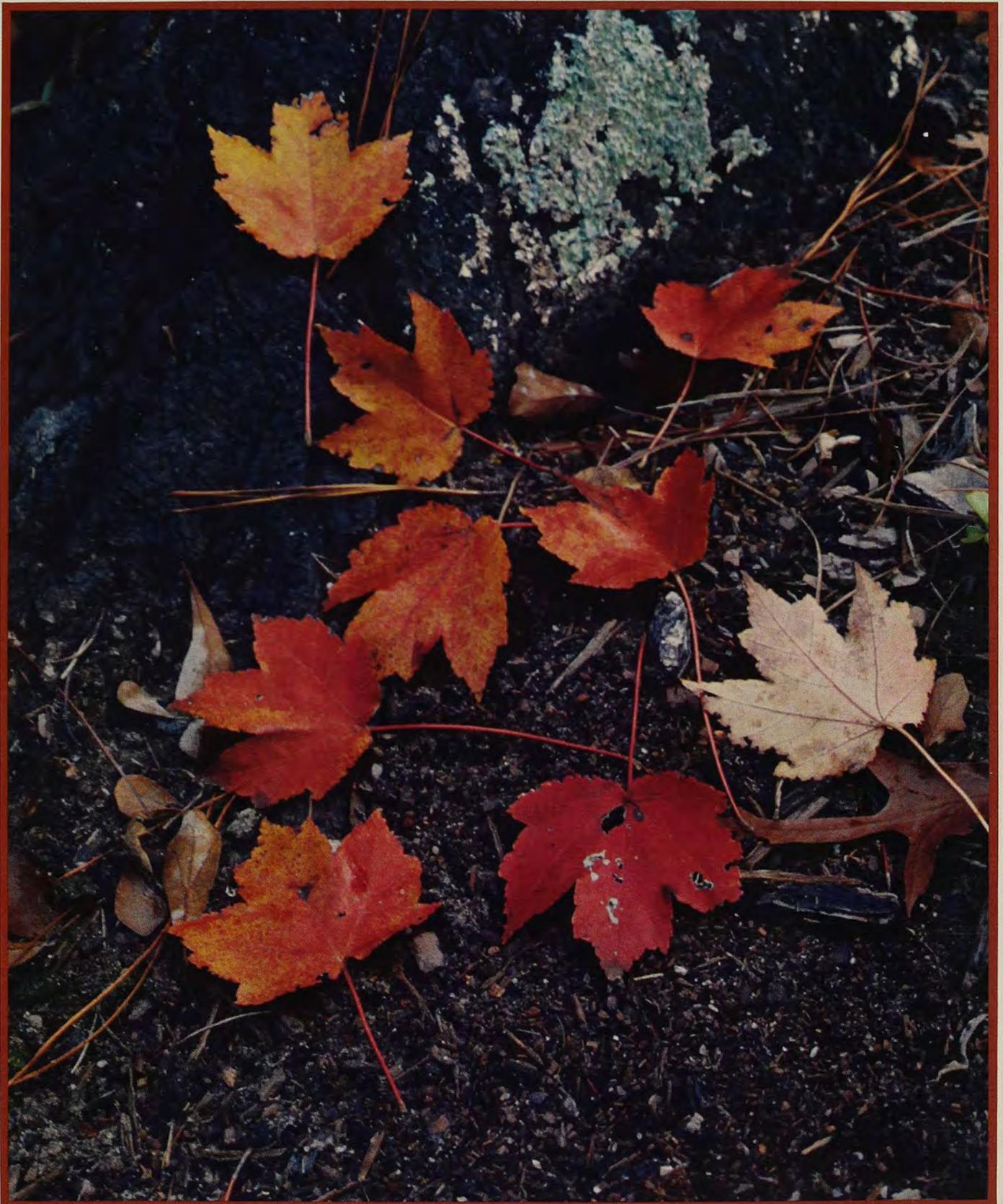


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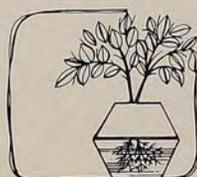
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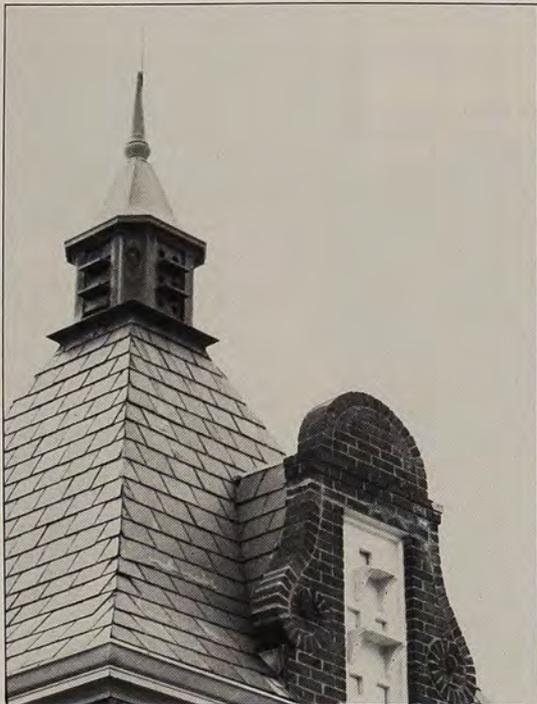
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ON THE COVER: The rich red and russet colors of maple leaves are synonymous with autumn. Pictured here, fallen leaves of *Acer rubrum* 'October Glory'. Photograph by Pamela Harper.

PRESIDENT'S PAGE

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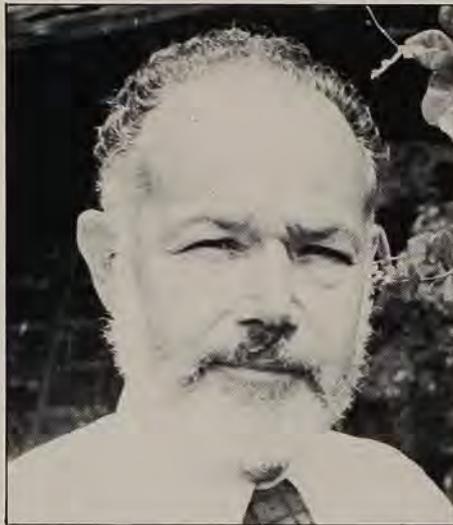
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The growing season is over. Except for some hardy crops that may still be hanging on in the vegetable garden, or some carrots or parsnips still in the ground, there is relatively little left to do now except to clean up the garden and get ready for next spring. This is the time to lime the garden and the lawn. If you plow your vegetable garden, that too is best done in the fall. This is also a good time to prune your trees and shrubs, particularly any fruit trees that may have grown watersprouts in the wrong places. But don't touch forsythia or any other shrub that blooms on old wood or you will sacrifice spring flowers.

There are always a few more chores, but to all accounts, the gardening season is over—over from the point of view of manual labor, but not mental labor. Now is the time to use your head! Begin planning next year's garden. While still fresh in your mind, make lists of all the things that went wrong—the vegetables that were planted too early or too late, the new flowers you tried that weren't happy where you planted them, the flowers and vegetables you saw in a neighbor's garden that you want to try for yourself. The list of things you could have done better is probably quite long if you really are a good gardener. Now is the time to learn from your mistakes. The catalogues for next year won't be available for a while yet, but it's not too early to start planning for their arrival. Make lists of all the vegetables and flowers you want to try next year. Correct the quantities. Did you really plant enough 'Sugar Snap' peas?

Lay out next year's vegetable garden. Think about crop rotation. You don't want

to plant cabbage or broccoli in the same spot two years in a row. Did the cucumbers get enough sun? Or do you have to try them in a different spot that gets more sun throughout the day? Were your tomato cages big enough? Should you try a larger diameter or a higher cage? Could you save space by growing some of your vining crops on a trellis or free standing A-frame? And what about succession crops? Did some of the garden space remain empty after the early beans were harvested? Why not follow with a fast crop of turnips? They mature rapidly, and they do well in the cool fall weather. For the fun of it, when planning next year's garden, test your knowledge against the computer. Read John Wott's article on computer vegetable gardening in this issue for details.

One of the joys of gardening for me is constantly thinking about what I could do better next time. This is the time of year to collect those thoughts. If you've just gone through your first growing season in a new home, be critical about the landscaping. Were the shade trees really in the best place to keep the house cool on those hot summer days? Just because a tree is there doesn't mean you have to live with it forever. Consider planting better trees in better locations. And don't be afraid to remove those that are just wrong for your lifestyle. Is the shrubbery where you want it or does it interfere with your preferred traffic patterns? Shrubs can be moved, and now is the best time of year to move them.

And don't forget to take care of your garden tools. Fall is the best time to clean, sharpen and oil all your hoes and shovels. That hoe you bought for a few dollars a year or two ago may cost twenty dollars to replace a few years hence. It pays to care for your tools. Don't forget your motorized equipment either. Drain the gas tanks and be sure the carburetors are clean. When it's time to start the lawnmower next spring you will want to start off with the first pull. If you need professional repairs, have the work done now. Don't wait until the grass is six inches high and heading for your knees before you take your lawnmower to a repairman at his busiest time of the year.

Gardening constantly offers new experiences to even the most seasoned expert. Last year's garden may have been a great success, but next year's will be better still—if you plan ahead.

Gilbert S. Daniels



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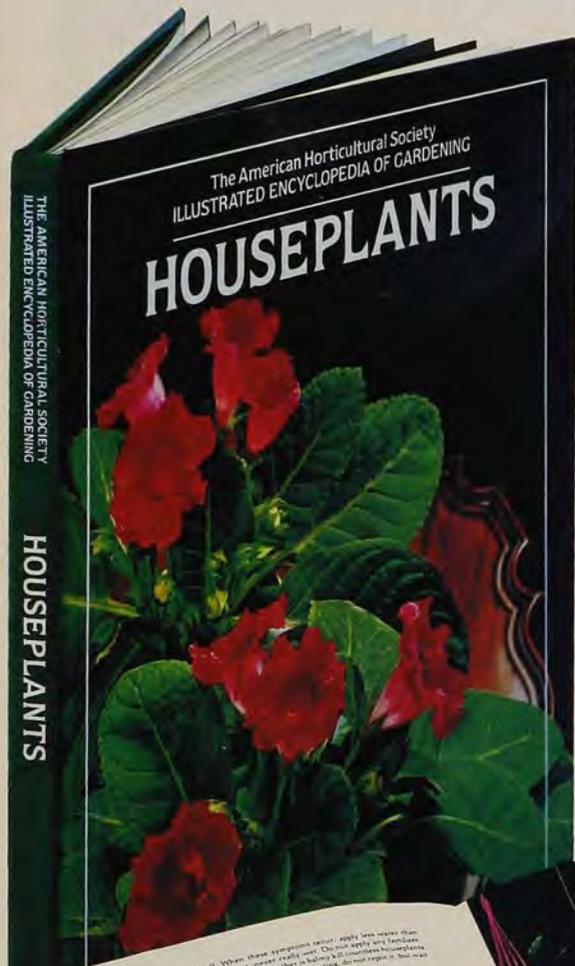
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FIRE-RETARDANT PLANTS



U.S. Forest Service

Sudden explosive brush fires are a constant threat to hillside residents of Southern California. As the U.S. Forest Service states, "Walls of flame, blackened acres, gutted homes and exhausted fire crews cross the local TV screen in a garish blur almost every summer and fall." They are a way of life, a natural phenomenon in this area where it is not unusual to experience an eight-month-long summer with little or no rainfall.

The most serious threat of fire originates, of course, whenever man decides to live in an area with so little rainfall. The use of fire retardant plants becomes a most important feature of fire prevention.

The typical vegetation on the mountain slopes in southern California, below the yellow pine forests, is chaparral. This growth is a dense, complex plant association of hard-leaved evergreens three to 15 feet in height—a natural mini-forest.



Stuart L. Block

TOP: Given dry conditions, and aided by northeasterly winds, a raging fire like this will destroy 13 acres of vegetation per minute. ABOVE: A number of plants possess fire-retardant qualities. One type is a low-growing groundcover that rapidly forms a solid layer of succulent growth, of which *Santolina virens*, pictured here, is a good example.

The dry, oily nature of many of these plants will ignite spontaneously from a match, a cigarette, lightning or exhaust from a

car. One spark on this highly flammable vegetation, whisked by northeasterly winds that roar over the ridges and down can-

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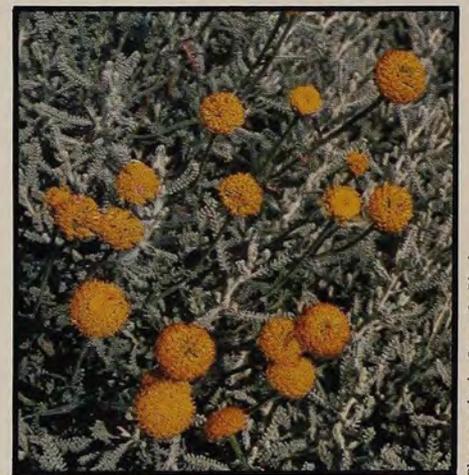
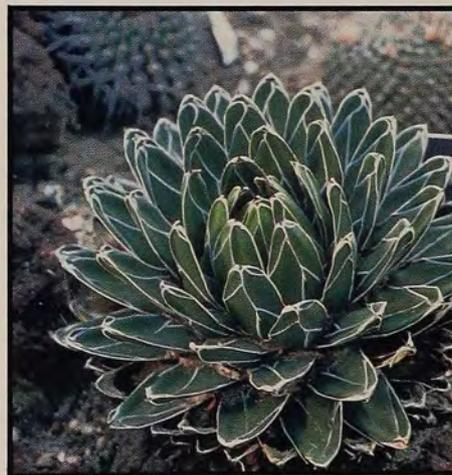
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yons, often devours 50 tons of brush per acre and destroys 13 acres per minute.

Since 1952, in an effort to identify plants that do not burn as readily as the native vegetation, the Los Angeles State and County Arboretum has conducted research on plant flammability in cooperation with the United States Forest Service, the University of California, local fire departments and some other agencies.

Absolute identification of fire retardant qualities in a plant is not an easy task. Their selection is somewhat a matter of personal preference, suitability to the soil, topography and climate. Fire-retardant plant research has two major objectives: the first is to obtain a fundamental knowledge of plant flammability and the properties that contribute to low flammability. The second is to recommend species for planting that would reduce the danger of fire and also control water runoff and soil



Other plants whose qualities make them good candidates for planting in a fire prone area are, TOP: *Gazania*; LEFT: *Agave victoriae-reginae*; and RIGHT: *Santolina chamaecyparissus*.

erosion. Some physical characteristics of fuel potential such as plant size, density and shape must also be considered.

Dr. Eamor Nord, a plant ecologist with

the U.S. Forest Service working at the fire laboratory at Riverside, California, grew selected species for burning. Other scientists devised a mechanism that would re-

Photography by Stuart L. Block

produce small-scale fire whirlwind conditions to which these species would be subjected. The whirlwinds were measured to obtain flame velocity, fire temperatures and smoke density. Other fire tests were conducted on an actual chaparral site.

Tests indicated the most fire-retardant plants were those whose earliest leaves remained green.

Results indicated that the most desirable low-growing groundcovers were those that rapidly formed a solid layer of succulent growth, a tangled mass several inches in depth over the soil. Furthermore, the best plants were those whose earliest leaves remained green. This characteristic would help to deter a fire from creeping under the cover along the surface of the soil. In addition, the best groundcovers were those that would take root on steep slopes.

Knowledge gained from this type of research has been incorporated into a comprehensive land management program in southern California. Residents of hillside areas, for example, must include greenbelts—landscaped, irrigated zones 100 feet in width around a house—for fire retardation. All native brush must be removed from this area and replaced with low growing, low-fuel volume plants that have a high moisture content. A permanent sprinkler system must be provided to supply water, especially during the fire season. Weeds and plant litter must be removed, and enough fertilizer and water must be supplied during the growing season to keep the succulent plants in a vigorous, growing condition. This last measure is an important one to keep in mind. Frequently, residents develop a sense of security during a period of adequate winter rains. Instead, this precipitation tends to produce an increase in the growth of succulent under-cover, which, as it dehydrates during the summer, produces more fuel and increases the fire hazard.

The use of greenbelts has been supplemented with community firebreaks, safe ingress and egress for fire and other emergency equipment, highly visible street names and numbers and strategically placed sources of water.

Experts often disagree about which plants should be included on a fire-retardant plant list, but the one published by the Los An-

geles State and County Arboretum is comprehensive enough to have received general acceptance. This list describes 25 low-growing, succulent plants with greatest fire resistance, of which 18 have been isolated here that are not only fire-resistant but also especially attractive in the landscape.

It should be emphasized, however, that these plants only seem to *retard* fires; they are not fire proof. Richard G. Maire, in a recent leaflet published by the University of California, reminds us: "There is no such thing as a plant that will not burn. The term 'fire resistant' has been used and may be misleading. All plants will burn if there is enough heat and other conditions are right."

Groundcovers with Greatest Fire Retardance

Agave victoriae-reginae. The agaves are commonly called century plants. This species has stiff, thick leaves with narrow white stripes. A slow growing plant that forms clumps; leaves to six inches. Greenish-white flowers borne at maturity (about 20 years). After blooming, plant dies.

Aloe aristata. A dwarf succulent; commonly called torch plant or lace aloe. Four-inch, narrow lanceolate leaves have soft, white teeth on the margin and end in whip-like strings. Orange-red flowers borne in winter.

Aloe brevifolia. Low clumps of blunt, thick, three-inch, spine-edged leaves. Clusters of red flowers on long spikes to 16 inches tall borne intermittently all year.

Crassula multicaeva. Dark-green, three-inch leaves. A rampant grower with a spreading habit. Light-pink flowers borne in late winter and spring.

Crassula tetragona. Commonly called the baby-pine-of-China or Chinese pine. Narrow, awl-shaped, fleshy leaves. Height to two feet. A good plant for mass plantings. Bears white flowers.

Delosperma algoense 'Alba'. Commonly called white trailing ice plant. A dwarf plant, to 10 inches, it roots freely, covers quickly and has small leaves. Heat and drought resistant and a good soil holder. Bears small, white flowers.

Maleophora crocea. Dense, smooth, pale-green leaves borne on heavily branched plants. Hardy, tolerant of heat and wind. Reddish-yellow flowers borne intermittently all year.

Sedum acre. Commonly called gold moss sedum. Upright stems bear tiny, light-green leaves. Grows rapidly in poor soil, re-

quires little water. Bears clusters of yellow flowers.

Sedum X rubrotinctum. Often sold as *S. quatemalense* and commonly called brown bean sedum or Christmas cheer. A rapidly rooting plant with a sprawling habit. The bronze leaves look like jelly beans. Flowers are reddish-yellow. Requires little water.

Low Growing Shrubs with Moderate Fire Retardance

Artemisia caucasica. The artemisias are commonly known as mugworts or sagebrush. Dense, woody, gray-green, silky-hairy shrub that bears yellow flowers. Requires little water.

Atriplex cuneata. Members of this genus are often called saltbush. Dense, silvery-gray foliage. Flowers inconspicuous. A plant that is tolerant of dry, alkaline soils.

Atriplex gardneri. Another saltbush with small, gray-green leaves and inconspicuous flowers. Forms large clumps and is deep rooted.

Atriplex semibaccata. Commonly called Australian saltbush. Gray-green leaves borne on plants that form a dense mat six feet in diameter. Grows very rapidly. Often heavily browsed by deer.

Gazania rigens var. *leucolaena*. Commonly called treasure-flower. A plant with silver-gray foliage that rapidly forms an attractive cover. Yellow, orange, white or bronze daisy-like flowers present all year.

Phyla nodiflora var. *canescens*. Commonly called frog fruit, cape weed or turkey-tangle. A creeping evergreen perennial that grows rapidly. Unattractive in winter. Tolerates sun and heat. Bears lilac flowers with yellow throats.

Salvia sonomensis. Commonly called creeping sage or creeping salvia. Gray-green aromatic foliage. Fine textured plant forms a tight mat. Roots along trailing stems. Bears small, blue-violet flowers.

Santolina chamaecyparissus. Commonly called gray lavender-cotton. Fine-textured, tomentose, gray-green, aromatic foliage. Rapid growing plant that forms mounds. Bears small, yellow, button-like flowers in winter.

Santolina virens. Commonly called green lavender-cotton. Very similar to *S. chamaecyparissus* but has green foliage and yellow-green flowers. ☼

—Donald Watson

Donald Watson is Professor Emeritus of the Department of Horticulture, University of Hawaii, and now lives in California.

BOOK REVIEWS



The Essential Earthman Henry Mitchell on Gardening

Henry Mitchell is to gardening what Izaak Walton was to fishing. *The Essential Earthman* brings together many of Mitchell's most memorable pieces from his long-running *Washington Post* column. He offers invaluable tips to the seasoned gardener; at the heart of his essays are piquant observations. Some examples: "'Plant material' is one of the supremely vulgar phrases of this language. . . . Plants are not 'material.' The phrase is commonly used by people of careless habits, indifferent brains, and I suspect, no morals whatever." "Marigolds gain enormously in impact when used as sparingly as ultimatums." **\$12.95**



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THE ORCHIDS—NATURAL HISTORY AND CLASSIFICATION.
Robert L. Dressler. *Harvard University Press. Cambridge, Massachusetts.* 1981. 332 pages; hardbound, \$27.50 plus \$1.25 postage and handling.

This is not a book for gardeners. It is a study of the biology and the basis for classification within the orchid family. It is written both for the professional biologist and the interested, amateur orchid grower. Major chapters are devoted to the geography, floral structure, evolution and principles of classification of the many thousands of orchid species. For the biologist interested in evolution, the insects associated with orchids, or the orchids themselves, this work is an important analysis of available data and a new synthesis of evolutionary theories.

SEED TO CIVILIZATION—THE STORY OF FOOD (2ND EDITION).
Charles B. Heiser, Jr. W.H. Freeman and Co. San Francisco, California. 1981. 254 pages; hardbound, \$19.95; softbound, \$9.95. AHS discount price, \$18.20 hardbound; \$9.70 softbound.

In these days of spreading world famine, it gives those of us fortunate enough to live in areas of plenty a better understanding of world problems if we have some knowledge of the history of man's food. Professor Heiser is a botanist, and it is therefore not surprising that he gives most of his attention to plant crops, but he also includes a brief history of domesticated food animals in his discussion. If you are interested in the origins of today's food plants, this book offers a very compact and readable history of their use and development.

ALPINES FOR YOUR GARDEN.
Alan Bloom. Floraprint, USA. Chicago, Illinois. 1981. 128 pages; hardbound, \$14.95 plus \$1.25 postage and handling.

PERENNIALS FOR YOUR GARDEN.
Alan Bloom. Floraprint, USA. Chicago, Illinois. 1981. 144 pages; hardbound, \$14.95 plus \$1.25 postage and handling.

Alan Bloom is generally acknowledged to be the dean of English perennial gardeners. Accordingly, these beautifully illustrated books are full of great ideas for gardens of this type. The first 20 pages or so of each volume are devoted to garden plan-

ning, and the rest of each work is organized as an encyclopedia of plants. The colored photographs of each species are inspiring, but the cultural descriptions are much too brief. Propagating instructions, when present, are of no use at all. These books are supposed to have been edited for North American use by Derek Fell, but I can find no evidence that any such specific information has been added to the original English text. These are great idea books for advanced gardeners, but less knowledgeable gardeners will have to look elsewhere for information on whether or not the plants discussed can be grown in their gardens.

THE BERRY BOOK.
Robert Hendrickson. Doubleday and Company Inc. Garden City, New York. 1981. 259 pages; hardbound, \$14.95. AHS discount price, \$11.75 including postage and handling.

Here is a complete guide to choosing and growing berries of all sorts. Cultural instructions are good and the cultivar descriptions are excellent. Various tables rank cultivars for such things as season, size, quality, etc. If you are confused by the catalogue descriptions of berry cultivars, this book will help you make the right decision for your garden. Separate chapters are devoted to each of the major berry crops (strawberry, blackberry, blueberry, etc.), and a final chapter gives information on more than 35 less common berries such as bearberry, buffalo berry, pokeweed and wintergreen.

FRESHWATER WETLANDS—A GUIDE TO COMMON INDICATOR PLANTS OF THE NORTHEAST.
Dennis W. Magee. The University of Massachusetts Press. Amherst. 1981. 246 pages; hardbound, \$20.00, paperback, \$8.95. AHS discount price, \$17.25 hardbound and \$8.25 paperback including postage and handling.

Wetlands are one of the most fragile and fast disappearing ecological units in the United States. They act as natural flood control basins and reservoirs, and they are the home of many unique plants and animals. This book offers a way to define and identify these wetlands by the plants growing in them. Through identification keys and individual descriptions, 182 plants of the wetlands are presented. Identifica-

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Like most Americans, I love mushrooms. Mushrooms on steak...in an omelet...stuffed mushrooms...as part of my salad...mushroom gravy—you name it, I eat 'em up.

When I can afford it!

With the price of mushrooms *mushrooming* to over \$2 a pound for the small button type—when you can find them—and the fancy dried imported kind going for \$20-\$40 a pound and more, I think twice before indulging myself. Is it any wonder that I've even tried growing them myself? What I got for my labors was a handful of tiny buttons, along with some nasty comments and dirty looks from my neighbors. (Our American or "button" mushrooms require large amounts of manure to grow.)

A TASTE EXPERIENCE

Do I love my food? Let's just say that I very seldom miss a meal. Recently, on a business trip to California, I was treated to a business lunch at an absolutely delightful restaurant in Beverly Hills. Of course I ordered a mushroom salad. It was incredible! I had never tasted anything like it before. Not even the imported mushrooms came close. I can only describe the flavor as being somewhere between filet mignon and lobster! I not only ate my salad, I ordered two more to boot. In fact I almost OD'd on mushroom salad!



THEY ARE CALLED SHIITAKE'S

That was my introduction to the Shiitake Mushroom. Let me tell you, I did not leave that restaurant without learning their source. I discovered they were being raised in very limited supply by a Chinese American botanist, Dr. Henry Mee. I called Dr. Mee thinking I could tote a few pounds home with me. He most graciously invited me out to his facilities. I went to buy mushrooms, but instead, received an education.

ELIXIR OF LIFE

The first Shiitake spawned during the misty era of a hundred million years ago. Early Chinese sages attributed great powers to the Shiitake and it was often called the Emperor's Food. In ancient China and Japan, it was eaten by royalty

to fend off old age, revered as an aphrodisiac and fought over by Japanese warriors who fiercely guarded the growing sites.

In their natural habitat, it takes two years to bring a Shiitake crop to harvest. They grow on oak logs in the remote mountain forests of Japan. After 25 years of study and labor Dr. Mee has developed a method that cuts the time down to 45 days. He now produces some 100 pounds daily, of which the entire crop is taken by a relatively small handful of gourmet restaurants and shops.

MORE THAN I BARGAINED FOR

Rather than sell me a few pounds of mushrooms, Dr. Mee suggested I grow my own. He had perfected his process to the point where he claimed anyone who could water a house plant could enjoy fresh, luscious "Shiitake" mushrooms. Simply stated, he simulates their natural habitat by producing a "log" fabricated of 100% sterilized organic plant material, with nothing artificial, and no chemicals added. The log is then inoculated with pure culture of the "Shiitake" mushroom spore...and then cured or "aged" to hasten fruition under home environment with the addition of nothing but water. When Dr. Mee said I would not require any manure or fertilizer of any kind, I decided to give it a try.

SIMPLE AS A.B.C.

The instructions were simple. Start by soaking the log in water for 24 hours. Then simply place the tree in its own wooden planter-stand and set on a foam rubber pad, which is supplied with each log and acts as a moisture "reservoir". After that just mist it once a day. And, unlike buttons, Shiitakes thrive in daylight.

INCREDIBLE RESULTS

In only 5 days I actually saw mushrooms start budding, 10 days later I picked my first giant Shiitake. One month later I had enough for not only myself but my friends as well. What's more, Dr. Mee has informed me that I can expect the log to keep producing for the next 10 to 12 months. If you're growing more mushrooms than you can use, simply store the tree in the frig (or outdoors if the weather is cool) and it will stop growing. When you want more mushrooms, just place it at room temperature and it will start producing.

NUTRITION

With a virtually unlimited supply of my favorite food I've become something of an expert. Mushrooms are nature's unique low cal fat-free food. One pound contains fewer calories than a single apple! Shiitake mushrooms have more than twice as much protein and fiber as common button mushrooms, almost 3 times the minerals. Calcium, Phosphorous and Iron are present in large quantities, as are high levels of B Vitamins and Vitamin D2.

A FEAST

All of this nutrition stuff is great. But the eating is even better! One ounce of Shiitake will equal the flavor of an entire pound of buttons. They are super meaty, super mushroomy in taste, succulent, heady and 100% edible from cap to stem.

One of two slices turn an ordinary pot roast into a gourmet delicacy...an ordinary salad into

an extraordinary taste sensation...a gravy into a nectar for the gods. And spaghetti; let me tell you about my spaghetti. I serve it with a mushroom meat sauce that is truly memorable!

My guests insist that Julia Childs had come in to cook for me!

AM I SELFISH?

My friends (and my wife) have accused me of being selfish. I admit to being somewhat of a miser when it came to sharing my mushroom crop. It seems every time I gave my friends a super-size Shiitake, they would come back and pester me for more. I finally had to ask Dr. Mee for additional mushroom logs to save my sanity and several valued friendships.

Dr. Mee is now producing a limited number of Shiitake Mushroom Log kits. We at the Lovin' Spoonful are fortunate in being chosen to introduce it to the general public. As a measure of our enthusiasm and our confidence we offer it to you at our risk. If the Shiitake is not every bit as delicious as we claim, or for any reason, you are not satisfied with the production of the log, return it for a full refund of purchase price. The cost is only \$19.95, complete with everything you need to grow a bumper crop. We also include a selection of fabulous mushroom recipes. I guarantee it will be the most delicious investment you will have ever made.

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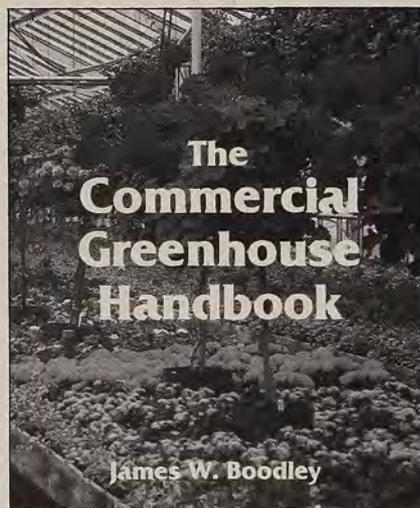
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BOOK REVIEWS CONT'D

tion is further aided by the fine line drawings that accompany each species description. For readers interested in protecting the few remaining wetlands in this country, this book will help them identify such

areas. On a more practical level, these same plants can help readers identify a piece of land that may be too wet for at least a part of the year and therefore possibly unsuitable for house construction.

TWO TEXTBOOKS



THE COMMERCIAL GREENHOUSE HANDBOOK.

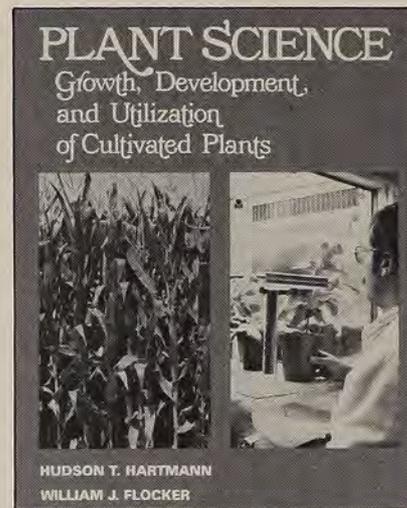
James W. Boodley. Van Nostrand Reinhold Company. New York. 1981. 568 pages; hardbound, \$24.95. AHS discount price, \$22.45 including postage and handling.

PLANT SCIENCE—GROWTH DEVELOPMENT AND UTILIZATION OF CULTIVATED PLANTS.

Hudson T. Hartmann, William J. Flocher and Anton M. Kofrenek. Prentice-Hall, Inc. Englewood Cliffs, New Jersey. 1981. 676 pages; hardbound, \$25.95. AHS discount price, \$24.60 including postage and handling.

The advanced amateur gardener can often profit more by reading current college texts in the plant sciences than many of the gardening books published today. These two textbooks cover almost every phase of gardening indoors and out.

The Commercial Greenhouse Handbook addresses all aspects of greenhouse growing from selection and construction of the greenhouse itself to the health and growing requirements of most of the current ornamental greenhouse crops. Chap-



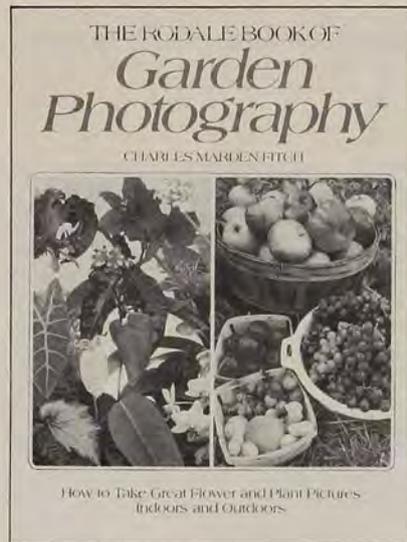
ters on the development of the industry and post harvest handling and marketing of cut flowers may not be of interest to the amateur grower, but the sections on growing media, environmental factors, nutrition, plant propagation, container crops and cut flowers are directly applicable to the home greenhouse owner. A quiz at the end of each chapter lets the reader (student) test himself on his comprehension of the contents. Unfortunately, no bibliography is given; further reading could be difficult for the amateur gardener to track down.

Plant Science covers both botany and horticulture (as well as some agriculture). The basics of plant taxonomy, economic botany, plant anatomy and physiology, plant propagation and soil are all covered in sufficient depth to be of value, yet the writing style is simple and understandable. More than half of the book deals with the cultural requirements of specific plants such as house plants, trees, shrubs, cut flowers, vegetables, etc. In each case most of the commonly grown species are treated in individual detail. A good bibliography of supplemental reading is given at the end of each chapter. This is the sort of book the advanced amateur gardener should have on hand for easy reference or continuing education.

THE RODALE BOOK OF GARDEN PHOTOGRAPHY.

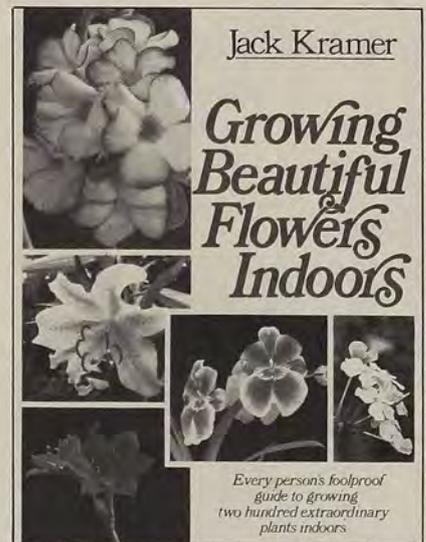
Charles Marden Fitch. *Amphoto Books*. New York. 1981. 176 pages; paperbound, \$12.95. AHS discount price, \$11.60 including postage and handling.

Photography is often a natural extension of gardening. Through photographs one can preserve those fleeting moments of perfection in the garden and enjoy the beauty of many a transient flower at any time of the year. This book by a horticulturist and professional photographer tells the reader through text and illustrations how to take top quality photographs in the garden. The instructions are aimed at the beginning photographer, but even if the reader has been taking pictures for years, some of the specialized approaches to plant photography may be new and useful to him.



to the gardener who would want to use these shrubs in his own garden. Many of our native shrubs are ignored in the United States but highly regarded in European gardens. This book offers the reader in the East an opportunity to learn more about those choice additions to the landscape that may be growing in the wild within a stone's throw of his home.

ROCK GARDENS (5th Edition).
 Wilhelm Schacht. *Universe Books*. New York. 1981. 192 pages; hardbound, \$18.75, including postage and handling. Wilhelm Schacht was, until he retired, the curator of the Alpine Section of the Munich Botanical Gardens. He is also an excellent photographer. By combining these two areas of expertise, he has produced a well written and beautifully illustrated book on one of the more challenging speciali-



zations in gardening. Introductory chapters tell the reader how to construct various forms of rock gardens and list plants suitable for various environmental conditions. Roughly two-thirds of the book is devoted to descriptions and brief cultural notes of plants ideal for the rock garden and the alpine house. Comments on specific growing conditions for the United States are given where applicable, and sources of plant materials from Great Britain, Europe and North America are listed in an appendix. Specialized sources from Israel, Japan, New Zealand and South Africa are also included. Of particular significance is the attention Schacht has given to current and correct nomenclature. ♦

—Gilbert S. Daniels

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

GROWING BEAUTIFUL FLOWERS INDOORS.

Jack Kramer. *St. Martin's Press*. New York. 1980. 208 pages; hardbound, \$24.95. AHS discount, \$21.20 including postage and handling.

This book is about flowering house plants, although some of the plants rated difficult to bloom would probably grow more easily in the greenhouse. Completely illustrated with beautiful color photographs, this work comes close to being a "coffee table book." Practical growing instructions and illustrations of individual species consume three-quarters of the text. The remaining portion is devoted to general culture, plant propagation and insects and disease. The choice of house plants is particularly broad and should encourage any indoor gardener to try some of the less common plants on his own windowsill.

GROW NATIVE SHRUBS IN YOUR GARDEN.

F.M. Mooberry and Jane H. Scott. *Brandywine Conservancy*. Chadds Ford, Pennsylvania. 1980. 68 pages; paperbound, \$7.20, including postage and handling.

This little book organizes plants by the seasons. Shrubs native to the eastern United States are grouped according to the time of year when they contribute most to the garden. Descriptions and cultural instructions, as well as line drawings and specific comments on hardiness, serve as a guide

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THE AROID FAMILY

Among the most popular and fool-proof house plants are *Philodendron*, *Monstera*, *Aglaonema*, *Dieffenbachia* and *Epipremnum*. These five genera belong to the Araceae or aroid family, which consists of approximately 115 genera and 2,000 species. Aroids are largely of tropical origin and are tough plants. They may be terrestrial, aquatic or epiphytic.

Although most of the Araceae grown as house plants are grown for their foliage rather than their flowers, several family members have very attractive flowers and at least one bears edible fruit. The usual inflorescence of plants belonging to this family resembles the Jack-in-the-pulpit, *Arisaema triphyllum*, a typical aroid with a spathe and a spadix. The spadix is a thick or fleshy spike covered with minute flowers, and it is surrounded by the spathe, a bract or leaf that may be green or another color. One of the best known of these plants is *Anthurium*, with its flat, leathery, almost plastic looking spathe. Another aroid famed for its flowers is the so-called calla lily, *Zantedeschia*. *Monstera deliciosa*, perhaps most commonly known in this part of the world as cut-leaf philodendron, bears aromatic, flavorful fruit. Some of its other common names, such as breadfruit vine and fruit salad plant, as well as its specific epithet, obviously refer to this characteristic.

The sap from the stems and tubers of aroids is bitter and often toxic, containing oxalic acid. *Dieffenbachia* for instance, is called dumb cane because it will irritate the inside of one's mouth and paralyze the vocal chords if tasted.

The aroid family is widely varied. Some are epiphytes, having some roots that cling and others that absorb moisture from the air. *Philodendron* is a mostly epiphytic genus. Still other aroids are aquatic, a good example being *Pistia stratiotes*, the floating water lettuce or shellflower found in quiet ponds throughout the tropics and subtropics. Our own western skunk cabbage, *Lysichiton americanum*, whose flowers form underground in autumn and push through the ground to appear in late winter, is another aroid thriving in wet places. (The eastern skunk cabbage is *Symplocarpus foetidus*.)



Zantedeschia

Of the many species in this family, comparatively few are in cultivation. Approximately 1,000 species of aroids are grown by man, and of these a mere handful have found favor as house plants. Yet these few species provide the basis for a surprising amount of indoor gardening. Leaving *Syngonium*, *Anthurium* and *Caladium*, which can most easily be grown in a greenhouse but are not impossible as house plants, one could have a very respectable collection of house plants just by relying on five genera of aroids.

Philodendron leads the list. Almost everyone has at least one *Philodendron*, the most common being *Philodendron scandens* subsp. *oxycardium*, commonly known as heart-leaf philodendron, and often incorrectly sold under the name *P. cordatum*. My own *Philodendron*, sitting happily in a clay pot set into another pottery container, is positioned in the kitchen between two sliding glass doors. It has literally "climbed the wall" and is now covering part of the ceiling. Its shiny, dark leaves show up nicely against my yellow paint job. Surprisingly, few people comment on it. I suspect most people think it is merely a plastic plant, ingeniously glued to the wall. It requires watering once a



Monstera

week and an occasional feeding. Otherwise, I never bother it. It grows in a cool place, with temperatures never over 55° F in winter but perhaps reaching 80° F on a summer day. It receives light all day, but little direct sun.

Of course, there are many other species of *Philodendron* to choose from. Interestingly shaped leaves make *P. bipennifolium* (almost always sold incorrectly as *P. panduriforme*), the fiddle leaf, horsehead or panda plant, a good choice. Equally attractive is *P. domesticum*, or elephant's ear, while the pleasing color of red-leaf philodendron, *P. 'Mandaianum'* (a cross between *P. domesticum* and *P. erubescens*), recommends it as still another type to try. Also, there are various cut-leaf species to consider, and some tree types, and these by no means exhaust the list. None is particularly demanding except that washing off the leaves once in a while improves their appearance and is healthful for the plant. This care-free aspect is generally one of the most ingratiating features of the philodendron.

Closely related and an equally easy epiphyte to grow is *Monstera*, a genus of plants often mistakenly misnamed *Philodendron*. Particularly confusing is *Mon-*

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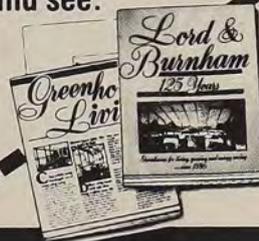


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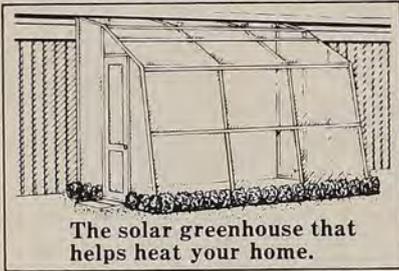
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STRANGE RELATIVES CONT'D

stera deliciosa, because its immature form is almost always erroneously called *Philodendron pertusum*. With their split and often perforated leaves, the monsterae are arresting plants. My own *Monstera obliqua* var. *espilata*, or window leaf, is planted

The usual inflorescence of plants belonging to this family resembles the Jack-in-the-pulpit, *Arisaema triphyllum*.

in our cool greenhouse (55° F) and receives some humidity, a thorough weekly watering, but only occasional feeding. It is rapidly spreading over the perlite-filled bench, threatening to join the philodendron in the nearby kitchen.

Aglaonema is a very different aroid. It is terrestrial, slower growing and more compact. Most familiar is the Chinese evergreen, *Aglaonema modestum*, a plant durable enough to grow in water as long as the leaves are not submerged. It does equally well in a pot full of dry soil in a dark corner. More dramatic is *Aglaonema commutatum* and the other variegated species such as *A. crispum*, commonly called painted drop-tongue, with their leather-like, variegated leaves. Two other exciting cultivars are *A. 'Silver King'* and *'Silver Queen'*. My own *Aglaonema* was planted in a shady part of the garden last summer while still in its pot. Unfortunately, on its return to the greenhouse in early fall it was overwatered, having been inadvertently placed among moisture loving ferns and camellias. Overwatering made its leaves curl, but once moved to a dry area it soon recovered.

Somewhat similar in appearance is *Dieffenbachia*, another plant very commonly found on windowsills or more often as a floor plant in the house. These plants can become lanky, especially if kept in poor light, but the top can be easily cut off and rooted. The old plant also will sprout some new shoots. Like *Aglaonema*, *Dieffenbachia* seems to need little care, although it likes somewhat warmer temperatures. Surprisingly, since most dieffenbachias originally came from the moist tropics of Central and South America, they even tolerate low humidity. Among the most commonly found and easily maintained dieffenbachias are cultivars of *D. maculata*. The species has green leaves splashed with



Caladium

white. Perhaps its most striking cultivar is 'Rudolf Roehrs' with cream leaves and dark-green midrib and leaf margin.

Epipremnum, commonly called devil's ivy or pothos, is another old standby in the aroid family. Its leaves are reminiscent of *Philodendron*, but they are smaller and more leathery. It is a vine and a graceful trailer. Epipremnums require fairly warm growing conditions, but otherwise are satisfactory house plants. *E. aureum*, formerly called *Scindapsus aureus*, is an often grown species. Perhaps even more popular is its cultivar, 'Marble Queen', with white to cream leaves irregularly dotted and striped with green. If planted in soil, epipremnums should be kept fairly dry. Otherwise they may lose their leaves and even rot completely. Hardier types can be grown in water. I have a fairly ordinary pothos, its bright-green leaves splashed with white, growing in a water-filled green bottle in my kitchen window.

The most common of these aroids have become great favorites of interior decorators, partly because they are so undemanding and also because of their dramatic effect. In my own home I try not to be intimidated by this fact. Properly selected and cared for, aroids can make interesting and attractive house plants, no matter what their surroundings. ☘

—Adelaide C. Rackemann

Adelaide C. Rackemann, guest columnist for this month's *Strange Relatives*, is active in the Horticultural Society of Maryland and works as a volunteer at Cylburn Nature Center and Wildflower Preserve in Baltimore, Maryland.

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ORNAMENTAL TREES

A new look at some old favorites.

Selecting an ornamental tree for the garden should be a pleasurable experience. After all, a beautiful tree will provide many future years of enjoyment. Unfortunately, too many individuals make hasty and improper choices that often lead to dissatisfaction and regret a few years down the road. Although a number of circumstances can lead the homeowner to make an unsatisfactory purchase, lack of knowledge is often a major cause. The uninformed buyer commonly chooses a poor species susceptible to insect and disease problems or one with inherently weak wood, which is prone to storm damage. Or he plants a quality ornamental in a location where it cannot possibly thrive. The slow growing, amply proportioned bur oak (*Quercus macrocarpa*), for example, would make a very poor selection near a patio where a fast maturing, small shade tree is desired, yet it would serve admirably in a large, park-like area where its massive size could be better used and appreciated.

Ornamental trees can serve a variety of purposes and provide much satisfaction if sufficient forethought is exercised. A knowledgeable, qualified nurseryman is invaluable in helping to assure that the newly purchased plant and its future location are properly matched. (*Editor's note: the sidebar on page 38 offers some good advice on what to look for when buying a quality tree.*)

Even such popular ornamentals as the ones mentioned in the following paragraphs deserve to be reevaluated. Although they are used frequently in home landscapes, some of them are of little benefit, and others are valuable as plant material only as long as the consumer is aware of the handicaps they may possess. It is time well spent to take a new look at these old favorites.

European white birch, *Betula pendula*, is a popular tree with an ornamental



Donald W. Jackson received his Bachelor of Science degree in Ornamental Horticulture from the University of Kentucky in June and is now the supervisor of the Stanely M. Rowe Arboretum in Cincinnati, Ohio.

TEXT BY DONALD W. JACKSON
PHOTOGRAPHY BY PAMELA HARPER



OPPOSITE TOP: *Albizia julibrissin*; BOT-
TOM: Close-up of
flowers of *Albizia ju-
librissin*, commonly
called mimosa or silk
tree; LEFT: *Liquid-
ambar styraciflua*.

RIGHT: Fallen leaves
of *Acer rubrum*
'October Glory'; OP-
POSITE TOP: Su-
maras (fruit) of *Acer*
saccharinum; BOT-
TOM: Flower of yell-
wood, *Cladrastis*
lutea.





drooping form and white bark that flakes off in layers. The bark is particularly attractive when the tree is still young. Unfortunately, this species is very susceptible to leaf miners and bronze birch borers. These insects cause a great deal of damage, and a conscientious spray program is a necessity if the plant is to be kept healthy. River birch, *Betula nigra*, is a superior choice in areas where the borer is a problem. This species has attractive exfoliating bark that varies greatly in color, primarily in the reddish-brown shades. Also called red birch, this is a native species and grows best in a moist, slightly acid environment. Monarch birch, *B. maximowicziana*, is also a good alternative to the European white birch. Resistant to the bronze birch borer, monarch birch has exfoliating bark and seems to survive quite well in urban areas.

London plane, *Platanus X acerifolia*, is a cross between the oriental plane tree, *P. orientalis*, and the American plane tree, *P. occidentalis*. The oriental plane tree is a desirable parent tree because of its greater resistance to the disease anthracnose, a common plant disease caused by a genus of fungi, *Gnomonia*. Still, the London plane is not a superior ornamental shade tree. One major disadvantage is its massive size (to 120 feet), which poses an increasingly difficult problem to deal with as the dimensions of residential building lots continue to shrink. Few trees, either native or introduced, approach the proportions, both in height and breadth, of *P. X acerifolia* or the American plane tree, which can attain a height of 150 feet.

Additionally, the London plane tree also has other undesirable characteristics, including susceptibility to cankerstain (*Ceratocystis fimbriata* F. *platani*), powdery mildew and sycamore lace bug. It also requires a time consuming fall cleanup project due to its numerous large leaves and its fruit.

Two native species that are used as ornamentals are the common persimmon, *Diospyros virginiana*, and the American sweet gum, *Liquidambar styraciflua*. Both trees have a number of good attributes when used as ornamental shade trees, including strong wood and reasonable

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The William Paca House Garden

BY JOAN SAYERS BROWN



Maryland Historical Society

ABOVE: Visual evidence, such as that supplied by this portrait of William Paca in his garden painted by Charles Willson Peale in 1772, was just one of the sources used to reconstruct the garden. RIGHT: Today the reconstructed house and garden look much as they did during William Paca's tenure.

The garden of the William Paca House in Annapolis, Maryland, is one of the foremost examples of 18th-century design and planting in this country. Buried under construction and rubble for almost a hundred years, it has recently been meticulously reconstructed to conform to Paca's original design.

William Paca, who was a member of the Continental Congress, a signer of the Declaration of Independence and a federal judge, purchased two adjoining lots on Prince George Street in Annapolis soon after his marriage in 1763. There he built what is considered to be one of the finest townhouses in Maryland. The garden adjacent to the house was also acclaimed. Paca lived in this house until 1780, and then the house passed through several owners for the next 200 years. By 1901, it had become the lobby for a 200-room hotel, Carvel Hall, which stood on most of the garden. A parking lot and bus depot were later built, destroying the remaining portion. In 1965 a developer purchased the dilapidated hotel with the intention of developing or reselling the property for a high-rise apartment office building. Historic Annapolis, Inc. rescued Paca House and 12 feet of its garden with donated funds. After intense lobbying by preservationists, the State of Maryland agreed to buy the rest of the property on which the garden had once existed and appointed the Maryland Historical Trust to undertake its restoration. Today the magnificent house and garden are maintained by Historic Annapolis, Inc.

All sorts of fascinating archaeological discoveries provided documentation for researchers seeking to find out how the garden looked during William Paca's tenure. Visual evidence was found in the portrait of William Paca by Charles Willson Peale, which shows the proud owner in his garden with a Chinese Chippendale bridge over the pond in the lower area, the octagonal pavilion with its statue of Mercury on top, and brick dependencies. An 1880 drawing by Frank B. Mayer depicts the garden side of the house with wide steps descending into the garden, off-center. Rosalie de Stier, one-time occupant of the house, wrote to her brother in 1797 that it was ". . . the finest garden in Annapolis

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in which there is a spring, a cold bath house well fitted up and a running stream.”

Archaeologists located the foundations for the structures shown in Peale’s portrait, and described by Stier, as well as the shape of the pond and the rock supports for the bridge. The old foundations of the canal were also discovered. This canal carried water from a nearby spring, past neighbors’ houses, through the Paca garden and finally to a pond and the Severn River at

LEFT: Mountain laurel, *Kalmia latifolia*, is one of the native plants that flourishes in the wilderness garden. BELOW: The boxwood parterre, a typical feature of an 18th-century garden, now occupies a spot on the lower of three terraces in the upper garden. RIGHT: Heliotrope, *Heliotropium arborescens*, grows in containers placed in the holly parterre.

a spot where the U.S. Naval Academy now stands. In Paca’s time the canal did not run into his pond. Today, however, the spring water runs underground to emerge in the canal and flow into the pond. Its purity is evidenced by the number of healthy fish. The remains of a sanitary drain, completely separate, which ran from the kitchen area to the river, were also found.

Portions of the original wall of Paca’s garden appeared as the hotel was being demolished, indicating the location and fall of the terraces. Unearthed cap bricks suggested the wall’s shape. Gelling (small stones in the mortar) also evidently strengthened the original brick wall to a height of three or four feet.

The reconstructed garden, which was



planted in 1969, contains only plants that would have grown there during the Paca occupancy. One hundred twenty-five woody samples were found by archaeologists, including boxwood, holly, willow, oak and pine. Permanent plantings adorn the basic plan, and five thousand additional plants are raised for the seasonal flower beds each year.

Three terraces divided into parterres or "rooms," as they were called in colonial days, occupy the upper gardens. Because the construction of Carvel Hall destroyed the exact evidence of the terraces, Laurence Brigham, designer of the reconstruction plan, relied on his knowledge of 18th-century American and English gardens to fill in the gaps. A grand allée descends

through the terraces, off-center from the house, but centered on the lot and based on archaeological evidence. Steps and a gravel walk were also reconstructed when a stone step was found during excavation. Grass walks were more common at that time.

The rose parterre, gift of the Roland Park Garden Club of Baltimore, contains eglantine, moss, French gallica, Castile and Austrian copper roses. They begin blooming in May and scent their "room" with a delightful fragrance. The adjacent magnolia-centered flower parterre is planted with seasonal flowers. On the next level the holly parterre holds native holly trees and, in the center, a magnificent registered William Paca holly, which was trans-



Photography by Joan Sayers Brown



Mark Borchelt



Joan Sayers Brown

Archaeologists located the foundations for the structures shown in Peale's portrait, and described by Stier, as well as the shape of the pond and the rock supports for the bridge.

planted from Wye Plantation on Maryland's Eastern Shore, where Paca lived after leaving Annapolis. The boxwood parterre is typical of a small box garden; its beds bloom with seasonal flowers. On either side of the formal terraces are specialized areas for fruit trees, herbs, vegetables and nursery gardens. The original vegetable (kitchen) garden is thought to have been separated from the formal garden by a wall near the kitchen wing of the house. Today a private residence occupies that property.

The wilderness garden, which encompasses an area below the terraces, blooms from early spring with delicate native iris near the edge of the pond, dogwood, daisies, violets and other native species. Efforts have been made to plant this portion of the garden only with wildflowers indigenous to the Maryland area.

Many individuals and garden clubs contributed to the rescue and re-creation of the Paca House garden. Instrumental to the effort was Mrs. J. M. P. Wright, president of Historic Annapolis, Inc., who was selected as chairman of the garden committee. Garden clubs included the Four Rivers Garden Club, Crofton Village Garden Club, Crofton Greenery Garden Club, Arundell Garden Club, Gibson Island Garden Club, Garden Club of Annapolis Towne, the Naval Academy Garden Club, Severn River Garden Club, Holly Berry Wardour Garden Club, Seven Seas Garden Club and Amberly Garden Club.

The contributions of these clubs and other committed volunteers have made the Paca House garden one of the most prominent examples of an increasingly important aspect of historic preservation: garden restoration. ☉

Editor's note: The garden is open Monday through Saturday from 10:00 a.m. to 4:00 p.m. and on Sunday from noon to 4:00 p.m., except Thanksgiving and Christmas Day. Admission is \$1.50 for adults and \$.75 for students; children under eight are admitted free.

TOP LEFT: The rose parterre is filled with the old roses that would have grown there during Paca's day. ABOVE: A southern magnolia, *Magnolia grandiflora*, is surrounded by geometric borders filled with seasonal plantings. RIGHT: Moisture-loving iris grow happily next to the Chinese Chippendale bridge reconstructed from the visual evidence in Peale's portrait of Paca.

Mark Borchelt



Amelanchiers

BY RICHARD IVERSON

The luminous foliage against an October sky was what first caught my eye, and as the seasons changed, continued observation compounded my admiration and delight. Here was a genus that seemed to abound in subtle surprises each season of the year, and one that certainly merited more vigorous investigation. The genus was *Amelanchier*.

Known by a variety of common names, among them serviceberry, Juneberry and shadbush, *Amelanchier* is a member of the rose family, and thus has a close kinship to the apple, pear, mountain ash and quince. The genus contains some 20 to 25 species of small trees and shrubs, but only 12 of these are recorded in *Hortus III*. Fewer than that are propagated by American nurserymen, and fewer still are known by American gardeners.

Amelanchier is certainly deserving of greater visibility for virtually all of its species have superb qualities to offer the gardening public. In early spring billowy masses of small, white flowers provide a spectacular floral display of airy delicacy. These are followed by reddish-purple fruits maturing in early summer that in several species are sweet and tasty, providing an excellent home fruit crop. The autumn leaf coloration is dependably brilliant, ranging from purplish-reds to red-oranges. In addition to these outstanding attributes, its smooth, soft-gray bark, which often has an interesting pale striping and a tidy, graceful shape, makes *Amelanchier* a most desirable ornamental landscape plant throughout the year.

The cultural requirements of amelanchiers are not exacting. Soils in the native habitats of these species range from alkaline to acidic. Many species are found in dry, rocky soils indicating drought resistance, while others, indigenous to swampy areas, demonstrate wet-site tolerance. All are hardy to USDA Zone 4 and some to Zones 3 and 2.

If *Amelanchier* is largely overlooked by

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present day gardeners, such was not the case with our forefathers for whom it was a favorite. Early settlers on the East Coast foraged for the berries of several *Amelanchier* species and used them extensively for preserves and pies. Branches of blossoms were used at early spring burial services for colonists who died during the harsh New England winters, thus one of the many common names, serviceberry. On the prairies *Amelanchier alnifolia* was the only fruit available to Indians and pioneers.

The serviceberry's virtues have not been lost to wildlife. The succulent fruits are quickly stripped by a wide variety of birds, and other animals attracted to the fruits, foliage, twigs or bark include white tailed deer, turkey, beaver, skunk, red fox, moose, squirrel, black bear and cottontail rabbit.

American gardeners who continue to turn to Japanese flowering cherries, purple-leaf plums and crab apples in nursery yards cannot really be faulted, for, surprisingly, most nurserymen are either unfamiliar with *Amelanchier* or are reluctant to grow it. The cause for this neglect seems to lie principally in the confused taxonomic state of the genus. The extreme variability of the North American species made it difficult for taxonomists to delimit species and assign valid names to them. It is still common for a single species to be called by several different names. (Among invalid names still published for *Amelanchier X grandiflora* is the unfortunately appropriate *A. confusa*.) The wealth of variation within species of *Amelanchier* should, in fact, make it easy for nurserymen to select better forms and assign valid cultivar names. With proper breeding and plant selection, this worthy genus could leave its identity crisis behind.

There are species or varieties of *Amelanchier* to fill a wide range of horticultural niches. Let us begin with the tree forms: *Amelanchier laevis*, *A. arborea* and *A. X grandiflora*. Although botanically they are classified as separate species, horticulturally we can treat them as a single group

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Amelanchier, commonly known as the shadbush or serviceberry, flowers prominently and enhances the spring landscape in the wild, but is rarely seen in gardens. This specimen was photographed along the Blue Ridge Parkway.



Pamela Harper



The Kingwood Orangery

BY MAGGIE OSTER

A look backward can be a look forward. Just ask Fred Roberts, Director of Kingwood Center, a public display garden in Mansfield, Ohio. He has just overseen the construction of an orangery at the Center.

An orangery, to brush up your horticultural history, is a several-centuries-old concept in growing structures and the precursor of the greenhouse as we know it today. It was not until the mid-1800's that "greenhouses" became "glass houses." Prior to that time, they were masonry structures with solid roofs, large, many-paned windows and an occasional skylight.

Orangeries were brought to their zenith during the French Renaissance by members of the French court. These aristocrats were envious of the plants the Italians and Spanish could grow, especially the citrus and other subtropical fruits. There was an appreciation of the beneficial effects of eating citrus, but pride in beautiful plants probably played as much of a role as health. Since the French climate was too harsh to grow citrus outdoors year-round, structures were built to house them in the winter. These became known as orangeries since oranges were the most popular crop.

So much for history.

To return to Roberts and Kingwood,

why would a public garden actually build a 17th-century structure in the latter half of the 20th century?

Roberts explained, "Kingwood needed a display house for the beautiful seasonal material we grow, such as camellias, amaryllis, poinsettias, chrysanthemums and forced bulbs. We wanted something that was elegant and in keeping with the French provincial architecture of the other buildings at Kingwood, but it also had to be within a reasonable budget and not increase the energy load on our heating system because of the spiraling cost of fuel."

The solution was obvious to Roberts, who is interested in and has studied in depth the various types of growing structures. The style of orangeries in their heyday would readily adapt to the architecture at Kingwood. It could be an attractive structure that would show off the plants to their best advantage. Best of all, with 20th-century technology, an orangery could be built that would be much more energy efficient than the totally glassed-in, conservatory-type building used by many public gardens today.

Roberts employed a local Mansfield architect, Robert W. Soulen, to design the new orangery. But in talking with Roberts, it is clear that he had much to say over the three years of planning about both the design and construction of the orangery. The resulting building opened this spring. Built against a pre-existing wall, and ad-

acent to a complex of greenhouses and other structures, it is impossible to tell where the previously existing structures end and the new begins. In scale and appearance, the orangery blends in beautifully.

The outside is brick with a stain that will weather to a soft, muted color. The roof is an artificial slate that was chosen because it was one-third the cost of real slate and will last about three times as long. The planting beds in front are not yet completed but will mainly be planted in shrubbery. A Roberts touch is the cupola with little doors, a home for tumbling pigeons someday, to add to the menagerie of guineas, ducks, swans, turkeys, geese and other fowl at the garden.

What is most striking about the orangery are the windows—tall, wide, multi-paned windows with gracefully arching tops. Looking through them from the outside, one sees the luxurious plants inside being sniffed and admired.

The orangery is entered up a small ramp so that it is easily accessible to the handicapped. Once inside, everything is on the same plane, again for the handicapped.

As I entered through the double doors on my visit to Kingwood's orangery, Roberts proudly pointed out the solid brass fittings. He diligently searched for months, finding them at last in Cincinnati. They grace the windows and light garden cases as well as the doors.

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Maggie Oster is a free lance writer on gardening and cooking topics and was editor of *The Green Pages*, *The Complete Indoor Plant Catalog*.

Orangeries were the precursors of greenhouses, or glasshouses as they were called in the 19th century. In keeping with the 17th-century French flavor of Kingwood Center, a public garden in Mansfield, Ohio, an orangery was recently constructed there to display seasonal material. Built like its predecessors, the Kingwood Orangery is a brick building with large, multipaned, arched windows that let in welcome sunlight. Unlike earlier structures, however, this orangery has windows on both the south and north walls to provide visitors with better views.





COMPUTER VEGETABLES

BY JOHN WOTT

ILLUSTRATION BY GEORGE SHAFFER

Anyone who has ever had a large vegetable garden knows that designing it can sometimes be as challenging as solving a Chinese puzzle. There are so many different factors to consider: what vegetables to plant, how many of each, which varieties to choose, how far apart to plant, where to plant? The variations seem endless because no two garden plots are ever alike. In the past, trial and error has been the usual method of devising the "perfect" vegetable garden, but specialists at Purdue have found a better way. They have developed a unique program linking vegetable gardening and computer technology and have made it accessible to thousands of gardeners all across the country. Now virtually any gardener can join forces with the computer to plan a garden capable of meeting his own very specifically designed needs.

The Purdue program evolved as a result of the development of the FACTS computer system, which stands for Fast Agricultural Communications Terminal System. This system was developed about five years ago when several Purdue deans wanted to find a way to transmit complex as well as current information in a timely manner to all Indiana county extension agents.

An initial \$1.2 million grant in 1977 from the W. K. Kellogg Foundation, along with additional state and federal funds, was used to develop FACTS into the largest computer system of its type in the nation. In fact, the gardening plan program is just one of many individual programs available on the FACTS system. A quick glance at the computer menu reveals that programs are also available on such diverse topics as food preservation, fabric stain removal, pesticide regulations, home budget planning, livestock rations, 4-H projects and home insulation.

The original FACTS system consisted of a computer terminal in each of the 92 county extension offices in Indiana and in nearly all the agricultural and consumer and family sciences (home economics) departmental offices at Purdue. In this system, the county and departmental terminals were "intelligent," which meant they had the capability to do more than just transmit and receive data. Each terminal was in itself a small computer and had the capacity for individual local information processing. Each county could run any of the desired programs on their local terminal without calling up the master computer. In other words, a gardener coming into a local office had only to wait as long as it took the computer to run his individual program, which was a matter of a few minutes.

The terminals were also linked via telephone lines to a com-

John Wott is developing a continuing education and public service program in the newly created Center for Urban Horticulture, University of Washington, Seattle.

puter called the front-end processor at Purdue. If there was a message to be sent between counties or between county terminals and the campus, this computer acted as the message-switcher. In addition, the front-end processor relayed the problem from the county and called the county with the answer.

Assured that the program would be technically efficient, the Purdue specialists waited to see how the public would receive it. Happily, the response was extremely encouraging. Not only were beginning gardeners grateful for the help the system could give them, but the specialists also discovered long-time gardeners were equally intrigued. These "experts" took great delight in challenging the computer and "those little men who ran around inside it." Satisfied customers sent letters of thanks, which typically read like the following one: "One warm day last spring my wife and I planted our vegetable garden. The next day I went to the county extension office and decided to see how much differently the computer would plan my garden. Lo and behold, the computer planned my garden exactly as I had planted it. It made me wonder if all my jobs would eventually be taken over by a computer!"

Encouraged by its reception among Indiana gardeners (estimates indicate nearly 15,000 computer gardens were planned in 1980 alone), the Purdue Research Foundation copyrighted the program and later released it to the Northrup-King Company of Minneapolis. Northrup-King adapted it for use throughout the United States, regionalizing the recommendations. The program was also licensed for educational use through the Cooperative Extension Services of Utah, Mississippi, Missouri, Montana, Michigan, Alaska, Wisconsin and the Maryland National Capital Parks Commission. (*Editor's Note: refer to the sidebar that accompanies this article for information on how to obtain your own computerized garden plan.*)

One of the nicest features of this technologically advanced system is that a gardener doesn't need to have any special training to use the program. He needs to be able to answer several questions the computer will ask him about his garden plan, and he should be prepared to take advantage of several special features the computer offers that he probably wouldn't normally trouble with himself.

A review of how a typical garden program is obtained will give the reader some idea of what to expect should he wish to use one of the systems listed in the accompanying sidebar to design his garden plan for next spring.

The operator, usually an extension agent, simply plugs the computer into any wall outlet (no special connections are needed), places the appropriate discs into the machine, and after a short warming up period, the computer is ready. The screen of the terminal above the keyboard lights up and begins asking the user a set of predetermined questions. All the operator has to do is type in the answers. He doesn't even really need to know how to type—the one-finger method will do.

First the computer asks the gardener his name. After he answers the question, the operator simply hits the return key and the next question appears. Then he enters the size of the user's

garden plot in feet. The program plans gardens as small as 11' x 11' or as large as 900' x 900'.

The gardener's next decision involves selecting one out of a series of six possible garden shapes. He selects the one that most nearly approximates his garden plot in shape and orientation to the sun. He needs to tell the computer this information so that it knows which direction in his garden is north. Later the computer uses this information to properly place the user's selected crops so that the tall ones do not shade the shorter ones. As the garden is planned, the computer also makes sure that the gardener's sweet corn (if he wants to grow it) is block planted to ensure good pollination.

The next response the gardener makes entails telling the computer how he intends to cultivate his garden. If he plans to use a rototiller he may want all rows spaced three feet apart, but if he is a small-plot gardener and prefers hoeing, he would indicate a row spacing of one foot. Regardless, the computer has already been programmed to place spreading crops such as melons on four-foot row spacings.

Then comes the choice of the vegetables the gardener wants to grow. He is asked to enter the number of adults he plans to feed for both fresh and process use. For example, the first vegetable on the list is green beans. If the gardener has three adults in his family and all eat large amounts of fresh green beans, then he enters three in the fresh use category. However, if one adult also likes them frozen, the gardener indicates one for the processed category. The computer is programmed with all types of statistics on how many plants (or feet of row) are needed to produce the average quantity one person can consume. If the gardener has children, he lists their needs based upon an adult portion.

The vegetable list also gives the gardener an idea of the amount of vegetables one adult would eat for each category. For example, one adult usually eats nine pounds of fresh green beans and 18 pounds of processed beans per year. These figures were based on the best statistics available.

The user proceeds through the list of 27 different vegetables. Included are such crops as lima beans, summer and winter squash, broccoli, eggplant, okra, peas and swiss chard. He also indicates whether he will be growing tomatoes in the caged, staked or nonstaked method.

When the gardener has completed his list, the operator can sit back and listen to the humming and clicking sounds as the computer plans the garden. First it decides if the user's garden is large enough to grow sweet corn and vine crops. These are vegetables that require lots of space. It next decides if there is enough area to grow all the vegetables in the amounts the gardener has requested. If his plot isn't large enough, it reduces the amounts of vegetables selected proportionally. After he has seen the print-out, the gardener might want to rerun the program and adjust some of his initial input figures.

In a few minutes, the print-out appears. The first sheet summarizes all the information the gardener gave the computer. The next sheet summarizes the amount of each vegetable he can plant

HOW TO GET YOUR OWN COMPUTER PLAN

Computer garden plans are available from a variety of sources. The Purdue system has been licensed for educational use through the Cooperative Extension Services of Utah, Mississippi, Missouri, Montana, Alaska, Wisconsin, Michigan and the Maryland National Capital Parks Commission. The states are in different stages of setting up their programs, so in 1982 the availability of the system may vary. Residents of the states where the system is being made available should call or write one of the addresses listed below.

ALASKA: Wayne Vandre, Cooperative Extension Service, University of Alaska, 2651 Providence Avenue, Anchorage, AK 99504.

INDIANA: Residents of Indiana should call their local County Extension Service.

MARYLAND: Carl Hahn, Chief of Hort., 9500 Brunett Avenue, Silver Spring, MD 20901. Program to be offered at Brookside Botanic Gardens in Wheaton.

MICHIGAN: Lee Taylor, Horticulture Department, Michigan State University, East Lansing, MI 48824.

MISSISSIPPI: Danny Cheatham, Cooperative Extension Service, Mississippi State University, Box 5405, Mississippi State, MS 39762.

MISSOURI: E. Karla Vollmar, Department of Human Nutrition, College of Home Economics, University of Missouri, 300 Gwynn Hall, Columbia, MO 65211, (314) 882-2334.

MONTANA: Duane Griffith, Cooperative Extension Service,

Montana State University, 211 Linfield Hall, Bozeman, MT 59717.

UTAH: Wayne Rose, Extension Service, Utah State University, UMC 49, P.O. 86765, Logan, UT 84322, (801) 750-1033.

WISCONSIN: Horticulture Department, University of Wisconsin, 432 North Lake Street, Madison, WI 53706, (608) 262-1292.

The Purdue University system has also been released to Northrup-King Company. Gardeners can obtain the necessary forms to plan their garden by mail by writing to Northrup-King Company, Box 1615, Minneapolis, MN 55440. Forms should also be available on the Northrup-King seed displays in stores this spring. This service costs \$3.95, and payment should accompany the completed form.

An alternative computer gardening service that stresses companion planting and the Biodynamic/French Intensive method of gardening is also in operation. For \$12.50, CompuGarden™ will provide two detailed garden maps, one for cool season and one for warm season vegetables, and an eight- to 10-page planting guide explaining exactly when, where and how to plant your garden. Plans are now underway to expand the system, and gardeners will soon be able to order separate “gardens” for spring and fall cool season plantings. (*American Horticulturist* news will keep readers informed of these developments.) For more information on CompuGarden™, write CompuGarden™ Inc., 725 Richmond Avenue, Silver Spring, MD 20910.

and tells the number of people each vegetable would feed. This information is particularly important if the vegetable requirements had to be reduced because the gardener's plot was too small for his needs.

Then comes the plan! Right before the gardener's eyes, a blueprint of his garden is laid out. Each vegetable is indicated by specifically spaced plants for such crops as tomatoes, cabbages and melons. All row crops are indicated and spaced accordingly. The plan tells him exactly how many plants he needs, how far apart each row should be, how far apart each plant should be from each other and exactly where each crop should be placed in the plot for best growth. This plan is designed so that the gardener can take it right into the garden with him to use as a handy planting guide.

Following the plan is a summary of the number of plants, hills or feet of row of each vegetable he would be planting in each row of his computer garden. It also gives the gardener a key to the vegetable symbols just in case he can't tell the difference between a cauliflower and a cabbage plant.

Next follows a chart that tells him how, when, how deep and how far apart to plant each specific vegetable. This chart also gives him specific planting dates for each crop and tells him which crops should be planted for more efficient use of space.

For novice gardeners, a brief explanation of such terms as drilling, hilling and successive planting is given. The explanation also describes which crops can be planted for fall gardens. Then, just for added interest, the computer includes some brief cultural notes for each individual vegetable crop. For example, it tells the user that “radishes grow best in cool weather. Supply adequate water for quick, steady growth. Lack of water causes hot flavor and woody texture.” To conclude the user's wealth of gardening information, the computer finishes with a list of 10 good gardening rules. With this list, the printer stops, and the gardener is handed his very own computer plan.

With the help of new technology, the guesswork of garden planning has been eliminated, but old-fashioned gardeners needn't worry—science has yet to find a substitute for elbow grease to ensure a productive harvest. ☘

PLANNING A LOW-MAINTENANCE GARDEN

When my husband and I became the owners of a Frank Lloyd Wright house in northern Illinois in 1974, I was aware that the house and garden were in dire need of restoration. Our goal was to create the maximum effect with minimum expense and maintenance. After five years, this labor of love had almost neared completion. All that remained to be done in the garden was to create a low-maintenance seasonal floral display around a particularly outstanding architectural feature of the house—the rounded porch in the shape of a ship's prow, which was part of the front view of the residence. To accomplish this objective, however, I needed far more than seeds, plants and bulbs. Having moved to the area from the East, I first had to learn what grew well in my new surroundings.

My move West had been accomplished with the help of a small trailer filled with house plants and slips from the old garden. Some barely survived, some didn't, and others flourished. By keeping my eyes open on walks, bike rides and car trips, I also increased my awareness of the new territory. Experimentation in my new garden, with the aid of a diary and a "floorplan," was augmented by trips to the local library and visits to the nearby Morton Arboretum, where I took courses. This knowledge, coupled with the aid of free manpower in the form of two sons, provided the basic requirements for the success of my venture.

My challenge in designing this flower bed was to fulfill the architect's ideas of openness and visibility without sacrificing privacy and to create a harmonious landscape. The first task facing me was the removal of four obtrusive evergreens. This was followed by the removal and uprooting of 1,000 cubic feet of overgrown yews and junipers, all of which obscured a view of Wright's design. I replaced these evergreens with small, deciduous trees: a pink crab apple (*Malus 'Hopa'*), flanked by two plum trees (*Prunus cerasifera 'Atropurpurea'*). The deep-purplish-brown leaves of the plum trees complimented the darkly stained, rough-hewn cedar trim that outlined the beige stucco on the house. I retained two low evergreens, a pink-flow-



Tom Moran

The distinctive ship's prow shape of this porch on a Frank Lloyd Wright house is accentuated by concentric rings of hostas, daylilies and *Cleome*.

ering dogwood and a variegated dogwood at the outer edges. The results were worth the effort: the newly revealed porch, which rose eight feet above ground level, would clearly provide an attractive backdrop against which to establish the flower bed. I took into consideration different plant heights and their distance from the sidewalk, and my sons shaped the bed to follow the lines of the porch. The plantings were laid out in a series of arcs similar to the concentric rings formed in a pond by the casting of a pebble.

Fortunately, preparations required to make the bed "flower ready" were minimal. The soil under the evergreens had not been disturbed, so a natural decomposition process had taken place. A few loads of our own compost were added and worked in to raise the level of the soil after so many tree and shrub roots had been removed. This arduous task loosened the soil as nicely as double digging would have done.

The flower bed measured 20 feet in length and 16 feet at its widest point in the center of the arc. Once established, the blooming season opened in April with blue scillas

along the outer edge of the bed, which was rimmed with bricks to prevent grass from encroaching. Behind the scillas were orange-red, seven-inch *Tulipa praestans*. By the time the scillas had died down, the emerging leaves of lily-of-the-valley were visible. I transplanted the scillas and tulips from other flower beds in my yard where they had multiplied. A row of hostas, also thinned out from existing stock, provided summer edging. An arc of daylilies was planted behind the lavender-flowered hostas for additional midsummer bloom. The daylilies were also obtained from existing stock, having been thinned out from a bed along the driveway. Their foliage effectively hid the dying leaves of 90 white tulips, a few dark-purple 'Queen of the Night' Darwin tulips and 10 erect, lavender-pink 'Cum Laude' tulips, which had bloomed gloriously for three weeks in May. I plan to extend the curve with many more 'Cum Laude' tulips this fall.

The color combinations in this flower bed were particularly successful. The white tulips contrasted beautifully with the brown trim on the waterline. The thin, tall *Allium sphaerocephalum* (commonly called round-

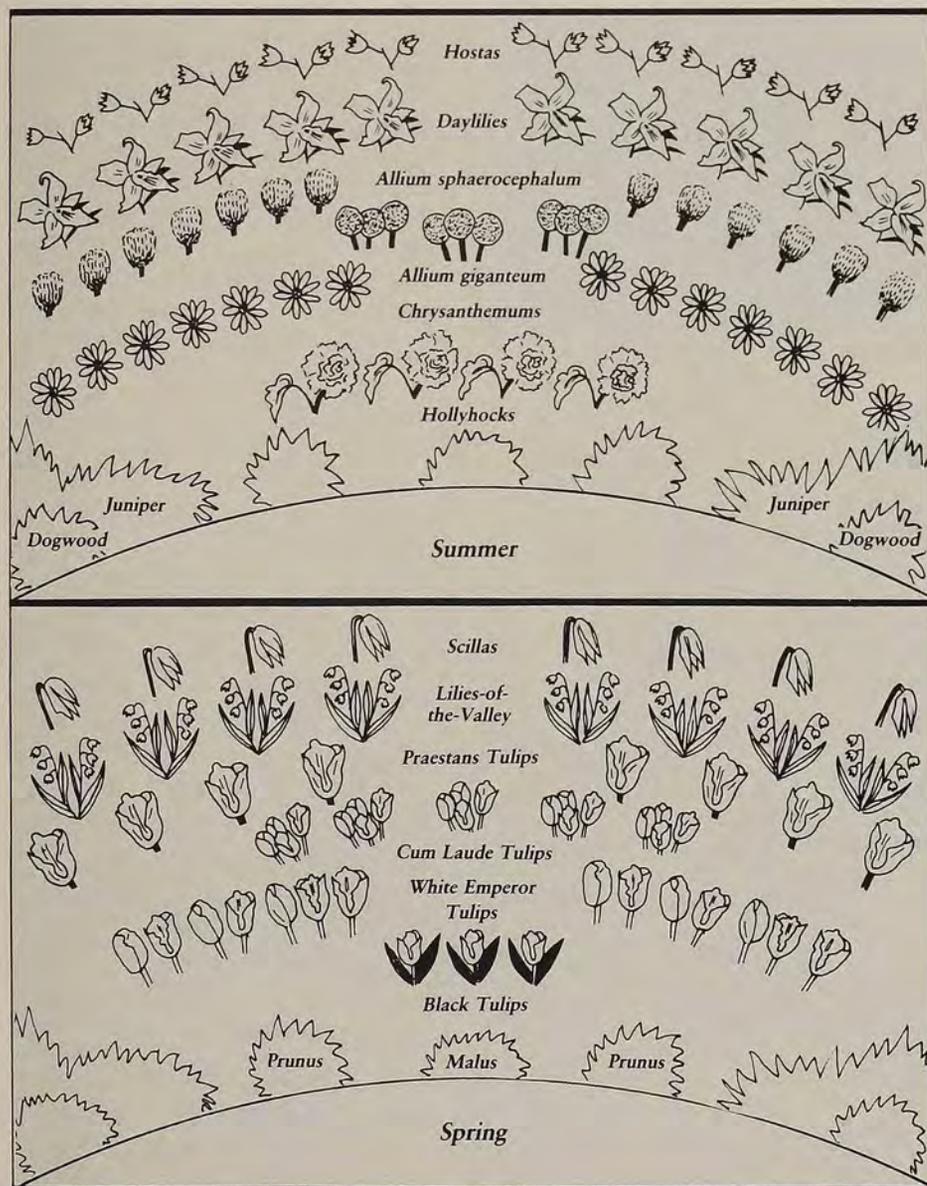
headed garlic) directly behind the orange daylilies added a purple touch in July. In June the purple coloring was provided by six *Allium giganteum*. Eight lavender-pink magic lilies (*Lycoris squamigera*) were planted near the crab apple for August bloom. Orange oriental poppies filled the void left by the white tulips, and by the time the tulips had reached their peak, mums had just begun to show above the soil. A row of white hollyhocks, started from seed from a friend's garden, also bloomed until frost cut them down. The only annual used was *Cleome*, spider flower, which bloomed in late summer and reseeded itself. I avoided overcrowding them by a thinning out in June.

Other areas of the property had already been planted with shrubs, perennials, an-

nuals, bulbs and vegetables. Minimal maintenance of this flower bed was therefore a top priority. I think I succeeded. Once planted, this garden bloomed almost effortlessly from April until late fall. By the time the mums had faded, all that remained to be done was to remove the dead stalks and await yet another beautiful spring. More important, harmony with the building and the surroundings had been achieved. Carefree flowers that did well in this environment were chosen and did not overpower or obscure the much photographed house. My family, as well as passersby, have enjoyed the ever changing display. 🌱

—Maya Moran

Maya Moran is a part-time artist and teacher with an interest in architecture.



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AMELANCHIERS CONT'D

Continued from page 26

because their differences from a horticultural standpoint are insignificant. The emerging foliage of *A. laevis* is reddish and less pubescent than *A. arborea*. The flowers of *A. X grandiflora* may be slightly larger and more profuse, and they often have a slight pink cast. Each is an excellent small tree for use as a lawn specimen, a street tree or in a woodland planting. Picturesque of habit, they can be grown with

a single trunk or as a multi-stemmed specimen. Their typical vase shape responds well to pruning, although it is seldom required. All three of these species have beautiful, hard and injury-resistant wood. Annual growth can easily reach 12 to 15 inches under favorable conditions, and the trees mature at about 20 to 30 feet. Roots are dense and lateral, without tap root development. The leaves are small and

rather sparsely produced and so require little raking after the magnificent red-orange autumn display occurs, in mid-October in the New York City area. And the flowers! The largest and most profuse of all the amelanchiers, they make their incomparable show in mid April.

There are some liabilities. The flowers can be short-lived in heat or rain, sometimes lasting but three to five days. Lacebugs can be troublesome; also, they brown the leaves and reduce the October glory of the plant. However, they can be controlled with the proper application of a systemic insecticide.

When shopping for a tree species of *Amelanchier*, do not be surprised to find one of them incorrectly labeled *Amelanchier canadensis*. This is one of the most common misnomers. An excellent specimen in its own right, the true *A. canadensis* is not a tree but a large, upright, bushy, often fountain-shaped shrub that reaches a height of about 20 feet. It suckers readily from the base and eventually forms a dense clump. *A. canadensis* has stems that are smooth and light gray, and its flowers are smaller than those of the *A. laevis*-*A. arborea*-*A. X grandiflora* group. They open about a week later. The fruit, while also smaller, is sweet, juicy and succulent. Autumn leaf coloration in this species tends



Richard Iversen

ABOVE: *Amelanchier canadensis* flowering in Montauk, Long Island. BELOW: Daffodils and *A. canadensis* decorate the spring landscape.



Jerome Jajinski

toward more golds and yellows. A native of swamps and bogs along the eastern coast, it is wet-site tolerant. It would be for this quality as well as for its dense, upright form that one would choose *Amelanchier canadensis*.

Amelanchier alnifolia, the saskatoon, is native to the northern Midwestern prairies. Either erect or spreading in habit, it is a suckering shrub that can range from three to 24 feet tall! The fruit of this species, similar in taste to the blueberry, is among the best. Prairie Indians mixed it with buffalo meat and fat to make pemmican, their principal winter food, a practice adopted by fur traders and voyageurs. Tolerant of harsh, alkaline environmental conditions, *Amelanchier alnifolia* has untapped potential as a commercial fruit crop for wine, jelly and pie fillings.

Perhaps the best of the smaller, shrubby species (three to nine feet) for general cultivation is *Amelanchier sanguinea*. It is almost like a miniature *A. laevis* or *A. arborea* in habit, but its flowers are less spectacular. Culturally it will tolerate the poorest of soils: dry, rocky and alkaline. To locate this species in the trade, however, is extremely difficult. Certainly selected forms should be tested and propagated by nurserymen.

One of the smallest species, ranging in height from one to six feet, is *Amelanchier spicata*. Its stoloniferous habit and tolerance of dry, alkaline soils, together with its fine ornamental qualities, make this plant an excellent choice for highway planting and erosion control, but it is virtually impossible to locate from nurserymen.

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Sources for amelanchiers:

A. canadensis

Deeter Nurseries, 8150 Hoke Road,
Clayton, OH 45315

Princeton Nurseries, PO Box 191,
Princeton, NJ 08540

A. laevis

Wayside Gardens, Hodges, SC 29695

A. canadensis, *A. alnifolia*, *A. X grandiflora*, *A. laevis*

Weston Nurseries, Hopkinton, MA
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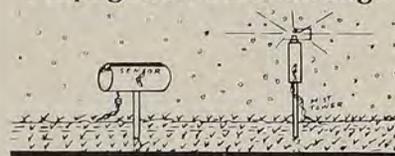
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Continued from page 19

adaptability to a variety of soil types. Neither species is appreciably bothered by insect or disease pests. Persimmons have a distinctive, deep, blocky bark pattern and normally tolerate city conditions quite well. Sweet gums usually have very beautiful autumn foliage that ranges from yellow to red or purple. Their star-shaped leaves and corky-ridged stems are also characteristic.

Both species bear fruit abundantly, and this tendency can cause maintenance problems. The light-colored berry of the persimmon is about an inch or slightly larger in diameter and is very astringent tasting before maturity. Upon ripening (between early and mid-autumn, depending on the locality), it sweetens and becomes very palatable to both humans and many forms of wildlife. As the large berries begin to soften and decompose, however, they can become quite messy, particularly if the tree is located in a high traffic area of the lawn, making judicious clean-up imperative.

Like the persimmon, the fruit of the sweet gum can also pose a problem. Fortunately, the sweet gum's fruit, a hard, spiny ball, does not readily decompose and can be more easily raked. The fruit does, however, take an extended period of time to completely fall, and many persist long after the onset of cold weather.

Yellowwood, *Cladrastis lutea*, is another ornamental shade tree that, despite a few



Acer saccharinum, silver maple.

problems, boasts a number of excellent features. The large, fragrant, white flowers are very showy as they mature in the latter part of May and into June. The smooth, gray, beech-like bark is also distinctive and contrasts very well with freshly fallen snow. Yellowwood tolerates a wide range of soil pH levels and has very few insect or disease problems. However, major branches arising from the same point of origin often result in inferior branching angles that makes this species prone to storm damage.

The mimosa or silk tree, *Albizia juliflora*,

is a widely used species, planted mainly for its feathery, pink flowers, borne during the summer months. Although it is not an exceptionally tall tree, attaining approximately 30 feet at maturity, it does have a wide, spreading crown which can restrict its use in small, crowded residential areas. Mimosa is susceptible to webworm and is only hardy to Arnold Arboretum Zone 7, although it will survive in protected locations farther north.

Silver maple, *Acer saccharinum*, is frequently seen both in local nurseries and in mail-order catalogs. Native to many areas of the country, this species can grow in a wide variety of soil types (moist areas are preferred), survives transplanting well, and is often recommended for areas where a fast growing shade tree is desired. The positive features of this species are, however, far outweighed by its long list of disadvantages. Weak, brittle wood and a shallow rooting system, combined with many insect and disease problems, often make the silver maple a short-lived shade tree and a poor choice as an ornamental. Red maple, *Acer rubrum*, especially in its cultivar forms, is a very suitable alternative. With similar cultural requirements, it generally gives a much more attractive fall color, has stronger wood and has few damaging pests. 'Autumn Flame' and 'October Glory' are popular cultivars.

Carefully weigh the advantages and disadvantages of a tree when trying to choose a plant that will best fit your needs. The extra time you spend *before* making the selection and investment of new plant material will help to ensure that you enjoy your purchase for many years to come. ●

What to Look for When Buying a Quality Tree

- Is the tree susceptible to serious insect or disease problems?
- Does the cold-hardiness of the species or cultivar match the conditions under which it will be planted?
- Will the height and the width still be compatible with the surrounding landscape when it reaches maturity?
- Will the expected rate of growth fulfill your needs (for example, for shade trees around a new home)?
- Is the expected form or growth habit aesthetically pleasing and functional for its future landscape location (weeping, pyramidal, oval, etc.)?
- Do the cultural requirements coincide with those available at the planting site: existing pH, soil, moisture, amount of sunlight, fertilization requirements, etc.?
- Does the tree have strong wood and acceptable branching angles, or will it be susceptible to storm damage?
- What are the time of year, duration, color and size characteristics of the flowers, if effective, as well as the aesthetic qualities of the autumn foliage? Will it be planted in a location that will set these attributes off to best advantage?
- Does the tree under consideration produce obnoxious or even poisonous fruit?

Never underestimate the advantages of consulting a qualified nurseryman before buying an expensive tree. Ideally, the nurseryman should make an on-site inspection of your garden if you plan to make a large purchase, but if a house call seems cost-prohibitive, take snapshots of the planting locations you have in mind to the nursery. The nurseryman can then better visualize your landscape needs.

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KINGWOOD ORANGERY CONT'D

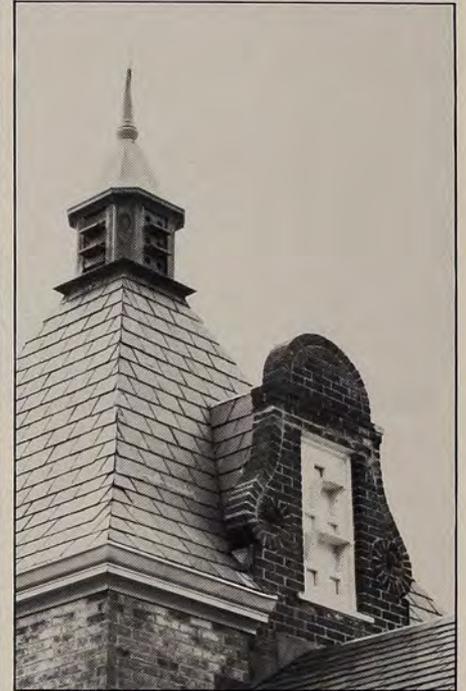
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After entering the vestibule of the orangery, I wanted to go in three directions at once. In front of me was the cactus house with large-flowered epiphyllums in bloom, to my right was the most attractive light

garden I had ever seen, and to my left, past a garden bench and through an arched doorway, was the orangery filled with citrus trees and hydrangeas.

Roberts began to point out all the fea-

tures, making note of both their functional as well as their aesthetic qualities. The walls of the orangery were constructed of a double layer of brick with an inch of styrofoam insulation in between. The hermetically



Clockwise from top right: A cupola with little doors will be a future home for tumbling pigeons; The orangery provides the ideal climate for the raising of fruit; It blends in beautifully with buildings constructed earlier. The arrangement forms a pleasant courtyard effect; Arched windows add strong architectural detail to the complex of buildings. Skylights are visible inside.

Photography by Maggie Oster

sealed window panes were double-glazed thermopane tempered for safety. The window frames were made of Honduran mahogany stained a subtle gray color. This mahogany is one of the most water resistant woods available and should last for years.

Overhead, the high ceiling was made of spruce decking. On the south slope of the roof was a large skylight of aluminum and a double layer of SDP acrylic with an air space between layers. Underfoot was easily maintained quarry tile flooring.

Although orangeries originally had windows only on the south side, at Kingwood there were windows on north and south walls so visitors could enjoy the outside gardens. Doors in the south wall opened out onto what will be a courtyard garden in several months.

Circulating hot water heated by a convertible gas-oil furnace warmed the orangery. The adjacent plant sales room and office derived much of their heat, however, from the wood furnace in the basement below. Besides the hot water heat, there was a fan that pulled the hot air off the light garden cases into the orangery.

The temperature in the orangery will be maintained much as it would have been several hundred years ago, with a minimum of 40° F in the winter. This is a temperature quite adequate for the citrus collection of oranges, lemons, limes, grapefruit and kumquats housed there as well as the short-term flowering displays.

As was done in 17th-century orangeries, the citrus plants, grown in large pots and tubs, will be set outside during the warmer months of the year.

Kingwood's orangery now takes its place with a handful of other orangeries in this country. One of the most beautiful and best known is the restored, late-18th-century one at Mount Vernon. Another orangery open to the public is the one built by a communal colony in Zoar, Ohio, in the early 1800's.

These early orangeries as well as the new one at Kingwood provide working examples of one type of growing structure. With the advent of plate glass and iron in the mid 1800's, orangeries became relics of the past. In these days of costly and limited fuel supplies, however, orangeries are once again proving their usefulness.

Kingwood Center

Kingwood Center was the gift of the late Charles Kelley King, who came to Mansfield, Ohio from Maine to help found the Ohio Brass Company. In the 1920's he built the large French provincial house on the property and installed the formal gardens. Although married twice, King had no children. So, in 1937, he requested the National Park and Recreation Association to do a study detailing how his estate and grounds could best be used. They recommended a public display garden.

King wrote in his will the outline and plans for such a garden, and when he died in 1952 at the age of 84, most of his four million dollar estate was left in trust to provide funds for Kingwood's operation. The trust maintains the Center under the direction of a Board of Administrators. There is no assistance or connection with any level of government. A staff of 25 maintains the 47-acre Center today.

Kingwood's grounds, greenhouses, orangery and nature area are open every day of the year from 8:00 a.m. to sundown. The house, with its extensive garden library, is open from 8:00 a.m. to 5:00 p.m., Tuesday through Saturday. From Easter through October it is also open on Sunday afternoons from 1:30 p.m. to 4:30 p.m.

Organizations use Kingwood's meeting rooms and facilities for shows and gatherings on the subjects that fall within the scope of the center's activities. These include horticulture, art, nature, bird study and related subjects.

Mansfield is located near the junction of I-71 and Ohio Route 30, almost halfway between Columbus and Cleveland. In Mansfield, there are directional road signs to Kingwood, which is located at 900 Park Avenue West.

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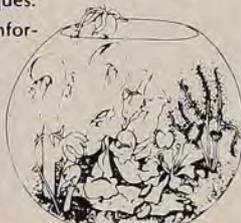
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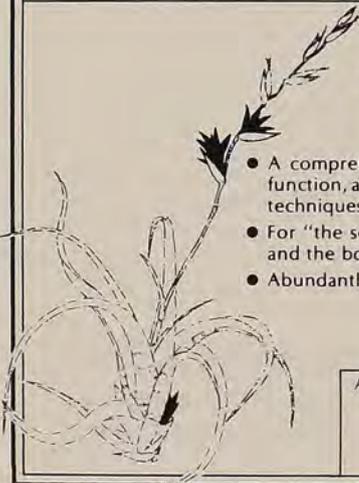
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PRONUNCIATION GUIDE

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".

Acer rubrum A-ser ROO-brum
Acer saccharinum A-ser sack-ah-RY-num
Agave victoriae-reginae
ah-GAV-ee vic-TORE-ee-ee re-JIN-ee
Aglaonema commutatum
ag-lay-o-NEE-ma com-mew-TAY-tum
Aglaonema crispum
ag-lay-o-NEE-ma KRISP-um
Aglaonema modestum
ag-lay-o-NEE-ma mo-DES-tum
Albizia julibrissin
al-BIZ-ee-ah jew-li-BRISS-en
Allium giganteum
AL-ee-um ji-GAN-tee-um
Allium sphaerocephalum
AL-ee-um spheer-o-SEF-ah-lum
Aloe aristata AL-oh-ee air-iss-TAY-ta
Aloe brevifolia AL-oh-ee brev-i-FOL-ee-ah
Amelanchier alnifolia
am-el-ANK-ee-er all-ni-FOE-lee-ah
Amelanchier arborea
am-el-ANK-ee-er ar-BOR-ee-ah
Amelanchier canadensis
am-el-ANK-ee-er can-ah-DEN-sis
Amelanchier confusa
am-el-ANK-ee-er con-FEW-sa
Amelanchier X grandiflora
am-el-ANK-ee-er grand-i-FLOR-ah
Amelanchier laevis
am-el-ANK-ee-er LEE-vis
Amelanchier sanguinea
am-el-ANK-ee-er san-GWIN-ee-ah
Amelanchier spicata
am-el-ANK-ee-er spy-KAY-ta
Anthurium an-THUR-ee-um
Arisaema triphyllum
air-iss-SEE-ma try-FILL-um
Artemisia caucasica
ar-tem-EEZ-ee-ah kaw-KASS-i-ka
Atriplex cuneata AT-tri-plex kew-nee-A-ta
Atriplex gardneri
AT-tri-plex GARD-ner-eye
Atriplex semibaccata
AT-tri-plex se-me-ba-KA-ta
Betula maximowicziana
BET-yew-la max-i-mo-wicks-ee-A-na
Betula nigra BET-yew-la NY-gra
Betula pendula BET-yew-la PEN-dew-la
Caladium ka-LAY-dee-um
Cladrastis lutea
kla-DRASS-tiss LOO-tee-ah
Cleome clay-O-me
Crassula multicava
KRASS-you-la mul-tee-CAVE-ah
Crassula tetragona
KRASS-you-la te-tra-GON-ah

Delosperma algoense
dell-o-SPER-ma al-go-EN-see
Dieffenbachia maculata
dee-fen-BACH-ee-ah mack-yew-LAY-ta
Diospyros virginiana
dy-o-SPY-ros ver-jin-ee-A-na
Epipremnum aureum
ep-i-PREM-num OR-ee-um
Gazania rigens var. *leucolaena*
ga-ZANE-ee-ah REE-genz lew-ko-LEE-na
Ilex opaca EYE-lex o-PAY-ca
Liquidambar styraciflua
lick-quid-AM-ber sty-rass-i-FLEW-ah
Lycoris squamigera
ly-KOR-iss skwa-mi-JER-ah
Lysichiton americanum
ly-si-KY-ton ah-mer-i-CAY-num
Maleophora crocea
mal-ee-OFF-er-ah KRO-see-ah
Malus MAL-us
Monstera deliciosa
mon-STAIR-ah de-liss-ee-O-sa
Monstera obliqua espilata
mon-STAIR-ah o-BLEE-qua ess-pi-LAY-ta
Philodendron bipennifolium
phil-o-DEN-dron by-pen-i-FO-lee-um
Philodendron cordatum
phil-o-DEN-dron kor-DAY-tum
Philodendron domesticum
phil-o-DEN-dron do-MESS-ti-kum
Philodendron erubescens
phil-o-DEN-dron air-oo-BESS-enz
Philodendron panduriforme
phil-o-DEN-dron pan-dur-i-FOR-me
Philodendron pertusum
phil-o-DEN-dron per-TOO-sum
Philodendron scandens subsp. *oxycardium*
phil-o-DEN-dron SCAN-denz
ock-si-CAR-dee-um
Phyla nodiflora var. *canescens*
FY-la no-di-FLOR-ah ka-NESS-enz
Pistia stratiotes PIS-tee-ah strat-ee-O-tees
Platanus X acerifolia
PLAT-in-us a-ser-i-FO-lee-ah
Platanus occidentalis
PLAT-in-us ock-si-den-TAY-liss
Platanus orientalis
PLAT-in-us or-ee-en-TAY-liss
Prunus cerasifera
PRUNE-us ser-ah-SIFF-er-ah
Quercus macrocarpa
QUER-kus mack-ro-KAR-pa
Salvia sonomensis
SAL-vee-ah so-no-MEN-sis
Santolina chamaecyparissus
san-toe-LEE-na kam-ee-sy-pair-ISS-us
Santolina virens san-toe-LEE-na Vy-renz
Scindapsus aureus skin-DAP-sus OR-ee-us
Sedum acre SEE-dum A-kree
Sedum X rubrotinctum
SEE-dum rew-bro-TINK-tum
Symplocarpus foetidus
sim-plo-CARP-us FE-tid-us
Syngonium sin-GO-nee-um
Tulipa praestans TOO-lip-ah PREE-stanz
Zantedeschia zan-ta-DESH-ee-ah

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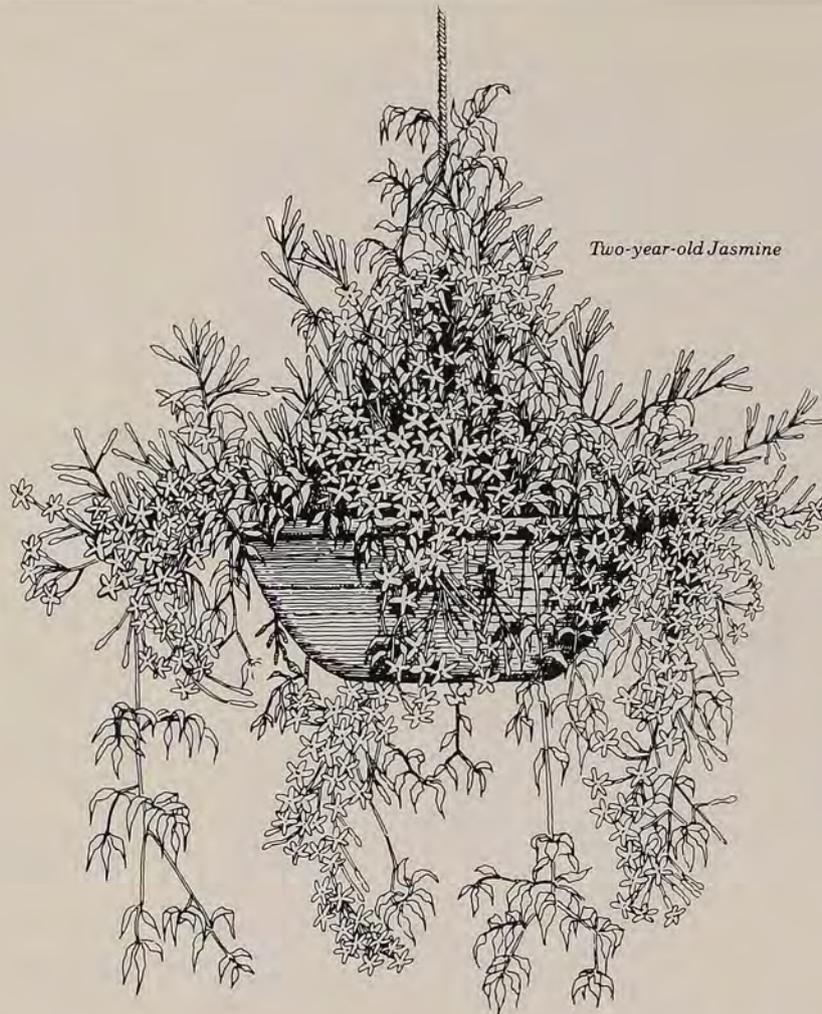
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