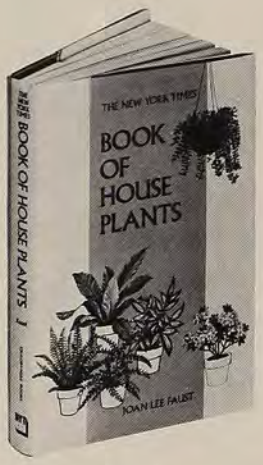
American Horticulturist

Volume 54 Number 1 Early Spring 1975

5 For the plant lover

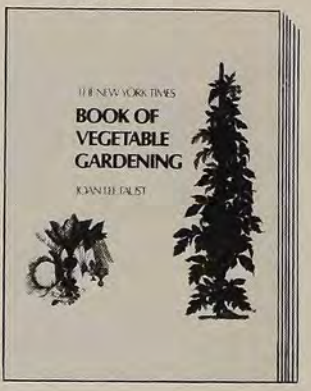
from Quadrangle/The New York Times Book Co.



The New York Times Book of House Plants

Joan Lee Faust

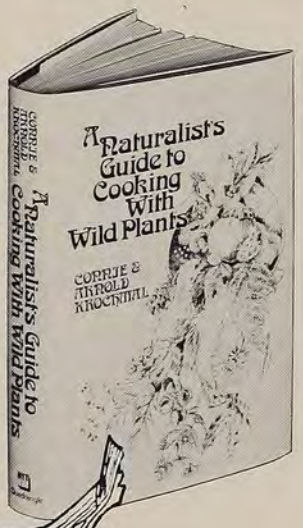
If you're not quite satisfied with your house plants, here is the answer to your problems. 105 plants are covered in detail, explaining where they come from, what they look like, what watering, soil, light, feeding and temperature each one needs. Save time and money while adding to your pleasure. 150 illustrations, glossary. $9.95.



The New York Times Book of Vegetable Gardening

Joan Lee Faust

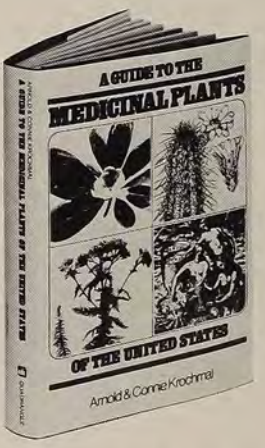
Economy minded? Learn how to grow 47 vegetables; complete information on soil, tools, fertilizer, pest control, etc. Special chapter for city dwellers. Book includes bibliography, how-to drawings, 100 color illustrations. $9.95.



A Naturalist's Guide to Cooking with Wild Plants

Arnold & Connie Krochmal

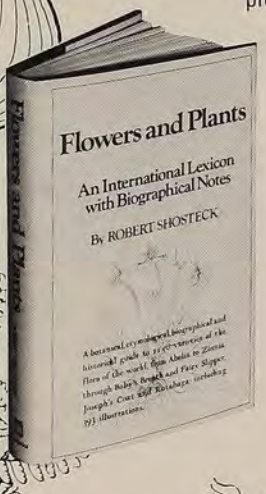
Ever eat crabgrass? Dandelions? Seaweed? They're tasty and cost-free if you know what to look for and where. Over 300 plants are included, with more than 200 fascinating recipes; how to harvest and store plants. Illustrated. $9.95



A Guide to the Medicinal Plants of the United States

Arnold & Connie Krochmal

This illustrated guide shows how to recognize those plants that can contribute to health and well-being, from ginseng to licorice root—and explain what each is used for, the environments it prefers, how it is harvested. $9.95.



Flowers and Plants

Robert Shosteck

How did plants and flowers get their names? What roles did history play, Folklore? Science? The stories behind the naming of plants is often fascinating and useful to know. And here is a book that unfolds this wealth of information. Some 1,150 varieties are presented alphabetically by their common names, plus scientific name, origin, use and history. With 393 illustrations. $9.95

AT LEADING BOOKSTORES OR MAIL THIS COUPON.

NYT

Quadrangle/The New York Times Book Co., Dept. 245
10 E. 53 St., N.Y., N.Y. 10022

Enclosed please find check or money order in the amount of $_____ for the books indicated below. If I find this order unsuitable, I may return it within 10 days and my money will be refunded in full.

CHARGE MY MASTERCHARGE _____

Add $.60 for postage and handling.

No.	*Title*	*Price*

Name _____

Address _____

City _____ St. ____ Zip _____

Signature _____

N.Y. and Ill. residents add sales tax.

How do you handle these loads now?

GARDEN RESIDUES

GARDEN HARVESTS

BALED HAY

BUSHELS & BUSHELS OF LEAVES

If you handle any of the above loads (or any other heavy or bulky loads) by hand, or with an inadequate cart or wheelbarrow — please send postcard for your FREE Cart Catalog describing our complete line of time and labor-saving carts.

NOW... *Carry TEN TIMES the Load of a Common Wheelbarrow or Cart with* ***INCREDIBLE EASE!***

This Big NEW Jumbo sized cart is the culmination of 20 **years** of cart research! It has the **largest** load carrying ability of any cart or wheelbarrow available for home and business use!

- Carries 10 times the load of a common wheelbarrow!
- Saves time and steps—make one trip instead of ten!
- So easy to handle, so perfectly balanced you can guide it with JUST ONE HAND!
- Actually feels lighter when it's fully loaded!
- Loads won't fall out forward.
- Carries 5 bales of hay, 5 trash cans!
- Tips down to take on heavy loads without lifting!
- Rolls up steps and down with ease.
- Open end lets you load long handled tools, even **long** extension ladders and lumber.
- Two wheels instead of one keeps loads from tipping sideways.
- Big 26" diameter easy roll **pneumatic** wheels with ball bearings. Special wide hubs to handle heavy loads.
- Stores easily on end, saves space.
- Special stand straddles rows in the garden, without damage to plants.
- Rust resistant steel parts and durable weather-proof plywood for years and years of service.
- No need to keep indoors—turn over and this cart becomes its own garage.
- Just so useful, you'll wonder how you ever did without it.
- Not sold in stores.
- At last—the **perfect** cart for lawn, garden and countless other uses.
- Order for and charge to your business. Borrow to use at home. Soon you will be ordering another to keep home all the time!
- Several smaller models of same unique design also available.
- Please send for FREE CATALOG with all the specifications, sizes and prices.

OFF-SEASON SAVINGS NOW IN EFFECT !

Garden Way Research, Charlotte, Vt. 05445

All models available complete or in Money-Saving KIT FORM !

Here is how this Big NEW Cart compares with a very widely sold Cart (with tiny wheels and almost no load space). Our "Jumbo" Cart will carry *15 times* the load of this little cart.

GARDEN WAY RESEARCH
Dept. 54402
Charlotte, Vermont 05445

Please send FREE CATALOG including prices and OFF-SEASON Savings now in effect.

Name .....

Address .....

City ..... State ..... Zip .....

an editorial. . . .

Gardener's Favorite Plants

As I see it, one of the finest accolades you can give a person is to say that he is a good gardener. *Horticulturist* is a good term, too, but research institutions are full of horticulturists who see plants only as "experimental organisms" with which to work. To be a good gardener you have to know the arts and the science of horticulture, but your delight comes in actually growing your plants to perfection, finding new plants to grow, enjoying the arranging of plants into a suitable landscape design. At the 1974 A. H. S. Congress participants were treated to visits to several wonderful gardeners. Notable horticulturists—the real, gardening type—were among the crowd, accessible to lay gardeners searching for plant identification or a word about culture. Several congress-goers mentioned the desirability of hearing from these notable people in the world of horticulture in our magazine. Therefore, the special emphasis in this issue. We asked a number of "notables" to write about a favorite plant.

Parma violets are Nelson Coon's first love, and he freely admits that his enjoyment in growing them is not at all diminished by the botanists' failure to properly classify them. Anne Wood is famous for her outstanding flower arranging programs, and there can be little doubt that her great skill as a gardener combined with her great love for her plants furnishes the solid basis for her fine arrangements. Mrs. Wood likes plants with year round value; first she wrote about her arums, then decided that bergenia deserved mention. We felt we had to include both of her favorites. Magnolias come in for a double hearing; just now, magnolias are enjoying a high level of popularity, with old sorts coming to the fore, and wonderful new cultivars appearing in breeders' gardens around the country. As a top-flight research plantsman Professor J. C. McDaniel writes about certain magnolias with emphasis on one he favors, and the professional magnolia man, Mr. James Gossler, writes about a special one that promises to become an important garden plant in short order. Professor Jim Feucht thinks that the Little Leaf Linden is a choice tree for Colorado gardens, and Mr. Gerardi, long famous for his studies of nut trees, thinks that everybody should have a nut tree on the lawn (with full agreement from Professor L. H. MacDaniels at Cornell who furnished illustrations of superior nuts). Dr. Donald Wyman, with his reservoir of horticultural knowledge and gardening lore, favors another tree, the crab apple 'Dorothea,' and Professor Clarence Lewis feels that the old fashioned bleeding heart belongs in every garden. Peggy Macneale thinks most highly of daffodils, especially a yellow and white one called 'Festivity.' There is another chapter in the *Impatiens* saga from Fleeta B. Woodroffe. As you read the articles by these noted horticulturists you easily can spot a unifying theme; everyone of them loves to grow plants. That's what horticulture is all about.

The American Horticultural Society helps people grow plants, with various publications, with informative seminars and Congress programs, and with other services. When you have digested this issue of *American Horticulturist* you will know a great deal about growing several choice plants in your garden. There are other sources of information, too. Horticultural societies, botanic gardens and arboreta, and plant societies are fine sources for local, detailed cultural information and for information in depth on a special plant. Read about changes underway at the Missouri Botanical Garden, all designed to ease the ivory tower status and build up popular appeal. The Pennsylvania Horticultural Society rises to the challenge of taking horticulture to the people with its Gardenmobile, and Longwood Gardens builds full scale, example gardens to show various ways of solving a specific garden design problem. Who can help but be excited by all of this activity, by these new ways of sharing horticulture? Who does not want to hear more from people who know and love certain plants? The umbrella over all of this exciting world of horticulture is the American Horticultural Society. It is the unifying organization for everything that goes on in the American gardening world. As we support A. H. S. we give every aspect of gardening, of horticulture, a boost. Won't you enlist your friends to help promote horticulture in America?

Financial support for A. H. S. has come from corporations through the special membership classification, "Industrial Associate Members." The following corporations have enrolled to date: Alcoa Foundation; American Garden Products, Inc.; American Telephone & Telegraph Company; Coca-Cola Company; Corning Glass Works Foundation; Goodyear Tire and Rubber Company; H. J. Heinz Company; International Business Machines Corporation; Proctor & Gamble Company; and the Whirlpool Corporation. Most of these organizations have contributed $1,000.00. Generous annual contributions from these public-spirited corporations help A. H. S. achieve its goals.—**JPB**

American
Horticulturist
Volume 54 Number 1 Early Spring 1975

JOHN PHILIP BAUMGARDT, *Editor*

The American Horticultural Society, *Publisher*
Mount Vernon, Virginia 22121
703/768-5700
O. KEISTER EVANS, *Executive Director*

For United Horticulture . . . the particular objects and business of The American Horticultural Society are to promote and encourage national interest in scientific research and education in horticulture in all of its branches.

AMERICAN HORTICULTURIST is the official publication of The American Horticultural Society, 7931 East Boulevard Drive, Alexandria, Virginia, 22308, and is issued in February, April, June, August, October, and December. Membership in the Society automatically includes a subscription to *American Horticulturist* and $1.50 is designated for each issue of this publication. Membership dues start at $15.00 a year.

Refer editorial matters to:
American Horticulturist
Mount Vernon, Virginia 22121

Refer advertising matters to:
Publisher Services, Inc.
621 Duke Street
Alexandria, Virginia 22314

Address requests for reprints of articles to The American Horticultural Society,
Mount Vernon, Virginia.

AMERICAN HORTICULTURIST is devoted to the dissemination of knowledge in the science and art of growing ornamental plants, fruits, vegetables, and related subjects. Original papers which increase knowledge of plant materials of economic and aesthetic importance are invited. For manuscript specifications please address the Executive Director, Mount Vernon, Virginia 22121.

Replacement issues of *AMERICAN HORTICULTURIST* are available at a cost of $2.50 per copy, but not beyond twelve months prior to date of current issue.

Second class postage paid at Alexandria, Virginia and at additional mailing offices.

IN THIS ISSUE

OUR COVER PHOTO—Magnolia 'Diva,' an exciting hybrid of recent introduction, promises to beautify American gardens over a wide range of growing conditions. Mr. James Gossler writes about 'Diva' on page 14 of this issue. Photo by M. Gossler.

GRAPHICS: DOROTHY CHAISSON / PRINTING: GREINER-FIFIELD, KANSAS CITY, KANSAS

Daffodils in General,

*Peggy Macneale**

If ten different A.H.S. members were asked to name their favorite flower, there would likely be ten different ones chosen. On the other hand, if the question were: what flower denotes spring? the answer would very likely be "daffodil." As far as I am concerned, the answer to both questions would be even more specific: the daffodil 'Festivity.' Before launching into the wonders of this flower, however, let's explore the genus *Narcissus* botanically and horticulturally.

Introduction to Daffodils

Shall it be narcissus or daffodil? We will stick to daffodil because it means exactly the same thing as *Narcissus*, being the English, or common, name for the Latin term. Also, it is a lot easier to say daffodils than narcissi, when dealing with the plural. Listen to what happens when you say "American Narcissus Society" very fast—no wonder that it is, instead, the American Daffodil Society.

The daffodil belongs to the family *Amaryllidacae*, and numbers some thirty species and natural hybrids, mostly native to the Mediterranean area. From these, thousands of named cultivars have been developed, and these have been classified into twelve divisions. (Division 12, consisting of a few newer miscellaneous miniatures, is hardly known, even to most A.D.S. members so will not be discussed here.) The introduction of new varieties has burgeoned since World War II, with amateurs both here and abroad vying with professional hybridists in the attempt to develop new color breaks, better form and substance in all divisions, earlier and later blooming periods, dependable miniatures that really are tiny, and other miracles that doubtless will be achieved.

Structure of the Flower

The daffodil flower has three sepals and three petals, which make up the perianth. The outer perianth segments, the sepals, usually are indistinguishable in size, shape, and color from the petals. Modern fashion dictates that, moreover, these six segments should overlap to form a smooth circle around the trumpet or cup. A wavy, ridged, "informal" perianth is unacceptable if you hope to win a blue ribbon. The trumpet, or cup, probably is the result of inner petal segments that have evolved into a solid cylinder. Did this evolution take place as a protective device to shield the pollen from early spring snow and ice? In any case, the resulting trumpet is a characteristic feature of the daffodil, and purists rather scorn the double types (Division 4) and the new "split corona" or "collar" daffodils (Division 11) as being too unlike *real* daffodils to deserve notice. As a matter of fact, both of these types may well be, some think, simply earlier or primitive forms of the daffodil flower. Many of the newer doubles look like

**524 Abilene Trail, Cincinnati, Ohio 45215*

Especially 'FESTIVITY'

camellias, and have been bred with ample strength in the stem to support the flower. The named cultivars in Division 11 are fascinatingly beautiful, with heavy substance, good color contrast, and of tremendous appeal to the flower arranger.

The six stamens of the typical flower are of equal length in most species, while a few have three stamens that are shorter. They cling tightly in a circle around the extended pistil. The ovary, exposed below the petals, is partly enwrapped by a papery sheath which has protected the bud. As the flower expands its perianth at a right angle to the cup. If the weather is uncooperative, and a heat wave forces the flowers up too fast, they will burst into bloom before stems elongate to proper length, and before buds can bend.

Daffodils, February through May

Depending on the variety of bulb, the blooming season of the daffodil can extend at least two months. Some of the miniature species bloom in February or March along with winter-aconite and early crocus. Unfortunately, it is often hard to find just the right microclimate for these tiny sorts, and many gardeners, attracted by the ads for tiny *N. asturiensis* (often mislabeled *N. minimus*) and Angel's Tears (*N. triandrus albus*) will never see a bloom after the first year, if at all. Native to the mountains of Spain and Portugal, these species are collected when they are in bloom, and are not able to ripen their bulbs before being sold. Tolerant of the melting snow around their roots at blooming time, they demand a thorough baking during the summer months, and it's hard to provide these Iberian peninsula conditions in most American gardens. A rockery with sharp drainage, and no sprinkler during the hot weather will give these species daffodils the best chance to survive. Some succeed when grown in sod, but again—no artificial watering.

The hybrids derived from the species *N. cyclamineus* are also early bloomers. Some of these Division 6 daffodils are very familiar: 'February Gold,' 'March Sunshine,' and 'Peeping Tom' indicate their early blooming habits by their names. There are also some rather early trumpets (Division 1). In fact, the great majority of the bulbs sold in garden stores are these, and many gardeners never get beyond 'King Alfred'—a great pity.

About mid-season come the *N. triandrus* hybrids (Division 5), along with Divisions 4 and 11.

At the end of the season, up into May, we find the poets (Division 9) and the small cups (Division 3), especially a few of the white ones, such as 'Frigid.' There are also some late varieties in Division 7 (the jonquil group) and Division 8 (the cluster type, or tazettas).

So where is Division 2? These are the large cups, blooming early to mid-sea-

Daffodil 'Festivity,' a 1954 Grant Mitsch Introduction.

Photo by Wells Knierim, courtesy American Daffodil Society.

son, and there are more of these than almost all the other daffodils put together. A daffodil is in Division 2 rather than Division 1 (trumpet) if, when a perianth segment is bent down along the cup, it is longer than the cup. On the other hand, the cup cannot be less than one-third the length of the perianth segment or it falls into Division 3, the short cups. Admittedly, this is very arbitrary, and although the R.H.S. and the A.D.S. have wrestled with this problem of classification for years, at the moment the system stands as indicated. The more cultivars and species are crossed, however, the more difficult it becomes to decide in which division some newly introduced flowers belong, so before too many years go by, perhaps the system will be revised again.

In any case, the flowers in Division 2 have the widest range of color, and some of the most interesting variations in cup form. There are ruffles, pleats, flat wheels, and stove-pipes to be found. Cup colors range from brilliant ruby red, pure yellow, intense orange, luscious pink, to pure white, some with green eyes. Many are banded in several hues. Perianths are likewise varied in color: limey, solid gold, apricot-flushed, and glistening white. It is really impossible to limit yourself when it comes to buying Division 2 bulbs!

Garden Culture

So now you have a nice selection from all the divisions and it's time to plant them. Unless you live in Oregon, where the climate seems to be ideal for growing the biggest flowers with richest colors, we have to make do with what we have. Fortunately, daffodils are very accommodating, and though we all can't grow all types, there are some that will succeed almost everywhere. Whether the soil is sandy or heavy clay, as long as there is good drainage when

the bulbs are dormant (no roots), you can grow daffodils. The worst problems are root competition from shrubs, and extended dry spells in fall or spring or both. If fall rains are not adequate, it is imperative to water your bulb plantings before cold weather sets in, as roots must form before the ground freezes. An open site with good drainage is ideal. If you wish to naturalize daffodils in sod, do so and refrain from mowing the grass until mid-June or July. Under trees, particularly surface-rooting maples, the conditions are less favorable, but if the tree branches are trimmed high so as much light as possible will reach the ripening daffodil foliage before shade grows too heavy, daffodils may succeed. For blue-ribbon flowers, however, a more traditional flower bed —some advocate a specially raised bed —is best. Dig deep, incorporating bulb fertilizer high in phosphorus and potash, low in nitrogen, well below planting level, then set the bulbs, not in contact with the fertilizer. Six inches of soil over the 'shoulder'' of the bulb is considered about right for the larger bulbs in average soil. In heavy soil the planting could be shallower, but bulbs usually adjust themselves to the proper depth. Daffodils planted too shallow, however, tend to split rapidly into offsets that are too small to bloom. This poor planting practice, along with competition with shrub roots, is the cause of the large clumps of foliage and scarce bloom that many amateurs complain about. Once properly planted, daffodils can be left undisturbed as long as they bloom well. Rodents do not bother them and they have few diseases or pests.

Sources of Bulbs

Perhaps another problem that should be mentioned is finding a source of the newer and more exciting daffodils. One simply will never see any of these in local supply places so the only alternative is to look for catalog ads. Friends in the American Daffodil Society will be happy to steer you in the right direction, and will usually give you a start of newer bulbs to whet your taste. Growers in England, Ireland, and even New Zealand issue listings, but these are rarely illustrated. To see what the flowers look like you must visit daffodil shows. There are very fine growers here in the States, of course. At least three American introductions have won international awards: 'Aircastle,' a 3b, 'Daydream,' a 2d and 'Festivity,' a 2b.

My Favorite, 'Festivity'

At last we will hear more about 'Festivity!' To give you some idea of how this flower has grown in popularity, here are a few statistics. Introduced in 1954, by 1959 it rated 6th in the A.D.S. annual symposium for the white-with-yellow Division 2 section. Three years later it was in second place, and long since it has been in first place, with 154 votes last year against 39 for the second place flower. 'Festivity' was bred from 'Bodilly' × 'Brunswick,' both of which were developed by P. D. Williams, a British hybridizer who is famous for the quality of his bulbs, as well as for the distinction of the flowers themselves. (A P. D. W. bulb will thrive in the most difficult situation.) 'Festivity' performs as a garden flower supreme, increasing to a bountiful clump in a few years. When dug, the bulbs are firm, clean, and of good size, even when down five or six years with little attention in the way of fertilizing. Now for the best part: the beauty of this flower grows on you each time you see it. The perianth is absolutely smooth, pressed flat, and gleaming white, in startling contrast to the glowing rich chrome of the cup, which does not fade in the spring sun. 'Festivity' is a large flower, but graceful, and in perfect proportion to the stem length. You might think—oh, just another yellow and white daffodil, but if you should grow it—and why not, the cost is very moderate, about seventy cents per bulb—you could not help but be entranced by its perfection. Like a piece of rare porcelain, 'Festivity's loveliness is praised by all, and if daffodil breeder Grant Mitsch had raised no other flower, this one would be his monument. It is a spring poem if there ever was one.

Classified List and International Register of Daffodil Names*

DIVISION 1
Trumpet narcissus of garden origin.
DIVISION 2
Large-cupped narcissus of garden origin.
DIVISION 3
Small-cupped narcissus of garden origin.
DIVISION 4
Double narcissus of garden origin.
DIVISION 5
Triandrus narcissus of garden origin.
DIVISION 6
Cyclamineus narcissus of garden origin.
DIVISION 7
Jonquilla narcissus of garden origin.
DIVISION 8
Tazetta narcissus of garden origin.
DIVISION 9
Poeticus narcissus of garden origin.
DIVISION 10
Species and wild forms and wild hybrids.
DIVISION 11
Miscellaneous narcissus.

*Narcissus classifications as presented in *The American Horticultural Magazine Daffodil Handbook*, January 1966.

My Favorite Plant

Malus

*Donald Wyman**

One May day in 1943 Heman Howard and I, of the Arnold Arboretum staff, were walking through some miscellaneous shrubby material that had grown up at the edge of the flowering crab apple plantings. Our attention was taken with a crab apple seedling in flower the likes of which we had not seen before. It had lovely pink to white double flowers, some of them almost two inches in diameter. This was not the first time that an interesting seedling had cropped up in this great collection of woody plants, for Arboretum staff were always on the watch for new hybrid seedlings growing on the edges of the woodlands of this 265 acre tract.

With 250 species and varieties of crab apples growing together in close proximity, it was reasonable to expect that new hybrids might arise, for much cross pollination was possible. When we found this seedling, we of course compared the flowers with all the other varieties, cut out the brush around it to give it more growing space, and then, in the fall, we noticed that the fruits turned a golden yellow. I realized then this was a new and valued hybrid. At that time there were no double pink flowering crab apples in our collection that bore yellow fruits. Nor were there any in commercial nurseries, as far as I knew. Naturally we propagated it and after a few years, offered it to the trade as *Malus* 'Dorothea' named after my older daughter.

Over the years, this has proved to be one of the best of all the many crab apples grown in this country. It is probably a cross of *Malus halliana* 'Parkmannii' and *M.* × *arnoldiana*, the latter plant being a hybrid also originating in the Arnold Arboretum in

Crab apple 'Dorothea' fruit; a fine golden-yellow autumn display.

Crab apple 'Dorothea,' a spreading tree of moderately small stature, bears an annual crop of showy pink to white blossoms.

Photos courtesy Arnold Arboretum.

**59 Jericho Road, Weston, Massachusetts 02193*

'Dorothea'

1883. The leaves are not quite as leathery as those of the Parkman Crab, and the fruit is slightly larger than those of the Arnold Crab. Both of its parents are among the best of all the ornamental crab apples, and certainly 'Dorothea' is a great addition to the clan.

In preparation for this article I looked at the oldest plant growing anywhere, a thirty year old plant in the collection at the Arnold Arboretum. It is now a densely rounded specimen, fifteen feet across and about twelve feet tall. Certainly it could be a desired addition to anyone's garden, growing wherever apples do well which, in fact, is a greater part of the United States. The height range for this group of ornamental trees is anywhere from about eight feet to well over fifty feet, so that 'Dorothea' is one of the few lower-growing types ideally suitable for the small garden.

Because of its low growth it needs little pruning. Sometimes the vigorous young shoots grow so fast and long that, in order to keep the tree from becoming too open in habit, a small amount of correctional pruning is necessary at the start. Then too, one of the things that became evident in our nursery as the new young plants were developing, was the fact that they started to bloom when they were very young, sometimes even one year old grafted plants produced flowering spurs. This meant that the nurserymen would have good display specimens in a short time, another factor in its popularity by commercial growers.

'Dorothea' bears its flowers annually, a desirable trait. The flowers are semi-double with about sixteen petals, and appear in mid-May, along with the majority of the other crab apples. Because the flowers have so many petals they are prominent longer than single flowered types. The fruits are bright yellow, often one half inch in diameter, and it is the only double flowered crab apple with yellow fruits, another desirable trait. In fact there are very few golden fruited crab apples which also produce good flowers.

Like all other members of this group of small trees 'Dorothea' is not particular about the soil in which it grows, providing of course that it is not extremely poor, dry or wet. It does best in full sunshine. Since the oldest tree in America is only about thirty years old, one can not be positive about its ultimate height, but judging from the way it has grown in Boston, it will remain under fifteen to twenty feet in height (and as broad) for many, many years.

We have grown several trees of 'Dorothea' about our house and watched them over the years. Just to give my younger daughter something to talk about, I named another double flowering crab apple after her—'Barbara Ann'. Over the years there has been many a wise crack between the two young ladies about the relative merits of "their" trees. 'Barbara Ann' has deep red flowers with purplish fruits, and is closely related to *Malus purpurea*. It will grow much taller, and possibly because its fruits are not as conspicuous as those of 'Dorothea' it has not proved popular among nurserymen. However, when it is in full bloom, with its double red flowers stretched to their full two inches, it will catch the eye from a great distance.

The Arnold Arboretum has had a long record of introducing many woody ornamentals to the gardens of America. It has been most interesting to see how this one has "caught on" with plantsmen, from the time it was an unknown specimen growing in Boston, until now when it is available widely throughout the country. Its low-growing characteristics, its ability to produce flowers every year as well as its colorful fruits, all go to make it an asset in the planting about any home. Crab apples in general are among the best of our ornamental trees and this one in particular is an asset in the increasing number of small gardens across America. ◈

Some Asiatic-American Magnolia Hybrids

*Joseph C. McDaniel**

Eastern Asia shares several important genera of woody plants with eastern North America. Some of our native species hybridize with more or less closely allied species from trans-Pacific sources. I do not yet know of any American-eastern Asiatic hybrids in maples, persimmons, or oaks, but there have been introductions of American-Asiatic five-needle pines, hollies (both evergreen and deciduous), and the intergeneric hybrid × *Macludrania hybrida* Andre whose parents are the Osage-orange (*Maclura pomifera* Schneid.) and the spiny Chinese fruit tree called Che (*Cudrania tricuspidata* Lav.). In the *Magnoliaceae*, Dr. Frank S. Santamour, Jr. at the U.S. National Arboretum recently has obtained the first hybrids between *Liriodendron tulipifera* L. and L. *chinense* Sarg. Hybrids occur spontaneously between the originally Chinese *Morus alba* L. and our red mulberry *M. rubra* L. The list could be extended with hybrid willows and poplars, not to mention hybrids recently claimed between a Hong Kong *Camellia* and *Franklinia*.

In *Magnolia*, American-Asiatic or Asiatic-American *Magnolia* hybrids have now been bred in both of the two subgenera. The one now farthest along in availability to gardeners is *M.* × *brooklynensis* Kalmbacher, the hybrid between the American cucumber tree, *M. acuminata*, a forest tree with mostly green but sometimes yellow flowers, and the Chinese lily-flowered magnolia, *M. liliflora*, a shrubby multistemmed plant whose different clones possess flowers with various degrees of purple pigmentation. *M.* × *brooklynensis* 'Woodsman' combines all the flower colors of the two parents, has hardiness and a spring flowering season approaching the American parent, and bears flowers larger than either. Like its Asiatic parent it may be propagated by softwood cuttings. Nurseries in America, Holland and England are multiplying it. A tree for future Canadian propagation is at the Royal Botanical Gardens, Hamilton, Ontario.

M. liliflora Desrousseaux, also sometimes called *M. quinquepeta* (Buc'hoz) Dandy, is the sole Asiatic species in Section *Tulipastrum* of subgenus *Yulania*. *M. acuminata* (L.) Linnaeus, with its horticulturally wellmarked var. *subcordata* (Spach) Dandy (more often listed as *M. cordata* Michaux or var. *cordata* (Michx.) Seringe) represents that section in the Americas. It is the only Magnolia native to Canada (south of Lake Ontario) and is perhaps the hardiest of all American magnolias, succeeding at Minneapolis, Minnesota and Ottawa, Canada (Zone 4a). Its

**Assistant Professor, Ornamental Horticulture, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801.*

Photo by Author.

***Magnolia* × *brooklynensis* 'Woodsman,' an American hybrid highly regarded by Professor Joseph McDaniel.**

southern distribution takes it to a few miles from the Gulf of Mexico in Mississippi, Alabama and northern Florida (borders between Zones 8 and 9). Both species are exceptional in being natural tetraploids (4N = 78), and they yield fertile tetraploid hybrids when *M. acuminata* flowers in the late bud stage or just at anthesis are pollinated with pollen from an older flower of *M. liliflora*. (I do not know whether the reciprocal cross has succeeded.)

Mrs. Evamaria Sparber, under the directorship of Dr. George M. Avery at the Brooklyn Botanic Garden, bred the first *M.* × *brooklynensis* hybrids. The first cultivar selection is named in her honor, 'Evamaria'. It is patented but has not yet become commercially available. Further breeding for the Brooklyn Botanic Garden was done by Doris M. Stone. Some yellow flowered clones, now under evaluation for possible introduction, resulted from her crossing of 'Evamaria' with *M. acuminata* var. *subcordata*.

These newer hybrids still combine two ancestral species, *M. acuminata* with *M. liliflora*, so are still to be classified under *M.* × *brooklynensis*, the name for all such hybrids.

M. liliflora has not been collected as an indisputably wild plant, but there is little doubt that it is of Chinese origin, long preserved from extinction by cultivation in gardens of that country, later in Japan and still later in western Europe (in-

troduced 1790) and America. It is a popular species in Zones 6 through 9. Seedlings and possibly mutations have given rise to different cultivar forms. Some are darker, larger flowered and apparently hardier than others. Most *M. liliflora* in the United States is offered by nurseries as *M. liliflora* 'Nigra' or (mistakenly) as *M. soulangiana* 'Nigra', but not all propagators and perhaps not even a majority of them, seem to have the true very deep purple flowered *M. liliflora* 'Nigra' which James Gould Veitch of England introduced from Japan in 1861. Other cultivars long in the literature are 'Gracilis' (1807) with a smaller shrub, narrower leaves and small flowers; 'Inodora' (1817) with paler large flowers reflexed at the apex; 'Purpurea' (1797) with larger, darker flowers than the type; and 'Reflorescens' (circa 1850) with large, dark purple flowers. 'Darkest Purple', probably introduced from Japan to Alabama before 1941 as a *M.* × *soulangiana* cultivar, has been reclassified under *M. liliflora*. There are still other forms in American gardens. The relatively vigorous, dark and large flowered clone I used in crossing with *M. acuminata* to produce 'Woodsman' is of unknown original cultivar name, but now called 'O'Neill' for the owner of the home where it grows in Champaign, Illinois. It is the hardiest, darkest, largest flowered and best *M. liliflora* I have seen cultivated in Illinois at the border of Zones 5 and 6.

Photo by Author.

A magnolia hybrid, seedling relative of 'Woodsman' with great promise.

M. acuminata is a tree species with considerable variability, in which several botanical varieties have been proposed; it seems likely now that only the heavily pubescent, more yellow flowered, usually more compact growing var. *subcordata* (Spach) Dandy will be maintained by taxonomists. This rare variety, also called *M. cordata* Michaux, was found by the elder Michaux near Augusta, Georgia, and much later in both of the Carolinas and Alabama. A new, larger yellow flowered cultivar, 'Miss Honeybee' was recently registered from Painesville, Ohio, by James Merrill. It is quite fertile to cross pollination with the typical species. *M. acuminata* forma *aurea* (Ashe) Hardin of mountain regions in the western Carolinas and east Tennessee probably owes its yellow flower color to introgression from var. *subcordata*. (One cultivar of f. *aurea* from Sevier County, Tennessee, is 'Golden Glow'.) Not having either f. *aurea* or var. *subcordata* available in the early 1960's, I crossed *M. liliflora* 'O'Neill' both ways with a typical *M. acuminata* that was a good seed producer in cultivation at Urbana, Illinois. Two true hybrids grew from the seed of *acuminata*: the darker flowered one was registered with the American Magnolia Society in 1974 as 'Woodsman'.

'Woodsman' and other hybrids to be selected within *M.* × *brooklynensis* and its outcrosses promise to correct the principal weakness in early flowering deciduous magnolias for gardens over much of eastern North America. The Asiatic species and hybrids, particularly if earlier than *M. liliflora*, too often start to open their flowers in our earliest hot days only to get zapped by a return of winter conditions. 'Woodsman', by contrast, survived 19° F. in April 1973 and 3° F. in late March 1974 to bloom normally in late April to mid-May at Urbana, top-worked on *M.* × *soulangiana* branches.

'Woodsman', like other *M.* × *brooklynensis* hybrids, inherits much of the tree habit of *M. acuminata*, along with its hardiness. It can be pruned to a single trunk or allowed to grow with several stems. In ultimate height, it probably will grow taller than *M.* × *soulangiana*, the best known hybrid magnolia, which shares its *M. liliflora* parentage on one side. At favored eastern locations the other parent of *soulangiana, M. denudata*, sometimes attains fifty feet, but *M. acuminata* trees over 100 feet tall are known and even the var. *subcordata* specimen at Longwood Gardens has grown to about ninety feet. Among future possibilities is a more compact tree combining 'Woodsman' with the new large flowered *M. stellata* 'Centennial'. I will try that cross this year.

Other Hybrids in Prospect

There are numerous other recent hybrids of *M. liliflora*; the newest, described in 1974, is M. × 'Caerhays Surprise' which was bred at Caerhays Castle in Cornwall by pollinating *M. liliflora* 'Nigra' with the large Asiatic *M. campbellii* subspecies *mollicomata* W. W. Smith. It has large pink flowers and should be considerably hardier than *M. c. mollicomata*, which itself is hardier than typical *M. campbellii*. Harold Hillier tells me it is a very fine thing. 'Royal Crown', now on the American market, combines *M. liliflora* with *M.* × *veitchii* (= *M. denudata* × *M. campbellii*).

At the U.S. National Arboretum are some promising vigorous trees from William M. Kosar's cross, *M. liliflora* 'Nigra' × *M. sprengeri* Pampanini cultivar 'Diva', the pollen parent belonging to a relatively hardy (Zone 6) but still rare western Chinese species. Already introduced are eight dwarf hybrid cultivars (sterile triploids) bred at the Arboretum as crosses between *liliflora* and *stellata*. The cultivar 'Orchid' (also sterile) appears to be *stellata* × *liliflora* and originated at Hillenmeyer Nurseries, Lexington, Kentucky.

Kosar made an Asiatic-American cross in subgenus *Magnolia*. His Asiatic parent for this was *M. hypoleuca* Sieb & Zucc. (until recently called *M. obovata* Thunb.), the Japanese whiteleaf magnolia, a large forest tree whose outpost in the Kurile Islands makes it the most northern of Asiatic magnolias. The several hybrids now at the National Arboretum of *M. hypoleuca* × *M. virginiana* L. (Sweetbay magnolia) parentage are intermediate between the parents, producing handsome, very fragrant, large white flowers in May-June, on sturdy, large leaved, late-deciduous trees. One of them will eventually be named and introduced. 'Charles Coates', a Kew Gardens hybrid of *M. sieboldii* Koch × *M. tripetata* L., is already in English nursery lists and a few trees of it grow in America.

M. hypoleuca is the seed parent of some young hybrids with two additional American species, still some years away from flowering. Philip M. Savage, Jr., editor of *Newsletter of the American Magnolia Society*, made these crosses at his home, 2150 Woodward Avenue, Bloomfield Hills, Michigan 48013. The two pollen parents were Savage's own tree of *M. fraseri* Walter (mountain magnolia) and a tree of *M. macrophylla* Michx. (big leaf magnolia) cultivated in Urbana. Since *M. fraseri, M. macrophylla* and *M. hypoleuca* all belong to section *Rytidiospermum*, there is a good chance that these hybrids will prove fertile, unlike the intersectional *M. hypoleuca* × *M. virginiana* hybrid trees which set no seed. These are some of the other frost-resistant magnolias that may appear in our gardens before many years. "Woodsman' will be available in small quantities in 1975-76.

In my experience so far, 'Woodsman' sets very few seed-bearing fruit aggregates unless hand-pollinated. Seeds are always rare on its pollen parent, *M. liliflora*, and on most of the cultivated trees of *M. acuminata*, around Urbana, Illinois. According to studies which Dr. Leonard B. Thein of Tulane University is publishing in American Journal of Botany, small flower beetles called nitidulids are the natural pollinator insects for the American species, carrying pollen when they move from older flowers to buds not yet fully open at the time stigmas become receptive. Apparently there are not enough of the nitidulid beetles attracted to the vicinity of many cultivated *M. acuminata* trees to transfer their pollen effectively and this condition probably applies also to *M. liliflora*. Self-incompatibility has been suspected in some clones of *M. acuminata*, but not proven. For readers interested in breeding their own hybrid magnolias, a good reference is my article in the *Plants and Gardens* handbook on "Breeding plants for home and garden," Vol. 30, No. 1, Spring, 1974, available from Brooklyn Botanic Garden at $1.50.

Magnolia sprengeri 'Diva'

(Featured on cover.)

*Joseph Gossler**

Occasionally a plant or tree previously known as a rare species rightly deserves more attention from the gardening public. The Asiatic magnolia 'Diva' is a favorite of mine, and worthy of much wider cultivation for many good reasons.

Magnolia sprengeri 'Diva,' as judged by many horticultural experts, has all that it takes to make it a first-rate garden specimen. Early beginnings of this tree in England trace back to Ernest Wilson who collected seeds from Changyang Hsien, China, in 1900. The famed tree at Caerhays Castle, Cornwall, comes from this introduction. Dr. Otto Staff, the botanist, called this beautiful tree 'Diva,' or Goddess, presumably because of its exceptionally fine flowers. Ancestry and technical classification has been in dispute for years but this does not detract from the fine attributes of this magnificent deciduous tree.

The habit is exceptionally symmetrical, very tree-like and adaptable as a specimen of medium to large proportions. The lovely flowers are beautifully presented on the tips of bare branches at about midseason. The tepals (a term used in reference to the petal-like structures of magnolia blossoms) are of fine substance with elegant saucer shape. Flowers are crimson-pink outside and fainter light pink inside and as good as many forms of the more difficult *M. campbellii*. Most flowers, although not as large as the spectacular *M. sargentiana* 'Robusta' blooms, measure about nine inches across. It is thought to be most closely related to the latter which bears heroic-sized flowers and is not as cold hardy as 'Diva.' *M. sprengeri* 'Diva' is more floriferous than most any of the Chinese magnolias and consistently bears abundant crops of well spaced blooms.

The tree at full maturity can reach fifty feet and grows to a well developed central leader if the young plant is grown as a single stem. The form and hardiness of this tree only enhances its need to be more widely appreciated. It will prosper and flower successfully after extreme winter lows of -20° F. Trees in Western Oregon perform equally well as those at the National Arboretum in Washington, D.C. 'Diva' thrives, producing a profusion of gorgeous pink flowers in the mild climate of the Strybing Arboretum, San Francisco, and at the more rigorous climate of the Morris Arboretum in Philadelphia. It grows surprisingly well in Detroit and more easily on Long Island. It is obvious from grower reports that this tree is completely adaptable to a wide spectrum of climatic conditions.

P. H. Brydon, plantsman and former director of the Strybing Arboretum, is highly knowledgeable on magnolias after a lifetime of experience with the genus. Mr. Brydon rates 'Diva' as perhaps the most unheralded tree of the genus, and horticulturally as important as *M. denudata* which is universally accepted as a garden gem.

Culture of this tree usually proceeds from a single-stemmed nursery grafted plant which should be set in well drained garden loam enriched with humus. Try to duplicate its native environment if possible and set it in a woodland with partial shade. Avoid planting in a windy site since all magnolias resent drying winds. It can grow successfully in full sun, but avoid an overheated trap too close to a structure. Summer irrigation aids in vigorous growth, especially when trees are young, and until a transplanted tree has had a chance to establish a root system at its new site. First blossoms usually appear at about eight years on a grafted specimen. Beneficial results will be obtained by a mulch over the root area. The mulch should contain some well rotted manure. Although bark split from freezing is infrequent on this tree, any wounds should be cleaned and painted with a tree wound dressing or paint. It is preferable to prune away excess branches in the spring and to dress all cuts immediately.

One especially unique habit of this tree is its enormous production of large seed cones. These heavy cone structures are handsome crimson, and in September they expel bright orange-red fruits to the delight of greedy squirrels and birds. Some cones reach nine inches long and will weight the branches alarmingly if not thinned by hand.

Some exciting work is in progress by plant breeders at the National Arboretum with *M. liliflora* × *M. sprengeri* 'Diva,' with *M. liliflora* as seed parent. Offspring show desirable characteristics of both parents, flowering at a younger age, with a more shrublike habit, and they are easier to propagate. Without question these plants should possess extreme cold hardiness and should bloom later in the season, thus avoiding late, destructive frosts. Plants from this work have been distributed across the country for evaluation prior to naming and release for propagation. When fully evaluated, they will appear on the market for retail sale. Meanwhile, the beautiful, desirable parent, *M. sprengeri* 'Diva' is currently available, a choice tree in every way, a tree that deserves to be planted widely wherever it proves hardy.

**Gossler Farms Nursery, 1200 Weaver Road, Springfield, Oregon 97477*

Photos by Author.

***Arum italicum* foliage in April.**

***Arum italicum* bloom in May.**

Arum italicum

*Anne Wertsner Wood**

Not many perennial tuberous-rooted plants give twelve months of interest in the garden, but *Arum italicum*, "green-calla," does. The best common name for this species seems to be Italian arum, not so colorful as "cuckoo-pint," or "lords and ladies," which British gardeners call their native *Arum maculatum*. The plant is listed in a catalogue as an "attractive novelty." It does seem to be that because so few people seem to know it or grow it. Mine came originally from West Virginia and I was told theirs came from New York state. I doubt that it would be hardy any farther north because it is a species from England eastward to southeastern Europe and the Canary Islands.

***Arum italicum* fruits ripening in late July.**

Winter Foliage

A. italicum is grown mainly for its beautiful foliage. The individual leaves are veined and marbled silver on a dark green ground. These appear in early September and continue to grow and increase in numbers until May when they stand

**400 Walnut Lane, Swarthmore, Pennsylvania 19081*

about twelve to fifteen inches in height. During the winter they are useful for cutting and using in arrangements. Even when they are covered with snow and appear limp, if the ends of the stems are cut obliquely and placed in warm water they quickly revive indoors. The foliage is especially lush and beautiful as it reaches its peak in the spring.

Spring Blooms

In May green spikes appear that unfold producing parchment-like, apple green, nearly translucent flowers ten inches or more in height. They last but a few days and as they fade the foliage begins to die down. As the leaves die fruits are developing on the flower stalks. These somewhat resemble the fruit of jack-in-the-pulpit but are much larger, do not get soft, and the stems remain very sturdy. During June and early July they are a rich green and by mid-July they begin to turn red and remain so through late July and August. During this time the fruiting stems are useful for arrangements. By September the fruits have fully ripened and the fruits begin to drop and the stems fall over. At this time the leaves begin to appear and by October there is again a good showing of leaves.

Botany of Arum italicum

This "novelty" belongs to the *Araceae* family and is a genus of European and Mediterranean perennial tuberous herbs now limited to about twelve species. A number of plants that were originally in this genus are now classified in others. The characters distinguishing it are the flowers unisexual and naked on the spadix with sterile flowers between the areas occupied by the male and female flowers. The spathe is large and convolute and the spadix club-shaped at the top.

The leaves of the arum are widely hastate (spear or arrow shape) with spreading lobes.

Italian Arums in My Garden

The tubers are easy to grow in a rich soil. Rapid growth is encouraged because the foliage is so beautiful. They need plenty of water during their growing season from fall through spring. They are excellent for naturalizing in a semi-shaded woodland. Mine are at the end of a partially shaded border. In colder areas a winter mulch would be beneficial, but I have never mulched mine. A top dressing of rich soil and leaf mold with some complete fertilizer is spread over the soil in early September just before the new leaves appear.

Arums can be propagated by divisions of natural offsets during the late spring or summer, or by seeds. These are best sown in pots and not disturbed for a year. Then, disturbing the roots as little as possible, they may be transferred to their permanent places.

With little care, but the proper soil and location given at the time of planting, I know of no other plant of this kind that will give so much pleasure for the year round.

Anne Wertsner Wood

Bergenia

There is hardly a month in the year that someone does not stop at my house to inquire about the "distinctive, large-leaf plants" at the corner of the property where formerly there was a driveway. They are *Bergenia* (previously *Megasea* or *Saxifraga*), a member of the *Saxifragacea* family. No good common name is accepted.

Bergenia Foliage

The plants are perennial, evergreen herbs with thick rootstocks which spread and develop into low clumps. They have big, leathery, glossy round or oblong leaves on thick stems that sheath at the base. They are pretty all year. Leaves are a deep green all summer and early fall; as the days get shorter and colder they begin to take on deep red and plum shades and remain colorful all winter. With warm spring days they turn green again and remain so all summer.

Bergenia Flowers

Although I grow mine for their foliage they do have strong-stemmed florescences of pure rose, light or deep pink, purple and white flowers. These appear in the early spring March to May depending on their location.

Hardy Bergenias

There are only about eight species of *Bergenia* (pronounced bur-GEN-ni-ah) named in honor of Karl August von Bergen (1704-60) physician and botanist of Frankfort. The two hardy species in the north are *B. cordifolia* and *B. crassifolia* introduced from Siberia in the late 18th century. They are plants for the border or large rock garden and are also good in the wild garden in open places. They do well in a loamy soil or even in a poor soil in a hot dry position, but are apt not to flower as well as when in a good soil.

Botanical Details

Bergenia cordifolia has leaves that are orbicular-cordate and they have wavy-toothed margins and the leaves differ from *B. crassifolia* in the broader cordate base. The flowers are produced on stems twelve to fifteen inches high and are clear rose color in nodding cymes. There is a cultivar 'Purpu-

***Bergenia* blooming in early spring.**

rea' with deep reddish-purple flowers on taller stalks, also cultivars 'Alba' and 'Rosea.'

Bergenia crassifolia also has smooth, shining leaves, obovate and slightly toothed or entire. The flowers stand well above the leaves and are rose, lilac or purple. There is a cultivar 'Orbicularis' which has a branching habit and an abundance of light rose color flowers.

Bergenias in My Garden

My plants are in various places. The ones on the corner that attract so much attention are in poor soil and a hot sunny position and are under an arc light. They bloomed profusely until about ten years ago when the light was installed. This, I am sure has affected the bloom, but not the growth of the leaves not their lovely coloring. Divisions made from these plants, planted elsewhere in the flower borders and at the edge of the woods flower each year. They also make distinctive container plants for sunny terraces.

The foliage serves as a setting or foil for plants that need a background or contrast such as annuals, or *Phlox divaricata, Ajuga, Stachys lanata, Veronica incana*, and more. They do to the garden what a frame does for a picture, or lawn and shrubs do for a house. They are good plants for the corners of flower beds because of their all year interest.

They require the minimum of maintenance and have no pests.

***Bergenia* foliage remains attractive throughout the year.**

Photos by Author.

A fine cluster of Japanese walnuts.

Photos by L. H. MacDaniels.

My Favorite Plant

Promising Nut Tree Cultivars

*Louis Gerardi**

The occasional walnut or butternut tree growing in the garden has, until recently, been considered a mixed blessing. The trees give good shade and are attractive, but the nuts attract squirrels and little boys. Today we are taking a new look at nut trees. Many kinds grow into handsome, trouble-free shade trees and the nuts are a worthwhile bonus. As food supplies grow shorter, any plant producing edible seeds or fruits looks better to the gardener, and oil-rich nuts, high in protein, rank high as a crop to be cultivated.

To choose a nut tree or trees for your garden, consult local nut tree experts or reference material from your State College of Agriculture Extension Service. Probably your County Agent has leaflets or bulletins that will be useful. By way of generalities, most nut trees will grow where the minimum winter temperature is -20° F., and the frost free summer period is a minimum of 150 days. A more moderate winter low and a longer, warmer growing season is preferable. Gardeners interested in fruit production can tell from these figures that we are discussing an environment suitable for peach growing. There is a good rule of thumb. If peaches do well in your area, probably you will have little trouble in growing several sorts of first quality nut trees.

Last year was the poorest nut year I can remember in my fifty years of growing nut trees. With late frosts in spring and a cold and wet spring to follow, weather tolerant trees were easy to spot. Those that began growth early were frosted and bore no nuts. The anthracnose susceptible walnuts were defoliated early in the summer. While no one likes to see a bad growing season, it does give an opportunity to select out the more reliable strains.

Black Walnuts

The black walnut tree, *Juglans nigra*, is valuable for growing from the eastern edge of the Great Plains through to the

19

*Mr. Gerardi is a pioneer in the selection and growing nut tree clones. R.R. 1, O'Fallon, Illinois 62269.

Additional reading: *Nut Growing in New York State*, L. H. MacDaniels, Information Bulletin 71, Cornell University, Ithaca, New York 14850.

A selected clone of heartnut bears large nuts.

Shagbark hickory 'Kentucky' is recommended by nut enthusiasts.

Atlantic Ocean. This fine tree is valuable not only for the nuts it produces but also for prime lumber. Numerous clones of black walnut are propagated for commercial and home growing. These vary in quality and size of the nut, in thickness of the shell, in characteristics of the hull, in resistance to anthracnose and to hull maggot, and so on. I like to think of the best black walnut tree as the one that sets nuts almost every year, holds its leaves late in the year, and produces large, well-flavored nuts that are relatively easy to crack. The cultivar 'Sparrow' is one of the best cultivars in my immediate area. It has rarely failed to produce good nuts over a period of twenty-five years. Today better cracking sorts are available, but they are too new to have been thoroughly tested. The cultivar 'Emma K' seems to be one of the most promising of the newer sorts in my test plantings. The cultivar 'Drake' ripens early, an advantage over late ripening sorts, especially where the season is short. I cannot say that there is *one* cultivar of black walnut good enough to justify my recommend planting a single sort. In fact, taking such factors as pollen shed, female receptiveness, weather hardiness, and so on, into consideration, I cannot justify recommending that a gardener plant just one tree. For optimum yields, always plant two or three cultivars of the same species.

English Walnuts

The English walnut of the grocery store grows natively in Asia minor and is more correctly called the Persian walnut. Botanically it is *Juglans regia*. In cultivation over many centuries, a great number of clonal selections of this fine tree have been made. The hardiest, adapted for growing in the lower Mississippi and the Ohio river drainages, are the so-called "carpathian" walnuts which are Persian walnuts with their ancestral roots in Poland. All of these trees are beautiful in the garden, clean, neat, and with handsome foliage. Unfortunately, many selections of *J. regia* tend to begin growing very early in the season and the new growth with its flower buds is frosted. I find that about thirty cultivars of the Carpathian group of Persian walnuts are worthwhile. The 'Hansen' cultivar, perhaps not a Carpathian, is one of the best for me. It is as hardy as any Carpathian, quite thin-shelled, and somewhat smaller than most Carpathian cultivars. Over a ten year period it will out-produce any of my other Carpathians. The

"best" Carpathian is a matter of controversy, much depending on location and soil.

The cultivar 'Lake' is a fine Carpathian walnut. Others I like include 'Merkel,' 'Fateley,' 'Helmle,' 'Jacobs,' 'McKinster,' and 'Royal.' Other cultivars may outdo these in other growing conditions.

Heartnuts

The heartnuts are related to the other walnuts, being a variety of the Japanese or Siebold walnut. Botanically all heartnuts are *Juglans sieboldiana* var. *cordiformis*. Here is a tree that makes rapid growth, even in relatively poor soil. It is luxuriant, a good shade tree. There is considerable variation in hardiness among the heartnuts. Most are young, prolific, bearers. While it is controversial, I very much like the taste of the heartnuts. They are wonderful for baking, with a very pleasing (to me) flavor. The drawback to these is their early growth in spring when late frosts still are a hazard. Recently I have located a clone—not yet commercially propagated or named—that blooms about two weeks later than most, which will solve a major difficulty with heartnuts. The best varieties for me are 'Rhodes,' 'Schubert,' and 'Fodermaier.' As you may have guessed, I prefer the flavor of heartnuts to that of any other nut.

Hickory Nuts

All hickories are in the genus *Carya*. Aside from the pecans, *Carya illinoensis*, which deserve an entire article to themselves, the two most edible species are the shagbark hickory, *C. ovata*, and the shellbark or kingnut hickory, *C. laciniosa*. Both are native American trees, growing on uplands from eastern Kansas eastward.

The shagbark hickory bears younger than any shellbark, and is more prolific, in my experience. This is the hickory that most people and squirrels prefer. The shell is thin enough to be easily cracked, and the flavor is marvelous. Shagbark hickories make one of the most beautiful of all shade trees. Cultivars are very similar; good ones include 'Weschecke,' 'Wilcox,' 'Retzer,' and 'Shinnerling.' As hickory nuts hybridize easily, and since some species produce bitter, inedible nuts, it pays to plant only a proven, grafted cultivar.

The 'Wilcox' hickory makes a good shade tree and bears choice fruit.

In addition to the nuts I have discussed above, others worth growing include the various Chinese chestnuts, *Castanea mollissima*, cultivars, many of which are well worth growing, and certain hybrid forms of the filbert, or hazelnut. These all grow bush-form.

Buy nut trees from nut tree specialists. While nut trees often are listed in catalogs of general nursery stock, quality and accuracy of labelling may prove to be a problem. All trees purchased for nut production should be named cultivars known to produce well in your immediate area. Nut trees grow best in deep, well drained medium loam with relatively high fertility. When next you think of planting a shade tree on your property, look into the possibility of selecting a nut tree. It will give a lot more than just shade.

Cyclone hybrid *Impatiens* in an outdoor setting; 'Blue Velvet' at the left, and 'Star Burst.'

Cyclone Hybrids *Impatiens* Take Hurdles of Heat Sun Shade

*Fleeta Brownell Woodroffe**

The six "Cyclone Hybrids" *Impatiens* cultivars introduced to the American trade and flower-loving public last spring and the additional sextet released last fall had their origin at Iowa State University. There, plant hybridizer Allen R. Beck and his staff, with support from the Society of Iowa Florists, tested thousands of seedlings derived from crosses they have made between *Impatiens* cultivars long in the American bedding-plant trade and specimens from one of the more than one hundred sets containing twenty-five new *Impatiens* introductions each —these from New Guinea and released to qualified plant breeders by The Plant Science Research Division of the U.S. Department of Agriculture. These imports originated as cuttings and seeds obtained on the island of New Guinea during a plant collecting expedition sponsored jointly in 1970 by the A.R.S. and Longwood Gardens. (See American Horticulturist vol. 52, No. 3, Fall 1973 for account by Harold F. Winters, research horticulturist at the Beltsville, Md. station and a leader of this collecting expedition. See also American Horticulturist vol. 53, No. 1, Spring 1974 for *An Impatiens Circus* by Robert J. Armstrong, geneticist, Longwood Gardens.)

Far from treating their new hybrids delicately, Beck and his staff planted their greenhouse-started seedlings and cuttings in beds open to sky and sun on the terraced expanses of the Iowa State University Horticultural Farm which lies close to the exact center of the state.

Comparison tests were run in open beds with tent roofs made of two layers of ordinary saran screening. These, Beck estimates, reduced the light approximately fifty per cent.

The soil is a native brown loam with a medium content of organic matter. Drainage is good.

Rainfall through the growing season was near twenty-eight inches. An overhead sprinkling system was used as needed. Cultivation approximated that of well-tended home gardens.

Judged by the response of the public, the Cyclone Hybrids *Impatiens* 'Star Fire' gets top rating for showiness, adaptability and a year round flowering season. 'Star Fire' forms a well-branched rounded mound, adapts to basket and pot culture, and never loses the bright yellow in centers of all leaves.

'Orange Chiffon,' another all-year producer of gay blooms, is equally adaptable to light conditions. With brilliant nasturtium-red flowers and rather small green leaves, it shows off particu-

*Garden Columnist, The Des Moines Sunday Register

larly well when used as a basket plant.

'Blue Velvet,' also dwarf, eight to twelve inches, and compact in habit, is adaptable to bright sun as well as shade and is a fine subject for rock gardens, as a ground cover, also good for basket culture. The flowers are a bright, imperial purple and these remain at their prettiest and freshest when grown in light shade.

'Star Dazzle,' well-branched and taller than the first three, is a find for basket culture. For this use it adds bright crimson flowers in abundance to gold-centered leaves all through late summer, fall and winter.

'Star Dancer' grows in the manner of 'Star Dazzler' (twenty-four inches); has leaves with rosy-salmon center accents on tops and rosy suffusions on the undersides. Performs most colorfully through late summer, fall and winter with flowers that match rose bengal on the color chart.

'Star Burst,' another of well-branched, low and compact habit that performs well in both shade and full sun. The flowers, bright cyclamen purple, are produced the year round when plants are potted. The foliage is a dark green, each leaf with a gold inlay along the midrib, so that the whorled end of each new branch is truly a star burst.

Six Additional Cyclone Hybrids Are Now Announced

These will be available to gardeners in the near future. Watch for advertisements in horticultural journals and gardening magazines.

'Purple Silk,' semi-prostrate, averaging twelve inches tall and the same across. Foliage is medium in size and of a mid to dark purple color. Leaf petioles and the main stems carry the same hues. A very attractive plant even without the large orange-red flowers that appear in abundance all year long. An excellent choice for baskets and pots since it grows well in shade and also under moderate exposure to sun.

'Pink Satin,' an upright grower, to two feet, well-branched, thick and tight with short internodes, pyramidal in outline. Flowers are large, of a delightful salmon-pink and produced all year long. Leaves are larger than average and a very bright green. This new Cyclone Hybrid also does well in both shade and sun and provides another color choice for bedding, pots and baskets.

'Arctic Star,' a well-branched upright plant with heavy stems. The very large flowers, two inches, are a glistening white and produced throughout the year. Leaves are large, with bright gold areas along the midribs. Does well in shade and extends the color range of the group.

'Summer Star,' of prostrate habit, this plant resembles a plump cushion, ten to twelve inches wide. Bright and colorful with a bright yellow center to each small leaf and purple flowers produced throughout the year. Makes a good basket or pot plant.

'Morning Star,' of upright habit and a promising candidate for display in pots. Leaves with very bright-pink midrib sections. Bright pink flowers are produced mostly during fall and winter months.

'Rainbow Star,' with flowers of deep orange. The foliage provides rainbow effects, with pinks, reds, orange shades and gold-greens, changing from month to month. Plants are upright, well-branched and grow well in shade.

Cyclone hybrid 'Orange Chiffon.'

Photos by Bob Long, courtesy Des Moines Register and Tribune.

Little Leaf Linden

*James R. Feucht**

Photo furnished by Author.

The little leaf linden, *Tilia cordata*, native of Europe, often is called the small-leaved European linden. It should not, however, be confused with the European linden, *T.* × *europaea*, which is actually a hybrid between *T. cordata* and *T. platyphyllos*. The latter has rather large, coarse leaves similar to the American linden. The little leaf linden is noted for its small foliage but, unfortunately, has also received a reputation for slow growth. While it may be of slower growth than the American and European lindens, if in a well-drained soil it will easily produce eighteen to twenty-four inches of growth a year and in the first twenty years of the life of the tree may average growth in excess of twenty-four inches per year.

The little leaf linden is particularly suited to Colorado conditions. It is a strong tree, thus not subject to the devastation of untimely snow storms. Its hardening-off is primarily regulated by shortening day lengths, at least more so than temperatures. Thus the tree is rarely injured in an early freeze.

While the little leaf linden is considered a medium-size tree, it can attain ninety feet or more in its native habitat. In the Rocky Mountain region its average mature height is more likely to be forty-five to fifty feet. The tree is easily recognized at a distance, particularly in winter, because of its symmetrical, almost sheared, appearance. As a young tree it is mostly conical in shape but as it matures it develops a nearly columnar growth habit.

Perhaps one of the best features of the little leaf linden, in addition to its strong branch structures, is that it falls prey to few insect pests and diseases.

**Extension Professor, Cooperative Extension Service, Colorado State University, Fort Collins, Colorado 80521.*

LITTLE LEAF LINDEN

Tilia cordata Mill.

Flowers: Perfect. Appearing in summer. In cymes and subtended from a strap-like, light green bract. Sweet fragrance.

Fruit: A dry drupe. Slightly angled. Faintly tomentose.

Foliage: Alternate, suborbicular, cordate at base. Margins with sharp serrations. Leaves average 3 inches long.

Branchlets: Greenish red to yellowish red. Buds lopsided. True terminal bud lacking.

Height: 40-50 feet

Growth Habit: Mostly conical when young. Nearly columnar with age.

Habitat: Native of Europe. Zone III.

Soil Preference: Well drained

Propagation: Seed, grafting

Principal Pest: Few of significance. Aphids, eriophyid mites and leaf-roller on occasion.

GENERAL REMARKS: A strongly-branched tree and highly recommended for Colorado cities where soils are adequately drained. Supplemental irrigation is usually necessary.

a - twig in winter b - leaf c - fruit on subtending bract d - flowers e - growth habit of intermediate-sized tree

Even in years when leaf roller activity was high, this tree showed little if any damage. Aphids, while occasionally causing some damage to the tree, are usually of little consequence. Perhaps the worst enemy of the linden is man, himself, when he plants the tree in a heavy clay soil with little or no drainage and dumps weed-and-feed chemicals on the root system.

Little leaf linden is widely used on the streets in Europe and has gained favor in many American cities. Crosses, using little leaf linden as one of the parents, have also resulted in some useful trees for the landscape, including *T.* × *euchlora*, the Crimean linden.

A selection of *T. cordata*, which has become popular in the Central Rocky Mountain area, is 'Greenspire.' This upright selection has wide appeal for use in shopping center malls, as a street tree, and in gardens where horizontal space may be limiting.

Blaine Bonham, a staff horticulturist and director of the Pennsylvania Horticultural Society's community gardening program, gives out 'Philadelphia Summer Gardens' T-shirts to junior members of a neighborhood garden club.

Inspecting for trouble. Aphids on the cabbage!

Photos furnished by Author.

**The Pennsylvania Horticultural Society 325 Walnut Street, Philadelphia, Pennsylvania 19106*

The Gardenmobile

*Ernesta D. Ballard**

It's eleven o'clock on a summer morning somewhere in Philadelphia—not Society Hill where the well-to-do live, but the heart of the city populated by plain people, black and white. Several of these plain people are working in a community garden, painstakingly fashioned out of a deserted lot. All at once, around the corner appears a dazzling white Chevrolet Step-Van, apparently encircled by a huge vine of nondescript taxonomy. It is—as it announces in bold orange letters—the Gardenmobile of the Pennsylvania Horticultural Society.

What does the Gardenmobile bring to this particular garden, and to many others like it throughout the city? Information, advice and above all, encouragement. The mobile is packed with books chosen by the P.H.S. librarian; handouts on gardening subjects supplied by the Cooperative Extension Service of Pennsylvania and New Jersey; seeds, plants, tools, fertilizers, insecticides; and, most important, a person who knows how to get things done in the city and wants to make center-city gardening work. What Mr. Fixit is to the distressed homeowner, the Gardenmobile is to the harrassed community gardener.

The Gardenmobile is not a new concept. More than a decade ago the late R. Gwynne Stout, then President of the Society, began to urge the idea of such a vehicle on all who would listen. While he pictured it traveling between shopping centers (this was before the malls) and through suburban developments, the function he envisioned for it was the same, namely, to bring know-how and experience to groups that desperately need assistance.

Skeptics may ask why we make so much of the vehicle. Could not the same results be obtained out of the back of a station wagon? The question misses the point. The vehicle becomes the embodiment of the Pennsylvania Horticultural Society, attracting attention, inviting inquiries, and eliciting happy recognition. Sure, it is possible to sell popsicles from a pickup, but would the Good Humor man really bring good humor without his truck? ◈

The Great Fertilizer Shortage

John Philip Baumgardt

Why is there a fertilizer shortage? Why is fertilizer production tied up with oil costs? What fertilizer conservation measures applied in my own garden will ease the situation? These are just a few questions gardeners are asking these days, and clear-cut, concise answers are one more thing in short supply.

The fertilizer shortage needs to be defined. Agricultural fertilizers, particularly fertilizers formulated for field crop production, are in short supply at least in part because of buyer demand. Populations are exploding at a rate to make healthy rabbits blush and countries that used little if any fertilizer a few years back now are buying it. There is a real shortage of certain formulations of agricultural fertilizer. This shortage of supply is aggravated by high costs. Without going into the industrial technique of inflating profits when demand is high and supplies are low, we can look briefly into the reason for increased production costs.

This is a simple matter; we all confront it at the gas pump. It takes energy to make fertilizer. The world's energy supply is in a turmoil, with prices going up and up. When a fertilizer manufacturer has to pay more for fuel to power his boilers, the cost of that fuel has to be written into the product. The result is increased cost of fertilizer. You and I know that gas, oil, and the like have nearly doubled in price over the past months. Some agricultural fertilizers have quadrupled in price. Draw your own conclusions.

Now, about those fertilizers designed to fertilize the lawn, the orchids, and the lilacs. Home garden fertilizers are special formulations. The processes used to make them, to bag them, and to distribute them are incompatible with agricultural fertilizer production. You can't convert a lawn fertilizer plant into a farm fertilizer plant—you only can shut it down. Why not let the farmer use the lawn fertilizer? Why not shut down home garden fertilizer operations, conserving raw materials for the agricultural fertilizer producing plants? These are good questions, but again, incompatibility comes into the picture.

Farm machinery that spreads agricultural fertilizers cannot be geared to spread home-type fertilizers. Almost all home garden fertilizers, especially the grass and turf fertilizers, are light weight products, where a little goes a long way. Agricultural fertilizers are heavy products. Having tried, years back, to fertilize a farm lawn by spreading turf fertilizer through a farm spreader, I concluded that it was infinitely simpler to hike over the acreage pushing a hand lawn spreader. As for raw materials, there certainly is no shortage of nitrogen, and phosphates and potash can be bought —get this—from the under-developed nations if they will pull themselves together to process it. It is true some energy could be saved by closing out the home fertilizer operations—at the cost of increased joblessness, loss of small, private businesses, and nationwide frustration of home gardeners.

Let me tell you a little story about fertilizer-making. During the late 1930's and early 40's an acquaintance of mine operated the family strip coal mining business in southeastern Kansas. The coal was soft, poor quality, and brought a moderately poor price. With an engineering degree in his desk and an agricultural community background, this man got to work. He built a small plant—quite unsophisticated—and burned his own coal, condensing the carbon dioxide thus produced with heat from the fires, and made commercial, pressure-bottled CO_2 and dry ice. His plant was near the Spring River, and he went further. Using well known engineering techniques he created steam, compressed air, and took both apart into various fractions. Soon he was able to supply not only commercial CO_2, but also, oxygen (O_2), hydrogen (H), and nitrogen (N). The next steps were obvious. React the nitrogen with the hydrogen to make ammonia (NH_3), and combine nitrogen and oxygen to form nitrate (NO_3), and react these two to make ammonium nitrate, that most potent of nitrogenous fertilizers, the stuff that produces bin bursting crops of wheat, rice, barley, rye, corn, and similar cereals. Raw materials? Cheap coal, water, and air!

Can you wonder that new fertilizer plants presently are being built in quantity? The end of the fertilizer shortage, so far as production capacity is concerned, is in sight. There remains the bugbear of energy to power the whole operation, but that obstacle is not insurmountable. Take India, for example, with a fine new nuclear reactor. Environmentalists hate nuclear reactors primarily because they produce heat, heat that pollutes the air, heat that overheats the water, upsetting its ecology. Heat that could be used to make fertilizer. In fact, if every major grain producing state in the U.S. had nuclear powered electrical generators to help the farm communities do their jobs and to produce fertilizer, the problem would be solved. Over-simplification? Yes, it fails to take politics, industrial profits, and all the rest into consideration. Strip away human greed and prejudice, and the job is not all that complicated.

Finally, a word about giving up home-use formulated fertilizers. Aside from a slight energy savings, nobody would benefit. Would anyone suffer? What would our cities look like with no thrifty trees, no green parks, lawns and parkways, no flowerbeds. At least a fraction of society is trying to stabilize humanity by introducing people to the joys of gardening, the creative thrill of producing a healthy plant. You can't do it without fertilizer. Certainly, the stability of our communities, already shaken, would be further eroded by collapse of esthetics based on good horticulture. A green world around us gives a peace of mind that apparently cannot be achieved any other way.

Dicentra spectabilis, Garden Bleeding Heart

*Clarence E. Lewis**

It is not difficult for me to write about my favorite perennial. My first association with it was during my boyhood—and this goes back a good many years! So, there is some nostalgia included among the words that follow. The plant is *Dicentra spectabilis*, the common or garden bleeding heart.

The derivation of the generic name is interesting. The name *Dicentra* comes from two words, *di*, meaning duplication or two, and *centra*, from the Greek word *kentron*, a spur, in reference to the two spurs of the corolla, or petals. The species, or specific name, *spectabilis*, means just what you would expect—remarkable, showy, or spectacular. It was known at one time by the generic name of Kielytra, and is in the *Fumariaceae* family.

Dr. Cumming and Dr. Lee in their book *Contemporary Perennials* indicate that this species was brought to England from Japan in 1847 by the well known plant collector, Robert Fortune. They also say that it was a favorite of the Chinese mandarins, who called it Hong-pak-moutan-wha.

My first impression of the heart-shaped flowers was that it was symbolic of Valentine's Day, and so we do have a living valentine. Too bad it does not ordinarily flower on February 14th, but it could be made to do so under controlled conditions. Maybe someone has already explored this possibility. Ordinarily in the northern states it flowers in May or early June. My colored slide record shows it to have been in flower on May 20th. The pink hearts appear on curved racemes, and these, with the whole plant and its graceful stems, is a symbol of lasting beauty not surpassed, and maybe unequalled in the perennial plant world. The double-winged effect of the flower is like a lyre, all the more reason for being nostalgic, since the

**Professor Emeritus, Michigan State University, 1520 Ridgewood Drive, East Lansing, Michigan 48827*

Photo by Roy Mecklenburg.

Bleeding Heart, *Dicentra spectabilis*, is a wonderful, long-lived, spring blooming perennial suited to most American gardens.

lyre is an old Greek musical instrument woven many times into Greek history. Look at the flowers and judge for yourself.

Partial shade is the best location, whether in the garden border, or planted elsewhere. It need not be grown in the border, but can be slipped in among shrubs so that it is protected, but not overwhelmed by the shrubs. It can grow to a height of three feet, but probably thirty inches is more common. Finding one plant in full flower is a real joy. The soil should be rich in humus, and possess excellent drainage in order for *D. spectabilis* to thrive and grow to a healthy plant with treasures of late spring flowers.

The foliage of garden bleeding heart is a rich green, a deeper green than that of the east coast plume bleeding heart, *D. eximia*. The texture is fine enough to be a welcome addition to the flower border, and to provide contrast with the neighboring plants.

Spring planting before new growth begins seems to give the best results. *D. spectabilis*, once planted seems to thrive best left alone in an undisturbed environment.

Cumming and Lee recommend root cuttings as a good means of propagating this best known bleeding heart. Dig beside the plant and take cuttings in early summer and set two inches deep. They say also, that top cuttings or heel cuttings of vegetative shoots root well in midsummer (late July).

Is *Dicentra* poisonous?—Dr. John M. Kingsburg, in his book *Poisonous Plants of the United States and Canada* states that only limited feeding experiments with livestock have been carried out with *Dicentra* species. *D. cucullaria*, Dutchman's breeches, alone, has proven poisonous—but not fatally so. Protopine is the only alkaloid yet characterized in *D. spectabilis*.

There is a variant known as *D. spectabilis* 'Alba,' which is white as you would assume from the name; usually it is not as sturdy or reliable as the species—and much more difficult to locate.

Garden bleeding heart is one of the most common of perennials, and goes back many years, and appreciated by such people as your grandparents—and, even their grandparents. The only way to improve on this species, *D. spectabilis*, is to grow and use more of it.

The Parma Violet

A Botanical and Historical Mystery

*Nelson Coon**

Most flower historians seem to agree that the rose has always been the most popular flower; with only a little disagreement the violet is rated second. The reason for this love of violets seems to have been the perfume which is found in a few of the species, and nowhere more than in *Viola odorata*. Roy Genders and Geoffrey Grigson, both diggers into floral history, agree that the scent of violets raised "the violet out of its wild obscurity more than two thousand years ago." Grigson notes that "Scent suggested sex, so the violet was the flower of Aphrodite and also of her son Priapus, the deity of gardens and generation." As a matter of fact, Priapeion was the Greek name for the violet. In the wedding scene of the famed tapestry *The Hunt of the Unicorn* violets are notably shown. Indeed, all the way back to the "basic" medical writer, Theophrastus, much has been written about the healing values of the violet.

Yet, with all this interest and usage, little is known about one of the most desired of all violets, the so-called Parma violet. Named after a city in northern Italy, possibly Italy was the source of plants for cultivation in England. The Parma violet enjoyed great popularity as the flower of Napoleon, whence came the name of the best purple sort, the cultivar 'Marie Louise.' There is indeed a whole story about this Napoleonic connection.

I have been concerned with the growing of the fragrant, purple, double violets since 1905, when I was but one of some 135 growers in the little town of Rhinebeck-on-Hudson (pop. 1,500). In the intervening years I have spent part of my horticultural lifetime digging into the history of these violets and find that perhaps in few other plants is so little known botanically. You may well say—"Why not consult your botanies and fine out." This I surely have done and once, some years ago, in suggesting to the late great, Liberty Hyde Bailey that his putting the Parma violet in the classification of *V. odorata* was questionable, he wrote me that he only placed it there in his *Hortus* because he didn't know where else to put it!

For the benefit of those who perhaps know little of the *Viola* family, it might be noted that the family includes not only such plants as the "true violets," but the larger and pansy-like violas, and of course, the much-loved real pansies. Bailey in *Hortus* lists about 125 species of interest in this country but a recent reference speaks of their being some 500 species in the genus. And yet none of these or many other basic books, have any solution to the violets which we call the "Parmas."

What is the reason and mystery in such a statement?

The Parma violets are completely double and totally sterile although with some variety in colors from the mild lavender in 'Lady Hume Campbell,' a reddish sort, 'Mrs. J. J. Astor,' and the pure white as in 'Swanley White.'

All these, being sterile, leave little to the laboratory botanist to work with so

**P.O. Box 1, Vineyard Haven, Mass. 02568*

From Hortus Eystettensis, Besler 1613

1.

Viola martia purpurea multiplici flore.

far as chromosome studies go, and because they are sterile, they are not botanically classified. Thus, they are outside the interest of the pure scientist, who might, through a chromosome count, assign them to a specific group. And yet, with all this non-knowledge they have for centuries been the one great violet of commercial importance. With long lasting and highly fragrant blooms they have been a sort to grow (as in France) for the extraction of perfume. The Parma violets were grown in great quantity a century ago at Windsor Castle for Queen Victoria and for the first quarter-century of the 1900's in America they were the one flower for the corsage of My Lady. (Then with change and the fickleness of fashion the gardenia and orchid took first place.)

You may again ask where the mystery is—and it is this matter of the origin and classification of Parma violet. As a lifetime horticulturist who has seen yellow flowers grow on plants of blooming pink chrysanthemums and has seen and read much of natural variations of both wild and cultivated plants, it is not hard for me to understand how nature might somewhere make a break in some of the hundreds of species of violets and to produce the anomaly of sterility. While such a mutation as sterility often causes plants to disappear, it appears that the perpetuation of these sterile violets was due to their fragrance and to the interest people took in them. The operators of the great Europe—Asia trade routes (some thousand years back) were on the alert for spices and plants of fragrance for use in perfumes, for dyes, and for medicine. And all these things are to be found in the Parma violet.

As to the original home of these violets, many writers take us back to the Orient. To quote from *The Royal Horticultural Society Dictionary:*

"The large flowering double violets, known as Parma or Neapolitan violets are evidently of Oriental origin and derived not from *V. odorata*, but another species, probably *V. alba.*"

In the book *The Coming of the Flowers*, Reisegal says:

"Some authorities believe that the far famed sweet violets of Parma may have originated in the Moorish gardens of old Spain, while others think they came from Turkey, by way of Italy."

That these were indeed the double violets of our concern is shown in an illustration which appeared in Besler's *Hortus Eystettensis*, published in 1613, showing pictures of both white and purple forms of what he names "Viola martia purpurea (and albe) multiplicia flore." In following along this line of literary research, another picture of these is to be found in a book by J. Bauhin in 1619, while in the *Herbaro* of Castor Durante in 1612 one reads of a double violet of the size of the "rose domestiche" which is "above all others," with its "suavissima odore." In the next century one again finds a picture of a Parma violet in the work of Dr. Ignacio Arena, *Della Natura e Coltura dei Fiori* of 1768. This he called "Doppio che tra del turchino" with the last word suggesting again a Turkish origin.

For many years such an Oriental origin was only a possibility, until recently confirmation has come to light through translations which I have had made of parts of a book written in Syria in the year 904 A.D. by Ibn Wahhschiji. This book appears to be an Arabic translation by him of an earlier work written in the Nabataan tongue by the author Qutsami. In this extensive agricultural manuscript there is a chapter about the culture of the violet, there called "Al-Banafsadsch," which, while it does not describe the actual flowers themselves, does give particular details of cultivation out-of-doors, and puts the time and length of blooming into exactly the culture of the Parmas as I know them. It tells of propagation methods, preparation and fertilizing of the soil, methods of shading by interplanting taller growing annuals and perennials, and tells of special needs for cool climate, moisture, and so on—all exactly identical with methods which I described in my book, *Practical Violet Culture*, published in 1925.

As an aside to this bit of evidence, it will please the "herbal culturists" of this century to know that recommendations included instructions for the interplanting of plants of rue, alternately with plants of a species of fig, the two plants to be burned together in place to eliminate disease and pests. Also included was a complete discussion of the use of such plants in agriculture to obtain effects which seem to sound like what is now called bio-dynamic gardening. Perhaps human nature has not changed very much in 1,000 (or should one say 1,000,000) years.

From all of the above it is not hard to understand why I believe that these double, fragrant, beautiful, purple violets are very ancient in their origin and a plant to be perpetuated even if the botanical world does not find a place to put them.

The relatively tender violet cultivars which are called Parma violets, are not the same as the more hardy double and single Russian violets. These latter have rich purple, somewhat sweet-smelling flowers, and seem to be quite like the Parmas except that the plants are low and small, the flowers tiny, and a plant for the choice rockery or other "cared-for" spot.

The culture of Parma violets is simple but specialized. Give them a cool shaded place in summer and a 40° to 45° F. temperature in winter. A good growing medium is well rotted cow manure, sand, and loam. Drainage must be good. In winter bright light helps produce an abundant crop of long-stemmed intensely fragrant, blossoms.

Longwood Gardens

Service Area Gardens

The Delaware Valley Landscape Design Council's 1973-74 Achievement Award was presented to Longwood Gardens, Kennett Square, Pennsylvania. In ceremonies held at the Gardens, representatives of the Council recognized Longwood for "promoting public interest and initiative in landscaping of home grounds through an annual display of example gardens."

The Example Garden program at Longwood was developed to illustrate a variety of solutions for common home-landscaping problems. Each year a specific design problem is given to four landscape architects. Their solutions are presented three-dimensionally as small gardens, and two-dimensionally in a small booklet which includes landscape plans, plant lists, cost estimates, and design interpretations. The Example Gardens are built inside the Longwood conservatory for year-round accessibility.

Longwood Gardens is one of the outstanding horticultural display gardens in America. Its great conservatories and unusual fountains rival those of the finest gardens in Europe. The Gardens are open every day of the year. There is an admission charge.

This year's Example Gardens, displayed in Longwood Gardens' new conservatory, show four landscape architects' solutions to the design problem of a "Service Area Garden." The "Service Area" refers to that portion of one's property which is most involved with the routine and utility aspects of daily life. With proper planning, this sector of outdoor living can be attractively arranged as an outside work center while at the same time serving as a convenient passageway to the rear or secondary entrance of the house.

It is not intended that you copy any one of these designs, but rather to suggest that by considering the site requirements as well as the desires of the homeowner-client in a given situation, a variety of satisfactory designs is possible.

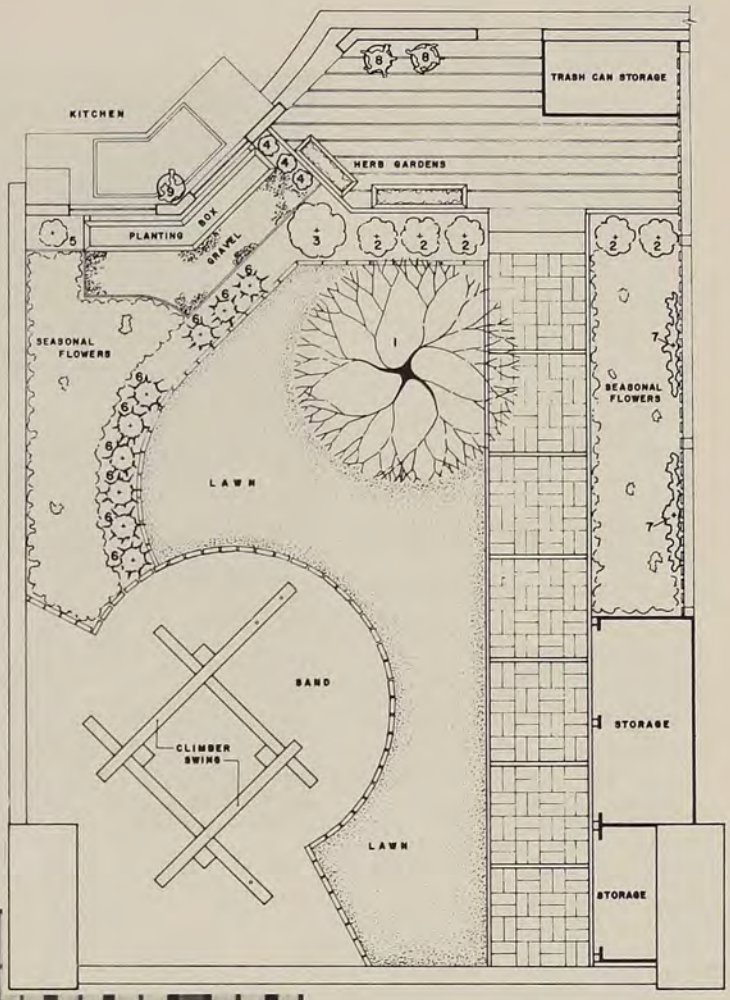
Longwood Gardens has reproduced the four plans, each architect's interpretation of his plan, his plant list, and a cost estimate, hoping that you will consider the kind of reasoning and thought which result in well-ordered and pleasing garden designs, remembering that plants are but one element in a larger whole. At Longwood you have the opportunity to relate the plan, which represents the thinking stages of a design, to its three dimensional manifestation—the garden.

"Beauty, like truth, is never so glorious as when it goes the plainest"—Laurence Sterne (1713-1768) British novelist.

A service area garden generally represents the utilitarian portion of the home grounds. In order to play down the utilitarian functions, simplicity was used as the basic design concept. Convenience to the home owner prompted the location of many of the elements in the design. The "Herb Garden," for example, has been located a few steps from the kitchen door. Trash disposal is also convenient, but not close enough to the kitchen door to be objectionable. Storage areas have been placed in locations appropriate to their use. The play area has been situated to facilitate supervision from the kitchen and rear of the home but at a sufficient distance to minimize sounds from this area.

Plantings have been incorporated into the design to soften the hard lines of utilitarian objects and to enhance views from the kitchen window and within the garden itself.

Lawrence G. Paglia, Newtown Square, PA



PLANT LIST

1. *Laburnum x watereri*—Golden-chain Tree
2. *Abelia x grandiflora*—Glossy Abelia
3. *Viburnum carlesii*—Fragrant Viburnum
4. *Pyracantha crenulata* 'Flava'—Yellow Pyracantha
5. *Cytisus x praecox* 'Coquette'—Coquette Broom
6. *Juniperus horizontalis* 'Blue Horizon'—Blue Horizon Juniper
7. *Cotoneaster divaricata*—Espaliered Spreading Cotoneaster
8. *Begonia* Rieger hybrid 'Aphrodite Pink'—Rieger's Pink Begonia—Hanging Basket
9. Seasonal foliage—Hanging Basket

Approximate Costs—Estimate
Execution by a Landscape Contracting Firm:

Construction (labor & materials)	$3,000–4,000
Plants Installed	650– 700
	$3,650–4,700

Approximate Costs—Estimate
Do It Yourself:

Construction (materials)	$1,500–2,000
Plants	500– 600
	$2,000–2,600

DESIGNER'S FEE ADDITIONAL

PLANT LIST

1. *Cornus kousa*—Oriental Dogwood
2. *Mahonia aquifolium*—Oregon Holly-grape
3. Culinary herbs
4. *Magnolia grandiflora* 'Russet'—Evergreen Magnolia
5. *Buxus sempervirens* 'Suffruticosa'—Dwarf Boxwood
6. Annuals for seasonal color
7. *Cryptomeria japonica* 'Bandai-Sugi'—Cryptomeria
8. *Ilex* hybrid 'Dr. Kassob'—Hybrid Holly
9. *Camellia sasanqua* 'Setaugekka'—White Fall-blooming Camellia
10. *Ilex pedunculosa*—Long-stalk Holly
11. *Wisteria sinensis*—Chinese Wisteria
12. Annuals for seasonal color

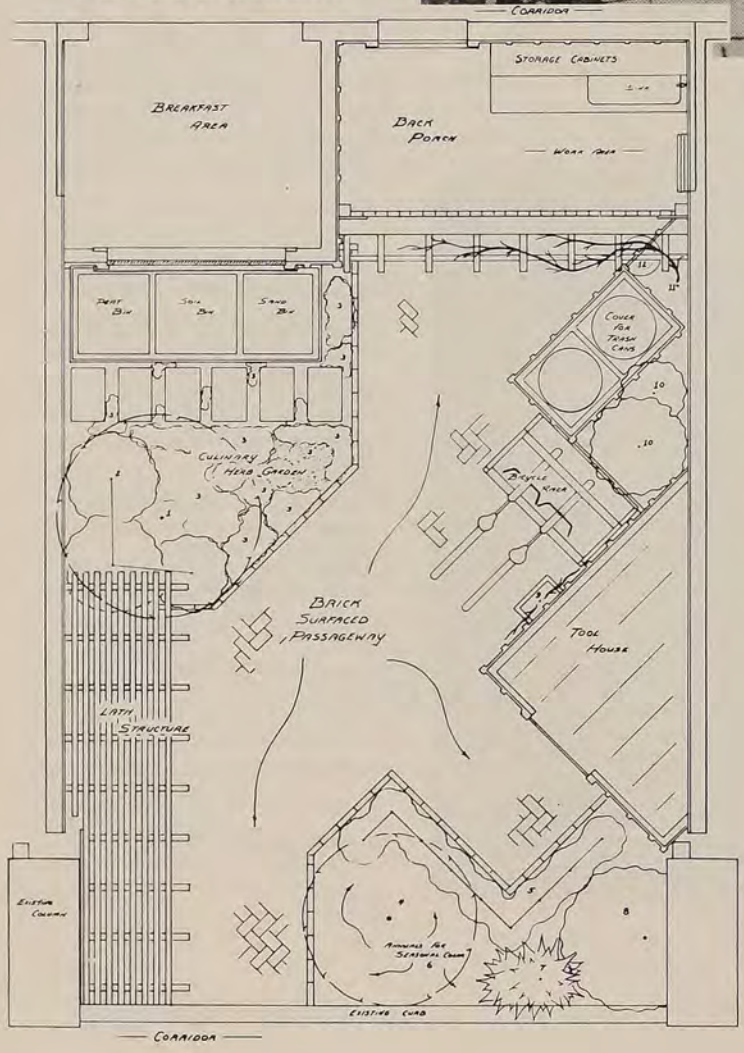
Approximate Costs—Estimate
Execution by a Landscape Contracting Firm:

Construction includes border preparation & mulching (labor & materials)	$3,000–4,000
Plants Installed	1,000–1,200
	$4,000–5,200

Approximate Costs—Estimate
Do It Yourself Materials:

Construction, mulches, etc. (materials)	$1,500–2,000
Plants	800– 850
	$2,300–2,850

DESIGNER'S FEE ADDITIONAL

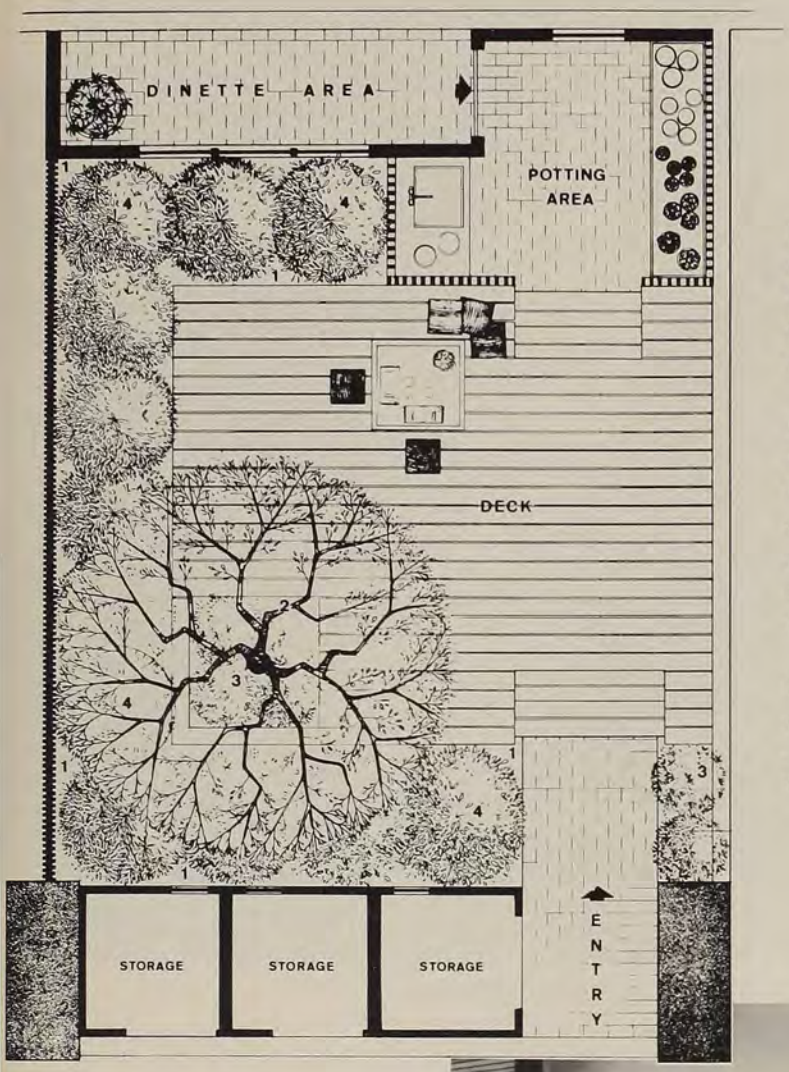


Solutions for this "Service Area Problem" assume a hypothetical family of four (parents and two teenage children) with horticultural interests. Goals were as follows:

1. The creation of an attractive garden when viewed from the breakfast room window or open Dutch door
2. A planned garden work and storage center close to the rear entrance which can double as an area for flower arranging and/or outside wash-up
3. Concealed storage for unsightly trash cans, potting materials, and mulches
4. A strategically located storage shed for tools and maintenance equipment which too often clutter the garage and basement area of the home
5. Defined parking for bicycles to keep them off the doorstep
6. A lath display structure for staging a prize collection of potted plants or Bonsai as well as for summer storage of house plants
7. A culinary herb patch close to the hand of the cook

The plants which enhance this Service Area were chosen to soften the architectural building lines and to create a refreshing atmosphere for work and play.

Richard W. Harris, Jr., Hockessin, DE



The latticework, as seen from the dinette area, visually links the home to the fence and storage area, thereby unifying the living space. This living space serves the functions of dining and entertainment, it provides room for family leisure activities or it may serve as a private retreat.

Easily accessible to the raised wooden deck, yet tastefully secondary, is the potting area which includes a sink with storage underneath for small garden tools, and a formica potting bench placed above another hidden storage area designed for potting soils, pots and firewood. The larger storage area situated adjacent to the entry provides ample room for trash barrels, garden equipment, and miscellaneous hardware.

The wooden deck is speckled with shadows cast by the broad oak canopy which also allows sunlight to filter down upon the planting of ericaceous materials below. Accents of seasonal color are provided by containers of flowers placed within the service area.

Donald R. Knox, Inc., Greenville, DE

PLANT LIST

1. *Vinca major*—Periwinkle
2. *Quercus phellos*—Willow Oak
3. *Skimmia japonica*—Japanese Skimmia
4. *Rhododendron catawbiense* 'Roseum Elegans'—Roseum Elegans Rhododendron

Approximate Costs—Estimate
Execution by a Landscape Contracting Firm:

Construction (labor & materials)	$6,000–7,000
Plants Installed	1,500–1,650
	$7,500–8,650

Approximate Costs—Estimate
Do It Yourself; Materials:

Construction (materials)	$3,000–3,500
Plants	1,200–1,300
	$4,200–4,800

DESIGNER'S FEE ADDITIONAL

PLANT LIST

1. *Ampelopsis brevipedunculata* 'Maximowiczii'—Porcelain Ampelopsis
2. *Buxus microphylla* 'Koreana'—Korean Boxwood
3. *Rhododendron* Glenn Dale hyb. 'Glacier'—Glenn Dale Azalea
4. *Buxus sempervirens* 'Suffruticosa'—Dwarf Common Boxwood
5. Flowers for seasonal color
6. Kitchen herbs
7. Flowers for seasonal color
8. *Acer palmatum* 'Dissectum'—Cutleaf Japanese Maple

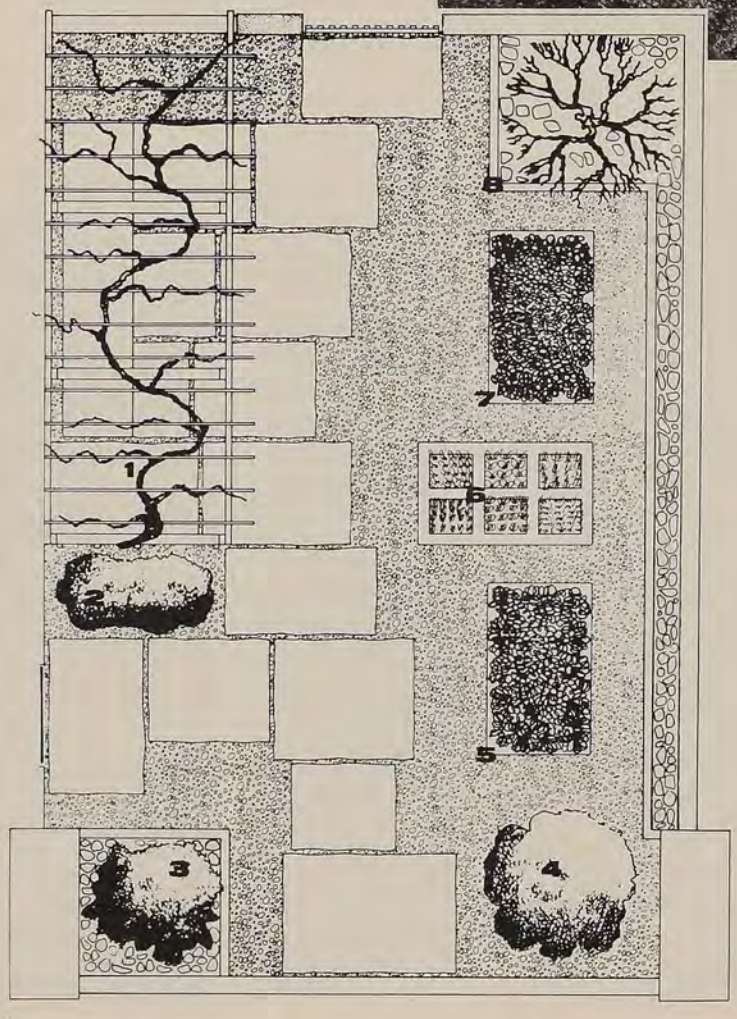
Approximate Costs—Estimate
Execution by a Landscape Contracting Firm:

Construction (labor & materials)	$2,500–3,500
Plants Installed	1,200–1,500
	$3,700–5,000

Approximate Costs—Estimate
Do It Yourself; Materials:

Construction (materials)	$1,250–1,500
Plants	850–1,000
	$2,100–2,500

DESIGNER'S FEE ADDITIONAL



This Service Area Garden is seen from inside the house and therefore is designed to look neat the year-round while still providing space for hiding tools and trash cans. The occupants of the house are considered to be hobbyists who like to grow hanging potted plants.

The space is purposely treated as a simple, almost severe, outdoor room. It is assumed that the gate at the far end opens into a garden of plants growing in wild profusion, in contrast to this simple and controlled space.

Texture has been an important design consideration. The rounded foliage of boxwood and azaleas relates to the rounded pebbles, which, in turn, relate to the rounded cobbles. The wood fence and the stucco walls have been painted subdued colors to harmonize with the subtle, natural colors of the gravel, cobbles and flagstone. All of these muted colors serve to tie the area together and unify it and to act as a background for a few well-chosen plants, just as the muted walls of a museum serve to emphasize and enhance colorful paintings.

Maintenance in this garden would be minimal.

George E. Patton, Philadelphia, PA

Photos furnished by Author.

Missouri Botanical Garden's new rose garden showing the gazebo.

Missouri Botanical Garden Today

*Robert Dingwall**

The Missouri Botanical Garden often referred to as Shaw's Garden and one of the oldest botanical gardens in the United States, continues to move into a new era under its present Director, Dr. Peter Raven. The Garden is supported by a private foundation receiving no tax support. Progress continues despite financial difficulties typical of those experienced throughout the country by other member institutions.

A new master plan for further development of the Garden was accepted last year; this includes several new features to be developed over the next few years. One major feature has been the construction of the new rose garden located just west of the Shaw House. Eugene Mackey Architects, in consultation with Harriet Bakewell, Landscape Architect, and the staff of the Missouri Botanical Garden, designed the new rose garden which includes the first in the series of major fountains to be installed in the Garden. The new fountain, called the Shapleigh Memorial

Chief Horticulturist, Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Missouri 63110

Fountain, adds a major touch to the rose garden entrance from the west side. Visitors approaching the Rose Garden see undulating water "curtains" and experience walking between walls of water into the center to sit on a raised dias and look out through water into the rose garden. The water slowly rises up and down to a height of approximately fifteen feet. Leaving the center of the fountain, visitors pass through between the two curtains of water and walk onto the first terrace. This is a large, circular lawn retained on the upper side by a low brick wall which opens at both ends to a sitting arrangement. Above the wall azalea plantings are featured for bloom in early spring. The second (higher) elevation consists of a series of rose beds which lead the viewer to either side and so approach sets of steps on the outside edges of the garden. In going up to the third terrace visitors see an extensive display of rose cultivars which do well here in the Middle West. Many of these cultivars have been selected out of the All-American Test Rose Garden. Beds are arranged so that visitors may walk between them, viewing the different roses while strolling toward the gazebo. The gazebo is across the rose garden from the fountain and here visitors sit under a roofed area viewing roses and water. There is a small fountain, and a view through a vista of roses to the undulating fountain. As visitors leave the new rose garden they may wander southwest and approach the new Japanese garden, now under construction, which will cover approximately thirteen acres. Professor Kawana is the designer.

This site contains a small man-made lake which was excavated last fall to about three times its previous size. Two small islands in the redesigned lake become part of the overall Japanese garden. Much of this portion of the Garden, under-developed for a number of years, now will be the first major Japanese garden in the Middle West. Construction utilizes local material in a Japanese setting along with many traditional Japanese plants. Mr. John Elsley, curator of hardy plants, recently made a trip to Japan to select and bring back new plants to be used in this garden. The garden is expected to draw many visitors as it continues to develop over the next three or four years, and it will become one of the highlights of interest in the Garden.

Soil removed during excavation of the Japanese garden lake has been contoured into mounds surrounding the Japanese garden. These planted berms will protect the garden from southwest winds which can be very damaging.

The boxwood garden, developed as a memorial to Dr. Edgar Andersen who was greatly interested in boxwood hardiness, will be located just north of the Japanese garden, and will contain approximately twenty different types of boxwood which have proven hardy in the St. Louis area over the last eight to ten years. Many of these will be planted on the sides of the knolls, protected from the winds. Other plans for the boxwood garden include additional evergreens and plants to provide a gradual transition from the Japanese garden to the boxwood garden.

The Garden continues as a very strong research center, well known throughout the country. The Lehmann Building Herbarium, which opened several years ago, has added immeasurably to the facilities of the Garden and has enabled the Garden to broaden out in both the use and storage of herbarium material as well as in research. Education programs for local plant and garden enthusiasts continue to be popular and increase in size and number each year; the demand always is very strong in this field.

The Climatron continues to be a very strong drawing card both locally and internationally. Considerable changes have been made in diversifying plant material and in adding new plants, many of which are extremely rare in the world today. The emphasis in the Climatron is horticulture display.

Visitors to Missouri Botanical Garden today see many changes which have occurred over the past few years. They see the Garden preparing for the future with detailed planning and thought going into all new developments. ◈

Support the American Horticultural Society
. . . a home for all horticulture

The American Horticultural Society has been serving the interests of American horticulture for over half a century. It is the one national organization designed to function as a unifying force. Its membership roster includes the widest range of horticultural interests, with representation of individuals, scientific organizations, institutions, and commercial enterprises.

The American Horticultural Society is establishing at George Washington's River Farm in Mount Vernon, Virginia, a National Center for American Horticulture where all scientific, professional, and amateur horticultural organizations who wish to do so, can join together in one facility.

It will take the gifts of many individuals to build the National Center. A charitable bequest provision in a will is one way to help finance the activities of the Society. A bequest rewards the giver throughout his lifetime with the knowledge that his contribution will be used to develop and support "a home for American horticulture". Individuals who wish to support the Society through charitable bequests are urged to consult with their attorney regarding the legal terminology or write the Executive Director, American Horticultural Society, Mount Vernon, Virginia, 22121 for further information.

Contributions and other gifts to the American Horticultural Society are deductible for Federal income tax purposes.

Don't use last year's books to learn about growing next year's plants.

Constant updating makes the new third edition of **PLANT PROPAGATION** by Hartmann and Kester one of the most modern texts available. Expertly written and lavishly illustrated, this is not a haphazard "green thumb" approach, but a scientific study based on the principles of plant physiology, biochemistry and plant anatomy.

PLANT PROPAGATION emphasizes the latest developments in plant propagation techniques and equipment as well as providing helpful information on disease control and plant nomenclature.

The last three chapters make up an encyclopedic reference section on propagating virtually everything from fruit trees to ornamental shrubs. The theory is separated from the techniques – both student and gardener can get straight to the matter that concerns them most.

Explore Hartmann and Kester's **PLANT PROPAGATION** yourself, and get this year's knowhow on growing next year's plants.

PLANT PROPAGATION:
Principles and Practices, 3rd Edition, 1975
Hudson T. Hartmann and Dale E. Kester
1975 704 pp. $17.25

To order write: Robert M. Jordan, Dept. J-83, College Division, Prentice-Hall, Englewood Cliffs, N.J. 07632 (If you order ten or more copies for class use we will cancel charges on your examination copy)

New- from Prentice-Hall

TREES & SHRUBS

EVERGREEN TREES

3 year, select trees; 8"-16". 25 5 each; Scotch Pine, Norway Spruce, Austrian Pine, Colorado Blue Spruce, Douglas Fir. FOR ONLY **$9.95**

CANADIAN HEMLOCK

These are heavy well rooted 10-15 inch 4-yr. Transplants, not Seedlings. Ideal hedge in sun or shade. Trim to desired height.

15 For $9.95
25 For $16.95
50 For $31.95

6 RHODODENDRON & 6 AZALEAS

Strong 1-yr. transplants 4" to 8" tall. Mass of roots, large leaves. Rhododendron from red flowering stock. Azaleas, hardy, mixed colors. 12 PLANTS FOR ONLY **$10.95**

NEW GROUND COVER

25 CROWNS—covers 100 sq. ft. . . $ 8.95
50 CROWNS—covers 200 sq. ft. . . $12.95
100 CROWNS—covers 400 sq. ft. . . $22.50
CROWNVETCH – perennial ground cover – Flowers June til frost. Beautiful, hardy, no mowing. Grows 12"-18" any climate, sun or partial shade. Chokes weeds, resists droughts.

Postpaid. No C.O.D. Pa. destinations add 6% tax.
☐ Send me the items circled above
☐ Send me FREE Catalog

Name _____
Address _____
City _____
State _____ Zip _____
Area Code _____ Phone No. _____

MUSSER BOX 310 **INDIANA PA. 15701**

Reach up and pick full-size fruit from your own home fruit garden. You never need a ladder. Send for FREE catalog now.

FREE Stark Bro's Catalog

Grow full-size apples, peaches, pears on Stark dwarf-size trees.

Trees about eight to ten feet tall bear full-size apples, peaches, pears, cherries. Smallest spot in your yard becomes a rich, bountiful orchard of fresh fruit and beauty.

Send for your **free** catalog today. New Stark catalog features more than 400 varieties of fruit trees, shrubs, roses, shade trees, nut trees plus landscaping tips.

Men, Women Wanted
Introduce Stark nursery stock to your friends. We need men and women who want to earn extra cash in their spare time. Check the block for complete details FREE.

New Catalog Free

Stark Bro's Box A17825 Louisiana, Missouri 63353

Stark Bro's Nurseries
Box A17825 Louisiana, Missouri 63353
☐ Send me your Free Catalog and special offer on early orders.
☐ Send me a free money-making kit and demonstration outfit.
Mr. (Please print)
Mrs.
Miss _____
Address _____
City _____ State _____ Zip _____

GARDENER'S MARKETPLACE

Azaleas and Rhododendrons

Rhododendrons-Azaleas— Free Catalog. Rhododendrons—wide variety. Azaleas—hardy Glenn Dale and Gables. THOMAS HENNY NURSERY, 7811 Stratford Drive, Brooks, Oregon 97305.

Specialists in Rhododendrons—both species and low-growing hybrids. Exbury azaleas, other rare plants. Fall catalog 25c. THE BOVEES NURSERY 1737 SW Coronado, Portland, Oregon 97219.

Begonias

Rieger Elatior Begonias, 24 varieties. Send .20 for list: Begonias & Exotic Plants, Dept. H, 42 Candee Ave., Sayville, N.Y. 11782.

Books

BOTANICAL & HORTICULTURAL BOOKS, Rare, Out-of-print, New.—Latest Catalog $1.00 S.J. Singer Co. 1133 Broadway, New York, N.Y. 10010.

Chrysanthemums

National Chrysanthemum Society, Inc. USA. Annual dues $5.00, includes 5 issues of The Chrysanthemum, Beginner's Handbook. MRS. WALTER CHRISTOFFERS, Sec., 394 Central Avenue, Mountainside, New Jersey 07092.

Delphiniums

New Melissa Hope Delphiniums. New exciting colors, New unusual forms. New huge sizes. Rugged, disease and wind resistant. Newest delphiniums available. Breeders select seed. $5.00 per pkt. (100 seeds). Ames Greenhouses, E. 13th St., RR #2, Ames, Iowa 50010.

Dwarf Conifers

Dwarf Conifers, Alpines, exotic Maples, Hostas, Sempervivums. Large new catalog 35c. Over 7,000 different plants at nursery. Visitors welcome. Palette Gardens, 26 West, Zionhill Road, Quakertown, Pennsylvania 18951.

Ferns

LEARN ABOUT FERNS—join the Los Angeles International Fern Society for only $4.50 yearly. Receive educational monthly bulletin and two page lesson; annual magazine. Address LAIFS, Box 448-H, Hawthorne, CA 90250.

House Plants

GUARANTEED PLANTS—of all families—exchange privilege if not 100% satisfied—a new strictly mail order club with limited continental U.S. membership—not sold wholesale or in stores—you get the discount prices—join today—remit $1.00 for 1974 dues and receive low, low prices, literature and membership card—tell your friends if they like to save money. GUARANTEED PLANT CLUB, Box 66GA, Robbinsville, N.J. 08691.

Hydroponics

Hydroponics Plus by Maxwell Bentley, Ph.D. $9.95 post paid, 232 pages, approximately 150 color plates, Ms. A.H. Gilbert, P.O. Box 630283, Miami, Florida 33163.

Lithops

LITHOPS. Also other South African mimicry plants, rooted. Cuttings of many choice Succulents. COLLECTOR'S SUCCULENTS, 548 Crestline Drive, Los Angeles, California 90049

Miscellaneous

Versatile Mister—Automated solid state system. Rapid heavy rooting and sturdy growth—Valve, sensor, power supply, cables —$69.50. Fully Guaranteed. AQUAMONITOR, Box 327-Z, Huntington, New York 11743.

Primroses

BARNHAVEN SILVER DOLLAR PRIMROSES for enchanting Spring color. Primula, rock garden and wild flower seed. Unique catalog, 25 cents. FAR NORTH GARDENS, 15621 Auburndale Way, Livonia, Michigan 48154.

Seeds

Seed of Primulas, Rock Garden and Wild Flowers. Famous Barnhaven Primroses—seed and plants. Unique catalog, 25 cents. FAR NORTH GARDENS.

VOLUNTEER PEACE CORPS

You are needed for Peace Corps projects in Latin America, Africa, Asia. Extension work in harvesting, storage & marketing, home gardening projects, research, nursery & orchard projects, etc. Transportation, housing, medical care, paid vacation. Singles or couples. Information: Lynn Rotenberg, ACTION, ORC Box F-18, Washington, D.C. 20525.

The "secret" to growing spectacular flowers is as old as the hills...

These days we seem to hear an awful lot about sprays, pest traps, fertilizers, and so on. There are all manner of devices for you to choose in your careful — often fretful — stewardship of the tiny flower seeds on their progress into pretty blossoms.

Now if you'd only let Mother Nature get more into the act, and take a little of the credit, together you could produce the most healthy, vigorous flowers you've *ever seen* — glowing with deep, rich colors and the longest life possible.

The "secret" to growing remarkable flowers is really as ancient as the hills. *You concentrate on gradually enriching your soil to the point where it's thoroughly cushioned with humus and bursting with soil life.*

In such a garden — *wherever* it is located and *whatever* the basic soil type — rain soaks in, never puddles. Because of the nice, fairly loose aggregates of soil bonded by organic matter in various stages of decomposition, drainage is near perfect. But during dry spells, moisture is available to plant roots as needed, held in storage by the sponge-like humus. Earthworms abound, creating a reservoir of plant nutrients. The earth smells sweet, a pleasure to feel. And, a beautifully fine, deep seedbed can be prepared in minutes — almost guaranteeing rapid, strong root growth.

"This state of the soil sounds delightful," you say, "but what's *your* device?"

True, we've got one, and we wager you'll agree that it's a welcomed change indeed. Our company designed and builds the Troy-Bilt Roto Tiller-Power Composter, the machine that thousands of enthusiastic gardeners of all ages are now using to grow truly bountiful plants.

You may have heard of us, but, frankly, we've mostly addressed our advertisements to folks pretty serious about raising vegetables and fruits, keeping one particular garden site constantly fertile and productive despite "harvesting" year after year. Many, many of our owners (especially those in their 70's, 80's, even 90's — men *and* women) tell us having one of our incredibly easy-handling tillers has meant the difference between filling a freezer or canned jars with plenty of fresh-tasting, inexpensive, home-grown food . . . or not having a garden at all.

But now we figure *all* gardeners are concerned with conserving soil, composting, and improving seedbeds.

You may not realize that the Troy-Bilt has *power-driven* wheels which balance all the weight and propel the machine smoothly forward. The more rapidly-revolving tines in the *rear* end are therefore free to both chop up and till under all types of vegetation for soil organic matter — weeds, leaves, sod, *all* garden residues.

Whether it is a narrow border of annuals along a fence, or a larger area for vegetables and fruits, . . . whether breaking ground, preparing a seedbed, cultivating, or "power composting" organic material . . . you actually *stroll* alongside the Troy-Bilt, easily guiding it with *just one hand.* It can literally turn your *whole garden* into one, big fabulously fertile "compost pile!" No wheelmarks, no footprints, no unbearable tangling, no struggle.

Of course, the "secret" of the Troy-Bilt is getting around. We're the oldest manufacturer of rotary tillers in the country . . . not "old as the hills," but almost 40 years now. We're darn proud of the way we build our tillers, and they come with a No-Time-Limit Warranty.

Most all of the other tillers with their tines in the *front* are cheaply built. They tangle up on just about any vegetation. They make you compact the soil with wheelmarks and footprints. They shake the living daylights out of you to boot. They take the *joy* out of gardening!

Fortunately, there are enough folks serious about improving their soil and gardening in spite of their age, physical strength or a possible handicap to make a very good business for us here in Troy just build-

ing our easy-handling, tines in *rear* Troy-Bilt Tillers.

We'd be happy to tell you all about them, the several models with and without electric starting, plus our OFF-SEASON SAVINGS now in effect. We also include a lot of just plain good reading on *gardening* — our favorite subject!

Please use the coupon below.

TROY-BILT® Roto Tiller-Power Composters
102nd St. & 9th Ave., Troy, N.Y. 12180

TROY-BILT® Roto Tiller-Power Composters
Garden Way Mfg. Co., Inc., Dept. 54412
102nd St. & 9th Ave., Troy, N.Y. 12180

Please send me the whole story of your Troy-Bilt Tillers, including prices and OFF-SEASON SAVINGS now in effect.

☐ Mr.
☐ Mrs.
☐ Ms. _____

Address _____ Box #

City _____

State _____ Zip _____