thousand or more that have been newly introduced. Our tests are mainly of varieties from our own breeding programs and of those recently introduced by other experiment stations in the United States and abroad. We have not thoroughly tested many varieties introduced by private apple originators.

This report gives a brief description of 24 new apple varieties which we and others have found to perform well and which we consider worthy for grower trials. Dates listed are average harvest dates at Geneva, New York (Zone 5, −20° to −10°F winter minimum) and are listed in order of ripening. Surely, there is at least one new variety that you will find appealing for your own garden.

'Vista Bella'—Aug. 4, introduced by Rutgers Univ., NJ in 1974, replaces 'Lodi', a green apple of the same season, one of the earliest fully red apples, very vigorous tree, sometimes watercore. Trees sold by nurseries Nos. 2, 3, 8, 13, 14, 15 (see nursery list below).

'Julyred'—Aug. 8, Rutgers, NJ, 1962, better quality than 'Crimson Beauty', 2¾ in. in diam., half red, brighter lighter red than 'Vista Bella', attractive, firmer than most summer varieties. 2, 11.

'Viking'—Aug. 20, U. Wisc., 1969, dark red, heavy waxy bloom on fruit, good quality, biennial cropping. 8.

'Jerseymac'—Aug. 20, Rutgers, NJ, 1971, 'McIntosh' type, but a month earlier, good quality, soft, drops, attractive color, extremely susceptible to scab. 1, 2, 3, 6, 7, 8, 10, 11, 13, 14, 15.

'Tydeman Early'—Aug. 28, England, 1964, similar to 'McIntosh', but ripens three weeks earlier, good 'McIntosh'-like quality, fully red, large, tree has long, lanky branches. 1, 2, 3, 7, 8, 11, 13, 17, 19.

'Paulared'—Sept. 5, discovered by a Michigan grower, 1967, two weeks before 'McIntosh', attractive red color, firmer than most early apples, medium quality. 2, 8, 18.

'Burgundy'—Sept. 8, Geneva, NY, 1974, glossy dark mahogany, firm, good quality, sometimes sunburns, hangs well after ripe, short storage life. 2, 10, 13.

'Akane' (Prime Red)—Sept. 10, Japan, 1970, very attractive bright red, medium size, medium yields, good eating quality. 2, 6, 9, 13, 14, 15.

'Prima'—Sept. 15, Purdue-Rutgers-Illinois, 1970, scab resistant, needs no scab spray, especially useful for home orchardist, early fall apple, good size, good red color, good quality. 3, 8, 15.

'Jonamac'—Sept. 20, Geneva, NY 1972, similar to 'McIntosh', but nearly a week earlier and better quality, very susceptible to apple scab fungus, good color, medium size. 1, 2, 3, 8, 10, 11, 13, 15.

'McIntosh' spurs—Sept. 25, smaller trees than nonspurs, very susceptible to apple scab fungus, 'MacSpur' (Nursery No. 8), 'SpurMac' (3), 'Starkspur McIntosh' (15), 'Morspur' (7); other new 'McIntosh' sports are also available.

'Gala'—Sept. 29, New Zealand, 1960, attractive, light bright red, yellow ground color, excellent fresh eating quality, medium size. 15.

'Spartan'—Oct. 1, Summerland, British Columbia, 1936, some resemblence to 'McIntosh', medium size, highly colored solid dark red, firm, crisp, white flesh, juicy, very good, widely grown. 2, 3, 6, 7, 8, 14, 15, 17.

'Ozark Gold'—Oct. 5, Missouri, 1970, yellow-green, three weeks. 6, 9, 13, 14, 15.

'Liberty'—Oct. 7, Geneva, NY, 1978, disease resistant, no disease controlling sprays needed, especially useful for home

orchardist, good color, good quality, medium size. 2, 9, 13.

'Priscilla'—Oct. 10, Purdue-Rutgers-Illinois, 1972, scab resistant, no scab sprays needed, especially useful for home orchardist, also resistant to fire blight and powdery mildew, highly colored, crisp. 3, 8.

'Empire'—Oct. 14, Geneva, NY, 1966, one of most widely accepted of new apple varieties, excellent tree shape, productive, good fruit color, excellent eating quality, medium size, long storage. 1, 2, 3, 6, 7, 8, 10, 11, 12, 13, 14, 15.

'Red Delicious' sports—Oct. 14, nearly 200 mutations for improved red color or compact tree growth (spur types) have been introduced. Spurs are generally preferred. Some of the most widely grown spurs are 'Idaho Spur' (Nursery No. 13), 'Starkrimson' (15), 'Redchief'(8), 'Oregon Spur'(9, 17), 'Miller Spur'(8), 'Redspur'(7), 'Starkspur'(15), 'Wellspur'(6, 17), 'Ultrared'(15), 'Silver Spur'(3,4), many others.

'Jonagold'—Oct. 15, Geneva, NY, 1968, widely planted in England, Europe and Japan, excellent quality, only half red, pollen not viable, very productive. 2, 8, 11, 12, 13.

'Golden Delicious' substitutes—'Hawaii'(6), 'Smoothee'(8), 'Honeygold'(8, 15, 16), 'Sungold'(1, 2), 'Virginiagold'(1), 'Echo'(13), 'Blushing Golden'(15), 'Firmgold'(3, 4), 'Clear Gold' (19), 'Goldspur'(7), 'Magnolia Gold'(3), 'Nugget'(3), 'Supergold'(3), 'Criterion'(5, 12). Most of these have slightly lower fresh eating quality, some have more red color, and some have less skin russet than 'Golden Delicious'.

'Idared'—Oct. 25, Idaho, 1942, late ripening, handsome, solid bright red, tart at harvest, mellows in storage, long keeping, tree medium vigor, heavy cropping, susceptible to fire blight. 1, 2, 3, 6, 7, 8, 10, 11, 12, 13, 14, 15, 19.

'Rome Beauty' sports—Oct. 25, 'Law'(2, 6, 9, 15), 'Law Spur'(8), 'Starkspur Red'(15), 'Spuree'(8).

'Melrose'—Oct. 25, Ohio, 1944, excellent quality, large, productive, color slightly dull, long storage. 1, 2, 3, 8, 9, 19.

'Mutsu'—Oct. 25, Japan, 1948, very large, yellow-green, excellent quality, productive, very long storage, pollen not viable. 2, 3, 6, 8, 10, 11, 12, 13, 14, 15.

Some good new apple varieties, but not outstanding in Geneva tests, are 'Wellington'(2), 'Milton'(2), 'Earliblaze'(15), 'Mollie's Delicious'(3, 8, 15), 'Macoun'(1, 2, 3, 8, 10, 11, 12, 13, 15, 19), 'Jonee'(8), 'Anna'(3, 9, 15), 'Holly', 'Sinta', 'Spigold'(2, 8, 12, 13), 'Spencer', 'Prime Gold'(17), 'Spijon'(2), 'Regent'(8, 16), 'Splendor', 'Fuji', 'Granny Smith' (1, 2, 3, 6, 7, 8, 9, 10, 12, 14, 15, 17). 'Granny Smith' requires a very long growing season; in most of the northern U.S., it will not fully ripen.

Some relatively new apple varieties, not recommended because of horticultural deficiencies, are 'Barry'(11), 'Wayne', 'Lodi'(1, 3, 6, 7, 8, 10, 12, 15, 17, 19), 'Quinte'(1, 3, 8), 'Puritan'(2, 10), 'Beacon'(3, 8, 16, 19), 'Sir Prize'(3).

Some very new varieties, not yet fully tested at Geneva in 1980, are 'Summer Treat'(15), 'State Fair'(3, 15), 'Sweet Sixteen'(3, 15), 'Macfree'(13), 'Jonafree', 'Nova Easygro'(13), 'Nittany', 'Maigold' (20).

— Roger D. Way

Tree fruit nurseries cited above:

1. Adams County Nursery, Aspers, PA 17304.
2. Amberg Nursery, Stanley, NY 14561.
3. Bountiful Ridge Nurseries, Princess Anne, MD 21853.
4. Callahan Nursery, 1315 Fruitvale Boulevard, Yakima, WA 98902.
5. Carlton Nursery, Dayton, OR 97114.
6. Columbia Basin Nursery, Quincy, WA 98848.
7. C & O Nurseries, Wenatchee, WA 98801.
8. Hilltop Nurseries, Hartford, MI 49057.
9. Johnson Nursery, Ellijay, GA 30540.
10. Kelly Bros. Nurseries, Dansville, NY 14437.
11. Mayo Nursery, Lyons, NY 14489.
12. Miller Nursery, Canandaigua, NY 14424.
13. New York State Fruit Testing Assn., Geneva, NY 14456.
14. Sierra Gold Nurseries, Yuba, CA 95991.
15. Stark Bro's Nurseries, Louisiana, MO 63353.
16. Swedberg Nurseries, Battle Lake, MN 56515.
17. Van Well Nursery, Wenatchee, WA 98801.
18. Wafler Nursery, Wolcott, NY 14590.
19. Worley Nursery, York Springs, PA 17372.
20. Yakima Valley Nursery, Yakima, WA 98902.

Most tree fruit nurseries are almost completely sold out of nursery stock for 1980. Order now for 1981.

PAGODA BELLS

You can almost hear the bell-like flowers clanging as they sway on a pagoda-shaped raceme. There is the added attraction of velvet foliage with handsome patterns to bring joy during the murky days of fall and early winter. I am talking about the colorful, easy to grow smithianthas which, unfortunately, are not usually offered in the retail trade except through specialty commercial gesneriad growers. (See the list at the end of this article.)

Smithiantha is a small genus of plants found in the mountains of Mexico and Guatemala; there are a few species and not many hybrids to date. Smithianthas grow upright from a scaly rhizome to as much as five feet for the Cornell Series (10 hybrids produced by Dr. Robert E. Lee of Cornell), or only six inches for the two small hybrids, 'Little One' and 'Ruth K'. There are varying sizes in between. 'Summer Sunshine', 'Sunburst', *S. multiflora* and *S. zebrina* are beautiful and not too tall for growing under lights. The species *S. cinnabarina* lives up to its name with deep-red velvet foliage and cinnabar flowers. The heart-shaped leaves are further enhanced by a deep pile of soft red hairs. The inflorescence is a terminal raceme of nodding bells.

Michael J. Kartuz

Smithianthas are members of the same fascinating plant family to which African violets and gloxinias belong. This *Smithiantha zebrina* is suitable for growing under lights.

Smithianthas are members of the same fascinating plant family to which African violets and gloxinias belong. As with others in this family, most of their culture is good horticultural common sense. The only really critical area is watering, which is discussed later in this article.

Your first plants will probably be grown from the scaly rhizomes you have received in the mail and which need to be potted. Most rhizomes are as thick as your thumb and perhaps longer. They will need at least a four-inch pot. If you've chosen one of the Cornell Series, it might be wise to use a larger size. Plant one rhizome per pot *horizontally*, about one-half inch deep. Allow only one sprout to develop for vigor and beauty.

The growing medium must be light and porous, it should drain easily and it should have a goodly supply of organic matter and maintain an even moisture. The addition of dolomitic limestone is important, for gesneriads need a pH of 5 to 5.6. For different climates this describes different mixes, which can be formulated from many ingredients. Compost and peat-lite mixes are both popular. In the wetter areas many plants are grown in a bark-peat-perlite mixture.

In order to have stocky plants that flower, it is necessary to grow them in very good light; some sun is preferable and artificial lights are ideal if you have the space. Smithianthas require more light to flower than African violets. If the light is sufficient, you'll have blooms from late summer until Christmas; under artificial light you may have flowers all winter. This is because these plants are photoperiodic and respond to short nights for bud formation. If you choose artificial light, keep their growing tips no more than six inches from the tubes and keep the light on for 14 hours daily.

The most critical aspect of growing any gesneriad with rhizomes is to keep the soil constantly moist but not soggy. Drying out tricks the plant into thinking it is time to become dormant. Buds blast when this happens. Sometimes the stems remain green if you continue to water, but growth slows tremendously and you may get serial propagules instead of flowers. The rhizomes will not go dormant the first time you forget to water, but if dryness continues long enough, or occurs often enough, this physiological reaction *will* take place. Perhaps wicking would be your answer to maintaining a constant, even moisture level at all times.

The amount of fertilizer you will need is dependent upon the growing medium you use. If it is compost, there should be enough nutrients to last the first couple of months, then it becomes necessary to add supplemental nutrients on a regular basis in the form of water-soluble elements needed by the plants. If you use a soil-less mix the application of liquid fertilizer should start immediately. Apply as one of your regular waterings ¼ teaspoon to one gallon of water of *Earth Care*, a balanced blend of nitrogen, phosphorous and potassium, fortified with iron and manganese, and a favorite formula of the professional growers because of the boost to both the root and shoot systems. *Earth Care* is available at leading nurseries, garden centers and hardware stores.

The more humidity, the more lush and floriferous your smithianthas will be.

The mountains where smithianthas grow naturally have cool nights even though they are in the tropics. Therefore, high summer night temperatures can cause smithianthas to sulk a bit because they prefer the dark period to be cooler than the day by at least 10 degrees. It can also get too cold for them. In the fall, allow them to become accustomed to a gradual decrease in night temperatures until you can stabilize them at 55° - 60°F.

The more humidity, the more lush and floriferous your smithianthas will be. In the window this could be a problem, but in a greenhouse or under artificial light it is possible to maintain a relative humidity of at least 50 percent.

It is nice to have plants that can be put into dormancy while your indoor garden is most crowded and which can be brought back into flower during the season you have the most space. After the flowering cycle, withhold water until the stem dies back, then remove it. Store the dormant rhizomes in the pot in which they have been grown if you can. Water occasionally to keep them plump. After dormancy of three to four months, new growth begins to break in the late spring.

When the rhizomes begin to break dormancy, harvest and repot. You will find they have multiplied; where you had one, there are now from three to five rhizomes. This is the most popular way to propagate smithianthas, although they can also be propagated by division of the rhizome or by tip cuttings. Seed is seldom used except by hybridizers because the other means are so quick and easy.

Unwanted house guests that could be particularly troublesome to smithianthas are whiteflies and mealybugs. If you have kept a small fan constantly operating in your garden, the moving air will help to reduce the possibility of these pests showing up. (Unfortunately, this will result in reduced humidity, which should be watched.) However, if any of your other plants are infested, expect the smithianthas to also become hosts. A clean indoor garden can best be attained by isolating every new plant for at least six weeks before it becomes a part of the collection. If you do find some "bad guys," dip the entire plant (not the soil) into a good insecticide and then isolate it until you are sure it is clean. Malathion is one such insecticide (but it cannot be used on ferns or cacti).

About three months after planting the rhizome you should see a terminal flower spike emerge. Nodding tubular flowers will appear alternately beginning with those at the bottom of the flower spike. The bell-shaped blossoms form a raceme shaped very much like a pagoda. *Smithiantha* blossoms appear in various shades of white, yellow, pink, salmon, rose and red, often with red spots in the throat. If growing conditions remain good, the plant will produce more racemes in the leaf axils beginning near the top of the plant. I have had them near the soil line when my plants were grown under lights.

Try this more unusual member of the gesneriad family in your indoor garden soon. To order plants, write one of the suppliers nearest you: Buell's Greenhouse, Box 218, Weeks Rd., Eastford, CT, 06242; Golden Gate Gardens, 3773 17 St., San Francisco, CA 94114; Kartuz Greenhouses, 1408 Sunset Drive, Vista, CA 92083; Lauray of Salisbury, Undermountain Rd., Salisbury, CT 06068; W. B. Richardson, R.R. #2, Box 81 E. Orleans, MA 02653; Tiki Nursery, Box 4252, Princeton, FL 33032.

—Ruth Katzenberger

THE MADDER FAMILY

SECOND OF A TWO-PART SERIES

The madder family is recognized for its flowering ornamental species as well as for the prominent commercial products—coffee, quinine and dyes—which were described in an earlier column.

The array of ornamentals includes plants for outdoor culture in frosty regions, colorful, tender species for the greenhouse or outdoors in warm climes, a rare native American shrub and a couple of small woodland species. Over 60 genera are listed as cultivated plants and there seems to be something for every gardener.

For the gardener in warm regions, exotic *Ixora,* flame-of-the-woods or jungle geranium, flaunts bright orange-scarlet flowers in showy "snowball" clusters atop six- to eight-foot shrubs. *Ixora,* native to the tropical East Indies, is cultivated in the open in California, Florida and Hawaii and is prominent in the landscape plantings of Caribbean islands. Seeds are said to be favored by peacocks.

Bouvardia, a tropical Asian shrub, provides a choice of red, pink, white or yellow flowers, several named cultivars being very fragrant. The sprays of starry blossoms are often included in bouquets and table arrangements by florists.

Serissa is a single Japanese species with white flowers in clusters. It can be grown outdoors from Zone 5 southward. Dwarf forms of *Serissa* are adaptable to dish garden and bonsai culture.

Pentas lanceolata, the Egyptian star-cluster, is suitable as a bedding plant in the South, furnishing flat clusters of star-shaped flowers in shades of red, pink, lavender and white. *Pentas* can be grown continuously without dormancy as an evergreen house plant. It makes a shapely 12-inch pot plant under fluorescent lights.

Illustration by Alice R. Tangerini

A healthy coffee plant is indeed a beautiful sight. Hardy only in Zone 10, coffee is a greenhouse or conservatory plant. Its rather leathery leaves help it to endure the relatively dry atmosphere of other interiors so that it is popular for interior landscaping and as a house plant. The fragrance of its small, starry, white flowers resembles that of the gardenia; heaviest bloom occurs from July to September. The bright-red berries are decorative, and when ripe, can be washed, dried, roasted and ground for coffee. We all have an urge to grow food plants indoors, but when coffee prices soared, the quantity of coffee beans produced on an indoor plant was far from adequate to meet a family's needs.

Then, of course, there is the gardenia. *Gardenia jasminoides,* the Cape jasmine, is a greenhouse or conservatory plant; it is less satisfactory as a house plant because of its high humidity requirement and the need of low night temperature to induce bud formation. However, many temperate zone gardeners succeed with this temperamental species, keeping it indoors in the winter, setting it outdoors in light shade in the summer, and otherwise meeting the challenge of its special care. Flowers, borne singly or in pairs, have long contributed their pervasive fragrance to perfumes, teas and oils, and the fruit has uses in certain recipes for soups, sauces, dyes and cosmetics. Although *Gardenia* is a genus of Chinese origin, the name commemorates Dr. Alexander Garden, a native of Charleston, South Carolina, and friend of Linnaeus.

For the gardener who likes to acquire oddities or rarities, several choices of very unlike character suggest themselves.

Pinckneya pubens is a rare, deciduous, large shrub or small tree, native to the southeastern United States. It was named for Charles Cotesworth Pinckney of South Carolina, a distinguished statesman and general of the American Revolution. During the Civil War, the bark of this tree was thought to be a substitute for quinine, hence the common names, Georgia bark and fever tree. *Pinckneya* is unique among native American trees in being the only member of the *Rubiaceae* outside of the tropics with showy petaloid sepals. The flowers, with these petal-like sepals, varying from deep to light pink, come in late spring; they seem poinsettia-like and account for another common name, summer poinsettia-tree.

Chinese serpent vine is a relatively unknown species of *Psychotria,* recommended for hanging baskets or as a creeping-climbing plant. Its one- to two-inch leaves are shiny dark green; the white berries which follow flowering endure decoratively for a long time.

Nertera, a tender, creeping herb, used as a pot plant, is known as coral-bead plant or English babytears. I have seen it in plant shops in England but never here (perhaps I haven't visited the right shops). The transparent, pea-size, orange-red berries for which it is admired and which give it its eye-catching character persist for months.

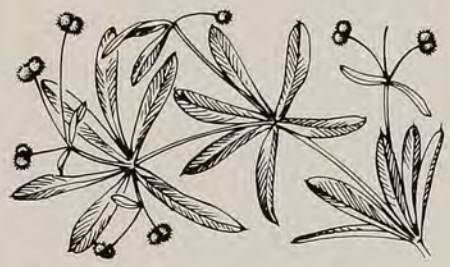
Flowering all year, sometimes profusely, sometimes sparsely, is the firecracker vine, *Manettia.* This is a four- or five-foot tropical American, twining, woody vine for greenhouse culture. The tubular, yellow-tipped red flowers are only about three-quarters of an inch in size. It can be pruned and maintained as a bushy vine of six to 12 inches, and as such the overall delicate effect makes it a good plant for artificial light gardens.

In temperate or cool gardening regions, the diversity of the madder family provides other choices, such as the wildflowers *Houstonia* and *Mitchella. Houstonia* (now reclassified as *Hedyotis*) is the delicate, spring-flowering native American bluet or Quakerladies, of which there are several species. With leaves in ground-hugging mats, it almost suggests moss. *Houstonia* is remarkably adaptable, yet it can be stubborn about taking hold in locations chosen by gardeners.

Mitchella repens, the partridgeberry, is another American native found in the woods over most of the eastern half of the United States; its flowers appear in united pairs and mature as the twinberry, the little scarlet drupe so popular for woodland terrariums. This plant is another member of the Rubiaceae named for an early American, the colonial Virginia botanist, John Mitchell.

In swampy areas or waterside sites, the buttonbush, *Cephalanthus occidentalis,* scents the air with small, white flowers in ball-shaped clusters from July to late September. It is hardy over most of the United States and perfectly at home in most garden soils.

Herb gardeners, and many others too, take delight in the familiar whorled leaves and minute springtime blossoms of *Asperula odorata,* sweet woodruff. This perennial is excellent as a ground cover or when used in clumps in the border or rock garden. It thrives in the shade. It is known for the fragrance of its dried leaves and for the aromatic enhancement the fresh leaves add to a glass or bowl of Moselle wine. Pick a sprig to send in a letter to a friend, to float in wine or just to slip into your pocket.



Gardeners interested in natural dyes from plants can make use of Galium *roots. There are at least sixty-eight members of the genus in the United States.*

Unfortunately this garden lovely has suffered the indignity of having its name changed from *Asperula* to *Galium odoratum,* and that is too bad, for other galiums are known as bedstraw and cleavers . . . also as weedy perennial herbs. The resemblance between sweet woodruff and bedstraw can be seen in the whorled leaves and extremely minute flowers. It is worthwhile to seek the more delicate forms of *Galium* for rock garden or informal border use.

Gardeners interested in natural dyes from plants can make use of *Galium* roots, including sweet woodruff, as a source of red, and by learning the distinctive features can collect from the wild for dye use. There are at least 30 members of the genus *Galium* growing in northeastern and central United States and another 38 in California; there are even a few in the arctic.

The fascination of the madder family does not end with the plants themselves. Choose one plant name and let it lead you through history, biography, plant exploration and romance. There is something for everyone among the Rubiaceae.

—Jane Steffey

CONTRIBUTORS

Mrs. Ralph Cannon holds a doctorate from the University of Chicago and is now retired as Emeritus Professor from that institution. She owns 26 acres of Illinois woodland where she has experimented with many gardening projects since 1939. She has contributed articles to *The American Daffodil Journal,* the *American Rock Garden Society Bulletin,* the *Hosta Bulletin, Flower and Garden* and *American Horticulturist.*

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Pamela Harper

The scorching summer of 1980 is behind us. Autumn has arrived. Take pleasure in the rich, jewel-like colors of the season and the beauty autumn brings to gardens everywhere.

BROMELIADS

IN AMERICAN HORTICULTURE

BY VICTORIA PADILLA

It is indeed mystifying that bromeliads have been so long in taking their rightful place in American horticulture. For over a century these plants have been favorites on the Continent, but it has been only in the past decade or two that their value as indoor plants and as striking specimens in frost-free gardens has been recognized in this country. Today, they are still relatively unknown, and many retail florists and nurseries are hesitant about stocking them.

What makes it even more strange is that bromeliads (with one lone exception in West Africa) are truly all-American plants, for they are to be found only in the Western Hemisphere. They are prevalent in parts of the Deep South, and their range extends from Virginia south through Mexico and Central America to within 500 miles of the southern tip of Argentina. Within this great area they are to be found almost everywhere—from sea level to the highest Andes—growing atop rocks on bleak mountainsides or in the dark corners of the jungle, perched on trees alongside orchids, clinging to sands along the ocean or in the high deserts of Peru. Mostly they are epiphytes, preferring the humid conditions of open forest where some light can filter through the canopy formed by the trees.

What do bromeliads look like? There are over 2,000 identifiable species, so they assume a number of forms. For the most part, they are in the shape of a rosette with the flower spike rising from the center. The best known species is the edible pineapple, which was the first bromeliad to

BELOW: One of the most colorful of all bromelaids, *Guzmania sanguinea*. RIGHT: *Aechmea chantinii*.

All photographs courtesy of the Bromeliad Society.

find itself away from America, being brought by Columbus as a gift to Queen Isabella. Another familiar bromeliad is the Spanish moss which festoons many of the trees in the South. This plant is a member of the subfamily Tillandsioideae, a group which is particularly popular in California. But it is the many highly ornamental bromeliads with their bizarre foliage markings and their striking inflorescences that first became popular in collections.

Bromeliads may be said to have entered horticulture during the last part of the 18th century. The earliest known collector was Nicolaus Jaquin, who left Holland in 1755 to go to the West Indies and Venezuela in search of new plants, and he brought back several bromeliads. It was not until the early years of the 19th century, however, that the popular and familiar species such as *Aechmea fasciata, Billbergia pyramidalis* and *Vriesea splendens* found their way into the botanical gardens and drawing rooms of Europe.

There is no record of bromeliads being cultivated to any extent in the United States until the 1890's. True, as early as 1857 the pineapple was reported growing in California, but the first reference to a bromeliad in a garden for decorative purposes was that of *Pitcairnia corallina* in Santa Barbara in 1880. Dr. Francisco Franceschi, the eminent Italian horticulturist who settled in Southern California, listed several puyas, billbergias and dyckias in his catalogue issued in the mid 1890's. In the East, the nursery of Pitcher and Manda in New Jersey listed 76 species in 16 genera in their 1896 catalogue, but these plants were little known and seldom seen outside botanical gardens.

By the 1930's, the figure that loomed first and foremost above all bromeliad growers was Mulford B. Foster of Orlando, Florida.

This was the era of the grand estate with its great conservatories and parklike grounds. Such an establishment necessitated the aid of well-educated and experienced gardeners, many of whom were brought from Europe. It is highly possible that many bromeliads were brought to this country by these men to whom bromeliads were familiar plants. One such plantsman was Henry Pfister, who for 30 years managed the White House Conservatories. Along with orchids he featured a number of rare and outstanding bromeliads. Particularly noteworthy were his many guzmanias—all rare items at that time—and his giant-sized *Aechmea mariae-reginae,* a plant which is difficult to obtain even today.

Undoubtedly, at this time bromeliads began to be introduced into many of the botanical gardens around the country—Chicago, Buffalo, New York and Brooklyn having the beginnings of collections. The Missouri Botanical Garden in St. Louis was one of the leaders in this field. The earliest recorded species was *Pitcairnia latifolia* which was listed in 1895 as having been in the Garden for some time. Through the assiduous efforts of Ladislaus Cutak,

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BELOW: *Tillandsia brachycaulos* growing on a branch. RIGHT: *Guzmania* x *Orangeade.*

Hardy Plants For Damp Soils

TEXT AND PHOTOGRAPHY BY MRS. RALPH CANNON

Poorly drained land can sometimes present a problem to the gardener, for gardening on damp soil is different from gardening elsewhere. But poor drainage needn't be a hindrance. In fact, it can be a unique challenge. There are many moisture-loving plants available that will fluorish on poorly drained soil, and with proper study and selection of plants you can transform such areas into the most rewarding parts of your garden.

Ironically, the main trouble with growing plants in poorly drained soil is drought. The root growth of the plants under these wet conditions is mainly restricted to the surface layers; consequently there is no deep root system to draw moisture from the lower soil regions if a dry spell does come along.

Perennial weeds growing in the damp soil also can cause trouble. Therefore, eliminate these weeds before you make any permanent plantings. After the weeds are eliminated, dig the ground and allow it to weather and dry out somewhat. A surface dressing of peat will aid in preparing the upper layer for receiving the permanent plants. If a large amount of peat is used, sprinkle the surface with a light application of fertilizer to prevent nitrogen starvation. An effort also must be made to discourage the future appearance of annual weeds by mulching heavily or using other techniques. In addition to actual dampness, other soil conditions are important for the successful growing of the chosen moisture-loving genera. For example, if your soil is full of clay, then humus, leaf mold and well-rotted manure must be added to loosen it up and allow aeration.

If your garden has an area of damp soil, here are suggestions for plants that will be happy there. In fact, these plants actually need damp soil to thrive. Native plants come to mind immediately, for they are easy plants to grow and are among the most handsome that can be grown in gardens.

Aruncus dioicus, the common goatsbeard, makes a fine plant for a background in the moist area. It grows about five feet tall, and anything that gives height is valuable in a garden. The stems carry large, fern-like, pinnate leaves that make handsome tufts. They also bear clusters of small cream-white flowers in great plume-like panicles. Blooming in June, goatsbeard is very noticeable. To provide winter inter-

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OPPOSITE: To keep the plants vigorous, transplant *Iris kaempferi* every three or four years. ABOVE: *Houttuynia cordata* displays attractive flowers in midsummer and colorful foliage in the fall.

Money-Saving Ideas For The Gar

Coming up with money-saving ideas for the garden is a tricky business. It can be argued that the best way to save money in the garden is to give up the pastime entirely. But to a true gardener this suggestion borders on heresy. Then again it can be argued that gardening is itself a money-saver because it can become such a consuming passion that it leaves little time for the pursuit of other, more expensive hobbies.

Most of us probably fall somewhere in the middle of these two extremes—devoted enough not to mind spending money on our hobby, but not so devoted that we object to saving money when we can. We hope you will find our money-saving suggestions helpful. Some of them may be practices you already employ; others may not apply to your gardening needs. But surely there are several ideas which, if put into practice during the next year, can save you at least $20. In that case, membership in The American Horticultural Society (which starts at $20 a year) may be the best money-saver of them all.

Illustrations by Robyn Johnson-Ross

MONEY-SAVING IDEAS FOR THE VEGETABLE GARDEN

- Plant only what you need. Unused produce simply represents wasted effort. For ideas on how to make next year's garden super-efficient, write to the National Garden Bureau, Inc., P.O. Box 344, Sycamore, IL 60178. Ask for their "Nonstop Vegetable Garden Plan."
- Keep the garden producing. As soon as you remove a crop of vegetables such as lettuce or early beets, replace it with another crop such as kale or Brussels sprouts.
- Use the soil as efficiently as possible, avoiding crops which spread over a large area. If possible, grow up instead of out. Plant beans, cucumbers, tomatoes, gourds and other viny plants on poles planted in the garden for that purpose.
- Make inexpensive permanent poles from used galvanized pipe bought at a junk yard.
- Use sunflowers as poles for your beans and accomplish two aims at once: the sunflowers are sturdy enough to hold beans as they grow, and they may ward off some insects at the same time. Simply plant sunflower seeds two weeks before you plant your beans so that they will always be a step ahead.
- If lack of space prevents you from growing all the vegetables you'd like, remember—vegetables don't have to grow in a vegetable garden. Consider edibles for ornamental borders. Many herbs (parsley and chives, for example), strawberries, eggplant, lettuce and other such plants provide attractive foliage to offset ornamental plantings while at the same time producing an edible crop.

ENERGY SAVERS . . .

- An energy-saving idea on which plants will grow—build a four-foot-wide eyebrow trellis across a portion of the south side of your house. Plant it with grape vines to screen out summer heat and to produce a fall harvest. In winter, after the leaves have fallen, the low winter sun will still be able to warm the walls and enter the windows.
- When choosing a new building site, search for land that naturally provides an advantageous climate. A south-facing slope, protected from winter winds by a hill above is especially desirable in cold regions. There's another bonus: the south-facing aspect of the land will give you an extra month or more of gardening weather. In a hot, muggy area, a breezy hilltop site may eliminate the need for air-conditioning. A lake or wide river can modify the extremes that are typical of midwestern

den

sites. Remember that a microclimate that's good for your house is also good for your garden—and vice versa.

• Indoor plants like fluorescent lights. These lights consume no more electricity than incandescent bulbs, give three times as much light for the wattage, last longer and give off considerably less heat as well as afford more even distribution of light. A two-tube, 24-inch fixture is the minimum practical size for growing plants under fluorescent lights. For most purposes, combine one cool white and one warm white tube in the fixture.

• Select tree species wisely to protect your home and other plantings from winter winds and to shade your house in summer. Of course, the design of plantings will depend upon property shape and size, but in general, larger evergreens (spruces, pines, junipers, etc.) can be remarkably effective in reducing winter cold when planted to the west and north of dwellings. Deciduous trees to the south shade the house from hot summer sun, but impede sunlight only slightly in winter when it is wanted. Midwest studies have shown energy savings up to 30% when using an evergreen windbreak, and deciduous trees planted on the south side of the house can reduce roof temperatures in summer by as much as 10°F.

• Save power and help your house plants at the same time during cold months. If you have an electric dishwasher, stop it at the end of the wash cycle, open the door, pull out the top shelf six to eight inches and let the dishes air dry. The moist, warm air will benefit nearby plants and humidify the area. And you'll save on your fuel bill.

• Ivy and other vines on brick or masonry walls will actually help with insulation. In summer the wall surface of a vine-covered sunny area may actually be up to 10°F cooler than an exposed wall. In winter the reverse effect is possible. A vine-covered north wall may remain up to 8°F warmer than a bare wall exposed to the north wind.

• Another winter money-saver: disconnect the dryer vent from the outlet so that it will vent humidity into the house and onto your plants. Move ailing plants to the laundry area for closest proximity to these ideal conditions (but not directly next to the vent or the heat could be damaging).

• Cover windows on the north side of your house with bubbled sheet plastic (you can buy it by the yard). This plastic admits enough light for most plants and keeps out the cold. Wet the window glass with a sponge and slap the plastic sheeting in place.

• If you own a greenhouse, send away for "Greenhouse Energy Conservation," a new book just published by the Penn State College of Agriculture. One commercial greenhouse which applied their suggestions saved $20,000 during a single winter! Each manual is $2.50. Order from Industrial Research and Innovation, 225 Pond Laboratory, Dept. AG, University Park, PA 16802.

INSECT CONTROL

• To conserve insecticide (and your health), spray only the plants—not the air you breathe. Cover the infected plant with plastic, cut a small flap through which to spray the insecticide, spray and remove the plastic the following day.

• Identify insects before spraying with a general purpose insecticide. Only after identifying an insect can the proper insecticide program be designed to control the pests. General purpose spraying is frequently wasteful. Your local USDA Extension Service can be of great help, both in insect identification and in suggesting a proper spray program.

• Plant squash near tomato plants in the garden in order to reduce spraying for whitefly. Whiteflies cause considerable problems on tomatoes. Squash, on the other hand, is not seriously damaged even though

it is a favorite host. Thus, planting the two vegetables next to one another will result in large numbers of insects on squash and few or no whiteflies on tomatoes.

- Consider this insect control idea for squash alone: place aluminum foil, shiny side up, under the plants. The light reflection it causes seems to confuse insects, but it doesn't produce enough heat to damage the squash.

MANY USES FOR GALLON-SIZE PLASTIC MILK JUGS:

- as dippers for potting soil, etc. The tops remaining after the bottoms have been cut for use as saucers are ideal for this purpose. Keep the cap on to prevent leaks. With the cap off, the scoop becomes a handy funnel.

- as solar heat traps in a greenhouse. Collect as many jugs as your greenhouse can use, fill them with water and place them in sunlight to allow the water to absorb the sun's heat. The heat they give off at night will help protect plants from cold temperatures. Each gallon of water weighs about 8 pounds and can therefore release 8 BTU's of energy for each degree it cools at night.

- as cloches—cut out the bottom, place over tender plants put out when there is still risk of frost, or over cuttings rooted *in situ* (leave the cap on to start with, then remove it when the cuttings have rooted to help harden them off before removing the jug entirely).

- as water jugs for container plants. For easier pouring, make a small second hole near the top of the handle through which air can enter—the same

principle one uses when pouring juice from a can. Keep the jugs handy and close by plants, so that when a patio plant needs attention, it gets it immediately and isn't forgotten before you get back with a watering can.

- as saucers for potted plants in areas where aesthetics don't matter (beauty is not one of the jug's strong points). Simply cut them down to the height desired.

DOUBLE DUTY

- Most people garden in old clothes, but old clothes also can be used *in* the garden. Cut up old shirts or trousers into strips for use as ties on plants. Cloth is better than wire twists because it won't cut into plants. Also, colorful cloth blowing in the wind will discourage birds where you don't want them.

- Hundreds of uses have been devised for old stretch stockings, but have you considered these: cut them into strips and use them to tie up tall, viny plants such as tomatoes, delphiniums, tall marigolds; use them to tie up bundles of twigs or stems for the trash heap or the fireplace when doing a fall garden cleaning; cut them into circles and use them as "filters" between your soil and drainage medium in pots to prevent soil from escaping.

- Use clear plastic (polystyrene) disposable tumblers as pots for small plants. Drill or melt a hole in the bottom for drainage (for best results, use a hot nail for this purpose). These clear pots allow you to easily evaluate moisture and root conditions. They also work well as temporary covers for newly potted small plants which need a high moisture level (a miniature greenhouse).

- Check sewer or pipeline construction sites for discarded tiles and coupling fittings. These terra cotta and concrete pieces make nice pots and garden ornaments. Be sure to ask permission to take them home, however.

- After the holidays, rescue your discarded Christmas tree and those of your neighbors and use the cut branches as windbreaks for your azaleas, rhododendrons and boxwood. Stake them up around the plants, being especially careful to protect the side on the prevailing winds.

- Use discarded sheer curtains to cover strawberries, currants, raspberries—any ripening fruit or vegetable—to protect them against birds and animals.

- Recycle bread wrappers and other plastic bags to create mini-greenhouses for seedlings and other plants which will benefit from high humidity.

- Simple and more effective substitutes for broken crockery over drainage holes in pots: cut-up pieces of foam cups and foam egg cartons; wedges of old kitchen sponges (they allow excess water to drain, but keep in welcome moisture—sterilize before using); fiberglass insulation strips (they can be cut to fit the pot bottom, they don't deteriorate and they repel pests and fungi); styrofoam packing bits (usually in the shape of peanuts and often called peanut packaging) which retailers use when packaging breakable items.

- Use plastic bags as liners inside clay pots or other porous containers. Punch drainage holes in the bottom and tuck it below the soil line so the plastic isn't seen. Potted plants treated in this manner and used on the patio, porch or balcony need watering less often.

- Use old bits of gift package yarn to mark new shrubs or young plants that will need extra attention when set out. These reminders can even be color coded: red for extra watering, green for special fertilizer, etc.

• Another use for plastic bleach bottles: cut them up into strips to use as plant labels, affix them with wire and write on them with a "Sharpie" pen (buy these at a dime store).

• For fine, permanent plant labels, consider the ones produced by the American Horticultural Society's Plant Science Data Center. These labels aren't inexpensive, but a comparable label purchased from any other source would cost 30% to 40% more. Write for our catalog in care of PSDC at the Society.

• After pruning, set aside the straightest, strongest or most supple branches, large and small, for staking plants.

• Use left-over wire fencing to make ring supports around peonies and other plants.

• Save the plastic containers which cottage cheese, ice cream and mixed dried fruit come in. They're excellent for growing paperwhite narcissus and come in especially handy when you want to give away paperwhites as gifts—you don't have to worry about getting the containers back.

WAYS TO SAVE MONEY ON MULCHES, FERTILIZERS, SOIL AMENDMENTS, ETC.

• Collect and store fireplace wood ashes in a dry place for use as a fertilizer additive. Filter out unburned rubbish first. Wood ashes contain 32% calcium, 5.5% potash and 3% phosphoric acid and trace elements which aid in root, flower and fruit development. Mix it into your soil at a rate of 10 pounds per 100 square feet or four ounces per square yard.

• Buy "spoiled hay" from local farmers. It costs about $1 to $1.50 per bale. Not only does it keep weeds down on vegetable and flower gardens, but it also adds nutrients to the soil and minimizes the need for periodic rototilling.

• Powdered eggshells are a good calcium additive for house plant potting soils—a teaspoonful to a three-inch pot.

• When preparing a new seed bed, save money on mulches and soil-lightening amendments by restricting their use to a strip about three inches wide where the seed is to be planted. Mix the amendments about three inches deep in the soil and plant your seed as usual. By the time seedling roots outgrow their mulched space, they will be strong enough to cope with the heavier surrounding soil.

• Manure is to soil what gold is to a bank. Get it free or at minimal cost from these direct sources: a nearby farm, riding stable, or, if you live in a large city, from your city's zoo. Allow it to break down prior to using it as a mulch or soil additive, and be sure that it hasn't been treated with chemicals which may damage your plants.

• Reserve some of the manure for manure tea, an inexpensive liquid fertilizer. Fill a five-gallon bucket with water and place one pound of manure which has been put in an improvised cloth bag holder inside the bucket. Push the bag down occasionally to aid in leaching and to ensure a richer brew. Remove the bag when bubbles appear and reserve this "stock" for later use as a liquid fertilizer in dilute form.

• If the trees in your own yard don't provide enough leaves for your mulching needs, check with your neighbors—but be a good sport and ensure your neighbors' cooperation by raking their yard yourself or providing them with bags if they prefer to do their own raking. If trees simply aren't abundant in your neighborhood, it is possible that your city or county has a leaf dump from which you can obtain all the leaf mulch you will need. Call your Sanitation or Public Works Department for information.

• Tree clearing companies such as Asplundh or Davey will often deliver a complete truckload of shredded branches to your house for a delivery fee of only about $10. They don't take reservations, however—instead, you must spot the truck in your area when a crew is cutting trees and make your delivery request to the driver. If he agrees that you're within a reasonable distance of his normal route, he will most likely also agree to give you the results of his day's labor. Keep in mind that a truckload is quite a bit of mulch. Perhaps you will wish to consider sharing this abundance with your neighbors.

• Save spent tea leaves for use as a mulch on acid-loving plants such as azaleas, magnolias, pieris.

• Use lawn clippings as mulch. Not only will grass clippings protect your plantings from

weeds and conserve moisture, but they will also add fertilizer to your soil. Two to four percent of the dry weight of grass clippings is organic nitrogen.

• If your area experiences heavy snowfalls during the winter, use it to your advantage. Snow is one of the least expensive of all mulches. Temperatures under snow cover are much warmer than the surrounding air and the humidity under the snow blanket is higher too.

• Provide your tomato plants with welcome calcium and a trace of phosphorus by adding one teaspoon of powdered milk to the hole in which the tomato seedlings are planted. The powdered milk will promote about a two-week advance in growth and help guard against blossom drop or rot.

• Encourage earthworms in your garden by reducing the chemical residues in the soil and increasing the organic content with leaf mold, compost, peat moss, etc. Worm castings are free fertilizer and worms keep the soil in great tilth.

MONEY-SAVING IDEAS FOR THE LAWN

• At high elevations and in northerly areas the summer season may be all too short for maximum plant growth. Especially when starting a new lawn, or reviving a dormant one, a close mowing (scalping) in late winter or early spring removes the insulating barrier of old vegetation and exposes darker soil that is more absorbant of sunlight. The ground warms, "bringing spring" as much as a couple of weeks early—all for the "cost" of a single mowing.

• Shallow watering of a lawn results in the development of shallow-rooted grass, which is vulnerable to almost all adverse conditions. Correct watering will help prevent the loss of a lawn, but how do you know if you're watering correctly? One solution: place a tin can, notched with a two-inch depth mark, in the area you plan to water. When the tin can has two inches of water in it, it is time to move your sprinkler to another location.

BUY IN GROUPS

• Some nurseries sell their stock wholesale. If you can pool orders with friends and neighbors, you can save substantially. And keep in mind that this discount may apply not only to plants but also to fertilizers, gardening tools, grass seed, mulches, etc. The same is true with mail-order firms. By ordering in quantity, you may not only be eligible for discount rates on the plants themselves, but you may also save substantially on shipping costs.

• A neighborhood cooperative purchase may be in order should you want to buy a large piece of equipment such as a leaf mulcher, rototiller or wood splitter. Choose your co-owners carefully, however. An irresponsible user could end up costing you more than shouldering the entire expense yourself. In that case, the best solution may be to rent the equipment. Renting could also be done on a cooperative basis.

MISCELLANEOUS

• Save by making your own general-purpose potting soil. Into a plastic trash bag put a 10-quart bucketful of shredded sphagnum peat and the same amount of either perlite or horticultural vermiculite. Add 3 tablespoons ground limestone, 2 tablespoons superphosphate, 5 tablespoons 5-10-5 fertilizer and 1 teaspoon chelated iron, all obtainable from a garden supply store. Tie the plastic bag shut and tumble and knead it until the ingredients are mixed. Wet the mixture with about 3 pints of water to which ¼ teaspoon of laundry detergent has been added (the detergent functions as a wetting agent). Again, knead the mixture until it is uniformly moist. Keep the moist mix in the plastic bag until you need it.

• A few annuals can be relied upon to re-seed themselves, thus saving you the yearly expense of buying new seed or new bedding plants. Some reliable examples are floral carpet snapdragons, 'Baby Doll' dianthus, portulaca, hardy begonia and the outdoor spiderplant (*Cleome*).

• Start plants from seed. Seeds, of course, are cheaper to buy than grown plants. If buying seed, buy only the best—you'll save money in the long run. Don't waste time, however, on seed you may have collected yourself from hybrid plants. They don't remain true to type. To keep seeds viable from one season to the next, store them in a dry, cool spot. One rule of thumb is to be sure that the humidity and temperature levels in your chosen spot always total less than 100 (the lower this figure the better). For instance, if your location has a relatively constant temperature of 50°F, be sure the humidity level is less than 50%. Seeds can even be frozen and remain viable as long as they are well packaged and are not thawed before you plan to use them.

Another way to save money by group buying is to try group bartering. No money exchanges hands—just plants. Pamela Harper explains how it is done in her community. "Every member who wants to participate must contribute plants, although no tally of how many plants each member of the group contributes is attempted. Plants are set out in alphabetical order (we usually hold the meetings in someone's garden, or if raining, in someone's garage). Once everyone has had a chance to inspect the merchandise, each participant draws a number from a hat (enough numbers are put into the hat to include all participants). Whoever is put in charge then calls the numbers in numerical order. Whoever is lucky enough to have drawn #1 gets first pick and may choose one plant. When all the numbers have been called, we start again. This time each participant chooses two plants. This procedure is followed until the number of plants remaining is fewer than the number of participants. Then there is a "free for all," when everyone may grab whatever is unclaimed. I have never known a plant to be left unadopted, and I have acquired some real treasures this way. It is something that could be done by any garden club, plant society or even a neighborhood group."

• In autumn take cuttings from your begonias, impatiens, coleus and geraniums to save over the winter. Put them in a cool room with a southeast or southwest window exposure and prune them to control legginess. As roots develop, take cuttings from these cuttings to make additional plants. By spring you will have plenty of "free" bedding plants for your outdoor garden.

• Raise your own perennials—and many shrubs—from seed. One packet of *Buddleia,* for example, will supply you, your neighbors and your friends with all the butterfly bushes you will ever want.

• Use more common native plants in your landscape plan. Transplant from the wild, being sure, however, that the plants you choose are not threatened or endangered and that you have permission to take them. Roadside construction sites are ideal places to find good plant specimens, and by rescuing them from destruction you will be doing the plants a favor.

The possibilities are almost limitless. Consider moneywort, meadow rue, wild columbine, bloodroot, violets, common asters, mosses and wild ferns. Remember to try to provide your transplant with an environment that is similar to what it had in the wild.

• If you would like to grow fruit trees, give special consideration to the dwarf varieties. Since they can be trained to grow no more than six feet high and still produce good yields, they are easier to spray, prune and harvest and will save you time and money in labor and maintenance costs.

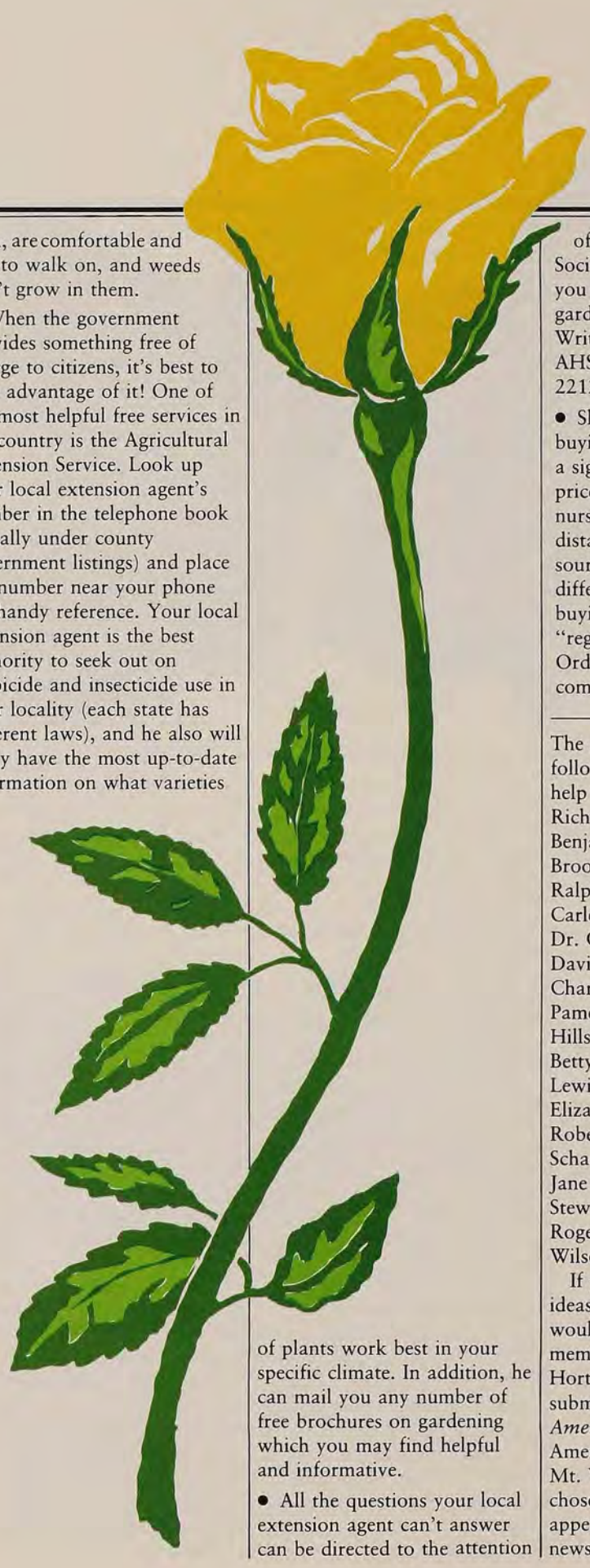
• Achieve color in a shady garden without spending money or planting time every year on flowering annuals. Instead, install permanent plants with variegated foliage. Some plant types that include varieties with variegated foliage are *Hosta, Aegopodium, Ligustrum, Lamium, Pachysandra* and *Euonymus*; also native spotted wintergreen and rattlesnake plantain exhibit this characteristic.

• Fashion your own topiary frames from old wire coat hangers. One method: plant eight to 10 sprays of fast-growing ivy in a good, large clay pot full of soil. Bend the hook of the coat hanger into a straight line with a pair of pliers, then insert the whole length of the straightened hook into the soil. This will give the hanger/frame a secure base. Twist the hanger into a desired shape (a circle is easiest and lends itself to many holiday ornamental possibilities) and allow the ivy to train itself around the frame. With the addition of a red bow at Christmas, you will have grown your own wreath.

• Elizabeth Schaeffer offers this idea for an inexpensive yet multi-purpose garden tool: a linoleum knife. You can buy it at almost any hardware store, and, says Schaeffer, "it cuts through the ground well without disturbing the ground around it, yet if you really want to disturb the ground a cross-hatching motion accomplishes the purpose. Weeds can be cut out well below the surface if you slant the blade the way you cut asparagus. The single blade cultivates between closely-planted annuals and weeds between stones or sidewalks better than the three-pronged cultivator or the traditional paring knife. Its sharper inner blade is great for cutting apart young plants in flats and trimming grass along beds, yet the blade, being sharp only on the inner curve, makes it safe as well as easy to use."

• Keep a garden log or diary of successes, failures, bloom time and the susceptibility of plants to certain diseases. This diary will not only allow you to cut down on future mistakes, but it will also make it easier for you to efficiently plan new garden projects—surely a money-saver.

• Save money on rhododendron and azalea plants by buying "liners" (rooted cuttings) rather than the more expensive 18″-20″ plants. Buy them through mail-order catalogs or find a nursery source near your home by looking through a library copy of *American Nurseryman* magazine. You will have to wait a few years for blooms to begin appearing on these plants, but not as long as you might think. Liners adapt well to your garden's micro-climate and grow quickly, while larger, "artificially" raised specimens may take one or two years to adjust to your garden's climate and not grow at all during the adjustment period. The difference in price will more than offset the longer wait for blooming time—and you will also have the newest cultivars in your garden as soon as professional nurserymen do.



• After having enjoyed the beauty of your roses, don't let the petals go to waste. Use them for potpourri, sachets, rose petal jam or jelly, refreshing rose water, even old-fashioned rose petal beads—all good gift ideas. Look for recipes in the June/July 1979 issue of *American Horticulturist*. Find others in gardening books in your local library or in the *Roses* volume of the American Horticultural Society's new *Illustrated Encyclopedia of Gardening*.

• Spend a little money to save some—invest in a heating cable for your soil (a cable costs as little as $8) if you like to start plants from seed. When used in combination with fluorescent plant lights, it makes raising healthy seedlings easy. Because of the bottom heat produced by these cables, seedlings emerge much faster (some in as little as two or three days) and germination can be considerably improved. Vegetable seeds germinated in this way can be set out as seedlings earlier in the season and thus produce for you earlier in the season as well.

• Make garden paths with old newspapers—enlist your neighbors to give you their newspapers in order to build up your supply. Pamela Harper explains her method: "I dig out the path a foot deep, put in newspapers (the whole paper, about ten sheets thick, not single pages) about four deep, then top with pinebark or hardwood mulch. Pine needles, if available, would also work." The advantages of this method are numerous: these paths are inexpensive to build, inconspicuous in an informal garden, can be easily moved if you change your landscape plan, are comfortable and dry to walk on, and weeds don't grow in them.

• When the government provides something free of charge to citizens, it's best to take advantage of it! One of the most helpful free services in the country is the Agricultural Extension Service. Look up your local extension agent's number in the telephone book (usually under county government listings) and place the number near your phone for handy reference. Your local extension agent is the best authority to seek out on herbicide and insecticide use in your locality (each state has different laws), and he also will likely have the most up-to-date information on what varieties of plants work best in your specific climate. In addition, he can mail you any number of free brochures on gardening which you may find helpful and informative.

• All the questions your local extension agent can't answer can be directed to the attention of the American Horticultural Society. As a member of AHS, you are entitled to our *free* gardener's information service. Write Jane Steffey, in care of AHS, Mount Vernon, VA 22121.

• Shop around even when buying by mail. There is often a significant variation in the prices of plants from one nursery to another. The more distant from each other the sources, the greater the differences in price. Mail-order buying opens the door to this "regional comparison buying." Order lots of catalogs, then compare and save.

The staff wishes to thank the following contributors for their help in preparing this article: Richard Adams II; Mrs. Benjamin P. Bole Jr.; J. Judson Brooks; Lorraine Burgess; Mrs. Ralph Cannon; R. Milton Carleton; Robert F. Carlson; Dr. Gilbert Daniels; Steven Davis; Anthony J. De Blasi; Charles Elstrodt; Gail Gibson; Pamela Harper; Judith Hillstrom; Mrs. Howard Kittel; Betty Ann Laws; Clarence E. Lewis; Jeannette Lowe; Elizabeth Pullar; Don Robertson; Elizabeth R. Schaeffer; Dr. Robert Schery; Jane Steffey; Shelton E. Stewart; T. Davis Sydnor; Mrs. Roger Thomas; and James W. Wilson.

If you have money-saving ideas for the garden which you would like to share with other members of the American Horticultural Society, please submit them to The Editor, *American Horticulturist*, American Horticultural Society, Mt. Vernon, VA 22121. Ideas chosen for publication will appear in future issues of the newsletter.

Why Are So Few Endangered Plants Protected?

BY BRUCE MACBRYDE

"The governments of the American Republics, wishing to protect and preserve in their natural habitat representatives of all species and genera of their native flora and fauna . . . in sufficient numbers and over areas extensive enough to assure them from becoming extinct through any agency within man's control," created the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere 40 years ago (on October 12, 1940). In Article VIII "The protection of the species mentioned in the Annex to the present Convention, is declared to be of special urgency and importance. Species included therein shall be protected as completely as possible . . ." In April 1942 Franklin Delano Roosevelt, as our president, proclaimed that the convention was "made public to the end that the same and every article and clause thereof may be observed and fulfilled with good faith by the United States of America and the citizens thereof . . ."

To have made such a perceptive commitment more than a generation ago is indeed something we can be proud of. It is equally clear that there is now greater urgency to conserve vulnerable plants because the earth has become so much more crowded. Sixteen nations in addition to the United States have ratified this treaty, and nine of them have added plant taxa to its Annex (Bolivia, which signed the treaty long ago, has also added plants, but that country still needs to ratify it). The U.S. government began placing species of animals on the Annex list in 1941; it has not named any plants for the list. At an inter-American conference relative to the convention which was held in Argentina in 1965, our country did provide an 'unofficial' list of 38 trees and 44 herbaceous plants which were considered rare and in need of protection, but we stated that new studies were necessary before we could prepare a complete and official list of our threatened flora.

In fairness, it must be stated that the treaty has been largely neglected by all countries in our hemisphere, and the Annex listing of plants is neither inclusive nor current for any of them. Yet the vision and promise of the convention remain, and five technical meetings on it in the past three years will culminate in a conference in 1981. This conference intends to bring together, in Washington, D.C., the heads of agencies of natural resources in the Americas to create a dynamic administrative structure for the convention within the Organization of American States, and renewed commitment and effective action in each of the countries which adheres to its principles.

Grand words, diplomatic intricacy and bureaucratic caution—nevertheless, wild plants are becoming extinct because we increasingly usurp their land to satisfy our needs, and sometimes we even collect the plants themselves without heeding their weakened capability to supply us in the future. How many species of wild native plants are we likely to lose?

The conservation of plants begins with the recognition of our scientific ignorance, as we admitted in Argentina in 1965. The few hundred years that western civilization has developed here is insufficient time to know our flora. Plant taxonomy itself only crystallized into a science in 1753 with the binomial nomenclature and artificial system of classification of Linnaeus, and botanical exploration and study in the United States still regularly yield new species in our flora as they did when Linnaeus sent his student Pehr Kalm here in 1747. In the last 15 years three species, each so different that it represents a new genus, have been discovered: *Apacheria* in Arizona, *Dedeckera* in California and *Harperocallis* in Florida. Since logic tells us that rare species are harder to find and live more precariously, it is not so surprising that all three have been recommended as endangered or threatened species. However, because we are so ignorant of our native flora, it can become difficult to decide whether a species is truly rare or simply little known. This difficulty can become an acute dilemma when there is a clear human threat to develop the only known habitat of such a little known species; we are not tolerant of delay in our plans based on ignorance and conjecture about an obscure plant.

The United States has given insufficient effort to developing and synthesizing knowledge of our botanical heritage through monographic and floristic taxonomic research. International comparison reveals our negligence. The *Flora of the U.S.S.R.* was published between 1934 and 1964, with an updating volume in 1973. *Flora Europaea* was published between 1964 and 1980. *Iconographia Cormophytorum Sinicorum* began publication in 1972. A checklist *Enumération des Plantes du Canada* was published in 1966-1967 and *The Flora of Canada* in 1978-1979.

In the United States, there have been discussions since 1965 to prepare a Flora of northern America (north of Mexico). In the fall and winter of 1972-1973 there was a full-fledged but short-lived attempt to begin such a Flora, when government funds were quickly withdrawn because of the need for a leaner federal budget. In the spring of 1980 the first comprehensive checklist of our flora was published as a result of sustained individual and private effort; this fall a second complete checklist will be published as a result of independent careful effort and federal funds. However, the preparation of a national Flora remains elusive.

Just after Christmas nearly seven years

Rhododendron chapmanii—Photograph by E. LaVerne Smith

Echinacea tennesseensis—Photograph by Dr. Paul Somers

ago, in 1973, the Congress emphasized by law that the careless endangerment and extinction of plants had become so likely that federal intervention was necessary. As in 1940, our government pledged to conserve jeopardized species in their ecosystems. The Endangered Species Act of 1973 had been preceded by earlier national legislation covering only animals. This new law not only included plants, but contained a unique section which required the Smithsonian Institution within a year to review the "species of plants which are now or may become endangered or threatened," and the methods for adequately conserving them. The resulting report of January 1975 named 3,187 plant taxa which were recommended for legal protection, of which 355 might already have become extinct. Thus about 10 percent of our continental flora, some 2,100 taxa, were thought to be at risk, and almost 50 percent of the more vulnerable Hawaiian flora, nearly 1,100 taxa.

Such severe stress on some of our native plants remains a problem too little noticed by botanists, horticulturists and other plantsmen. Congress was wise in designing a method to quickly address the scope of this problem in plant conservation, but it has been less than bold, in fact increasingly cautious, in providing for legislative solutions. While the 1973 act has been amended several times to bring more nearly equal possibilities for protection of plants, the animals still enjoy the potential for stronger coverage. More significantly, weakening amendments to the act in November 1978 have restricted the possibility of using the law for any vulnerable species. Nor should the exactness of lists of Latin names and state distributions in the Smithsonian's report (and its revised book in 1978) lull us into the belief that our rare plants are understood. Our flora remains poorly known: we do not know if many of these rare taxa are good species, subspecies, varieties or even entities, and we do not know their distributions well, even with regard to the states in which they occur.

In the nearly seven years that the Endangered Species Act has been law, only 56 native plants have been officially listed as endangered or threatened species (endangered species are defined as those in danger of extinction now, while threatened species are those somewhat better off, which might become extinct in the future if current trends continue). Twenty-one of the listed taxa are cacti, which generally suffer from both threats to their habitats and collecting for the horticultural and hobby markets. Some other attractive plants on the official list are *Rhododendron chapmanii* from Florida, *Echinacea tennesseensis, Betula uber* from Virginia, *Vicia menziesii* from Hawaii, *Trillium persistens* from Georgia and South Carolina, *Mirabilis macfarlanei* from Idaho and Oregon, *Arctomecon humilis* from Utah and *Harperocallis flava* (the species in one of the new genera mentioned earlier). Others which might be collected are *Dudleya traskiae* and *Delphinium kinkiense* in California, and *Sarracenia oreophila* in Alabama and Georgia, and formerly in Tennessee.

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The rarest plant on the list is *Kokia cookei,* a small Hawaiian tree with one individual left in the Waimea Arboretum, possibly a second individual at the Royal Botanic Gardens, Kew, and a leaf tissue culture in Japan. *Phacelia argillacea* is the rarest listed species still in nature, with four individuals growing on a railroad edge in Utah. An officially protected plant that may have agricultural value is *Zizania texana,* which could perhaps be used to breed a wild rice adapted to a warmer climate.

To reach the official list of the Endangered Species Act, a taxon must first be *proposed* for listing in the *Federal Register.* In June 1976 the U.S. Fish and Wildlife Service, which administers this law in the Department of the Interior, proposed 1,727 additional taxa along with the 56 above. About half these plants are endemic to Hawaii, 270 are in California, and some are located in every other state except the Dakotas, Nebraska and West Virginia. The legal fate for this majority of endangered candidates has been far different from that of the lucky 56. One of the new Congressional amendments to the act placed a two-year limit on proposals, requiring the candidate plants to be withdrawn in November 1979. Congress does allow a species to be reproposed, but only if other stringent new criteria can be met. First, there must be sufficient new information for a reproposal; the Service's administrative interpretation of this is that the information must be new subsequent to the withdrawal of the species, rather than new subsequent to its first proposal. As time goes on this criterion should become less important, for the plants will get closer to extinction and this will become the sufficient, new data!

Secondly, critical habitat must be proposed for each plant at the same time the species is proposed, to the maximum extent prudent. Critical habitat is the essential habitat a species needs for its survival and conservation. Only three of the 56 plants have legally designated critical habitats. While this concept seems useful, it is difficult to apply. To know the exact distribution of a species new field work is almost always necessary; to carry out this new work more funds are needed than have been made available, more skilled botanists with local taxonomic and geographic knowledge are needed than usually exist, and one may need time to wait, perhaps until the next spring. Judging a species' population dynamics and whether a buffer zone is necessary also is hard to do quickly. Additionally, the preciseness of a critical habitat map may give a false sense of finality and security, so that a developer won't bother to seek the plant elsewhere, and unknown populations might therefore be destroyed.

In evaluating the area to designate as critical habitat, Congress now requires a socioeconomic analysis as well, with the intent of excluding portions of the area if doing so is beneficial to those people affected and the species would not go extinct in consequence. Gathering economic data at such an early stage delays proposing the species and thus bringing attention to its environmental needs. Moreover, it may be premature or redundant: there is a consultation process through which possible conflicts may be resolved after the species is listed (with or without critical habitat), and if no accommodation is possible an exemption from the act can be sought, even if the development would cause a species' extinction.

Because the listing process is now so arduous, only six plants are currently proposed: *Potentilla robbinsiana, Hudsonia montana, Callirhoe scabriuscula, Spiranthes parksii, Eriogonum gypsophilum, Hedeoma todsenii* and *Astragalus yoder-williamsii.* (Two are proposed without critical habitats, since revealing their locations publicly might increase collecting.)

The time elapsed before there is a final listing in the *Federal Register* for such species is quite variable; the law requires a two/three month minimum, anticipates that the job can be done in eight months, and allots the two-year maximum. If necessary an emergency listing can be made, which temporarily bypasses the usual process and is good for eight months. This rule is now being used for the first time on a plant's behalf, the plant in question being *Astragalus yoder-williamsii.*

In order to bring some consideration to the many candidate endangered and threatened plants in the Smithsonian's report, the Service published an optional notice in the July 1975 Federal Register naming each taxon and its state distribution. In the past five years individual botanists, native plant societies and state and federal agencies have developed much new information about our vulnerable flora. To urge renewed consideration for our imperiled native plants in environmental planning and make use of the recent data, the Service will publish a new notice early this fall. While there will be many changes in the listings which reflect our improving knowledge, the magnitude of this problem in plant conservation appears similar to the 1975 assessment.

The Endangered Species Act provides an array of conservation measures for the 56 officially endangered and threatened plants. The greatest affects are on federal agencies, which cannot jeopardize listed species or damage their critical habitats (unless granted an exemption); they also must carry out conservation programs for the species. Perhaps half the candidate plants are on public land managed by the federal government, and probably a larger number are affected by federal activities. Fortunately some of these agencies, such as the U.S. Forest Service, have developed policies to treat candidate species as if they were listed and to so manage them that listing will be unnecessary. For virtually all listed species, the U.S. Fish and Wildlife Service is directed to prepare recovery plans with the objective of restoring their viability so that the act's measures are no longer needed. However, for some local species, sustained management and caution may be all that can be accomplished.

If necessary, land can be acquired for listed species. The remnant of the Antioch Dunes in California was purchased for *Erysimum capitatum* var. *angustatum* and *Oenothera deltoides* subsp. *howellii,* which appeared on U.S. postage stamps in June 1979 (an endangered butterfly also lives on this new refuge). A federal/state cooperative agreement is possible, with the federal government funding two thirds of a state's conservation program. Even though the state agency must meet only minimal qualifications, only six states have qualified for this opportunity to conserve plants. Those who care about plants should encourage use of this mechanism, since the funds and activities can be for plants not yet federally listed.

Lastly, the act establishes a regulatory process which prohibits commercial interstate trade and export/import of listed species, unless a permit has been issued. The intent here is to halt the traffic in wild plants and shift the market to cultivated specimens of the species. Horticulturists can help in this endeavor by learning how to propagate species now primarily taken from the wild, increasing species with limited stocks in cultivation so that the market can be satisfied from an acceptable source, encouraging all honest growers to put 'cultivated origin' on sales labels for any propagated species which also might have a recent wild origin, purchasing only from reputable nurseries, and educating others to undertake similar efforts. These trade prohibitions are enforced at our international borders by the Animal and Plant Health Inspection Service in the Department of Agriculture; interstate enforcement is the responsibility of the U.S. Fish and Wildlife Service. The private citizen also can help, and a reward is offered for furnishing information which leads to a conviction.

Regrettably, the act does not directly prohibit the actual digging up or collecting of listed wild plants (if there is no federal involvement), although a few state laws do prohibit taking, and the private land owner can prevent it on his property as well. The act does prohibit the taking of listed animals unless a permit has been issued. There has been speculation that the reason for this anomaly in the law is the unclear or ill-perceived tradition regarding the ownership of wild plants. However, Article VIII of the Western Hemisphere Convention states that species included in its Annex shall be protected as completely as possible, and that their " . . . taking shall be allowed only with the permission of the appropriate government authorities in the country." Populations of several candidate endangered plants on private land have been intentionally destroyed in the last few years; in other instances private land owners have been pleased to learn they harbor such unique species.

In international treaty and in national law our government has correctly recognized the value of wild plants and the doubtful future for too many of them. In the past 40 years the knowledge about our native plants has improved substantially, although it is too little when compared to that in some other countries, and it is far too little when exact questions arise regarding development or plant conservation at a specific site.

To conserve our endangered plants, we cannot carry on as before. The federal government should coordinate a Botanical Survey, which will sustain the preparation of a national Flora that thoroughly synthesizes existing knowledge of our vascular plants, and which will ensure that field work is carried out on our rare plants in a coordinated manner and as an urgent priority. We must support and improve government resolve and capability to conserve vulnerable plants, at both national and state levels. There are enough of us who care about plants to do the job, if we will.

The foremost change necessary to make certain our endangered plants survive is the participation of all gardeners, horticulturists, botanists, plantsmen—all who have made plants a significant part of their lives. Three thousand vulnerable native plants do not seem too great a number to be able to conserve, especially when one realizes that there are less than 20 candidates in over half the states, and over 100 in only eight states. Start a foster plant project with the endangered or threatened plant closest to your home—don't put it in your garden, but join with others in ensuring its survival in its natural habitat.

Start with the plant taxonomist at your local university, or join your state native plant society or botanical club, or check with your state government's Heritage Program or Department of Natural Resources, or inquire of the U.S. Fish and Wildlife Service through your phone book. If you cannot participate directly, support a local or national conservation society which is at work to protect endangered plants. For more information about conservation efforts going on in your state and locality, write to The Society (attn: Jane Steffey, AHS, Mt. Vernon, VA 22121) for a list of names and addresses of people you can contact.

LEFT: Potted geraniums pull one's eye upward along the wrought iron railing of a staircase leading to the Thomas' townhouse. TOP: Holly ferns thrive in the lush climate of Savannah. ABOVE: English ivy and potted azaleas provide a colorful backdrop for statuary.

A Southern Patio Garden

TEXT AND PHOTOGRAPHY
BY GEORGE TALOUMIS

Mrs. Hugenin Thomas of Savannah is small and energetic. With these attributes, plus vision and determination, she has designed, developed and realized a patio garden that is one of the most delightful and enchanting in Old Savannah.

ABOVE LEFT: An ornate iron grille door leads to a carport. Nearby grow ferns, aspidistra, English ivy, liriope, saucer magnolia and creeping fig. ABOVE RIGHT: 'Candidum' caladiums grow in pots next to the pool. RIGHT: Potted geraniums grow in pots along the balcony; at its base grow aralias, mahonias, ivy geraniums in hanging containers and palms.

Behind a row house at 7 East Gordon Street, on the south side, is an enclosed garden area open only to the sky. High brick walls and one facade of the Thomas' four-story house form its boundaries. One brick wall, on the carport side, has openings in the brickwork and an ornate iron grille door which allows air to circulate more freely through the garden. All walls, mellowed by time, are softened and patterned with English ivy and creeping fig.

The townhouse, started in 1850 and finished in 1853, is only 24 feet wide. Its width determined the dimensions of the square patio. Though only the size of a large room, the patio is filled with a wide array of plants and an interesting assortment of garden features and containers that presents a compendium of a "million" pictures.

When the Thomases acquired the property 15 years ago, there was no patio garden, "just a yard, a loquat tree, camellias all around, and dirt in the center," explains Mrs. Thomas. "Like the adjoining row houses, ours was two rooms deep, with the staircase at one side. We added rooms on the south side and the balcony from which to view the garden and walk down into it."

Bricks were laid for a floor and a raised bed along one side. This raised bed, plus the rise of the pool opposite the balcony, and the winding stairs lined with pots of geraniums, created interesting vertical levels of visual enjoyment in a tiny area that would otherwise have seemed flat and rather plain.

Little by little, the garden grew. The tulip tree (*Magnolia soulangiana*, called saucer magnolia in the North), palms and a crape myrtle were added to give height, along with azaleas, camellias, mahonias and other plants. In the neighboring yard, leaning over the wall, is a pecan tree, a blessing for the shade it casts in summer over the Thomas' property.

Behind the pool, accented with a figure of a child holding a jug through which water flows, is a lush planting of *Aspidistra*. Since it is shaded by the wall in winter, it does not become windburned. Pots of 'Candidum' caladiums are grouped at one end of the pool, and at the other, a large clump of holly fern grows luxuriantly. On the balcony are two elegant jardinières with yedda hawthorns (*Raphiolepis umbellata*).

Color is present in the garden during every season. Flanking the figure in front

LEFT: *Aspidistra* surrounds this playful fountain figure at the pool.

of the ivy-clad west wall are two pots of pink azaleas that flower in March. "When these finish blooming, they go into the sick bay under the balcony," says Mrs. Thomas. "They are followed by pots of caladiums and chrysanthemums in the fall. The pots of pink geraniums at the base of the balcony also add color, along with coleus and impatiens grown in the shade."

Mrs. Thomas is proud of her orchids, which she flowers successfully—cattleyas and phalaenopsis, including 'Amy Campbell', a favorite. They stay out until mid-November and then are wintered in a south window, on trays with moist pebbles, on the top floor of her house, where temperatures often go down into the forties.

Mrs. Thomas spends about an hour each morning tending her patio garden. For her it is one of low maintenance, designed chiefly for relaxation. "Since we live in it so much, like a room in a house, it has to be swept constantly."

Her most useful tool is a pair of manicuring scissors which she uses to cut off faded blossoms, tips of plants and generally maintain a neat appearance, an outstanding characteristic of the patio garden.

To water, Mrs. Thomas uses a hose with the nozzle removed, but a watering can for the container plants. She feeds plants with whatever she happens to have on hand, usually a mixed fertilizer, though orchids are given a special mix. There is an overall small feeding of all plants in March, followed by another feeding in the fall. The geraniums are given "a small dose" every week or 10 days.

In winter the bulk of the container plants stay outdoors. If the temperature goes below 30°F, the ferns and geraniums go under the balcony, where podocarpus, aralia and mahonias form a backdrop of green.

Pest problems are few, chiefly scale on aspidistra, oleander and the palms. Whiteflies on azaleas, the orange and the camellias are tackled with Malathion.

As much as Mrs. Thomas likes to talk about the gardening aspects of her patio garden, she would rather dwell on how freely it is used for outdoor living and enjoyment. In fact, all year round. "In summer we have breakfast, up and down. We lunch there on Saturdays, and on Sundays enjoy steaks, grilled in the carport area. In winter when we eat outdoors, we don extra sweaters and coats."

The several tables, chairs and benches make it possible to entertain several guests, and at night the globular lights add illumination, along with fascinating shadows.

For Mrs. Thomas and her family and friends, her patio garden is "not a place to live, but a way to live"—all in the midst of plants that are tenderly and lovingly cared for.

HORTICULTURAL TOURS

Upcoming offerings sponsored by The American Horticultural Society

Autumn Exploration of the Orient
—repeating a popular tour which includes visits to Japan, Taiwan and Hong Kong.
November 1-24, 1980

Baja, California and Copper Canyon
—includes "the most dramatic train ride in the Western Hemisphere" through Mexico and an area filled with gorges so huge they can swallow four Grand Canyons! Until several years ago this area was inaccessible except by horseback.
March 29-April 12, 1981

Garden Cruise of the British Isles on M.T.S. Argonaut
—including stops in England, Scotland, Wales, Scilly, Mull, Iona and Orkney with optional earlier departure to visit London and the famed Chelsea Flower Show.
May 21-June 2, 1981

To request additional details or to make reservations for any of these horticultural explorations, write to Dorothy Sowerby, Tour Coordinator, American Horticultural Society, Mount Vernon, VA 22121.

Our 1981 Symposium is scheduled for July 14-18 in Denver, Colorado. Please mark these dates on your calendar and make plans to join other members of the Society in a tour of the Mile-High City and the surrounding Rockies, with special emphasis on alpine gardening and cold-hardy plants. Accommodations will be at the world-famous Brown Palace Hotel.

Continued from page 18

a sizable collection was eventually accumulated and displayed with the other exotic plants for which the Garden is noted.

One of the outstanding estates in the West was that of the railroad magnate Henry E. Huntington, situated in San Marino, California. Under the inspired direction of William Hertrich, the garden became the repository of many rare specimens. Of special interest to bromeliad fanciers is the 25-acre Desert Garden, started in 1907, where the finest collection of xerophytic bromeliads may be seen. Puyas, bromeliads, pitcairnias, hechtias, dyckias—there are some in bloom throughout the year.

In Florida, the first large bromeliad collection of any note was that of Dr. Henry Nehrling in Gotha. As early as 1891 this eminent horticulturist was intrigued by the native tillandsias which then grew in abundance throughout the state, and he collected them for use in his own garden. He obtained bromeliads from Europe, botanical gardens in this country and from their lands of origin. His enthusiasm for these plants was boundless, and he was instrumental in introducing them to growers throughout Florida. He did extensive testing to determine their hardiness and was able to naturalize a number of species heretofore considered too tender. In the early 1920's he published in the *American Eagle,* a Florida newspaper, a series of notes concerning his garden, which are considered among the most eloquent words written in praise of bromeliads.

Also exuberant in his feelings towards these plants was Theodore L. Mead of Oviedo, Florida. From 1905 to 1923 he was interested chiefly in orchids; then he made his first trade of a bromeliad with Dr. Nehrling, and the die was cast. He started one of the great collections, and from 1926 until his death a decade later, all his energies went into the hybridization of these plants. To him must go the credit of being the first American to hybridize bromeliads. True, most of the crosses he made had already been done in Europe, but two of his bi-generic crosses, *Billbergia nutans* X *Cryptanthus beuckeri* and *Billbergia nutans* X *Cryptanthus bahianus,* are popular today. He sent the first cross on to a nurseryman in Escondido, California, W. I. Beecroft, for introduction into the trade.

Beecroft himself tried his hand at hybridizing billbergias, but he is to be remembered chiefly for having introduced into California a number of fine species and hybrids then popular in Europe.

The variegated pineapple, *Ananas comosus* 'Variegatus'.

The 1930's showed a marked increase in interest in the bromeliad family throughout the entire country. Particularly in southern California where it was found that these plants were hardy in the milder areas did these plants make their appearance in nurseries. Probably the one person who did more than any other at this time to arouse interest was Richard G. Atkinson of Leucadia, who made many exchanges both here and abroad and amassed a sizable collection. Upon his death his plants were obtained in 1942 by Evans & Reeves of West Los Angeles, a nursery noteworthy for handling plants that were "different." The rockery within their lathhouse contained a large specimen of *Aechmea fasciata*—a sight so stunning that many people at this time were bitten by the "bromeliad bug." In their catalogue for 1943 Evans & Reeves boasted of having thousands of various kinds.

Two other growers in southern California who were prominent at this time and exerted a not inconsiderable influence on other growers were James Giridlian and David Barry, Jr. James Giridlian, whose establishment, Oakhurst Gardens in Arcadia, was a mecca for rare bulb enthusiasts, offered bromeliads for sale in the early forties and championed them until his death some years later. The most eminent private collector was David Barry, Jr. of West Los Angeles, who used his many contacts throughout the world to gather an assemblage of plants that was second to none in the West. Later, his California Jungle Garden was for many years the best source of European hybrids in the country.

But the figure that looms first and foremost above all bromeliad growers was Mulford B. Foster of Orlando, Florida. One wonders how long it would have taken this family of plants to attain its present status if it had not been for this dynamic and tireless plantsman. His preoccupation with bromeliads began in 1928 with the acquisition of *Aechmea fulgens,* and was furthered by exchanges made with Theodore L. Mead in 1931. A series of collecting trips to Mexico served as an impetus to go farther into the field, and in 1939 he and his wife Racine went to Brazil and then on to practically every other country in Central and South America. He not only trod the path set out by the early explorers but also blazoned new trails and by doing so discovered 175 new bromeliads.

Foster was aided in the identification of his species by the American botanist,

Dr. Lyman B. Smith, then with the Gray Herbarium and more recently with the Smithsonian Institution. It goes without saying that today Dr. Smith is the foremost authority on the Bromeliaceae—his massive three-volume study on the family superseding all previous monographs devoted to it.

Foster's famous "Bromelario" in Orlando soon became the ultimate bromeliad garden and brought visitors from all parts of the world. The nursery which Foster established on the grounds issued a mail-order listing in 1942, and for the first time bromeliads became generally available to gardeners throughout the nation.

In the late forties a dozen zealous amateurs from southern California started a bromeliad round robin, which in turn led to the formation of the Bromeliad Society in 1950. Under the aegis of Mulford Foster, the first president and editor of the bulletin for its first 10 years, the society flourished and soon became international in scope. Through the efforts of the members bromeliads found their way into shows, into public plantings and horticultural establishments, and more and more nurseries began to feature these plants.

Today prominent places are assigned to bromeliads in all the major flower shows, and each year scores of exhibits featuring only bromeliads are held by the members. Not satisfied with the varieties that the nurseries have to offer, bromeliad enthusiasts are setting out to collect their own plants in Mexico, Central and South America. Whereas collectors in the forties might have been satisfied with any bromeliads they could lay their hands on, times have changed, and today even the most inexperienced novice has his sights set on those plants which are difficult to obtain and to grow. Hence the interest in the variegated forms of otherwise plain-leaved varieties. They are so in demand that the stocks of them are constantly being depleted and prices for them sometimes reach unbelievable heights.

Also in demand are the plants not yet in cultivation, those which come from the hinterlands of Ecuador, Colombia and Peru. No matter that many of these species come from the rarified atmosphere of the high Andes and resent ordinary cultivation, some collectors must have them at any cost. The nurseries of Europe, especially in Belgium and the Netherlands, have been besieged by requests for new hybrids, and so the demand for new plants goes on.

All this in turn has led to extensive hybridizing among American growers—a situation which has resulted in much confusion in nomenclature. A case in point is the late Ed Hummel of California, who produced some of the finest hybrids to be seen anywhere. He kept no record of his work, and the hundreds of his crosses which flood the market are like orphans—their parentage unknown. And so it is with dozens of other hybridists. However, there have emerged a few serious nurserymen who are endeavoring to bring order into the hybrid mixup. Such are Ervin Wurthmann, Robert Burstrom and Charles Coolbaugh of Florida and Joseph Carrone of Louisiana.

Although bromeliads may be seen chiefly in the southern states, there are few public gardens throughout the nation that do not have a spot reserved for them in their conservatories.

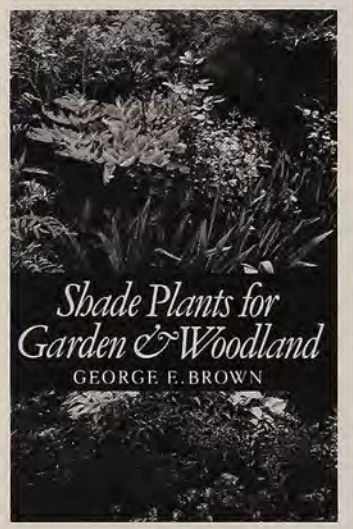
Florida and coastal southern California are the two areas where most of these plants may be grown outdoors the year round. In the Deep South with its humidity and heat, neoregelias with their colorful foliage and brilliant hearts reign supreme. This is true, also, in Florida, but other genera, those originally from lower elevations, thrive—the frequent rainfall proving to be a boon to these plants. In the Pacific Southwest, where semi-desert conditions prevail, tillandsias take their stand and decorate many a tree in the collector's garden. Xerophytic types also abound here.

The foremost bromeliad nursery in this country, and undoubtedly one of the most outstanding in the entire world, is to be found in Vista, California. Despite arid conditions the Kent family, with highly sophisticated equipment and 60,000 square feet of greenhouse, maintain a collection that is second to none. Their catalogue, which lists 1,536 species and hybrids in 49 categories, certainly demonstrates the progress that has been made with bromeliads. Mulford Foster's listing in 1945 contained 75 entries.

For further information about bromeliads and where these plants can be obtained write to: The Bromeliad Society, Inc., P. O. Box 41261, Los Angeles, CA 90041. All those interested in these plants are invited to join the Society, an international organization. Membership entitles one to receive its handsome journal with colored illustrations, access to seed fund, affiliation with local groups, etc.

BOOK REVIEWS

SHADE PLANTS FOR GARDEN AND WOODLAND. George E. Brown. Faber and Faber. London, England and Boston, Massachusetts. 1980. 240 pages; hardcover, $27.00. AHS discount price, $22.85 including postage and handling.



This English publication is a welcome addition to the American gardening bookshelf. Choosing plants for the shady garden is always something of a problem. Most of this book is devoted to "A Dictionary of Shade Plants." Genera and species tolerant to various degrees of shade are described, together with brief notes on culture and propagation. Both woody and herbaceous plant material is included. The introductory chapters deal with the design of a woodland garden, and a concluding appendix presents the potential garden use of all of the plant material in a briefly summarized table. Definitely a worthwhile treatment of an often troublesome aspect of gardening.

THE LARGER SPECIES OF RHODODENDRONS. Peter Cox. B. T. Batsford Ltd. London, England. 1979. 352 pages; hardcover, $47.50.

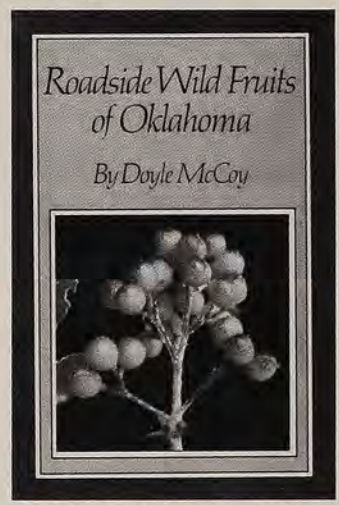
As a companion work to the author's earlier book on dwarf rhododendrons (1973), this volume describes all of those species whose mature growth exceeds 1.5 meters in height. The first 87 pages are devoted to cultural information for growing rhododendrons in all parts of the world. The rest of the book is devoted to species descriptions together with some history of introduction to cultivation and some notes on hardiness in the garden. The water color paintings, line drawings and photographs are excellent, but they only illustrate a small portion of the species described. Of particular interest for the rhododendron specialist, but probably too detailed for the average gardener.

GETTING THE MOST FROM YOUR GARDEN. Editors of Organic Gardening Magazine. Rodale Press. Emmaus, Pennsylvania. 1980. 482 pages; hardcover, $14.95. AHS discount price, $13.95 including postage and handling.

This handbook of intensive vegetable gardening discusses how to get a larger crop from less space and possibly with less labor. The chapters on growing beds and interplanting may surprise those of you who are used to the more conventional garden with plants in rows and cultivated areas in between. Even if you don't switch to this method, you can get lots of good ideas for increasing your vegetable yield. The chapter on companion planting is more controversial, and I'll let you make your own decisions on the validity of this approach to pest control and garden planning. The chapters on starting your own transplants from seed are particularly good. The last 150 pages of the book are devoted to regional reports from all over the United States. They will undoubtedly give you additional good ideas for your area. Whether or not you are an organic gardener, this book is worth reading.

REGIONAL PUBLICATIONS

ROADSIDE WILD FRUITS OF OKLAHOMA. Doyle McCoy. University of Oklahoma Press. Norman, Oklahoma. 1980. 82 pages; paperbound, $8.95. AHS discount price, $7.75 including postage and handling.



POISONOUS PLANTS OF THE CENTRAL UNITED STATES. H. A. Stephens. The Regents Press of Kansas. Lawrence, Kansas. 1980. 165 pages; paperbound, $9.95; hardcover, $16.00. AHS discount price, $9.20 paperbound and $15.65 hardbound including postage and handling.

TREES AND SHRUBS FOR NORTHERN GARDENS. Leon C. Snyder. University of Minnesota Press. Minneapolis, Minnesota. 1980. 411 pages; hardcover, $17.95.

DWARF SHRUBS FOR THE MIDWEST. Rebecca McIntosh Keith and F. A. Giles. University of Illinois at Urbana-Champaign (Special Publication 60). 1980. 163 pages; hardcover, $20.00; paperbound, $7.00.

Roadside Wild Fruits of Oklahoma is a useful little handbook that can be carried with you as you drive through the Midwest. The clear, color photographs and brief descriptions will enable you to easily identify most roadside plants by their fruit (mature propagule in the botanical sense—not necessarily edible). This book should be useful for many miles outside Oklahoma.

Poisonous Plants of the Central United States is a well illustrated handbook intended to familiarize the population of the central states with the poisonous plants likely to be encountered in that area. Both native and introduced species are included, as well as some of the more common house plants. Clear photographs, a good plant description, a discussion of the poisonous principle and the symptoms of poisoning are given for each plant. Arrangement is by plant family and no indices of symptoms or identification keys are included, so it is a book to read in advance, not a reference for use in an emergency.

Trees and Shrubs for Northern Gardens is a useful reference for the colder parts of the United States. Nearly 400 ornamental trees and shrubs are described, together with cultural information. Descriptions of the more popular cultivars are brief but adequate. Identification keys are given for genera and within each genus. This book can be used equally well to select a plant or to identify an unknown specimen. Good color photographs further increase the utility of this book.

Dwarf Shrubs for the Midwest is aimed primarily at helping the midwestern gardener landscape his home. It should be equally useful to the nursery industry in suggesting some more unusual (as well as more usual) plant material appropriate for use in the suburban

landscape. Cultural information includes hardiness data. Photographs and line drawings aid in identification and visualization for use as a guide in a landscape design.

Save time and money—buy books by mail! Order books available at a discount through the Society.

THE NEW YORK BOTANICAL GARDEN ILLUSTRATED ENCYCLOPEDIA OF HORTICULTURE. Thomas H. Everett. Garland Publishing, Inc. New York, New York. 1980. Ten volumes; hardcover, $525.00 the set.

Although only the first of 10 volumes has reached us for review (the others are to appear shortly), the publication of this new encyclopedia is an event whose announcement should not be delayed. Only two other major horticultural encyclopedias exist in the English language and both of them are long out of date (see President's Page in this issue). We have needed an updated, authoritative reference work particularly aimed at gardening in the United States and Canada, and we finally have it.

Entries are arranged alphabetically by genus or subject (such as air-layering), and the cultural information is extremely useful and easy to use. Abundant and excellent photographs help illustrate techniques and aid in plant identification. The plant descriptions, however, are more difficult to work with. The descriptions are good, with much useful cultural information included for each species, and if you are generally interested in all the species of a genus you will find that reading through the eight pages devoted to *Acer*, for example, is a very pleasant and informative activity. If, however, you are interested in *Acer griseum* only, you will have difficulty in finding the entry. Within each genus, the species are not arranged alphabetically, and the names are not at the beginning of the line but buried within the text. Although the names of major entries are in boldface, they are still difficult to locate. Nomenclature, too, leaves something to be desired. While the author has followed *Hortus III* as a guide to the most correct name for a plant, he has chosen not to indicate cultivars in the internationally accepted manner, but has invented his own inconsistent system (using the correct Roman typeface, single quotation mark style when the cultivar name is in English, but using italics when it is otherwise). Thus, most of the time, it is not possible to distinguish between a botanical variety and a cultivar. For identification, this work is fine, but you had better crosscheck each name in *Hortus III* before trying to communicate with any fellow gardener or nurseryman. In spite of these shortcomings, this is still an encyclopedia which is destined to become a standard work in American horticulture and which belongs on the shelf of every serious gardener.

—*Gilbert S. Daniels*

Instructions for ordering books by mail: Send orders to the attention of Dotty Sowerby, American Horticultural Society, Mount Vernon, VA 22121. Make checks payable to the Society. Virginia residents, add 4% sales tax. When a discount price is not listed for a book, please add $1.25 to the price listed to cover the cost of mailing and handling.

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est, do not cut down the tall stems in the fall but wait until the following spring because they keep their shape, color and give height to the area. Planted in groups three to four feet apart, they will make an impenetrable clump.

Best known of all native species for wet sites is the marsh marigold, *Caltha palustris*. It grows two feet high and has cordate leaves up to seven inches wide. Its five beautiful, bright, yellow-gold sepals, which look like petals, stand in clusters well above the foliage. The individual flowers are two inches across and the plants bloom profusely from April through June. Few plants are lovelier to look upon in spring than this plant with its wealth of blossoms.

A fine companion for the marsh marigolds is skunk cabbage, *Symplocarpus foetidus*. Although the pungent smell of the small, mottled, purplish-greenish flowers might suggest that it be banished from your planned moist area, the handsome, large, glossy, cordate leaves which grow cabbage-like one to two feet in height certainly should convince you to reinstate it. As early as February the cowl-shaped, spear-like spathes of a brownish-purple color are found sitting on the surface of the ground. These spathes enclose tiny flowers growing on a fleshy club-like spadix—all of this loveliness before the leaves even begin to grow! When the leaves grow to their full height, the plants really become outstanding.

Chelone lyonii grows naturally in moist soils. Turtlehead is the common name, taken from the form of the flowers. The flowers are rosy-purple in dense, showy, terminal spikes, perhaps the best in flower of this delightful genus. The leaves are deep-green in color, rounded at the base and tapering. These plants need rich ground and moisture in order to bloom profusely. The roots lie close to the surface. If covered with rotted manure the plant will bloom more profusely. This covering also will act as a preventive against drought.

Sweet flag, *Acorus calamus*, is a characteristic plant of marshy places. With grass-like leaves about three-quarters of an inch wide and four to five feet in height, it makes a clump of beautiful foliage. The flowers are an inconspicuous greenish-yellow, but the plants are worth growing for the foliage effect alone. Any planting needs foliar finery.

Iris pseudacorus or yellow flag is common in any wet landscape (see it pictured in the April/May 1980 issue, page 26). It blooms from May on. Its handsome yellow flowers growing among the tall, sword-like leaves are a splendid sight. The seed capsule will open into three pods, each having two rows of orange-red seed, providing a decorative effect for fall.

An early bloomer and lovely flower in a moist patch is the primula, quite well known by all.

The lobelias, both *L. cardinalis* and *L. siphilitica*, are natural candidates for the damp area. *Lobelia cardinalis*, the cardinal flower, has bright carmine-colored flowers with remarkably intense pigment. When in flower it flashes like a beacon. Flowers are about one inch long, borne in spikes on erect, unbranching, leafy stems two to four feet tall. Leaves are narrow, dying down after the blooming season. These plants like half shade and moisture. Each plant needs a foot of space for development and will survive winters if its flowering stems are left uncut. The stems are hollow—if cut near ground level they fill with water, which causes the roots to rot. *Lobelia siphilitica*, the great or blue lobelia, has suffered too much by comparison with its gorgeous sister, *L. cardinalis*. Flowers are one inch long, blue in color, marked with white, and are borne on dense, leafy spikes. It is a swamp plant and to make a success of it a permanent moist place is needed. All lobelias propagate easily from seed.

In addition to the native plants there are other selections which will thrive in moist soils. With such a damp area it becomes possible to grow with great success many plants which need special conditions. One of the most magnificent of all plants for the moist site is the fabulous Japanese iris (*Iris kaempferi*). These plants require a rich, fertilized soil of one third peat, one third organic manure and one third leaf mold. The leaves are long and narrow. The flower stems are stiff and slender and show little branching, usually two flowers at the apex and one side flower. The rhizomes are short and thin and roots are fibrous and abundant. To keep the plants vigorous, they must be transplanted every three or four years, either during the growing period or early in the spring before foliage growth. A good procedure is to divide some clumps one year and others the next year in order to have good bloom in the planting. They bloom from June through the first half of July. The varieties are classified as single, double and triple, depending on whether extra petaloid structures have developed. The flower colors range through all tints and tones from red, dark-purple to blue-purple, as well as pale colors to white forms. Some have colored veins with lighter tints and tones; some have dotted patterns; some have a mottled appearance and some have colored borders. When in bloom the effect can become a symphony of colors. These iris never look better than when planted near astilbes.

A large part of your moist garden can be devoted to astilbes. There are white-, pink- and red-flowered ones which are very impressive when grown in masses. Once established, these plants are self-supporting and may remain undisturbed for a number of years. As growth starts, the new foliage, which may be copper-red or yellow-green, is very decorative. The leaves are fern-like with toothed or cut leaflets, and they bear panicles of showy flowers. As they are heavy feeders, give them an annual dressing of well-rotted manure. They need plenty of moisture during their growing season. The spent inflorescenses turning brown, russet or chocolate are appealing if allowed to remain on the plants for autumn decoration. Some cultivars that are rewarding are: the whites, 'Snowcloud', 'Gladstone' and 'Deutschland'; the pinks, 'Gloria Superba', 'Bridal Veil' and 'Peach Blossom'; the reds, 'Feuer', 'Fanal' and 'Sentinel'. As the white flowers fade the reds begin to open and give life to the whole planting.

An early bloomer and lovely flower in a moist patch is the familiar primula, quite well known by all. Most of these primulas (*Primula polyantha*) are hybrids, and the flowers come in an astonishing range of colors and shades. They are vigorous in growth when in the right situation and surroundings. Their height ranges from six to 12 inches and they flower in the spring. They need partial shade for happiness; do not plant them in full sun or full shade. For vigorous growth they should be divided every two or three years in late summer. They are easily propagated from seed if sown as quickly as seeds mature on the blooming plants. Even quite green seeds will germinate.

Lythrum salicaria is one of the easiest plants to grow in damp soil. This purple loosestrife has large, purple flowers in a tall spike borne on a two- to five-foot high leafy stem. It is a late summer flowering plant. There are many forms and different colored flowers. A couple of worthy varieties are 'Roseum', with cherry-colored blossoms; 'Perry', which has cherry-red blossoms; or 'Robert', compact in habit with rose-carmine blossoms.

Ligularias make themselves comfortable where there is plenty of moisture. They are a member of the composite family and are very impressive perennials because of their large, glistening, leather-like, round leaves, sharply toothed with a width of 12 to 20 inches. When in bloom from July to September the flowering stems rise to about four feet, carrying heads of branching inflorescences in long racemes. Two cultivars which are easy to grow are 'Golden Queen', with green leaves and heads of golden-yellow flowers, and 'Othello', with bronze leaves and heads of bright-orange flowers. They are both elegant plants and are best used for background or as accent plants. (Editor's note: for more details about these plants, read Mrs. Cannon's article on ligularias which appeared in the June/July 1979 issue.)

Houttuynia cordata is a rare, rugged and joyful little plant that is happy growing in moist places. It will grow in full sun or part shade, is hardy and has a creeping root stock which is easily controlled. It grows 12 to 13 inches high, has blue-green cordate, alternate leaves two to three inches long and bright-red stems. The flower spikes, which bear many insignificant flowers, are set off by a collar of four white bracts which give the whole planting a snow-like appearance. These white bracts, appearing in midsummer, are leaf-like structures which are entirely different from the leaves. In autumn the leaves turn to a red-purple color and the spikes of densely packed flowers become spikes of small seeds. These attractive little plants with their whorl of snow-white bracts at the base of the flower heads will light up the forefront of any planting, and in the fall the purple shadow of their cordate leaves will add elegance to your garden.

Any of these plants will add greatly to the display in a damp soil garden from early spring through the summer. With a little care, you can enjoy the pleasure of their company for years and years.

Guide to Botanical Names in This Issue

The accent, or emphasis, falls on the syllable which appears in capital letters. The vowels which you see standing alone are pronounced as follows:
i—short sound; sounds like i in "hit"
o—long sound; sounds like o in "snow"
a—long sound; sounds like a in "hay".

In many cases there are several ways of pronouncing the same word. This guide attempts to convey the most generally accepted version.

Acorus calamus AK-o-rus KAL-ah-mus
Aechmea fasciata eek-ME-ah fash-ee-A-ta
Aechmea fulgens eek-ME-ah FUL-jens
Aechmea mariae-reginae
eek-ME-ah mar-EE-ee - re-JIN-ee
Apacheria ap-pat-CHER-ee-ah
Arctomecon humilis
ark-toe-MAY-con HEW-mil-iss
Aruncus dioicus ah-RUN-kus dy-O-i-kus
Asperula odorata
ass-PER-yew-la o-door-A-ta
Aspidistra ass-pi-DIS-tra
Astragalus yoder-williamsii
ass-TRAG-ah-lus YO-der
WILL-yums-ee-eye
Betula uber BET-yew-la YEW-ber
Billbergia nutans X
Cryptanthus beuckeri
bill-BERGE-ee-ah
NOO-tanz krip-TAN-thus BEW-ker-eye
Billbergia nutans X
Cryptanthus bahianus
bill-BERGE-ee-ah NOO-tanz
krip-TAN-thus ba-hee-A-nus
Billbergia pyramidalis
bill-BERGE-ee-ah peer-ah-mi-DAY-liss
Bouvardia boo-VAR-dee-ah
Callirhoe scabriuscula
ka-LI-row-ee sca-bri-US-kew-la
Caltha palustris CAL-tha pah-LUSS-tris
Cephalanthus occidentalis
seph-ah-LAN-thuss ock-si-den-TAY-liss
Chelone lyonii
kell-OWN-ee LION-ee-eye
Dedeckera de-DECK-er-ah
Delphinium kinkiense
del-FIN-ee-um kin-kee-EN-see
Dudleya traskiae
DUD-lee-ah TRASK-ee-ee
Echinacea tennesseensis
ek-i-NAY-see-ah ten-ah-see-EN-sis
Eriogonum gypsophilum
air-ee-OG-o-num jip-SOF-i-lum
Erysimum capitatum var.
angustatum
ee-RIS-i-mum cap-i-TAY-tum
an-gus-TAY-tum
Galium odoratum
GAY-lee-um o-door-A-tum
Gardenia jasminoides
gar-DEEN-ee-ah jaz-min-oh-EYE-deez
Harperocallis flava
harp-er-o-KAL-iss FLAY-va
Hedeoma todsenii
head-ee-OH-ma tod-SEN-ee-eye
Hedyotis head-ee-O-tiss
Houstonia hew-STONE-ee-ah
Houttuynia cordata
who-TY-nee-ah cor-DAY-ta
Hudsonia montana
hud-SOHN-ee-ah mon-TAN-ah
Iris kaempferi EYE-ris KEMP-fare-eye
Iris pseudacorus EYE-ris sue-DACK-o-rus
Ixora icks-O-ra
Kokia cookei KOK-ee-ah COOK-eye
Lobelia cardinalis
lo-BEEL-ee-ah car-di-NAY-liss
Lobelia siphilitica
lo-BEEL-ee-ah siph-i-LIT-i-ka
Lythrum salicaria
LITH-rum sal-i-KAY-ree-ah
Magnolia soulangiana
mag-NOL-ee-ah sue-lan-gee-A-na
Manettia ma-NET-ee-ah
Mirabilis macfarlanei
meer-RAB-i-liss mak-FAR-lan-eye
Mitchella MITCH-ell-ah REE-penz
Nertera NER-ter-ah
Oenothera deltoides subsp.
howellii
een-o-THEER-ah del-toe-EYE-deez
how-WELL-ee-eye
Pentas lanceolata
PEN-tass lan-see-o-LAY-ta
Phacelia argillacea
fa-SEE-lee-ah ar-jill-ACE-ee-ah
Pinckneya pubens PINK-nee-ah PEW-benz
Pitcairnia corallina
pit-CARE-nee-ah kor-ah-LEEN-ah
Pitcairnia latifolia
pit-CARE-nee-ah lat-i-FOL-ee-ah
Potentilla robbinsiana
po-ten-TILL-ah rob-ins-ee-A-na
Primula polyantha
PRIM-yew-la pol-ee-AN-tha
Psychotria sy-KOT-ree-ah
Raphiolepis umbellata
raf-ee-o-LEP-iss um-bell-A-ta
Rhododendron chapmanii
ro-do-DEN-dron chap-MAN-ee-eye
Sarracenia oreophila
sar-ah-SEEN-ee-ah or-ee-o-FILL-ah
Serissa se-RISS-ah
Smithiantha cinnabarina
smith-ee-AN-tha sin-ah-ba-RINE-ah
Smithiantha multiflora
smith-ee-AN-tha mul-tee-FLOR-ah
Smithiantha zebrina
smith-ee-AN-tha zee-BRINE-ah
Spiranthes parksii
spy-RAN-theez PARKS-ee-eye
Symplocarpus foetidus
sim-plo-CARP-us FE-tid-us
Trillium persistens
TRILL-ee-um per-SIS-tenz
Vicia menziesii
VISH-ee-ah men-ZEES-ee-eye
Vriesea splendens VREE-zee-ah SPLEN-denz
Zizania texana zy-ZANE-ee-ah tex-AN-ah

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