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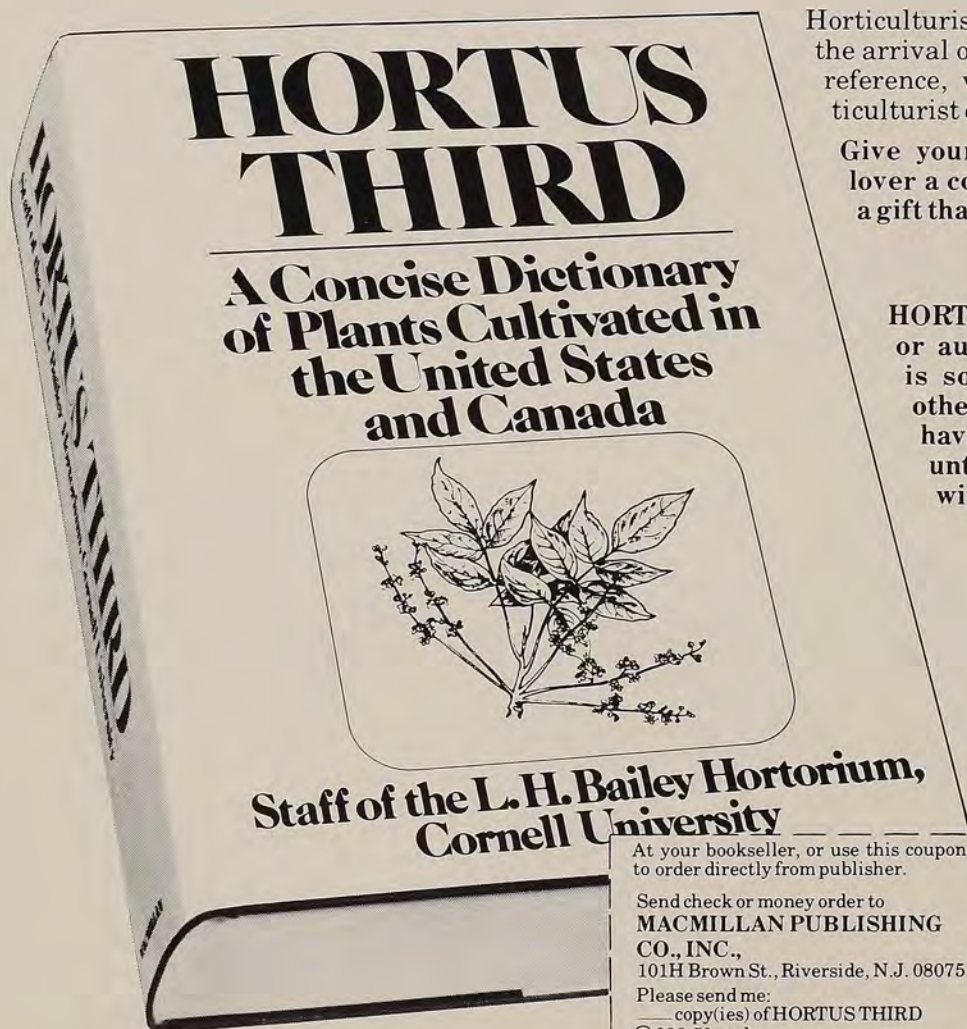
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Color separations by CHROMA-GRAPHICS INC.

Endangered Plants

In June of 1976, the U.S. Fish and Wildlife Service announced a list of 1,700 endangered plants found in the United States. Federal law prohibits their interstate transportation for commercial purposes, and likewise limits their exportation. The prohibitions apply to seeds, roots, and other parts of such plants.

The list is a remarkable compilation of obscure species and offers blanket protection of entire groups of plants. Examples are:

- *Native Hawaiian Plants*—Almost half the list relates to plants found only in Hawaii. Most of these are unknown and unseen by the casual visitor to the Islands. Many of the species are found in only one location—their disappearance is often due to livestock over-grazing and the rapid “touristization” of the Islands.

- *Native Cacti Found in the Southwest*—About 72 species, or 26 percent, of the 268 taxa of native cacti in the United States are vulnerable to extinction. Some are hardy and adaptable, such as the prickly pear. Most require and thrive only in niches of carefully defined areas. The poaching of these plants in the Southwest for commercial use is a national disgrace. Indoor gardeners are finding that cacti are some of the easiest plants to grow in their dark and dry spaces. Unfortunately, many of these plants die after 6 to 12 months in captivity.

- *Native Bog Plants*—Wetlands are a continuing area of concern—they act as blotters of the drainage patterns of the agriculturally productive land surrounding them. They are also the depository of a unique flora. As with the cacti, poachers have found that some of these plants have a fascinating allure for gardeners. Although gardeners repeatedly lose the plants, they will try to grow them again and again. Few gardeners can provide the correct environment

and succeed with them. Over the years, the reestablishment of these plants has not occurred. Many now face extinction.

The proposed rules for endangered and threatened plants contain the following provisions (note the language of the law):

- *Lists*—If a genus such as *Lewisia* is listed, all species, subspecies and varieties of that genus would be considered to be listed.

- *Similarity of Appearance*—When a species which is not endangered or threatened closely resembles an endangered or threatened species, it shall be treated as either endangered or threatened as well.

- *Permits—similarity of appearance*—Treatment as endangered or threatened requires documentary evidence or sworn affidavits to show species identification and the origin of the plants (or if cultivated, the place grown).

- *Import or Export*—it is unlawful to commercially deliver, receive, carry transport, or ship in interstate or foreign commerce, by any means whatsoever, any endangered plant.

- *Permit for scientific purposes or for the enhancement of propagation or survival*: Applications for permits must be submitted to the Director by the person who wishes to engage in the activity. However, the paperwork involved is extremely complex and individuals must conform to 29 stringent conditions.

- *Economic hardship permits*: Provision is provided to prevent undue economic hardship by issuing a permit authorizing any activity otherwise prohibited. A full statement, accompanied by copies of all relevant contracts, etc., including that portion of applicant's income derived from activities involving such plants, or the subsistence use of such plants is required.

The major recommendation from an environmental viewpoint is to preserve the habitat of the plants. This will mean that the exact ranges of each endangered species will need to be mapped. This information will help in locating reserves that should be established for habitat protection. We should expect to find that many of these endangered species already occur in public lands such as national and state parks, wildlife and game refuges. From an ecological view, research will establish the causes for rarity of certain species and develop techniques to increase the reproduction of endangered plants. Ecological research will help to increase the chances of successfully transplanting endangered species to similar habitats if such measures become necessary.

Horticulturists can make the most progress to insure the continued survival of the endangered species. What we already know about the seed propagation of a particular orchid or cactus can similarly be applied to the endangered plants, but this is prohibited under current law. This practice could supply the commercial markets with acclimatized container grown specimens which will survive use in urban areas, and also provide a source of living plants for possible return to the wild. This program would be analogous to supplying zoos with animals from captive bred stock rather than from the wild.

Many of the threatened plants seem to have little or no commercial value at this time. Thus, propagation and re-establishment of some plant species back into their habitat may require the development of new gardening skills.

Endangered species for the most part are found in niches of unique soil, moisture, and temperature. We know very little about bog, meadow, or grassland gardening when we introduce new seedlings. We rely on the natural growth systems, and impose control only through grazing, cutting, burning, flooding, or drought. Many of our standard gardening techniques cannot be practiced because they may change or kill co-existing species in the habitat.

Meanwhile, hearings have been held and testimony submitted to the Department of the Interior to reevaluate the proposed prohibitions and permits for exceptions.

The fish and wildlife hearings produced many conflicting viewpoints. Keith M. Schreiner, Endangered Species Program Manager, is the first to admit. . . "I feel we are still short of our goal of being a primary medium of communication for the whole endangered species recovery effort." Mr. Schreiner seems master of the understatement.

Dr. Henry M. Cathey
President



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*It's the flowers that
make the arrangements in
Colonial Williamsburg*

*Libbey Hodges
Colonial Williamsburg;
Williamsburg, Va.*

Foliage such as this magnolia is good at any time of year. In late fall the pods can be left on the branch for a focal point just as the flowers can be used earlier in the year.



Flower arrangements in Colonial Williamsburg's buildings appeal to most people because they are simple bouquets that can be created by them to bring natural beauty into their own homes. The apparent spontaneity and mass of colors in these 18th-century arrangements are a far cry from today's trend toward the abstract. In some modern arrangements, flowers seem to be an afterthought added to artificial contrivances.

Williamsburg arrangements are fun for both the professional and the amateur because the flowers immediately at hand and of any season are appropriate. In colonial days flower lovers were dependent upon the plants in nearby fields or those cultivated in their yards. No florists were available with out of season plants flown in from California. Thus, to achieve the "Williamsburg" effect you do not need to be an expert with years of study.

Archeological studies and old plans have provided many details leading to garden reconstruction in Williamsburg. The Benjamin Waller garden, with its garden house, is a leading example of excellent use of research material for this purpose.

There can be little question that the colonists of the 1700s arranged flowers in their homes, for there was immense interest in horticulture at that time. This is confirmed by the plant trading and correspondence between John Custis of Williamsburg, John Bartram of Philadelphia and Peter Collinson of London.

New England artists of the 1700s often placed flowers in their portraits of ladies. A painting by Joseph Blackburn, now in Brooklyn Museum, shows an unknown lady with a vase of tulips.

The same guidelines that ladies of the 18th century might have used still provide the basics for Williamsburg-style flower arrangements. The supplies needed are few—several containers of dif-

ferent sizes and shapes, each with needle point holders to fit; an abundance of flowers and foliage; buckets of water; sharp knives and clippers.

The 20th-century needle point holder, or oasis, makes arranging much easier. Before these conveniences, one had to be more ingenious. Examples are the Delft bricks with pierced tops and the Leed's creamware quintai flower horn designed in the 1700s for Queen Mary and Queen Anne in England. Wet sand or interwoven branches, which the Japanese arrangers still use, are other possibilities.

To protect an antique vase such as a porcelain cache pot, use a liner such as a plastic bowl. Then place a holder and flowers inside the liner.

Almost everyone has an understanding of the size and scale of objects needed to give a room an attractive setting. They also have favorite color combinations. An awareness of color and scale can be developed to use with flowers, too. Many books are available giving instructions to those who doubt their natural instincts. Study these suggestions, then tuck them away in the subconscious.

Extravagant use of color is one of the most appealing features in a Williamsburg arrangement. You need not limit yourself to prescribed ideas about color combinations as long as the colors blend and do not clash. Nor does the home arranger, in particular, need to be concerned with a flower show theme. After all, flowers are in a room to enhance its furnishings.

Mass bouquets which have become known as Williamsburg arrangements are easily done in any size container. The plant material can be a combination of garden flowers and foliage. A mass of black haw viburnum in flower, a mass of sunflowers alone, or greens alone, such as magnolia, are good examples.

These arrangements fit well into the antique and reproduction

vases in Williamsburg's historic buildings. They blend with the paintings and seem to exude the same richness of color as the curtains, oriental rugs and crewel work used in the rooms. Large arrangements are placed in the wide, airy halls, and during the summer, also in fireplaces.

On a small bedside table, however, only a handful of buttercups or a few sprigs of sweetshrub are necessary. Colorful flowers and the manner in which they are displayed can be a compliment to a room of any era.

An arrangement will always last longer if a few precautions are taken when picking the flowers. In hot weather, it is best to pick when the most moisture is in the plants. Although morning is best for an abundance of moisture, early evening is perhaps as good for cutting because the transpiration rate of the plants should have slowed down by that time. Plants also have been storing carbohydrates all day, and water and carbohydrates are important for continued life after cutting.

Use sharp knives or clippers. The flowers should be immediately placed in water, preferably at room temperature. Allow them to sit 24 hours in a cool, draft-free room. Woody stem foliage and shrubs can be split about an inch vertically at the base to allow more water absorption.

Arranging flowers and foliage in a mass is not difficult. Foliage and a variety of flower shapes are needed for a balanced arrangement. Spiked, rounded and small filler flowers provide the best combination.

Start an arrangement by selecting a vase which is clean and free of scum. In the bottom, place the largest holder which will fit the vase and which is sturdy enough to hold the stems of flowers to be arranged. Next, fill the vase—not too full—with warm water. The vase will probably be moved, and the

A PLANTSMAN'S *Colonial Williamsburg*

Pamela Harper and
Robert B. McCartney, Staff Biologist,
Colonial Williamsburg.

Had I not had the personal guidance of Bob McCartney I might never have discovered plantsman's Williamsburg. Believing that others, too, are missing much of interest there I persuaded Bob to collaborate with me in this article. Many of the plants were collected by Bob himself, either in the wild, brought back as cuttings from England, or spotted in nurseries and private gardens. Fred Heutte, former Superintendent of Norfolk Botanic Garden and himself a great plantsman, described Bob to me as "like a hound dog on the trail when in pursuit of a new plant".

Williamsburg . . . colonial history re-enacted . . . craftshops . . . old time taverns . . . farthingaled hostesses. And gardens, of course, green and formal in the main, but more casual ones too, with old fashioned flowers peeping through white picket fences.

Less well known is Williamsburg's role as an arboretum or botanic garden—not in the usual sense in that few of the plants are grouped systematically, and within the historic area plants are not labelled. The extensive plantings of native and exotic plants are an integral part of the overall landscape design of the various historic and commercial properties of the Colonial Williamsburg Foundation and the adjacent campus of the College of William and Mary. This

often poses a challenge, in that blending a plant into the landscape must take priority over the plant's needs for a particular type of site.

The major botanic gardens and arboreta of eastern North America are concentrated overwhelmingly in the north. Indeed, with horticultural knowledge gleaned only from garden books a foreigner might be forgiven for concluding that the U.S.A. terminated abruptly somewhere just south of Philadelphia. For those who would venture southward it is in Virginia's lower coastal plain that a southern touch is first likely to be noticed in the crops, flora and fauna, and gardens. The plant hardiness zones bend abruptly northward along the coast and Williamsburg, located between two major estuaries on Virginia's lower coastal plain, enjoys a milder climate than some inland areas much further south. It is here that camellias, *Magnolia grandiflora* and Crepe Myrtle first appear in abundance, along with such Zone 8 plants as Live Oak, Spanish Moss, Gardenia, Laurel-cherry, Oleander, Tea Olive and several species of Palm. Every nursery in the area also stocks an evergreen shrub with highly polished leaves and shrimp pink new growth known in the trade as "Cleyera" but misidentified, being in fact *Ternstroemia gym-*



Photos by Pam Harper



Top Left to Right-Hollyhocks, Tung-Oil Tree, *nandina domestica nana purpurea*

Below Left to Right-Gelsemium *sempervirens*, Autumn in Williamsburg



nanthera. *Eurya japonica* is also often confused with *Cleyera*. At Williamsburg the three plants, correctly named, can be compared.

Williamsburg's climatic advantage is further stretched by the skillful use of sheltered nooks such as the walled courtyard seen from the dining room of the Inn. Here grow *Eriobotrya deflexa*, *Parkinsonia aculeata*, *Escallonia* species and *Sarcococca saligna*, along with hardier plants like *Ginkgo*, *Poncirus* and *Acer palmatum*.

Williamsburg's unusually large variety of cultivated plants is the result of several factors. As the Capital of the Virginia Colony during most of the 18th century, Williamsburg was the home of Colonial plantsmen like Mark Catesby and John Custis and the nearest large town for others like John Clayton and John Mitchell. Persons of similar interests connected with the College of William and Mary, and over the past fifty years with the Williamsburg Restoration, have continued to introduce new plants and perpetuate a 200 year horticultural heritage in this small southern town. There is close liaison between Williamsburg's horticulturists and amateur and professional plantsmen in many parts of the country. As an institutional co-operator with both the U.S. National Arboretum and the U.S.D.A. Plant Introduction Station at Beltsville, Md., Colonial Williamsburg Foundation receives and evaluates numerous new introductions. Seed lists from arboreta throughout the world are carefully scanned. Some plants have come through normal commercial sources, while many fine but unavailable native species have been collected from the wild.

Outside the historic area is the major portion of the campus of the College of William and Mary and an array of visitor accommodation facilities operated by the Foundation. These areas and numerous privately owned properties are attractively landscaped, and here

there are no arbitrary limits on what can be used. Garden tours are a feature of the annual Williamsburg Garden Symposium held each spring. In 1976 these fell into two quite different categories. The "1776" tour featured Colonial gardens, whilst the "1976" tour concentrated on plant materials around the contemporary visitor facilities. The following are a few of the noteworthy plants seen on the latter tour:

Williamsburg Lodge and Conference Center

Aspidistra lurida (Saloon Plant, or Cast Iron Plant). Hardy outdoors at Williamsburg.

Persea borbonia (Redbay Persea). An evergreen tree related to the avocado, native to swamps and moist woods from Delaware to Florida, often disfigured by leaf galls caused by an insect.

Viburnum tinus (Laurestinus). Evergreen, blooming early in the year.

Aleurites fordii (Tung oil tree). A small Asian tree with nuts yielding an oil used in paints and varnishes. Once grown commercially in the Gulf States but also an attractive ornamental, so far proving hardy at Williamsburg.

Abby Aldrich Rockefeller Folk Art Collection

Cryptomeria japonica and the dwarf variety 'Globosa Nana'

Lagerstroemia subcostata (Formosa Crepe Myrtle)

Chionanthus retusus (Asiatic Fringetree)

Williamsburg Inn and Providence Hall Wings

Amelanchier asiatica (Asian Shadblow). A pink form of *Amelanchier* can also be seen in the grounds of the Governor's Palace.

Ulmus alatus (Winged Elm). Native locally.

Nandina domestica. An unusual white berried form is grown along with the red, and a dwarf form can also be seen.

Ilex vomitoria (Yaupon). A small leaved holly native to the south, to

be seen in both regular and weeping form. Much used here for hedges and topiary.

Rohdea japonica. A plant of the Lily family, resembling *Aspidistra* but lower growing.

Danaea racemosa (Poet's Laurel). An evergreen shrub of the Lily family, related to asparagus, bearing cherry sized orange fruits in fall.

Torreya taxifolia. Rare conifer from NW Florida.

Taiwania cryptomerioides. Rare conifer from Formosa, introduced by the U.S.D.A.

Cercis canadensis 'Forest Pansy'. A purple leaved form of the native Redbud.

Cercis reniformis 'Alba'. A white flowered form of the Texas Redbud.

Prunus persica 'Lona Baldwin'. A fastigiate peach discovered by the late Dr. John T. Baldwin of the College of William and Mary.

Clerodendron bungei. Rapidly spreading sub-shrub with plates of pink flower beloved of butterflies (here dying to the ground some winters but reappearing in spring).

Also near Providence Hall, grouped for purposes of comparison, are four different species of *Lindera*. On a sheltered, sandy bank nearby some 150 varieties of cacti and succulents grow, encompassing Cacti, *Yucca*, *Agave*, *Nolina*, *Dasylirion*, *Euphorbia*, *Sedum*, *Sempervivum*, etc. By taking advantage of other sheltered spots nearby such plants as *Mahonia lomarifolia*, *Pittosporum tobira*, *Fatsia japonica*, and *Chamaerops humilis* can also be seen at the northern limit of their culture.

Throughout Williamsburg's gardens there is special emphasis on woody native plants and there are relatively few species native to the southeast (excluding peninsular Florida) which are not either on the grounds or in test plots at Colonial Williamsburg's nursery. Many of these natives are of very

local distribution and are more often seen in cultivation abroad than at home. Others have been tested and found wanting by Old World collectors, or failed to survive New England winters, which in no way lessens their value for many parts of eastern U.S.A. After all, the flowering dogwood (*Cornus florida*) is unworthwhile judged by English standards, being ill adapted to that climate. Look for *Decumaria barbara* on the wall as you enter the right hand arbor in the grounds of the Governor's Palace, a self clinging vine (of which there are all too few) with ivylike flowers, native to the Williamsburg area. Also grown is *Pinckneya pubens*, a handsome small tree with spectacular pink bracted flowers in June. *Clematis texensis* always excites attention, the flowers like red radishes. It dies to the base in winter, re-emerging and making some fifteen feet of growth in spring.

Native species are especially prevalent in Williamsburg's historic area, where only plants which were, or could have been, grown in Colonial gardens are used. Plantsmen's keen eyes frequently spot in the wild mutant forms of native plants, the pink dogwood being one well known example. Among such mutants being grown at Williamsburg are a white form of the American Beautyberry, *Callicarpa americana*, a white form of the Maypop, *Passiflora incarnata*, and a yellow flowered variety of *Lonicera sempervirens*. A double form of the Carolina Jessamine, *Gelsemium sempervirens*, can be seen, and also the rare *G. rankinii* which inhabits swampy places and blooms in fall.

Few of the Asiatic introductions so prevalent today were introduced before 1800. One which was, and which seldom fails to draw comment, is the Paper Mulberry, *Broussonetia papyrifera*. They stand like grotesque sentinels along many Williamsburg streets, usually appearing decep-

tively ancient.

Too little evaluation has been done in the south. Many plants highly regarded in Europe or in California have not been adequately tested for east coast gardens. Among many on trial at Williamsburg are *Hydrangea villosa*, *Lomatia myricoides*, *Grevillea rosmarinifolia*, and *Araucaria imbricata*. Jerusalem Sage (*Phlomis fruticosa*) and the silvery *Odontospermum maritimum* have recently been incorporated into the landscape design after several years under test. Various species of *Eucalyptus* are being hardiness tested (*E. neglecta*, *E. perriniana* and *E. pauciflora*) having proved the toughest this far. *Illicium parviflorum* from Florida has proved so much at home here that it has been used for hedging at the Conference Center. *I. floridanum* can be seen alongside the canal in the Palace grounds, a fine evergreen with two inch red cartwheel flowers a little like those of Sweetshrub, and the Japanese *I. anisatum* is also grown.

Although there are many new introductions, there are also fine specimens of much older things. On the William & Mary College campus are perhaps the oldest and largest *Metasequoia* trees in the U.S. The late Dr. John T. Baldwin planted these in 1946 and at least one is over 120 feet in height. Dr. Baldwin, Professor of Botany at the College, was a dedicated plantsman who amassed on the campus a fascinating horticultural collection, including many different boxwoods, on which he was a noted authority. There are two noteworthy Redwoods (*Sequoia sempervirens*) well over 120 feet tall.

It would not have been possible to assemble such a wide range of plants, many of them rare, without the help of people too numerous to list individually but to each and everyone of them thanks are here expressed, and especially to Mr. Eugene Cline of Canton, Ga., and Mr. Tom Dodd, Jr., of Semmes, Ala., for their great generosity.

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Chestnuts

Richard A. Jaynes, Geneticist
Connecticut Agricultural Experiment
Station,
New Haven, CT 06504



10 Ninety year old stand of American chestnut before the blight fungus struck.

The American chestnut, *Castanea dentata*, is one of America's better known trees, even though it has disappeared as a dominant forest species. The tree was immortalized in Longfellow's poem, *The Village Blacksmith*: "Under a spreading chestnut-tree the village smithy stands . . .". Never mind that the tree referred to was a horsechestnut and that our native chestnut was most noted as a columnar, forest tree. Indeed, the American chestnut was the most valuable single tree species in our eastern forests at the turn of the century. It was the bread and butter tree. The decay resistant wood found many uses: from cribs to burying boxes and from mine timbers to utility poles. Tannin was extracted from bark and wood, and the nuts fed the farmer and his children as well as his animals and the wildlife.

A disease inadvertently introduced from the Orient, probably in the later 1800's, changed all this. Bark cankers caused by the chestnut blight fungus, *Endothia parasitica*, was first observed in 1904 in New York City. By 1920 most of the trees from Maine to Virginia were affected and in another 16 years the remaining large native chestnuts in the southern Appalachians were destroyed.

The fungal spores attacked through wounds or natural cracks in the bark. Large stems were most susceptible and killed by a girdling canker, but the root systems often survived and sprouts formed at the ground line. The existence of this once majestic tree is still evident in our eastern woodlands from live sprouts and rotting stumps. The sprouts seldom get more than a few inches in diameter but may sometimes grow to 12 inches in diameter before the spores of the fungus again find an opening, germinate, and form another canker.

Control measures were extensive

over the years. The State of Pennsylvania mounted the first concerted effort between 1911 and 1914 by clear cutting ahead of the advancing blight, by burning isolated infected trees, and by quarantine of plant movement from infected to non-infected areas. These efforts failed. Exotic chestnut species were subsequently introduced by the USDA, and one, the Chinese chestnut, *C. mollissima*, has proved to be blight resistant and a satisfactory nut tree. Its spreading habit, however, precludes its use as a forest tree.

Chemical control of the fungus with sprays or injections have been unsuccessful until recently. Research at the Connecticut Agricultural Experiment Station indicates that a systemic fungicide (Lignasan) can protect and even cure infected trees; however, the material is not registered for use on chestnut. Even if registered it would only have value for use on specimen trees because of the high cost of treatment. Lignasan is also proving helpful in treating Dutch elm disease.

The breeding of hybrid chestnut trees was begun years ago by USDA scientists Van Fleet, Gravatt, and Clapper and later in Connecticut by Graves, Nienstaedt, and Jaynes. A major goal has been to transfer disease resistance from the Chinese or Japanese chestnut species into a tree that is otherwise like the American chestnut. There has been considerable progress but much remains to be done to obtain a true breeding, blight resistant, forest tree. There are some named hybrid selections that have value as nut trees and as ornamental, landscape plants, but as yet their propagation has proved too difficult for them to be produced commercially. The limited propagation of selected chestnut cultivars has, therefore, mostly resulted from efforts of hobbyists who do their own grafting. Chinese and Chinese-hybrids can be grafted on Chinese seedlings, but even within

the species there may be problems with graft incompatibility.

Ever since the chestnut blight fungus was discovered people have searched for blight resistant American chestnut trees. Variation exists within the species but no fully resistant trees are known. The rare trees found within the native range are generally diseased and not well-formed trees. As one moves away from areas where the blight fungus is prevalent, large trees are sometimes found. Isolated trees and small plantings of blight-free American chestnuts occur in Missouri, Illinois, Iowa, and Michigan, as well as California, Oregon, and Washington, and other central and western states. These scattered plantings often remain free of the blight because of their wide separation and the prevailing westerly winds that prevent westward movement of air-borne spores.

The most promising possibility for the return of chestnut as a forest tree lies with the recent discovery of an unusual strain of the fungus in Europe. This strain has the ability to superinfect and inactivate the virulent or pathogenic strain of the fungus. This "hypovirulent" strain causes no serious canker by itself. Scientists at the Connecticut Station, using the European strain, converted American strains of the fungus into hypovirulent strains. When they inoculated one of these derived hypovirulent strains into natural cankers on American chestnut sprouts, growth of the canker stopped and the tree began to heal. The research has not progressed far enough to determine if this new hypovirulent strain will establish and maintain itself in our eastern forests and, thus, be able to exert a natural control over the chestnut blight. However, observations in Europe indicate that real hope exists for the biological control of the chestnut blight in America.

Until selected named cultivars be-

come more widely available or until the blight is controlled, Chinese chestnut seedlings are the obvious choice for home plantings. Their disadvantage is that, like most seedlings, each one is different from the others and may even become severely cankered. Where possible buy plants grown from locally adapted trees with large nuts (55 or fewer per pound). Unfortunately seed source and nut size are not indicated, except in a general way, in most of the catalogues. Few local nurserymen have chestnut trees, but most mail order nurseries do list Chinese chestnut seedlings.

Chestnut flowers are borne on catkins in June. Each tree produces male and female flowers, but cross-pollination is generally required to obtain filled nuts. Thus, two or more chestnuts should be planted unless there are other chestnut trees within a few hundred feet. The catkins are a golden color with a fragrant sweet scent. The trees perform best in full sun when planted in well drained, fertile, acid (pH 5.0-5.5) soil. They are commonly spaced 30-50 feet apart.

Chestnut trees are a bit messy and perhaps not ideal front yard trees because of the catkins that drop in July and the spiny burrs in the fall. However, they bear at a young age, often with a good crop three years after transplanting. Once fruiting commences they produce a reliable annual crop.

Pests are not usually a major problem. The trees are susceptible to most of the same leaf eating caterpillars as the oaks. The most serious pest of the nut is the chestnut weevil, which if present, can be controlled by spraying in late summer.

Chestnut fruits are high in carbohydrate and water content and are more perishable than oil rich pecans, walnuts, and peanuts. Fresh chestnuts should be refrigerated (32-40°F) and not allowed to dry out.

TRY WILD

Growing Wild Flowers From Seed

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In this era of "back to nature" there has been a rebirth of interest in using native rather than exotic plants. This is true not only in the flower garden but in low maintenance areas such as vacation homes, highway rights-of-way and municipal open spaces. Educational nature centers, too, wish to restore or increase species that were once plentiful in their native habitats.

Growing wild flowers often poses problems to individuals who know little about such plants. Knowledge of site and soil preferences, flowering and seeding times, and methods of propagation often spell the difference between success and failure.

Plants dug from the wild seldom survive unless they are moved and grown in conditions very similar to their native environment. Nursery-grown plants, when available, are often expensive and do not always survive travel and transplanting.

Growing wild plants from seed is a practical method of obtaining the wild flowers you want. It is the only method that aids conservation since digging from the wild or even division of plants eventually depletes wild areas. Many native species are difficult to grow from seed but those included in the accompanying table were chosen for their relative ease of propagation. Included is information on soil reaction (acid-base), site preference, time of flowering or seeding, and preferred times and methods of seed propagation.

Collection and Storage

Obtaining the desired seed of wild flowers is the first step. Few commercial seed houses sell them and the number of species offered is usually limited. Others in the eastern United States offer western species as "native". One alternative is to do your own collecting. You must recognize the plant and know the time it is likely to be setting seed. A general estimate is about two months after the start of flowering but this varies with the species. The rapidity of seed dispersal is important. Some flower species keep their seeds a long time. Others scatter seeds immediately upon ripening. In the latter case it may be necessary to tie a small muslin bag over the fruit to save the seed. *Remember to leave most of the fruits to take care of natural propagation.*

Pre-Germination Practices

Seeds of some species are best sown immediately after collection. Others may be stored and used later. If they are to be stored, spread them to dry and pick out or screen the debris. The seed can then be put into manila envelopes labelled with name, date, and place of collection. Be sure to store them in a cool dry place.

Many seeds require a warm temperature (65-75° F) for germination. Some germinate more readily at cooler temperatures (55-65°F); still others need a cold rest period (about 40°F) prior to the germination tem-

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perature. Those needing a cool temperature should be sown in early spring if put outdoors or placed in an unheated indoor room. Those needing cold temperatures before they germinate may be sown in the fall or stratified in layers of moist peat or soil and then left out over winter. If you plant indoors, refrigeration for eight weeks can take the place of overwintering. Placing the seeds in the freezer for three weeks can also satisfy the cold requirement. Either of these methods shortens the time needed for the cold treatment. Variations in the freezing method include defrosting once every week for 24 hours and then refreezing, to simulate natural conditions. This is especially useful for seeds with hard seed coats.

Germination Media

With extremely small seeds, germination may begin in fine grade vermiculite or milled sphagnum. After sprouting, feed with a diluted fertilizer and transfer to the proper soil mixture. If germinated in outdoor beds or cold frames, mix humus with loam and sand. In smaller flats and pots, the use of sterilized soil helps prevent seedling disease and weeds. The sand used can be sterilized with boiling water. Sphagnum peat is already sterile. One part each of loam, sharp sand and peat makes a good mix for starting many wild flowers. For acid-loving plants increase the sphagnum peat to two parts or

more. For those requiring more neutral or alkaline conditions use neutral peat (hypnum) or neutral humus in place of the sphagnum, or use a light sprinkling of horticultural lime well mixed with the soil or humus.

If sterile soil isn't used, a seed disinfectant such as Semesan is helpful. Use a pinch mixed with the seeds. A rooting hormone may also be added.

Containers

Containers may be of various types. Outside, use cold frames, flats, or large pots; inside, cans or aluminum pans make good containers. A cold frame gives the necessary protection against hard rains and rapid temperature changes. An old storm window can be used for the lid.

Drainage should be provided by punching holes in the bottoms of the containers. The soil, and especially the surface for small seeds, must be kept moist. This can be done with glass covers or light mulch on the flats and beds. Transparent plastic bags are useful in covering cans or small pans. Outdoor sowings can be protected from rodents with metal screening.

Planting depth depends on the size of the seed. One to two times the seed diameter is a general rule. For fine seeds, sieve a thin layer of peat on the surface, sprinkle the seeds over the medium and then sieve a very light sprinkling of peat or peat and fine sand over the top.

Water carefully by standing the container in water until the surface is moistened.

Light is needed for the germination of many seeds. If a heavy mulch was used over winter it should be removed in early spring. After the seeds have germinated, gradually lift any cover you were using. The plastic bags can be opened at this time. Partially shade the seedlings until they harden off.

Transplanting

Seedlings can be transplanted into flats when large enough to be handled. This is best done when the true leaves appear. Give the required amount of sun gradually. Place the seedlings in the garden only after a period of gradual hardening to light and drier air. Even then, placing a strawberry basket over the seedlings for short periods will protect them against too much sun, wind, small animals, etc.

Biennials do not flower until the second year. Do not expect the perennial flowers to bloom before the second and usually the third year. A few take even longer. Take heart, when wild flowers are planted in the right area, they provide a continuing source of beauty and pleasure.

(The table on page 32 is reproduced only in part. For a complete listing of 75 wild flowers send a stamped, self-addressed envelope to: Editor, American Horticultural Society, Mt. Vernon, VA 22121.)

TRY WILD

Photos by V. Ferreniea and M. Wright



Top Left to Right-White Baneberry fruit, Bluebead Lily fruit,

Cardinal flower

Below-*Asarum shuttleworthii*

FLOWERS



Ideal site for building your wildflower shade garden



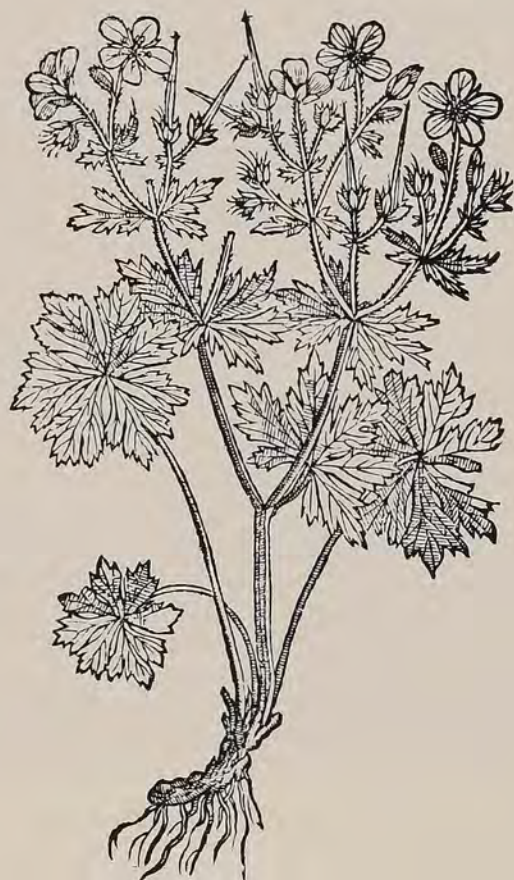
Top-Round lobed *Hepatica*
Bottom-Bunchberry fruit

TRY WILD

Why Not Wild Flowers

*Considerations for
the development of a
wild flower garden.*

Viki Ferreniea
Will C. Curtis Garden in the Woods
Framingham, MA 01701



We naturally tend to associate wild flowers with large areas. After all, they grow in vast woods, meadows, prairies and mountain ranges, but this does not mean that to experience the pleasures of growing and cultivating them successfully a large acreage is needed. In fact, one of the most delightful and varied wild flower gardens I know is only twenty feet by fifteen feet. There are two mature oak trees that provide the required high shade. The structural material for the framework of the garden consists of two *Rhododendron carolinianum* (Carolina Rhododendron), one *Rhododendron calendulaceum* (Flame Azalea), and a *Rhododendron vaseyi* (Pink Shell Azalea) and *Leucothoe fontensiana* (Dog Hobble). The herbaceous material growing beneath this is made up of sixteen different species of native plants and ferns including *Dodecatheon meadia* (Shooting Star), *Iris cristata* (Crested Iris), *Phlox divaricata* (Wood Phlox), *Shortia galacifolia* (Oconee Bells), *Trillium* species and *Adiantum pedatum* (Maidenhair Fern). Size, therefore is not important.

So let us look more closely at what is involved in developing a wild flower and/or woodland garden. The first bit of advice is to be patient and take time to observe the area, preferably over an entire growing season. It is important to know what conditions exist by being familiar with the area. It is this knowledge which will provide the foundation for the development of the garden. Such things as: what is the degree of shade, which areas get sun and when, where is the coolest spot, what type of soil conditions are present, what is the soil makeup, and what is the soil moisture content at different times of the year? If there is water in a low spot in the spring will it be dried up by mid-summer?

By making an inventory of the material already growing on the site it is possible to gain a concept of what conditions exist. These 'indicator plants' will give some idea of the soil type. For example: *Pyrola* species (Shinleaf), *Chimaphila* species (Pipsissewa) and *Cypripedium acaule* (Pink Lady Slipper) are gener-

FLOWERS

ally found in very acid, dry coniferous woods, while *Dicentra cucullaria* (Dutchman's-breeches) and *Adiantum pedatum* prefer a richer, more neutral to slightly limey soil, with the latter also showing a preference for moist situations. *Symphiocarpus foetidus* (Skunk Cabbage) is a sure sign of permanently wet situations; even if in August no water is visible, there will be plenty of ground moisture. It is a good idea to dig a small hole approximately 12-24 inches deep and 6-12 inches across to obtain some idea of the soil profile; how deep is the layer of topsoil, how much humus is present, what is the sub-soil make-up and how is the drainage. This may seem tedious and a lot of work, but the soil is an extremely important factor in the successful cultivation of wild flowers. The accumulation of all this information will tell us "what we have".

Now it is time to think about "what we would like to have". Again, time and patience are the key words. Rushing in to plant an area without sufficient preparation will inevitably mean disappointment. It is this initial preparation of the site which will provide the plants with optimum growing conditions and will avoid many problems and set-backs as the development of the area continues. While we have been studying the site for our proposed wild flower garden we should at the same time be observing closely and learning all we can about the plants we would like to grow. Looking at other gardens, asking questions, reading, all will help to build a base of knowledge from which we can draw to help us achieve success, in developing our own area to the best advantage for the plants and to give us the greatest amount of satisfaction and pleasure.

Cultivating wild flowers does not mean neglecting proper care and attention which should be given to all garden plants. These wildlings are going to need just as much consideration as other plants particularly in initial watering while they are establishing and again during dry spells afterwards. It is very time-consuming and tiresome and impractical to constantly carry pails of water for long distances. We should by

now have an idea of the soil requirements of the various plants we are interested in growing. For the woodland material a good rich dark humusy soil that has enough organic material to hold moisture and nutrients is what we should aim towards. This can then be adapted to the needs of other plants like *Aquilegia canadensis* (Columbine) that prefers a more open gravelly soil or *Trillium undulatum* (Painted Trillium) that needs a heavy acid soil. The improper balance of soil components could lead to problems. Too much clay could mean poor drainage or too much sand not enough moisture retention. Again it is a question of being familiar with the plants' needs.

If a woodland garden is contemplated, some tree work and clearing will usually be necessary. The clearing of underbrush, removal of dead and diseased material and the limbing-up of the trees that are going to comprise the shade canopy is important. This is necessary as few woodland plants do well in heavy shade. They do need protection from the sun and its heat but they also require light and good air circulation to maintain strong and floriferous growth. By the removal of some of the lower limbs we create a high umbrella-like cover which is ideal. Sometimes it is necessary to remove trees to enable those remaining to develop properly. Maples are a good choice for removal since they have shallow root systems which rob herbaceous plants of available moisture and food. The smaller trees can be cut into eight to ten foot lengths and used to edge the paths.

Try to develop a feeling for the actual land formation, how it dips and rises, and how these features can be made into the various habitats needed and which areas lend themselves to the siting of small specialty areas such as a bog garden or lime-stone rock garden.

An important practical consideration must now be 'accessibility'. Can equipment (a wheelbarrow or small garden tractor) be brought into this area with compost, mulch, plants and other items?

It is important that paths wind and twist through a

The Big Leaf Clan

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Some plants are so striking in appearance, so well dispersed in nature, so free of disease and environmental problems, so easy of cultivation, so dependable and attractive in flower, and so well adapted to gardens in various temperate climates that they are looked upon as champions of their kind. Which American *Magnolia* is the champ?

Is it the type species for the whole genus, *Magnolia virginiana* L., the Sweetbay, which American colonists found thriving from Massachusetts southward, which delighted European gardeners as early as 1688? Or the evergreen *M. grandiflora* L., a prized exotic on English walls a little later, now grown in mild-climate to tropical gardens the world over, even today the only plant that the average American can definitely identify as "Magnolia?" Or perhaps *M. acuminata* L., with less conspicuous flowers, but a massive timber species known as cucumber tree by the western settlers who encountered it in rich woods all the way from Ontario to Louisiana and northern Florida?

These three all have high qualifications, but a fourth candidate for All-American honors must be the incomparable Bigleaf Magnolia, which in one of its three species or, as some taxonomists stoutly maintain, varieties, extends from southeast Ohio through most of the mid-south, then mysteriously reappears disjunctly, riding in cloud forests along mountain crests of Veracruz and into Oaxaca south of Mexico City. Either as one species or a series, this is the greatest north-south natural distribution for any American magnolia, or any Asian one, either.

The magnificent foliage and flow-



Top Left to Right-*Magnolia macrophylla* ripe fruit cone, seedling loop straightening.

Below-*Magnolia macrophylla* flower



Photos by Philip G. Seiner

ers of *M. macrophylla* Michx. were not recorded in botanical literature under that name until after our War for Independence, although it was known and admired earlier by American colonists in at least one area where it had established itself east of its principal range on the western side of the Appalachians. The closely related Mexican Bigleaf, *M. dealbata* Zucc., entered taxonomical literature in 1837, but it has been little known and until now not at all in cultivation. *M. ashei* Weatherby, Ashe's Magnolia or the "Little Bigleaf," a native of northwestern Florida, did not come to botanical notice in its own right until the present century, an oversight that irked Harold Hillier, an English nurseryman sold on its ornamental potential for smaller-scale gardens, into saying he thought it "strange that a plant of this quality growing in a country enjoying western civilization was not recorded in cultivation until 1933."

The average gardener in America, whether conscious of it or not, has become attuned to the economy of the more conventional woody plants seen all his life on every hand. When his jaw drops at his first sight of a Bigleaf, it is scarcely a surprise to those who have already had the pleasure. From colonial times to the present, the Bigleaf's prodigality, heroic sized creamy white flowers as much as 18 inches in diameter, and leaves which can attain a base to apex length of a full yard, have combined to produce awe and incredulity in the beholder. Its broad sweeps of soft green foliage are relieved by glimpses of the glaucous undersides, and in May to earliest July by the flowers, weighing sometimes a pound or more in bud, and cresting in the center of a spiral of huge leaves at the branchlet tips. On their own Bigleaf flowers, the Indians of Oaxaca bestowed the same name they used for an ear of green maize. Indeed, when the white of inner tepals shows through the green sepal-like three outer tepals, the bud's resemblance to a partly shucked, old-fashioned "roasting

ear" is pretty close. The large, near globose, fleshy fruit aggregates on *M. macrophylla* ripen from greenish yellow to crimson in late summer. A mature Bigleaf tree will, over a period of weeks, provide feasts for squirrels and some birds as its seeds drop to the ground in thousands.

André Michaux, the great French botanical explorer in the early United States, apparently saw the tree of *M. macrophylla* in the first year of George Washington's presidency, on 16 November, 1789. Fording the Catawba River 14 miles above Charlotte, North Carolina, on that date, to continue into Lincoln County for a day's journey totaling 26 miles, he recorded in his Journal seeing two unidentified trees. One was "un Magnolia glauca foliis longissimis et cordatis et fructibus globosis, et ramis albicantibus acumine sericeis. Ce Magnolia est d'une stature moins haute que les autres espèces connus."

Except for omitting the flowers, missed by five months, Michaux's combined Latin-French description fits what he later published as *M. macrophylla*. He again missed seeing the flowers, but mentions the trees, on two subsequent trips through Lincoln County (July 1794 and April 1795), but on 8 June 1795, encountered them on trees in the Cumberland Mountains west of the Clinch River in Tennessee. His Journal for that date says: "Le 8 continue notre marche dans les montagnes 23 miles, Magnolia petalis basi purpureis."

M. macrophylla is the only U.S. Magnolia, aside from *M. ashei*, whose flowers have purple markings. These spots are usually visible in fully open flowers near the inside base of at least the inner three tepals, sometimes extending to include fainter marks on most of the other petal-like white tepals, which are usually six in number, but on some trees as many as ten, not counting the outermost three green sepal-like tepals. The purple may occur in varying intensities from one tree colony to another and indeed is missing altogether on flowers of

some trees in parts of Mississippi, Alabama, and Georgia.

Dr. Ronald F. Miller, the most recent writer on Florida's *M. ashei*, says that the variation in markings within that species is the same as within *M. macrophylla*; in the present authors' more limited observations on *M. ashei*, we have seen splotches of rather fainter intensity than most clones of *M. macrophylla* attain.

M. macrophylla may perhaps have been introduced to France by Michaux. In any event, someone, probably Fraser, introduced it to England some years before 1820, when a flowering specimen owned by James Vere, Esq., was drawn for the first plate in vol. 48 of *Curtis's Botanical Magazine*. John Sims, then the editor, explained that the flower was too large to be shown in the usual full scale on a double-page plate.

The Bigleaf magnolias belong to Section *Rytidospermum*, the most widely dispersed section in nature among all the living *Magnolia* species. *Rytidospermum* includes three Asian species, *M. hypoleuca* Sieb. & Zucc. (syn. *M. obovata* Thunb.), *M. officinalis* Rehd. & Wils., and *M. rostrata* W. W. Smith, all with reasonably large leaves, but without the Bigleaf's auriculate or cordate leaf bases. Two other American species in another series of this section do have auriculate leaf bases, but their smaller leaves and more slender twigs are glabrous, and their flowers are smaller than the smallest *M. ashei*. These two are *M. fraseri* Walt. of the southern Appalachians, and *M. pyramidata* Bartr., scattered in the coastal plains between South Carolina and Eastern Texas.

One more American magnolia in this section, *M. tripetala* L., called Umbrella Magnolia, has fairly large leaves and is the one perhaps most often confused with the Bigleaf, even by some nurserymen, but its cuneate-based leaves and glabrous shoots set it apart, even before its smaller, earlier (April-May) and

rather disagreeably scented flowers confirm its identity.

Bigleaf flowers in contrast have a lighter, but to most people pleasant, fragrance, and their twigs are silky-pubescent. Yet popular confusion with the more commonly occurring Umbrella Magnolia has extended even to some botanical gardens, where *M. tripetala* trees have masqueraded under a "*M. macrophylla*" label, or vice-versa. Excepting for *M. pyramidata*, the two U.S. Bigleafs are rarer than other American magnolias in most woods where they occur, though relatively heavy stands of *M. macrophylla* have been noted in several small local areas of states between Mississippi and Kentucky.

The seeds of *M. macrophylla* are commonly produced even on isolated trees planted in eastern United States. The species is thoroughly self-fertile, but, like other magnolias, does require insects (usually beetles) to transfer pollen from an older flower to one freshly opened. Its seeds have proved strongly viable from trees throughout the eastern states as far north as USDA Plant Hardiness Zone 5 in Illinois, Michigan, upstate New York, and Massachusetts. It has been introduced to Pacific Coast states too.

The tree does need some care in choosing a site. The wood of *M. macrophylla* is brittle and the branches subject to breakage in very strong summer winds. It is not a tree for youngsters to climb. Hailstorms can play havoc with its large thin leaves. It reaches a height of 35-50 feet and if uncrowded will probably reach an ultimate spread exceeding its height, but, if forced to compete for light with other trees, it is more narrow in spread.

M. macrophylla is relatively easy to grow, either in open places where protected from strong winds or in high woods as an understory tree. Seed may be planted outdoors in the south as soon as collected, at ½ inch depth, under a piece of hardware cloth or similar deterrent to digging by squirrels and other rodents.

Further north, it can be stored slightly moist in airtight plastic bags in the refrigerator vegetable bin and planted outside in the spring, or germinated earlier in pots or flats indoors. Some planters believe that germination is improved for magnolia seed, whether planted immediately or stored, if before mold sets in or drying out occurs they are soaked a day or two in water and the fermenting outer pulp carefully removed, then dipped in a mild fungicide suspension of one level teaspoon of wettable powder Captan or Arasan in two or three pints of water.

Tender fingerling plants need protection from slugs, garden snails and cutworms. Transplanting can begin any time after the first two leaves have matured above the cotyledons. Under ideal conditions, young plants grow rapidly. The pithy young stems are brittle and can snap off if handled roughly or bumped. It's safe to move larger plants, in the 1-to-2 year age range, even as late as midsummer, if the foliage is reasonably hardened, if the root ball is kept intact, and if protection is given for a few days against glare and heat of strong sunlight until the delicate roots, which should never be allowed to dry out through exposure to air, are reestablished in good contact with the soil.

In cultivation, both *M. macrophylla* and *M. ashei* have succeeded better than some of the literature would indicate. While native occurrences of both are usually in fairly acid soils, *M. ashei* frequently is in limestone-derived Florida soils and both have thrived in the near neutral to slightly alkaline black loams of central Illinois. Here they endured brisk prairie winds broken only by nearby houses or taller trees, and were uninjured by winter temperatures as low as -15°F. They did have good soil drainage. While neither species is a xerophyte, *M. macrophylla* in native woods is frequently concentrated higher on slopes, compared to *M. grandiflora*, *M. virginiana*, and *M. tripetala* in

lower, wetter soils of the same wooded tracts.

Because the Bigleaf is not available from most nurseries and in the interest of giving more gardeners an opportunity to grow this fine magnolia, some members of the American Magnolia Society will collect enough *M. macrophylla* seed this year to provide a supply in the American Horticultural Society seed distribution early in 1977. The American Magnolia Society has already offered its own members seed of this and numerous other magnolias at reasonable cost. We can put commercial nurserymen in touch with various seed sources in the U.S.

Layering and cutting propagation, under proper conditions, also have increased the Bigleaf, particularly in England where seed seldom is matured. In Illinois, cultivars of *M. macrophylla* have been successfully propagated on *M. macrophylla*, *M. acuminata* and *M. hypoleuca* stems as understocks, by chip-budding and other grafting methods.

Few cultivars have so far been registered, but the Bigleafs do show some variation from seed. Both 'Holy Grail,' selected some years ago in California, and 'Whopper,' registered from Illinois in 1974, are particularly large-flowered, purple marked clones of *M. macrophylla*, while 'Sara Gladney,' from a tree occurring in a native stand at Gloster Arboretum, Gloster, Mississippi, and beginning to be propagated northward by grafts, is a clone with a good history of producing large flowers unmarked with any purple.

Plants of *M. ashei* are slower growing, sometimes reaching 25 feet, but usually more shrubby. It is nearly as hardy as *M. macrophylla* (good at least in Zone 6), and despite its somewhat smaller flowers, it has some garden advantages. It frequently flowers in cultivation by the third year from seed, and will ordinarily yield more flowers at a given height than does a *macrophylla* seedling. Its leaves are only rela-

tively smaller than *M. macrophylla*'s, but so similar that the layman, or even a botanist, will often have difficulty telling them apart. *M. ashei* plants are more branched and multi-stemmed, their flowers more nearly tubular on the day of first opening, and their gynoecia and fruit aggregates are smaller, less globose, and have fewer carpels which mature somewhat smaller seeds than *M. macrophylla*. Thien et al (Taxon 24:557-568) state that "a comparison of their floral odors reveals that the floral odor of *M. ashei* is not only quite different from *M. macrophylla*, but distinct within the [U.S. native] portion of the genus . . ." Propagation has been accomplished by seed as described above for *M. macrophylla*. Both *M. ashei* and its recent hybrids with *M. macrophylla* have been grafted on *M. macrophylla* at Urbana, Illinois.

The Mexican Bigleaf, *M. dealbata*, was not known in cultivation until late 1975, when George A. Pfaffman brought cuttings and scion material to the U.S. from about 1400 meters on Cerro El Jarro, near the village of Chapulhuacan, Hidalgo. It occurs in remote mountains of other Mexican states, including Veracruz (type locality) and Oaxaca, and possibly also Tamaulipas. It has more disjunct distribution, but appears morphologically closer to *M. macrophylla* than *M. ashei* is. The one flower specimen in the U.S. National Herbarium collection (from Oaxaca, 21 April 1906, collected by Conzatti) even shows similar spots on the three inner tepals. At this writing, the hardiness of *M. dealbata* remains to be tested in the U.S., but it does endure sharp freezes on Cerro El Jarro, according to Mr. Pfaffman's Spanish-speaking guide (Sr. Agapito Pelcastre Oviedo, Calle Hidalgo No. 18, Chapulhuacan, Hgo., Mexico). Perhaps further study may confirm the belief of some taxonomists that the Mexican Bigleaf is actually only *M. macrophylla*, in a more southern, more elevated habitat. Several other eastern U.S. tree species, such as *Liquid-*


ambar styraciflua and *Nyssa sylvatica* similarly reappear in Mexico and even southward, where proper habitats occur. But chromatographic studies of floral odors may find *M. dealbata* closer to *M. ashei*.

Although *M. macrophylla* in the U.S. has probably always been relatively rare, it has become even more so in our own time. Natural stands have been reduced or obliterated because they happened to be on choice potential agricultural acreage or desirable building sites or in mixed woods where they are subject to being cut; girdled or poisoned to make room for tree species more valued for timber. The Mexican Bigleaf's predicament is even more precarious, it being one of a considerable number of cloud forest trees threatened with extinction, according to J. Rzedowski, the Mexican botanist who first informed us of the stand in Hidalgo.

The present situation for *M. macrophylla* was summed up 26 years ago by Donald Culross Peattie in his "A Natural History of Trees of Eastern and Central North America" (Houghton Mifflin, 1950):

"*Magnolia macrophylla* is probably rarer today than even in Michaux's time and the lucky amateur of trees who can boast that he has even seen it in its native setting is himself a rare specimen. When encountered, it symbolizes, perhaps more than any other tree, that lost and pre-Columbian America, that lush, sweet upland sylva of the south that was seen in its days of innocent perfection by those lucky first explorers, Bartram, Fraser, and Michaux."


Perhaps, but those who do see the Bigleaf today are just as hooked, just as awed by its solitary spectacle, its majestic sweep, its primeval and enduring grandeur as those earlier intruders in that pristine woodland paradise. Although a tree in the garden may not be the equal of one in the bush, the sight of this granddaddy of arboreal atavisms through your own window is still enough to reduce those two centuries to a tick of the clock.



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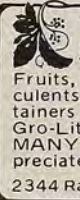

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CACTI AND SU

When you think of cacti and succulents, do you picture a hot, bearded, thirsty individual dragging himself across the desert and, finally, escaping death by tearing open some strange and lonely pointed plant full of water? If that's your association with cacti, you've got a lot to learn about these unique plants. But, first a definition to clear up the common confusion about cacti and succulents.

All cacti are succulents, but not all succulents are cacti. To be more specific, succulents include two

their fleshy stems and leaves. Then, during a dry spell, the plant drinks from its stored water.

The second succulent class are plants which have also adapted to a lack of water, but do not have special storage facilities. This group includes very different plants than the water-storing varieties. Well-known drought-resistant succulents include the yucca, dasyliirion, agave, fouquieria, hesperaloe, hesperoyucca, samuela and furcraea.

Because nature has been so good to succulents endowing them with the ability to thrive under the most severe conditions, they can stand more neglect than almost any other form of plant life. This, added to the fact that many succulents are extra-ordinarily beautiful (some even have colorful flowers), make them especially good house plants. In fact, succulents can be life-long friends, for if cared for properly, they can last from one generation to the next—thriving away.

If you have the collector's spirit, there are enough cacti and other succulents available to keep you fascinated for a lifetime or two. At last count, there were approximately 9,000 plants categorized in this diverse group.

Succulents are extremely easy to care for as long as you provide them with a few basic essentials.

CHOOSING A CONTAINER: When you choose a container for a succulent, remember one word—*drainage!* Though good drainage is important for all plants it is particularly important for succulents. If your container does not have a proper drainage hole, make sure to add stones, or pieces of broken crockery to the bottom before add-



ing the soil. The pot should be just large enough to accommodate the plant without overcrowding the roots. If you place the plant in a pot that's too large, the water will not be absorbed fast enough, and root rot may occur. Bonsai containers are perfect. They do a splendid job of showcasing the plants, and their drainage holes are ideal.

Because most succulents require drying between waterings, they usually prefer clay pots to plastic or other non-porous material. It's easier to control their wet-dry needs in a clay pot. However, there are some very good advantages to plastic pots—you don't have to water as often, because your plant won't dry out as fast.

WATERING: As with any other plant, water plays a vital role in the health of succulents. And these unique plants are extremely fussy about the quality of water. They prefer rain water or bottled water because they are quite sensitive to salt, which flows in great amounts in some areas, and runs high in softened water. Accumulated salts



basic types of plants. Each type has its own method for overcoming a lack of water. The first group, of which all the cactus family are members, are those plants that store water. These plants, like the mesembryanthemum, echeveria, rochea, kalanchoe, sempervivum and pachyphytum, draw water when it's abundant and store it in

SUCCULENTS

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around the roots will cripple the growth of your plant and will eventually cause it to die. If your area does have a great deal of salt in the water, don't despair, simply flush out your plant on a periodic basis. About every fourth watering, fill the pot with water from the top—let it drain—then repeat the process about three more times.

During the growing season, succulents should be watered whenever the soil is dry, but during their rest period, hold back on the liquid. Most succulents are also sensitive to being wet when the weather is cold. In late Fall, when the temperatures begin to drop, dole out the water sparingly, allowing just enough to keep the roots alive.

SOIL: All succulents require an open, well-draining mix. Although they are all, including the desert cacti, touted as "requiring" a lean (low nutritive content) mix, specialists agree that a fairly rich soil mix is actually preferred by succulent plants in cultivation.



Tropical succulents prefer an acid soil, while others, like the arid region species, favor a slight alkalinity.

FERTILIZING: Fertilizing should be done during the growth period *only*. And never fertilize with more than a fourth to a third of the recommended dilution printed on the directions. It's also important to remember that you should never feed your succulents during their resting period — it would be about as welcome as a plate of food forced on you in the middle of a sound sleep.

AIR TEMPERATURE AND LIGHT: Good air circulation is very important to the health of your succulents. Stagnant air will encourage mealy bugs on any "dry growing" plant. Early morning humidity is also welcomed by all succulents, even your desert cacti, but make sure that evaporation takes place to remove any excess moisture within a short period. And, never allow your succulents to go to bed with their leaves wet. Keep them cool—not cold—at night, and let the full sun warm them during the day, unless, of course, they're the kind that prefer the filtered sun, such as the tropical cacti.

Some succulents actually acquire more color in the sun, while others show nothing but green no matter what degree of light they get. Most, however, do tend to change their leaf size with more sun and stress—they get compact in habit and smaller. Conversely, they become larger, and more lush with more shading, water and nutrients.

About the best rule of thumb to follow with cacti and other succu-



lents is to "leave them alone." Don't kill them with too much kindness. Given half a chance, they will thrive beyond your wildest hopes. Remember that they just need the basics—good drainage, fresh air and some water when necessary. If you're still not sure how much to water, a good general rule to follow is to water well, then after the soil becomes dry, wait a day or two before watering again.

And don't be afraid to move your plant. If it isn't doing well in sunlight, move it to a location with filtered light. Contrary to what most people think, succulents thrive in shade and humidity. Just keep moving them around until you find a spot they like. Keep in mind, however, that when they're moved from indoors to outdoors, or vice versa, the transition should be done gradually.

Another important fact to keep in mind is not to waste your money on cheap plants. This will lead to disappointment, and wasted time and energy. Buy good and healthy

plants from legitimate dealers, or start your own from slips of plants belonging to friends. It's really very simple to do because succulents are easy to propagate.

Now that you know the main "points" needed to grow cacti and other succulents successfully, you'll probably want to rush out and get a few. Some of the more popular varieties include:

MISTLETOE CACTUS: These succulents, also known as *Rhipsalis*, are strange in appearance and resemble true mistletoe. They're attractive in baskets, pots and planters, and most are grown for their bright green foliage. In season, the blooms are an added treat.

ORCHID CACTI: These beautiful flowers are indeed as lovely as orchids, but are shaped more like water-lilies. Also known as *Epiphyllum*, their foliage is not really cactus-like, but rather leafy. Many of these plants are wonderful in baskets in a semi shady location.

ALOE: These succulents are easily cultivated members of the Lily family. Some, like *A. aristata*, stay as ground-hugging rosettes for so long that they can be considered miniatures, while others, like the *Aloe vera*, have individual leaves up to 24 inches long.

AGAVE: This famous succulent belongs to the *Amaryllis* family. These dramatic rosette plants are great accents placed on patios, terraces, steps or balconies. Favorites include *A. americana* varieties, such as *medio-picta* and *marginata*.

CRASSULA: There are hundreds of these succulents, treasured for their shape, color and growth habits. Most will bloom in season when provided with warmth and sunlight, indoors and out, in pots, baskets and dish garden desertscapes.

ECHEVERIA: As a rule, these hen-and-chickens succulents make geometrically perfect rosettes of leaves close to the ground—some even look like gorgeous green

roses. There are many species and hybrids to choose from, such as *crenulata*, *derenbergii*, *elegans*, *multicaulis* and *pulvinata*.

EUPHORBIA: "Weird and wonderful" are the words for these relatives of the Christmas poinsettia. There are many fascinating varieties available. The most popular is the crown-of-thorns (*E. splendens*), but for big bold accents, try the cowhorn (*E. gradicornis*) or pencil-cactus (*E. tirucalli*), and for an eye-catching display, Medusa's head (*E. caput-medusae*) and red milk bush (*Synadenium*).

KALANCHOE: These succulents are closely related to the *echeveria*—both are in the *Cras-sula* family. Some are grown primarily for their interesting foliage (*tomentosa*, *marmorata*, *pinnata*), while others are cultivated for their cherry, orange-red, apricot or yellow flowers (especially the *blossfeldiana* and its named varieties like *Tom Thumb*, *Vulcan* and *Brilliant Star*).

STONE PLANTS: These incredible little succulents seem to belong to the mineral kingdom rather than the world of plants. You can collect different species like *lophophora*, *dinteranthus* and *pleiospilos*, and then have fun searching for real stones which look like your plants. Some of these "rocks" sprout daisy-like flowers.

WINDOWED SUCCULENTS: These wonders of nature, related to the stone plants, have translucent "window" areas in the top of each fat, clublike stem. Some varieties also have translucent leaf tips, such as the *H. cymbiformis*.

As as stepping stone into this fascinating hobby, you may want to consult some special books on the subject, like Ortho's "Container and Hanging Gardens," or you may wish to get a bit more technical by obtaining literature from professional groups such as the Cactus and Succulent Society of America, Inc., Reseda, CA 91335.

No matter how you go about it, if you want to try something really

different, try cacti and succulents. Give them tender loving care and they will show you what show-offs they can be. And, if your area suffers a drought, you can always crawl across the living room and drink your plants.

Additional reference:

Cacti and Other Succulents, by R. Ginns in conjunction with The Royal Horticultural Society published by David & Charles, 1975, \$9.95.

Continued from page 5

Williamsburg Flower Arrangements

addition of flowers may cause the water level to rise and spills to follow.

Foliage, with its large stems, is the easiest material to place in the vase first. Cherry laurel, purple leaf plum, bayberry and boxwood are used in many of the Williamsburg arrangements. A few branches interspersed with the flowers will blend the two together. Foliage and flowers are more easily handled without numerous side branches. Straight stems that are not too bushy go directly into place. For ease in handling, strip the stems that will be in water. This practice also eliminates leaves which will decay in water.

Spiky flowers such as larkspur, celosia, bells of Ireland or scarlet sage are ideal for outlining the shape of an arrangement. The rounded forms of tulips, poppies, calendula and monarda give weight and substance.

Last, but very necessary, is filler material. Feverfew, tansy and cleome, with large heads of many small flowers, can be tucked in among the more prominent blossoms. Many roadside plants also fall in this last category. A few are Queen Anne's lace, boneset and goldenrod.

Since it is becoming more difficult to find abandoned fields

filled with these flowers, it may be necessary to plant them in the garden. Also, some wildflowers such as black-eyed Susan do not last well when cut. To get the same effect buy seed of a hybrid *Rudbeckia*.

Try to avoid making a flat arrangement. The various positions and sizes of flowers as well as the colors provide a feeling of depth and dimension. Look at flowers growing naturally for hints about how to create depth for they usually grow at different angles and heights. Use spiky flowers or buds which will extend a little beyond the others to prevent a flat arrangement.

Dark colors deep in an arrangement make it look more stable and dense. An arrangement looks top heavy if many dark blue iris, for instance, are used at the top. Lighter colored yellow or white iris could be used to better advantage at the top.

To create a mass effect, try to weave each color and type of flower throughout the arrangement. This helps the viewer's eye to move out and over the entire mass. More of the stronger colors and larger flowers toward the center give a focal point.

Take time to look at the composi-

tion from the angle and distance it will be seen. If it is planned for a hall, where it will be seen either from above or from the hall, walk up and down the stairs. Sit down at the table before the guests arrive if it is to become a center piece for a dinner party. Move away from the arrangement to discover if more flowers may be needed near the edge of the container to prevent the feeling that the flowers were arranged and then placed in the container.

Once the arrangement is made, it needs a little care. This means adding fresh water as needed and removing old flowers. Clean water and clean vases slow down the development of bacteria which cause flowers to decay.

Foliage will often last longer than the flowers. If this happens, discard all the flowers, recut the stems of the foliage, and add new water and flowers.

The charm of the arrangements in Williamsburg's buildings is twofold. The compositions are lavish yet uncomplicated and at the same time lend elegance to their surroundings. In addition, almost anyone finds these arrangements are not difficult, but a pleasure to do.

Flowers that were grown in Vir-

ginia in the 18th century are used in the exhibition buildings of Williamsburg. If the original species cannot be obtained, a variety that looks as authentic as possible is grown in the cutting garden.

No such restrictions complicate arrangements in your own home, however, nor is it necessary to use 18th-century flowers to create decorations in the style of colonial arrangements. Whether you select a large or small composition, with almost any mixture of materials and colors, a mass of real flowers structured in the Williamsburg style will enliven your home by adding extra touches of your own personality and character.

Flowers Most Often Used in Williamsburg Arrangements

Annuals & Perennials

- | | |
|-------------------------|------------------|
| 1 Ageratum | 11 Heliotrope |
| 2 Bachelor Button | 12 Larkspur |
| 3 Bush pea (Thermopsis) | 13 Marigolds |
| 4 Calendula | 14 Monarda |
| 5 China Asters | 15 Peony |
| 6 Cleome | 16 Phlox |
| 7 Coreopsis | 17 Pinks |
| 8 Feverfew | 18 Red hot poker |
| 9 Gaillardia | 19 Snap dragons |
| 10 Globe Amaranth | 20 Sweet William |
| | 21 Yarrow |

Flowering Shrubs

- 1 Clethra
- 2 Mock orange
- 3 Sweet shrub
- 4 Vitex

Foliage

- 1 Aucuba
- 2 Bayberry
- 3 Boxwood
- 4 Cherry-laurel
- 5 Magnolia
- 6 Pine
- 7 Purple leaf plum

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A Simplified Method of Close-up Photography

Christopher Kriss, T. Davis Sydnor
and Margaret Coon
Department of Horticulture, Ohio State University
Columbus, OH 43210

Close-up photographs and slides of plant material are valuable aids to both the professional and amateur horticulturist. Many of us have wished we could capture a flower, leaf, bud, insect or disease on film. We are often unable to do so because of lack of photographic knowledge or lack of the necessary equipment to perform the task. There is really little mystery to close-up photography and it can be relatively inexpensive to accomplish.

Following is a list of the necessary equipment, including approximate costs of purchase:

1. *35 mm Single Lens Reflex Camera with 50-55 mm lens*—The same lens is used for both viewing the subject matter and for taking the picture. The 50-55 mm is a normal lens for a 35 mm camera and is usually included with purchase. Camera prices range from \$130.00 to more than \$400.00.

2. *Extension Tubes or Bellows Unit*—Extension tubes are fixed length tubes available in various lengths, which are inserted between the camera body and the lens. The bellows is a variable length extension unit, inserted in the same position as extension tubes. Both tubes and bellows allow for greater subject magnification resulting from greater extension lengths. Extension tubes cost between \$25.00 and \$50.00 for a set of three. A bellows unit will cost between \$25.00 and \$150.00.

3. *Electronic Flash with Extension Cord*—A miniature electronic flash which can be hand held should be used. The extension cord allows the flash unit to be aimed at the subject rather than mounted on the camera. Prices for flash units range from \$19.00 to \$119.00 or more with the extension cord.

4. *A tripod with reversible mount*—A tripod is necessary and may be purchased for as little as \$25.00.

5. *An Eyepiece Magnifier Attachment*—Is especially helpful (but not essential) for close-up work when fine focusing is critical. A cost of \$15.00 or more can be expected.

6. *Floral Clay*—A pliable material used to mount specimens. Floral clay is preferred over other materials because it does not dry out and its weight adds stability to the mounted specimen. The cost is negligible.

Taking photographs using the listed equipment is relatively simple. Bud and stem specimens should be mounted in a 3½ inch block of floral clay. The cut end of the specimen should be pushed into the floral clay deep enough to insure support and the subject should be parallel with the film plane or back of the camera. If more than one specimen is to be photographed at a time, both specimens should be positioned in the same plane to insure that they will both be in focus in the photograph.

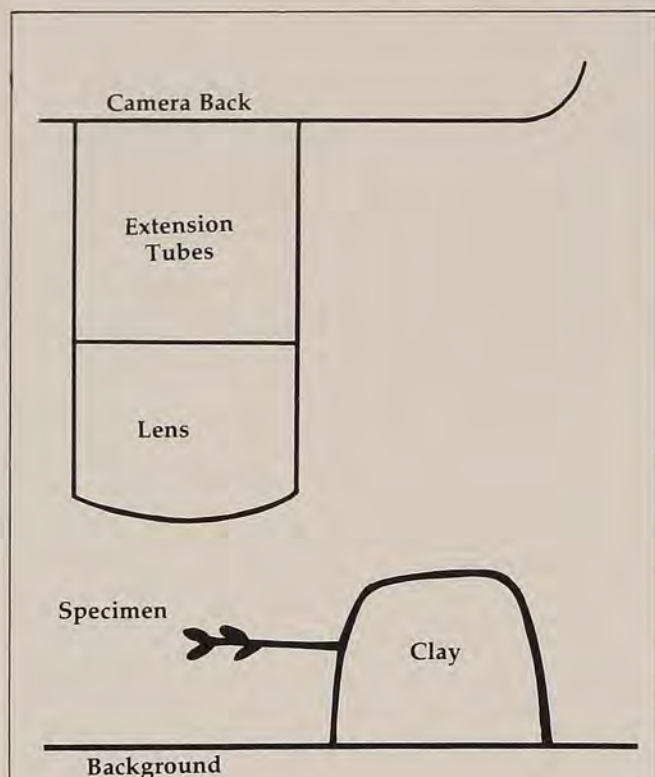
The background should be a uniform color such as a medium blue and should not detract from the object to



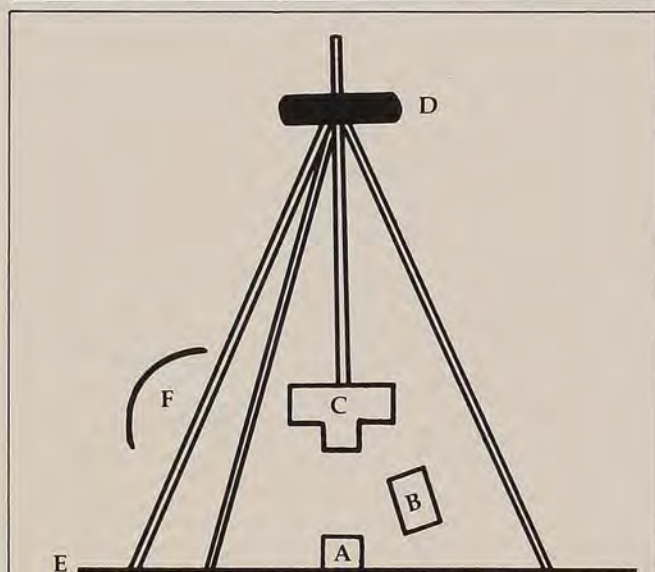
Above—Nymphs, pupae, and adults of greenhouse whitefly on the underside of a buckthorn leaf. Photograph taken with a Canon FT camera at f 16 with 35 mm of bellows extension. Flash to subject was 3 inches.

Right—Male flower of fibrous rooted begonia. Prominent stamens and lack of stigma characterize the male flower. Photograph taken with a Canon FT camera at f 16 with 100 mm bellows extension. Flash to subject distance 4 inches.





Relative positions of camera, subject or specimen and background. Film plane is parallel to camera back. Note that subject plane and film plane are also parallel.



KEY

- A Subject
- B Flash
- C Camera
- D Tripod
- E Background
- F Supplemental lights

Relative positions of camera tripod, subject and electronic flash.

be photographed. A background which is the complimentary color of the subject can also be used to intensify the hue of the specimen. The samples should be mounted at least two inches from the background to insure that the background is out of focus. This technique further isolates the subject. Leaf samples or other small items can also be mounted directly on the background material. In this case, the floral clay need not be used. The background material will also be in focus if the subject is placed directly on the background and subject isolation will not be as good.

The camera is mounted on a reversible tripod so that the camera is between the legs of the tripod. The tripod and camera are then placed over the specimen to be photographed. The lens is set for a medium distance with the *f*/stop (lens aperture) fully open and the camera is lowered until the subject is in approximate focus (about two inches from subject). Most reversible tripods are limited in distance to which they can be extended, but this can be compensated for by lowering the legs of the tripod or by raising the specimen. Mounted specimens are centered so that the objects to be photographed are within the viewing area of the lens. A single lens reflex camera is necessary for this step as the viewfinder line of sight is through the lens which allows the photographer to see exactly what the camera will photograph. For fine focusing, the eyepiece magnifier attachment may be used.

When ready to photograph, set the *f*/stop at the smallest aperture (largest number). This *f*/stop will give the greatest possible depth of field (the zone of sharp focus behind and in front of the exact point at which the camera is focused). The supplemental lights can be switched off at this time. The flash attachment should be held manually so that it is perpendicular to the long axis of the subject or subjects. The first exposure should be taken with the electronic flash unit held approximately three inches from the specimen. For the second exposure, extend the flash distance to six inches. The distances given are for films having an ASA (film speed) of 64 and using 30 mm of extension tubes at an *f* 22 *f*/stop.

These techniques make photographs with much more detail than would be possible with normal procedures.

Sharper pictures can usually be obtained by using this technique instead of supplementary lenses. Supplementary lenses are usually of poorer quality than the lens of the camera. Extension tubes and bellows do not add another lens, but magnify by adding distance.

Try your own close-up photography. Allow yourself time to study the marvel of a glistening dew drop on a delicate flower. Step back and view the tree as a whole or focus on one small leaflet—the view is merely a matter of perspective. Sometimes a close look serves to show us how much more there is to see.

Why Not Wild Flowers

woods even if it is only a small area, so that visual and mental faculties are stimulated and drawn into the garden. This can be effectively accomplished with the careful placement of plant material. Gardening is illusion. The use of plant material can create a desired effect. This includes the correct positioning of a screen of broad-leaved evergreens such as *Rhododendron catawbiense* (Rose-bay Rhododendron) accented with one or more flowering trees or shrubs to give the effect of distance and the feeling of acres of woodland beyond (when in fact this planting might be hiding the neighbor's garage or an unattractive view). On the other hand this same planting can also be used to bring a more intimate and close feeling to a large area. Backdrops of large heavily textured material like *Rhododendron maximum* (Rose-bay Rhododendron) and *Tsuga canadensis* (Hemlock) bring the perimeter in. Large eye-catching masses of material near the path bring the visual distance closer to us.



We must keep in mind the overall effect of the wild flower area and its place within the entire garden so that everything is tied together and exhibits continuity. We do not want to end up with a little patch of this here and a little patch of something over there, all totally unrelated and giving an unfinished jarring note. The whole garden must flow together as an entity. After all, it is our outdoor living room and needs the same thought and careful planning we give to the decoration of our indoor living space.

Having prepared the site we can begin to build the structure with plant material. You may wish to choose specimen plantings of a favorite, perhaps *Shortia galacifolia*, or feature spectacular plants like *Dicentra eximia* 'Purity' (Albino Wild Bleeding Heart), or *Galax aphylla*. Drifts of *Sanguinaria canadensis* (Bloodroot), *Trillium* and *Hepatica* species intermingled with ferns, *Lycopodiums* (Club Mosses) and other companion plants do well when planted near mossy stumps, rotting logs and well placed rocks. This is what we have been so patiently waiting and preparing for all this time. Now we can give full vent to our enthusiasm and go out and experiment with all the material that has held our interest and curiosity for so long. This is just a beginning.

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A different light on plant photography

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Move around. Look from behind a plant, from above, even from below it. When you see the picture you want—move in. Fill the viewfinder with the subject. Carefully compose the scene so that it is just as you wish to record it before you release the shutter.

Photographs which capture the exceptional lighting effects seen by gardeners at different times of the day are not limited to the professional photographer. Anyone willing to crouch or sit on the ground and spend extra time in the garden waiting for the sunlight to change can have excellent photographs.

A special lighting situation called “backlighting” exists if the sun is behind the object photographed and shadows point toward the camera. The use of this lighting technique can make your photographs more colorful and dramatic. Backlighting brings out subtle plant colors and lends depth to photographs.

The best light conditions for employing backlighting occur before 10:00 AM and after 3:00 PM. At this time of the day crouch, sit, or even lie down at plant or blossom level. With the sun behind your subject, observe how the light shines through and is reflected by different plant parts. This is the view to photograph.

When you are making your first attempts with backlighting repeat several photographs of the same subject at one or one-half f-stops under and over the reading which is called for by the light meter. This “bracketing” technique ensures proper exposure since your light meter may not always produce the desired effect.

Top left to right—*Pseudolarix amabilis* This was taken while lying on the ground looking up through the branches, *Acer rubrum* This was taken with the sun behind and to the right of the subject. The camera was held four feet above the ground.

Below left to right—*Prunus subhirtella* ‘pendula’ The sun was almost directly behind the subject. The photograph was taken with the camera five feet above the ground, *Nymphaea* Hybrid Cultivar This was photographed with the sun directly behind and above the subject. The camera was two feet above the ground.

Do not let the sun shine directly into the camera lens. This will cause “lens flare” which results in light blotches on the photograph. If necessary, move slightly to the left or right of your subject.

Each plant or blossom looks different and can be photographed differently at various times of the day. It is often necessary to wait for a picture to become available. A favorite iris may be shaded by a box hedge early in the morning. A water lily might not be fully opened or a cloud may obscure the sun for a time. It is important that you do wait for the proper light conditions in order to obtain the best possible photograph.

As you wait, observe the progressive changes that occur to individual plants and to the garden as a whole. Light intensity and color values change as the sun moves. Textures vary with the shifting shadows. Each of these changes can be photographed. It is up to you to be there at the right time to observe how the direction and angle of the sunlight can best be used.

Move around. Look from behind a plant, from above it, even from below it. When you see the picture you want—move in. Fill the viewfinder with the subject. Carefully compose the scene so that it is just as you wish to record it before you release the shutter. Even the most beautiful blossom will be ruined as an excellent photograph if the watering hose or a corner of the house is included. Since the viewfinder of a single lens reflex camera shows exactly what will be in the photograph, it is the most appropriate to use.

Try this technique. It will give you more exciting and pleasing photographs. At the same time it may help you to more fully appreciate your garden and enjoy the changes that occur in it throughout the day.

Wild Flowers from Seed

Germination Procedures for Wild Flowers Deciduous-Woodland Plants

Name	Site Preference	Flowering (f) Seeding (s) time	Germination Procedure
<i>Actaea rubra</i> Red Baneberry	Acid to neutral- humus- partial shade	May-June (f)	Clean seeds from berries- fresh seed best- fall sow outdoors- cover with peat moss- indoors, cold treatment
<i>Campanula rotundifolia</i> Harebell-Scotch Bluebell	Near neutral- rocky soil, open woods- drainage- sun, shade- in shade, cut back for further bloom	June-Sept. (f)	Seeds small- scatter on surface- sow fall or spring- germination indoors 10-30 days
<i>Sanguinaria canadensis</i> Bloodroot	Near neutral- rich moist soil- partial shade- dormant in late summer	Mar.-April (f)	Sow as soon as ripe in cold frame- protect with screen- cover with peat- some germination in spring

*All deciduous-woods plants have leaf mulch over winter in the wild.
They should thus be given a mulch of deciduous leaves if planted in the open.*

Plants of Acid (Evergreen) Woods

<i>Coptis groenlandica</i> Goldthread	Moist woods- shade	May-July (f) Aug. (s)	Fruits drop after ripe- fresh seed sown outdoors- germinate spring- indoors, cold treatment
<i>Epigaea repens</i> Trailing Arbutus	Sandy rocky woods or humusy rich, well-drained soil- partial shade	April-May (f) June-July (s)	Seeds tiny- bag fruits- sow outdoors when ripe or later- indoors germinates 4-8 wks- fresh seed best

Acid-loving plants do best with winter mulches of pine needles or evergreen branches.

Plants of Marshes-Wet Meadows

<i>Anemone canadensis</i> Canada Anemone	Damp thickets, moist ditches- rich, gravelly soil- sun to partial shade- withstands drying soil	May-Aug. (f)	Sow in fall or spring- fresh seed somewhat better- spreads into colonies
<i>Caltha palustris</i> Marsh Marigold	Wet meadows, swamps, brook-sides- rich soil- full sun or high open shade- dormant in summer	April-June (f)	Fresh seed best- cold helps- sow in moist soil- self sows freely

Plants tolerate near neutral soil unless otherwise stated. An over-winter mulch is helpful to all of these. Remove it gradually in spring.

Plants of Open Fields and Prairies

<i>Aster sericeus</i> Purple Aster	Near neutral to slightly acid- dry to moist fields and prairies- needs humus- sun to partial shade	Aug.-Oct. (f) Late Oct. (s)	In flats or outside- spring or fall- stratification or scarification helps- self-sows
<i>Opuntia fragilis</i> Prickly Pear	Sandy dry prairies	June-July (f) Aug. (s)	Flats or field- spring or fall- collect fruits in fall
<i>Tradescantia virginiana</i> Spiderwort	Meadows, woods' openings, railroad areas- gravelly to rich humusy soil- sun, part shade	May-June (f)	Sow in August- self-sows freely- may become weedy

Field and prairie plants take a soil near neutral to slightly alkaline unless otherwise noted, with enough sand or gravel to make it well-drained.

Prairie Grasses

<i>Andropogon gerardi</i> Big Bluestem	4-6'- dry soil, old fields, prairies, open woods	Oct.-Nov. (s)	Sow any time- blooms first year if sown early- stratification helps
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*The following specie is an exotic- that is, it is not native to the United States.
However, if a permanent fairly quick ground cover is needed under difficult conditions it is superior to any native species.*

<i>Coronilla varia</i> Crownvetch	Roadsides, wastelands, old house sites- good for erosion control- sun, partial shade	June-Aug. (f)	Seed in spring- needs inoculant- covers slope in 2-3 yrs.
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Continued from page 11

Chestnuts

Yet, newly harvested nuts contain excess moisture that if allowed to condense and accumulate on the nut surface leads to molding. Fresh nuts, whether for planting or eating, can be mixed with dry peat moss, and stored in a plastic bag in the refrigerator. The peat moss absorbs the excess moisture and acts as a buffer to keep the nuts in good condition.

Chestnuts can be prepared for eating hundreds of ways. Most children and many adults like them fresh. The Chinese chestnut is sweeter than the imported European chestnut that is commonly found in the grocery stores. The cooked nuts are a favorite in poultry dressing, as a condiment in vegetables, soups, and stews, or simply prepared in a white sauce. They are candied, mashed, or chopped for all kinds of desserts as well. The nut shells are readily cut and peeled after the nuts have been boiled in water for five minutes. Such shelled kernels can then be frozen for later use. At home we peel chestnuts while watching the fall football games.

Best germination occurs after the nuts have had at least two months of refrigeration. Nuts planted in the fall receive a natural cold treatment but should be mulched to protect from extreme cold and screened with wire or otherwise protected to prevent theft by wildlife. When planting, nuts should be covered with one to two inches of soil.

For those wishing to pursue interests in the selection, culture, and propagation of chestnuts I recommend membership in the Northern Nut Growers Association, 4518 Holston Hills Road, Knoxville, TN 37914, \$8.00 per year. The Association holds an annual meeting and has just published their 66th Annual Report. This one contains 190 pages and 35 reports by amateurs and professionals on the state of the art of selecting, breeding, and growing our temperate climate nut trees.



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The Gardens of Sussex, Surrey and Kent

*Paul Malo
303 Elm Street
Fayetteville, NY 13066*

The concept of a "landscape garden," is characteristically English. Yet it is often difficult to differentiate between the cultivated English garden and the natural scene. Driving in Great Britain is a pleasure, after one acquires a mirror image of one's normal reflexes. Distances are not great, by American standards, and many well-known features may be visited in a few days. It is the small-scaled fabric of the English scene, with hedged lanes weaving together old villages and noble country houses, which ought to be appreciated. The tourist is better rewarded if he concentrates on a few counties within a short tour.

The English landscape and its famous gardens have their seasons. Most perennial borders still are rather green, when the woodlands are illuminated by rhododendrons, azaleas and wild bluebells. Later, when the woods are darker, the herbaceous borders are heavy with a summer color. Although every month offers seasonal celebration, the occasional visitor probably will choose between the spring gardens or the summer gardens at their peak. The end of May is a good time for a spring visit. During the last week of that month the annual Chelsea Flower Show in London is a special attraction. When staying in the country, excellent train service makes the event convenient, within a day's excursion to town. Remarkable hybrids of rhododendron and azalea, some grown to colossal size, in dramatic settings, star at this time of the year. Roses are remarkably early in Britain (or seem so to us in the northern states) especially the older species. Hybrid teas begin more conventionally in June. For those accustomed to harder climates, it is surprising to see walls covered with roses in bloom concurrent with the flowering of spring bulbs. Clematis also is featured together with other showy wall plants such as abutilon, ceanothus and wis-



Gravetye Manor, the home of a famous gardener, is now a country hotel. It serves as an ideal base for touring the gardens of southeast England.

Photo by Paul Malo

teria. There is color in every garden.

For a sojourn of one to four weeks, southeast England affords the visitor a rich concentration of horticultural fare. The lovely landscape of hills, woods and meadows lying in southern Surrey, western Kent, and Sussex, between London and the sea, blessed by climate and by convenience, are enriched with outstanding gardens. For those beginning at London, a chain of great establishments might be linked, extending in an arc from London's Kew (see map) to include the Royal Savill Garden at Windsor (2), then turning southward to Wisley (3) as an initial itinerary. The vast Royal Botanic Gardens at Kew, however, require something of an expedition in themselves, and more properly are a part of the city rather than the country. Windsor is close to Heathrow Airport, for those arriving by air and departing by automobile for the south.

Many of the places to be visited are accessible by day trip from London, but more convenient is a central base. Of many delightful town and country hotels, few recommend themselves to the gardener as attractively as Gravetye Manor (4) picturesquely situated near the Sussex village of East Grinstead. Late in the 19th Century, William Robinson, an eminent gardener, author and publisher of garden books and periodicals, bought an old stone manor house. Surrounding it are classic model gardens representing the highest taste of the era. They are combined with the sensitive perceptions of designers such as Gertrude Jekyll.

In the immediate neighborhood of Gravetye Manor are many important gardens. One of the closest at hand is Wakehurst Place (5), an established garden which was acquired recently as a country annex to the Royal Botanic Gardens at Kew. As may be expected, standards here are highly professional.

Although lacking the intimacy of most private gardens, Wakehurst Place certainly is less institutional than is Kew itself. It retains much of the character given to it by Gerald W. E. Loder, one of the notable gardeners of the early 20th century.

Contrasting is another nearby garden, Beeches Farm (6). As the name might suggest, this is a domestic garden, surrounding a farmhouse. One suspects that the gardening is done by the owners. Not small by comparison to American residential grounds, it is not so grand as are some neighboring places here. The visitor may be charmed to find something familiar, recalling what he has been able to do with his own resources.

The logistics of visiting these private gardens is critical. Often they open at different hours, on different days of the week. Some are opened only on special occasions for local causes, or for the Garden Scheme, a national charitable program. Those which are open more regularly are listed with usual accuracy concerning times and conditions in a guide, *Historic Houses, Castles and Gardens* published annually by ABC Historic Publications of Oldhill, London Road, Gunstable, Bedfordshire, LU6 3EB, England—(readily available at Newsstands and bookstores throughout Britain).

Many private estates are remote from public transportation, and an automobile yields most satisfactory arrangements. Even though the *Historic Houses* guide may describe alternate strategies of varying complexity, there is considerable walking entailed, once one departs from public transportation. Between highway and garden may be a good hike down tree-lined driveways. With one's own vehicle, the garden gate itself can be approached directly, from a convenient parking lot. This is an advantage since considerable footwork usually is required once inside the garden gate. Several

roadmaps show locations of prominent houses and gardens. The *Mobil* map has served as a good guide, and it helps to have an alert navigator as a co-pilot.

Certainly the serious gardener ought not to be in this part of the world without visiting Wisley (3). This is another extensive country place which is the property of the Royal Horticultural Society. Although endowed naturally with little exceptional scenery, its wealth of plant material and quality of gardening absorb attention. There are rock gardens, woodland gardens, formal gardens, and extensive perennial borders. As one might expect, most aspects of English horticulture are represented. Perhaps most fascinating are the fields laid out functionally in beds, where the "trials" occur. The expanse of floral bloom is gorgeous and intriguing. Wisley is a place to learn, a place to visit with a pencil and pad.

More scenic is Sheffield Park (7). Not a flower garden, it is a "landscape garden" in the 18th century sense, laid out by "Capability" Brown about 1775 and much enriched by plantings early in the 20th century. A series of lakes have been contrived, varying in shape and elevation, affording a sequence of continually varied pictures. The diversity of trees and shrubs reminds one of a major arboretum, with specimens now grown to magnificent maturity. Sheffield park is a place to bring your camera.

A genuine landmark—one of England's major arts is Sissinghurst Castle (8), the well known modern garden created by the late V. Sackville-West and her husband, Harold Nicolson. They purchased the ruins of an ancient, moated castle, overrun with brambles which was used for agricultural and barnyard functions. Without a major house, save for a towered gateway and several cottages, the garden itself became the object of attention. It is conceived

as linked rooms, characterized by concealment and surprise.

Not far away is Great Dixter (9). The garden, creation of the well-known gardener and author, Christopher Lloyd. The house may be visited, and clearly it is a family home. The charm of the place is attributable not only to the Lloyds, but to architect, Sir Edwin Lutyens, who restored the dwelling and moved another old house to join it. Lutyens was a contemporary of William Robinson and Gertrude Jeckyll, and worked regularly with the latter in landscaping country houses in the formal-informal style influenced by the cottage garden. Plants are varied at Great Dixter. Some are for sale.

Bodiam Castle is also in the neighborhood (10). A picturesque ruin today, it is a genuine moated stone fortress of historical interest. Not far to the west is Rudyard Kipling's home (11). It may be of interest for its literary associations, although the gardens are not outstanding. If the itinerary may be extended as far as Canterbury, to include its cathedral, a route from Sissinghurst will pass through the attractive Kentish villages of Biddeford (12) and Smarden (13), where a detour from the main road is warranted. Chilham is a lovely place situated on a hilltop near Canterbury. Its half-timbered square is closed on one side by the walls and gates of Chilham Castle (14). No stone fortress, it is rather a brick country house of unusual shape, taking full advantage of its hilltop site. The terrace gardens here are good examples of their kind.

Not so far from the central expeditionary base is another "castle", south of the photogenic village of Goudhurst (14). Scotney Castle (15) is not a massive fortress. Here a 19th century "new" house overlooks a wooded vale and the romantic remains of the old Scotney Castle built on an island in a small lake. This is another place to bring your camera.

Still another "castle", and in its own way quite worth a visit, is the astonishing display created by the American expatriate William Waldorf Astor, at Hever Castle (16). Here vast, turn-of-the-century, supposedly "Italian" gardens are linked improbably with an ancient moated house. The pleasure grounds are reminiscent of William Randolph Hurst's taste at San Simeon in its more Cecil B. DeMille aspects. It is spectacular and a crowd pleaser. The house itself, needless to say, is worth seeing.

Some other very attractive houses ought to be pointed out in the neighborhood, even though they are not accompanied by splendid gardens. One such is Puttenden Manor (17), a genuinely intimate old house, despite its rambling size. There are more noble establishments in these counties, and Petworth House (18) and Knoll (19) come to mind, representing "stately homes" in all of



their grandeur. Although the gardens are not objects of pilgrimage, the contents of the houses are. Even if less interested in architecture and the decorative arts, the visiting horticulturist may wish to see a home such as Polesden Lacey (20). Its garden is good, but by itself might not be considered exceptional. But gardens, house and furnishings, taken together, add up to a rewarding experience. There is a sense of wholeness to the place.

At Penshurst Place (21) the gardens of another ancient castle are

elaborate, while Squerries Court (22) is very different, being a moderate sized house, (as English county seats go) with garden in scale. Mereworth Castle (23) is a monument of architectural history, but as it is not listed in the *Historic Houses* guide, special arrangements may be required to visit it. Another attractive landmark, even though it has no elaborate garden, is Ightham Mote (24). This ancient manor house is situated picturesquely on an artificial island. Even more modest is the intriguing old house in the village of Limpsfield, Surrey, called "Detillens" (25). Although more than a cottage, it is one of the smallest homes of the area open to the public.

Certainly no tour of these southern counties would be complete without a visit to the seashore. This means Brighton. There are some lavish floral displays in public areas, but second only to the sea itself as an attraction is the Royal Pavilion (26). This eccentric curiosity should amuse even the most jaded visitor to "stately homes". Nearby is a well known garden, Highdown (27) at Goring-By-Sea (Worthing). It is another property unlisted in *Historic Houses* and may require special arrangements to be seen. Many gardens not normally accessible to the public may be visited on special occasions, and in planning an itinerary a schedule of openings is helpful, such as the booklet prepared by the National Gardens Scheme, 57 Lower Belgrave Street, London, S.W.1.

"Thrilling" (the word is used judiciously) is Beachy Head (28), a magnificent windy promontory west of Eastbourne, where billowing fields of golden gorse rise to sheer white cliffs. Far below, a tall lighthouse rising from the sea appears as a toy. Gulls nest in the chalk hover suspended in the updraft. The air is clear, and the countryside unspoiled for miles around.

Although Western Sussex may be rather far afield, the historic city

of Chichester with its cathedral, nearby Arundel Castle (29) and the Weald and Downland Open Air Museum at Singleton (30), are worth the trip. Nearby is one of the most beautiful English houses, Uppark (31). It is not a garden which attracts visitors to this moderate sized house on the South Downs. Rather it is the special quality of the interiors, imbued (some have said "hauntingly") with a history of a family and its varying fortunes. Without great means at their disposal, recent generations have preserved and laboriously restored furnishings including original, centuries-old fabrics.

The more serious horticulturist of specialized interests might be directed instead to a place such as Great Comp (32). The house neither is an attraction nor is it open, but the extensive gardens concentrate on heathers and several other genera. The owners themselves are active horticulturists, and have created and maintained the grounds. They offer for sale many interesting and unusual specimens. Another more specialized garden is Borde Hill (33) which has a large collection of Rhododendrons, Azaleas, and Camellias. Accordingly, it is probably most rewarding at the end of May, although it has a smaller summer flower garden as well.

Without doubt the great woodland garden in this part of England is Leonardslee (34). It receives the public for several weeks in May and early June (and is open for one weekend in October for autumn color as well). A vast and gorgeous spring garden is spectacularly situated and whole vales are carpeted with azaleas in fragrant bloom.

The gardener may wish to conclude his tour with another major landmark of English gardening; Mymans (35) makes an excellent finale. It seems somewhat disorganized, particularly since arrival is not at the main entrance of the

house (which is not open) but at a secondary entrance at the service end of the gardens. Although one may feel slightly disoriented, all of the variety of the English garden is present here, combining the scenic view over a park, woodland gardens, heather and rock gardens, lawns and herbaceous borders, as well as rose gardens and spring borders. Much of the house was burned out some years ago, and the ruin of stone walls remain as a romantic backdrop for a terrace garden.

These gardens of Surrey, Kent and Sussex, provide a sampling. There are other fine places within the three counties. Perhaps the gardener, if visiting Britain only once, will prefer to travel greater distances to other famous gardens. To all of these, a good general introduction is *The English Garden*, by Edward Hyams, available in paperback from Thames and Hudson, 30 Bloomsbury St., London, WC 1. But, rather than attempting to "do" all of these most famous gardens in the British Isles on one trip, it may be more practical and comfortable to restrict the itinerary to a single region such as the southeast, convenient from a central point. Return, in varying seasons, to these many gardens of Surrey, Sussex and Kent. Plan as well to visit the other forty-nine counties of England and Wales, and the thirty-three more counties in Scotland, thence to Ireland. Many more good things await, regardless of how often one returns.

The American Horticultural Society is planning an August 1977 exploration of England, Scotland and Wales, and will be printing further details soon. If you wish immediate information, please write:

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Some of Nature's Gifts to Medicine

Joseph Jennings,
Dept. of Biological Sciences
Wellesley College
Wellesley, MA 02181

Favorite remedies are to be found inscribed on the world's oldest medical book, a Sumerian clay tablet which records plant drugs of forty centuries ago. In every culture and age man has scrutinized the plant world for a cure to his ills. So today, modern pharmacologists still seek out flowers and herbs for medicinal purposes. Long before members of the human race reached our shores, the fully advanced civilization of many races including the Aztecs, Incas, Indians, Chinese, Japanese and Africans discovered by success and failure the medicinal uses of the plants growing around them. Some of these have stood the test of time, and others have failed.

Although plants have been used in medicines for thousands of years, many are poisonous. Therefore, the pharmaceutical uses of the plants discussed should not be taken as an approval or sanction by the author.

A very delightful plant in the garden is the Madagascar periwinkle (*Vinca rosea*) "bright eyes". It requires very little care except an occasional watering, yet this plant is very important in the treatment of Hodgkins disease and childhood leukemia. From the pretty periwinkle vinblastine is obtained for Hodgkins disease which attacks the spleen, liver and lymph glands and vincristine for leukemia, a disease of the blood. It takes several tons of crushed leaves from India to make a small amount of vincristine sulfate.

Many of us plant the White Willow (*Salix alba*) as an ornamental tree for its quick growth, graceful foliage, pleasing form and bright golden or orange twig which in the winter will survive in most any conditions. It is a very important medicinal plant. For many years, country folk treated fevers with a compound from willow bark. Did you know that in the 1820's its active ingredient salicin was isolated and in 1899 a synthetic extraction gave the world *aspirin*?

The common Foxglove (*Digitalis purpurea*) is a biennial, and flowers the second year from seed sown in June. Also the Foxglove may be forced into bloom in the early Spring in the greenhouse. The plants are tall, erect, bearing long tubular purple or red spotted flowers in June and July. They prefer rich soil, a partially shaded location, and often seed themselves. In Pennsylvania it is cultivated for drug use, particularly as a heart stimulant. Once a native of Europe, it has spread from New York to South Carolina and the West Coast. As long ago as 1000 A.D. its medicinal value was known in England. Foxglove really owes its place in medicine to William Withering, the 18th century physician and botanist, who found that its dried leaves were of medical importance.

Aloe (*Aloe vera*) a perennial succulent herb native to Africa and belonging to the Lily family, is used to

make a sunburn lotion. Radiologists also have found a substance to help ease external atomic radiation burns. The Bible says it was brought to prepare the body of Christ. We grow Aloe in pots in a sandy loam soil with a little peat and old manure added along with some lime. Unless active growth is evident, very little water is given and plants should remain in the same pots for several years.

Eucalyptus globulus (Blue Gum) is a very tall tree up to 300 feet that is mostly planted in California. Here it is grown as a pot foliage plant. The foliage is blue on young trees and green on old specimens. This tree grows very rapidly. When the leaves are harvested and distilled they produce eucalyptol which can be used internally for bronchitis, tuberculosis and throat inflammation. By using boiled leaves or bark the vapor can be inhaled for cough or respiratory disease and diphtheria.

Camphor Tree (*Cinnamomum camphora*) grows up to 40 feet in height. Both the leaves and twigs produce a very strong camphor scent. The flowers are yellow. The tree can be found growing in Florida and California. We grow it as a pot plant keeping it trimmed to about five feet. It needs a fair amount of water and a warm temperature. This tree is still a source of camphor. The extract is made from the twigs and leaves. It acts as a circulatory stimu-



Top Left-*Hamamelis mollis brevipetala*.
Below Left-Jack-in-the-pulpit.
Below Right-*Asclepias tuberosa*.



Photos by Barbara H. Emerson

lant and has a calming effect in cases of neuralgia, hysteria and general nervousness. The oil has been used for rheumatism, diarrhea and muscle pains.

Arborvitae (*Thuja occidentalis*) is an evergreen which can attain a height of 60 feet. The needles are bright green on top and yellow green below. It bears long brown cones. This evergreen grows best in swampy areas or along streams. In bygone days the leaves were used for rheumatism, coughs, fever and gout, while the cones were made into a powder and mixed with milk to rub on the joints affected by rheumatism.

Flowering Dogwood (*Cornus florida*) is a tree about 35 feet tall with flowers that are greenish yellow or white without stems. It needs very little pruning and grows best in acid soil and shady moist areas. In the fall this tree produces red berries in dense clusters. One can find the Dogwood in New England west to Michigan, Illinois, Kansas, south to Texas and Florida. Years ago Indians boiled the bark in water and rubbed it on aching muscles. In Colonial times the flowers, fruit and bark were boiled and used for malaria. It is now used to treat jaundice, liver ailments and cholera.

Garlic (*Allium sativum*) is an annual coming from a bulb made up of several bulblets. Common in all parts of the United States one can find it along roadsides, pastures, fields and open woods. The entire plant can be used as a medicine since it contains a compound called allicin, used to control worms in pets and people. Poultices of the mashed plant have been used for snake bites, hornet and scorpion stings. Colds, coughs and asthma have been treated through eating the fresh bulbs. A toothache may also be treated by pressing the bulb against the gum.

Castor-oil Plant (*Ricinus communis*) is a plant of the Spurge family naturalized in the tropics and warm regions and used both for medicinal

Continued on page 42

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Publications

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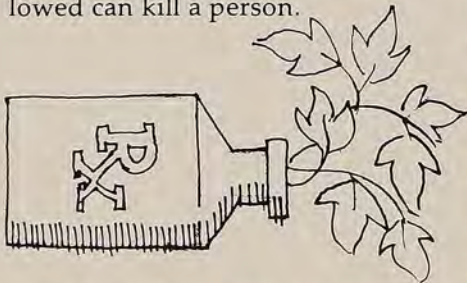


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and ornamental purposes. In the North it is treated as an annual and planted as a specimen or as a screen. The flowers without petals are born in panicles covered with dark brown spines. The fruit is a capsule containing three large seeds which when crushed yield the castor oil of commerce. A word of caution should be used when handling the beans. As few as two beans swallowed can kill a person.



Jack in the Pulpit (*Arisaema triphyllum*) commonly known as wild turnip, bog onion and wild pepper is found in swamps and the damp woodlands of New York, Massachusetts, Connecticut, south to Georgia and Kentucky. This perennial usually has two stalks of three leaves each, and a third stalk topped with a pulpit-covered hood. This pulpit is where the clusters of scarlet berries are found. During the spring or fall the corms have been grated and boiled in milk and used for coughs and tuberculosis Indians, however, used these same corms as food.

Garden Sage (*Salvia officinalis*), a perennial herb with grayish foliage, needs a well drained soil. Throughout the United States this plant can be found in fields, gardens, dumps or beside the road. In the earlier 19th century the leaves were used to eradicate warts. The Indians produced a salve from the leaves mixed with grease for the treatment of sores, coughs and colds. Sore throats have also been treated with leaves of this herb.

Golden Glow (*Rudbeckia laciniata*) is a ten foot perennial which grows especially well along the banks of streams or in the rich fields of New

England, south to Florida, Louisiana, Texas and New Mexico. When mature the New Mexicans make a tea from the leaves used on patients with kidney trouble and Brights disease.

Colchicum (*Colchicum autumnale*) is a fall flowering cormous plant, bearing clusters of large pale lavender blossoms in the fall. The corms are hardy enough in the temperate zone to be left undisturbed for years. The coarse grassy foliage appears in the spring, dying down before midsummer. The bulbs are used for treatment of rheumatism and gout.

Butterfly Milkweed (*Asclepias tuberosa*) has fuzzy leaves and is a perennial that grows up to three feet. The bright orange flowers come in clusters. This perennial can be found on the edge of forests, pastures, roadsides and gardens almost anywhere in the country. During the fall the leaves have been used as a tea to induce vomiting. Extracts from the roots taken have helped colic, hysteria, hemorrhaging and weakness while dried roots are used as poultices.

Common Club Moss (*Lycopodium clayatum*) or foxtail is a very low-growing evergreen perennial found not only in our eastern and western localities, but also in Alaska. Severe diarrhea, chafed skin and lack of appetite have been helped by using the spores of the plant.

Witch Hazel (*Hamamelis virginiana*) or winter bloom and white hazel are some of the names given this tree or shrub that produces conspicuous light yellow flowers in the late fall or early winter. It is a welcome sight before the snow comes. The bark, twigs and leaves are the basis of witch hazel extract. It is used in many medicinal lotions to treat sprains and bruises. The Indians used this plant extensively for many ailments.

Most of these plants mentioned may be obtained in local garden shops, but some of the tropical plants may be ordered from Florida or California.

WINTERIZE YOUR YARD AND GARDEN

by

George Taloumis

J. B. Lippincott Company, \$9.95

George Taloumis has done it again with a book that meets special needs of gardeners. This time it is "Winterize Your Yard and Garden." Why didn't somebody think of this before! There is so much in the way of day-to-day practical lore applicable to essential gardening chores which only years of accumulated experience can make known. Here it is between the covers of a readable book, for the novice who will welcome the help and for the old-timer who will welcome the reminders.

Preparation for winter is more than raking the leaves. The author's numerous black and white photographs show in detail other important activities, from shaking off the snow and sanding the paths to tying up the hose and beautifying the window boxes. You will learn which pulled-up plants from the vegetable garden should not be returned as organic matter to the soil, which flowering perennials are suited for fall lifting and moving, the before and after appearance of pruning methods, tying and bracing shrubs and trees, how to attract birds during the winter, and winter indoor gardening activities. Getting ready for spring is another whole section full of similar detail.

The book is divided into four sections: Fall Chores, Winter Activities, Getting Ready for Spring, and Schedule for the South designed especially for southern gardeners who have their own winter-related problems.

"In the South," Mr. Taloumis writes, "it is not so much a matter of 'winterizing'—winter in the south is short. Only tiny sections in California and Texas and a larger area in southern Florida are generally free of frost, but there are certain tasks to be performed." Special feeding recommendations, protective suggestions, lawn care and other winter occupations of the southern gardener receive attention in this final section of the book.

Mr. Taloumis writes that "winterizing the garden has become a sophisticated art—if attractiveness is kept in mind, as it should be. . . . Today we have a great many aids to make a secure, healthy garden in winter possi-

BOOKS

Reviews by Tom Stevenson

ble, as well as easy. It is all a matter of knowing what to do and when, this depending largely on weather, and perhaps the first requisite for success is to get to know your climate as much as you can . . .

"So no matter where you live in the country—except in a limited minute area—take precaution, with certain tender plants at least, if you want your garden to come through the winter as unscathed as possible. The purpose of this book is to help you achieve that goal."

As an assist, the Arnold Arboretum Hardiness Zone Map of the United States forms the end-papers of the book.

J. Steffey

ORCHIDS: FLOWERS OF ROMANCE

by

Jack Kramer

Harry N. Abrams, Inc.

New York, N.Y.—1976

309 pages, wonderfully illustrated, \$35.00

This big book (12 by 10½) is described by the publisher as shamelessly lovely, intoxicating to behold, with 92 full-page full-color pictures of orchids and 161 other illustrations. It is no exaggeration.

Orchids can be grown in the home and it could be an exalted hobby for someone who would take pride in the flower and find pleasure in making the plants bloom. With a careful choice, it is possible to have flowers throughout most of the year.

Most of the orchids in this book are from my collection, the author says, and were photographed in my garden room.

"I only wish that photographs could catch scent, because some orchids have such a lovely fragrance.

"There are many books on how to grow orchids," he says, "but few books on the plants themselves. I shall concentrate here (in the book) on the plant and its background.

"Included are the best possible photographs, which show the true beauty of the plants as they really are—the exquisite texture, the incredible form, the dramatic character of the flowers."

In fact, there is almost everything most gardeners would want to know from an orchid book that does not pretend to be a how-to.

INTERIOR DECORATING WITH PLANTS

by

Carla Wallach

Macmillan Publishing Co.

New York, N.Y.—1976

239 pages, beautifully illustrated, \$14.95

The author works in New York City as an indoor and outdoor plant and garden designer.

While the many superb interiors one sees gloriously pictured in home magazines show effective use of plants from a design point of view, says she, they are disastrous insofar as the culture of the plants is involved.

Saucers are nowhere in sight to catch the necessary drainage water, or else every plant is potted in a container without drainage holes, which is worse!

Geraniums are on a coffee table twenty feet from the nearest window. Shade-loving plants are in a brilliantly sunny alcove, or so dangerously close to the fireplace that they would be cooked vegetables should the owner light the logs.

"I have seen homes where plants flourish gloriously, in old stained pots, resting in makeshift saucers or in undisguised aluminum pans," she says. "No attempt is made to reconcile the plants with the rest of the otherwise attractive room."

It is possible to have both the beautiful and the functional, says she. Plants can be placed where they properly belong, and still be displayed attractively.

To a plant a pot is a pot, a container a container, therefore, why not select the right one, not only for the health of the plant but also for the room and the personality of the plant.

"If plants can thrive and do double duty by hiding some ugly spots in a room, why not take advantage of it?"

That is what the book is all about. It is a complete guide to attractive ways of beautifying the home with plants and how to take care of them.

JULIA CLEMENTS ABC OF FLOWER ARRANGING

by

Julia Clements

Quadrangle/The New York Times

Book Co.

New York, N.Y.—1976

96 pages, beautifully illustrated, \$6.95

The author has received the Victoria

Medal of Honour, the highest award of the Royal Horticultural Society of Great Britain, for her pioneer work in flower arranging.

If you have never before arranged flowers, this is the book for you. If you are wondering how to start an arrangement, your questions are answered, however elementary or advanced your knowledge.

Every basic point is explained in nontechnical language with over a hundred step-by-step photographs.

DRIED GRASSES, GRAINS, GOURDS, PODS AND CONES

by

Leonard Karel

Scarecrow Press, Inc.

Metuchen, N.J.—1976

201 pages, illustrated, \$8.00

This guide will broaden the horizons of those who wish to preserve the beauty of the plant world beyond its season. The author of a highly successful guide to flower drying, in this book covers other plant elements, telling where to find and how to use them for decorative purposes.

Several hundred species are listed with dimensions of pods, cones and the like, comments on the shapes of seed vessels, and discussion and description of methods for use and for modification through painting.

A brief history of the uses of these materials is included, along with illustrations of representative kinds which furnish the bases of arrangements.

GROWING HERBS IN POTS

by

John Burton Brimer

Simon and Schuster

New York, N.Y.—1976

206 pages, illustrated, \$5.95

Most of the herbs we commonly use in cookery lend themselves quite well to container culture, the author says, either indoors or outdoors, making this an interesting and rewarding hobby.

He tells us how to grow the most popular herbs on your windowsill, on terrace or anywhere in the house under artificial lights.

Also included is the most recent information on indoor gardening generally with fluorescent lighting.

A big section of the book is devoted to herb recipes.

Q&A

Questions

By Tom Stevenson

Q: We want to raise the soil level of our lawn 8 to 10 inches. Will this be o.k. for a pin oak growing there?

A: Raising the soil level around trees and some large shrubs often results in death or serious injury, according to Boyett Graves, horticulturist, Virginia Tech Truck and Ornamentals Research Station, Painter. It is generally felt, he says, that the damage is caused by oxygen starvation of the roots due to restriction of free air exchange in the root zone. Oaks and conifers (pines, fir, cedar, etc.) are the trees that appear to be most susceptible to over fill damage.

The damage may be prevented or reduced by constructing a well around the tree trunk and installing several porous tile tunnels radiating from the well to the outer edges of the overhanging branches. The overfill is placed on top of the tiles which supply air to the root system in the soil under the overfill.

Q: We have been using rock salt on our pavement during the winter to get rid of ice. Is this as bad as some people claim? Is our grass likely to be killed?

A: This is a question for which there is no really good answer at this point, because research results are inconclusive. The salt may do a lot of damage and then again it may not. The degree of harm to vegetation depends largely on the amount of salt used, the type of soil, total precipitation (to leach away the salt) and the kind of plants involved.

Dr. Charles E. Buck, Professor of Microbiology, University of Maine, made an investigation to determine if the soil adjacent to a major highway had been so heavily contaminated with sodium chloride that the number of aerobic bacteria present in the soil had decreased to a point where normal soil activities were inhibited.

It was thought that a major change in the microbial flora might result in undesirable activity taking place in the soil.

Soil samples were collected from three locations north of Bangor along Interstate 95 which had been salted during the winter months. Two of the areas had been salted for one year, while one area had been salted for six years. The soil samples collected from the edge of the roadbed and extending as far as 200 feet showed an increase in the number of aerobic bacteria nearest the roadbed and decreased numbers in samples collected at varying distances from the road.

However, a study of high salt concentration along roads in New Hampshire has shown a correlation between the decline of roadside maple trees and a high salt concentration in the soil.

Dr. Michael Dirr, Professor of Horticulture, University of Illinois, says that salt injury to trees is highly variable, with some plants more susceptible than others. This is complicated by the ability of plants to adapt to salt and evolve races and ecotypes that are tolerant. Sodium chloride injury occurs up to 50 feet and calcium chloride up to 200 feet from a treated highway, he says. The ex-

and Answers

posure time is very important as to whether injury occurs. Concentration is also important.

Specialists recommend that home owners play it safe and go easy with rock salt and other ice-melting chemicals. Salt injuries include one-sidedness, witches-broom effects, and stunting. Some of the most susceptible plants are hawthorn, crab apple, juniper, Scotch pine and pin oak. Factors that contribute to salt tolerance in plants include waxy needles and stems, hidden buds and certain biochemical factors.

Larch (tamarack) appears to have the ability to preclude sodium chloride from building up in its cells. It appears that sulfates of sodium are not toxic, whereas chlorides are bad for plants.

Q: Some years my Christmas cactus blooms beautifully and stays in bloom until Easter, but most years there is not a sign of a flower. Can you tell me how to take care of it so it will bloom for Christmas?

A: Dr. R. T. Poole, associate physiologist, Florida Agricultural Research Center, Apopka, has done three years' research with Christmas cactus. He says day length influences flower bud initiation as well as temperature.

With a 9-hour day (kept dark the remaining 15 hours) for six weeks or more, with night time temperatures no higher than 68 degrees, the plant will start to bloom in 9 to 14 weeks. Blooming continued for 4 to 8 weeks after the first flower opened, Dr. Poole reports.

With a 12-hour day, which occurs starting about Sept. 26, with

uninterrupted darkness at night, with night temperature of 60 degrees, the plant should start to bloom about Dec. 15.

When growth slows down in September, force the plant to rest by giving it only about half as much water as it was getting previously. Give it more water starting about Oct. 15. Give the plant very good light during the day with filtered sunlight preferred until about the middle of November when bright sunlight is best.

Q: For many years I have heard the old saw that ivy growing on buildings destroys the mortar between the bricks, yet I have seen ivy growing on half the buildings in Europe many of which have been standing for centuries. Just what is the story about ivy? I feel we should get the facts straight before the ivy is all ripped out.

A: Suzanne Warner Pierot (she is president of the American Ivy Society and a Fellow of the Royal Horticultural Society of Great Britain), author of "The Ivy Book," (Macmillan-\$4.95) says:

"I am convinced that many a stately home in England and many a neglected medieval building remains standing today because ivy chose centuries ago to throw a resplendent green mantle of glossy protection over it.

"Of course, ivy does loosen mortar. It does get under clapboards. It can be destructive and must be kept in check on some buildings.

"But for instant age and that old world look, nothing surpasses it. All you need is the money for repairs.

"Through the centuries there have been many people who have accused ivy of strangling trees . . . but ivy is not a parasite. The ivy does not sap the energies of a tree to live. It does not need the tree's nourishment."

Q: I have a black walnut tree which is eight years old. This year it had its first bearing—two nuts. The tree is about 20 feet tall. What I need is precise information on how to prune the tree. I do not want to hamper its bearing next year. The tree is beautiful with its sprawling branches, but I think it should be pruned.

A: Walnut trees old enough to bear nuts can be pruned any time during the winter dormant period. Prune in moderation. Cut out deadwood, and thin out crowded or crossing branches, or any that are lower than desired. Avoid cutting off the short twigs which grow on the limbs. Their leaves nourish and shade the limbs, and their removal could result in weak, sunburned limbs which become rotted and riddled by boring insects.

Avoid cutting branches much larger than four inches in diameter, since large wounds are slow to heal over. Heart-rot fungi may infect neglected wounds and weaken the entire tree.

Don't cut off ends of branches in an attempt to restrict the growth of the tree upward and outward. Keep its natural appearance by making only thinning cuts. Make cuts close to and parallel with the parent limb or next to a side branch. In other words, don't leave a stub that you can hang your hat on. Close cuts heal quickly, stubs may never heal over.

