

AMERICAN HORTICULTURIST

JUNE/JULY 1980



Plant Ecology Wallcharts

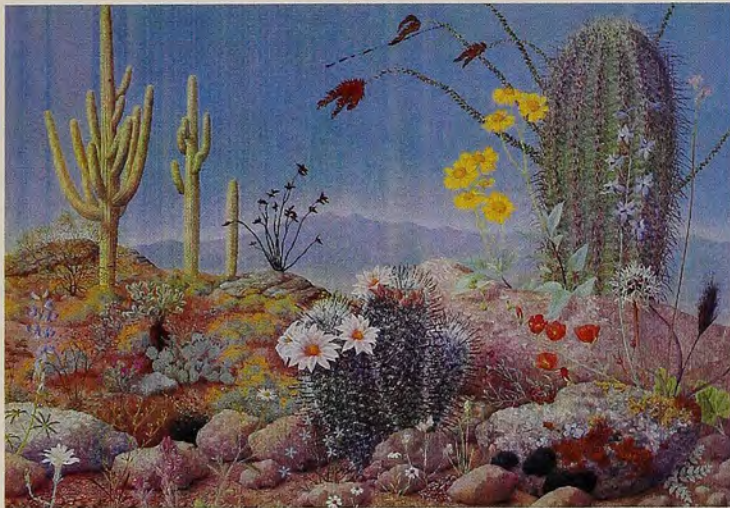
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COVER

Portion of "Wedding Present for Elliot Sussman and Jody Carr." 1978.

This fleurage by Harry White commemorates the wedding of close friends of the artist. A portion of a chupah, or hut made of pine boughs under which the couple is united in a Jewish wedding ceremony is visible. The symmetrical nature of the design suggests the balance of masculine and feminine elements. Flowers and plants for the fleurage were collected at the wedding and a dinner celebration following the wedding. They include bits of lettuce, ivy, marigolds, roses, cymbidium orchids, carnations, stephanotis and bachelor's buttons. For more about the art of fleurage, turn to page 28.



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How You Can Play an Active Role as a Member of AHS

The American Horticultural Society has nearly 30,000 members, but only a few of you are active in the Society's projects. We would like to get a lot more of you involved. One of the best ways you can help us promote the cause of horticulture is either to be a member of or to be active in working with one or more of the Society's committees.

The Society tries to recognize accomplishments in horticulture in a number of different ways. Awards are given to individuals at our Annual Congress in recognition of accomplishment in various aspects of horticulture. Achievements in education, professional activities, commercial activities and just all-around contributions to gardening are rewarded with a number of medals presented to individuals. If you know individuals who you believe should be recognized in this way, please send your nominations to the Awards and Citations Committee in care of River Farm.

We also try as an organization to recognize superior exhibits at flower shows put on by other organizations. This is the job of our Horticultural Awards Committee. If you would like to include an American Horticultural Society award as part of your flower show program we will be happy to tell you how to qualify. But you have to let us know that you are interested.

For many years we have been keeping all of you informed about new developments in gardening and horticulture through our publications. The Society's Education Committee would like to go beyond that limited approach and provide more direct educational opportunities to the gardening public. We have just completed a very well-received series of gardening lectures at River Farm. Would you be interested in an American Horticultural Society sponsored lecture series for your garden club or community? Let us know your needs and desires so that we can begin to develop a program.

As you may have guessed from my previous editorials, I am a collector of botanical and horticultural books. Many fine works have been published over the past 250 years which still are pertinent to our gardens today. Within the area of my own gardening interests, however, I am aware of some real gaps in the literature. So much of what is published in gardening literature today is just a rehash of the same old stuff. Every once in a while a new book will come along which really fills a need. Maybe one in 100 books adds to our knowledge, but the other 99 are just new versions of the same old thing. In the book review column of this magazine we try to bring to your attention the more unusual and worthwhile books on all facets of horticulture. From the reader response we observe, many of you are obviously interested. But there are surely subjects we haven't covered. This is a goal of the Society's Publications Committee—to improve the quality of gardening material published and to encourage the publication of titles on subjects which have not been given sufficient attention. But we need lots of help! Let us know what books you need but are unable to locate. Perhaps we can recommend an existing volume, but more to the point, we might be able to get a new work written that covers an area not currently included in the present-day literature.

Many of you belong to other horticultural or specialized plant societies. Is your favorite plant represented in the demonstration gardens at River Farm? Is your plant society keeping the American Horticultural Society informed of its activities so that we can share in the knowledge of your special plant interest? Demonstration gardens, where applicable, and articles in the *American Horticulturist* are a couple

of easy ways we can help you spread the word.

We are getting more letters from you all the time, and we are delighted that the numbers are increasing, even when you write to complain rather than to praise. For instance, some of you are obviously pleased with recent changes in our publications. Some of you are strongly critical. We can't please everyone, but we try to please as many of you as possible, and that task is easier when we know exactly how you feel. Keep those cards and letters coming.

Gilbert S. Daniels

—Gilbert S. Daniels
President



THE MISSOURI BOTANICAL GARDEN

St. Louis bears the stamp of a remarkable man. Streets, an arboretum and an urban garden carry his name.

Henry Shaw, a 19th-century businessman born in England, arrived in this brawling river town via a packet boat from New Orleans. The year was 1819 and the city was young, serving as the gateway to the West. It proved fertile ground for Shaw's thriving hardware business. He came to adopt St. Louis as his home and his legacy survives today.

At the corner of Tower Grove and Shaw Avenues, on a tract of land that was once prairie land but is now decidedly urban, lie the main elements of this legacy to the people of St. Louis—Tower Grove House, the Victorian country home built by Shaw in 1849, and the 79-acre Missouri Botanical Garden developed by Shaw, left in public trust by his will, and currently one of the most respected and far-reaching botanical institutions in the world.

Shaw made the most of the "boom-town" environment that existed in St. Louis in his time. With \$30,000 in capital borrowed from an uncle, he began to import hardware and earthenware from England and to export cotton and tobacco. He also began to invest in real estate and ultimately held title to 1,800 acres of land.

In a 20-year period Shaw amassed a fortune of \$250,000, roughly comparable to four times that amount today. Deciding that his holdings seemed to be enough for any man, he retired at the relatively young age of 39. Ten years later he commissioned a house to be built on one of the many tracts of land he owned. It came to be known as Tower Grove House because a tower was part of its design and because the house was situated next to a grove of trees. It was here that the Missouri Botanical Garden had its beginnings.

"Shaw's interests were many and varied," says Dr. Peter H. Raven, a 44-year-

old botanist, author and research scientist who has served as director of Missouri Botanical Garden since 1971. "In his youth he had visited the Royal Botanic Gardens at Kew in London and as a consequence had developed an intense interest in botany and horticulture. During the 1850's he began to develop the Missouri Botanical Garden into a major botanical institution in the European style. He lived the last 30 years of his life in Tower Grove House directing the growth and development of the Garden he would leave in the public trust."

Today Tower Grove House stands as a reminder of the splendor of its time. Completely restored and furnished with many of Mr. Shaw's possessions, the house is maintained by the Historical Committee. Tour guides provide history and background for persons visiting the house.

The original Garden of Shaw's time encompassed a small area. Tower Grove House and the Linnaean House, a greenhouse constructed by him and the oldest operating greenhouse west of the Alleghenies, formed the original north-south axis. Today, however, the Garden has grown to encompass a 79-acre tract in south St. Louis and offers its 400,000 annual visitors much more than Victorian history.

"The Garden exists today with a three-fold purpose," explains Dr. Raven. "We are dedicated to botanical research, education and display. The most visible element of that triangle, of course, is display."

The principal display features within the Garden include:

- The Climatron, a geodesic-domed, climate-controlled greenhouse which stands 70 feet high, 175 feet in diameter, covers an area of more than a half acre, and encloses an interior of 1.3 million cubic feet. Opened to the public in 1960, this greenhouse contains a diverse array of tropical and subtropical plants in a carefully landscaped natural setting. Included in the collection are many plants that are considered



Missouri Botanical Gardens

Japanese iris mixed hybrids flank the Yatshuhashi bridge in the Japanese Garden of the Missouri Botanical Garden.

The rare book room in the Garden library is the repository for the pre-Linnaean book collection. Tower Grove House is visible in the distance.



rare and endangered. These plants can be studied in a setting which approximates their native habitat. The Climatron is the feature for which the Garden is best known.

- The Desert House, constructed in 1912, houses a collection of cacti, succulents and plants of the arid regions of the world. The collection dates back to the turn of the century and demonstrates the evolutionary responses of different plant families to the arid environments of the desert.

- The Mediterranean House, the only greenhouse in the nation devoted exclusively to the display of plants from the regions of the world with a Mediterranean climate—cool, moist winters and hot, dry summers—contains many rare species and some that are in danger of extinction.

- The Rose Gardens include the Gladney Rose Garden, which contains nearly 2,000 rose bushes, and the Anne L. Lehmann Rose Garden with more than 3,000 rose plants. The garden, an All-America Rose Selection test center, provides data to help AARS judges make decisions as to which new roses are the most satisfying both horticulturally and aesthetically. Winners may be seen here a year before they are offered to the public.

- The English Woodland Garden, a naturalistic-style garden developed in 1976, features azaleas, dogwood and woodland wildflowers. During hot summer days the winding pathways invite strolls in the cool shade of tall trees. This garden provides a unique setting for the cultivation of woodland plants. Wildflowers blanket the earth in early spring followed by a succession of spring-blooming shrubs and small trees.

- The Scented Garden consists of raised beds containing plants with highly textured leaves and pronounced fragrances. It provides a botanical experience for those with impaired vision as well as for those who are sighted.

- The Japanese Garden, newest of the Garden's features, was dedicated in 1977. Designed by Koichi Kawana, a native of Japan and lecturer in environmental design and landscape architecture at the University of California, Los Angeles, this garden was nearly three years in construction. Named *Seiwa-En*, which means garden of pure, clear harmony and peace, it encompasses 14 acres surrounding a large lake. There are bridges, islands, waterfalls, dry gardens, stone lanterns, a Japanese tea house, plum viewing arbor and plantings appropriate to a Japanese garden setting. Pines, maples, cherries and magnolias, especially Japanese species, are featured in the plantings. Many are carefully trained. Hollies, azaleas, quince, dogwoods, crab apples, burning bush, mondo grass, ginkgo and Korean lilac complete this unique landscape.

Though less visible than the display features of the Botanical Garden, research and education are just as important. Both departments are headquartered in the modern John S. Lehmann Building, completed in 1972 as part of the Garden's master plan of development.

The Garden's research efforts have contributed a great deal to the understanding of the importance of tropical rain forests. The curatorial staff of 12 Ph.D. botanists track down plant specimens in Brazil, Panama, Kenya, Belize, Mexico, Madagascar, Sri Lanka, Peru and the United States.

Concentrating mainly in the areas of taxonomic and floristic research, collections of specimens are made by the botanists in their particular field of interest and are shipped back to the Garden, processed, and eventually stored in the modern herbarium on the lower level of the John S. Lehmann Building. The collection numbers over three million plant specimens.

The resident research scientists at the Garden also have been responsible for a number of practical discoveries. In past years they have developed several new hybrid water lily varieties, new techniques for the commercial production of mushrooms, and the use of creosote to preserve wood.

Nearing completion is a massive effort to document the flora of Panama. The results of this research have been published in the Garden's scientific publication, the *Annals*.

The Garden library is a repository for more than 300,000 books and manuscripts. A good part of the collection includes botanical works that are rare and priceless. This collection serves as a backbone for the ongoing research here as well as for visiting scientists.

Also housed within this modern building is the Garden's education department, which supports a year-round program of public lectures, seminars and demonstrations on subjects ranging from home horticulture to bonsai techniques.

Forty miles west of St. Louis lies Shaw Arboretum, another of the Garden's facilities. Within the Arboretum's boundaries are nearly four square miles of rolling Ozark landscape, including Meramec River frontage, 10 miles of trails and managed plant collections. It is a center for environmental teaching.

The legacy of Shaw exists in St. Louis today because of his vision and planning. Many who have shared his vision have followed after him to see that the Garden has continued to develop and grow. The Missouri Botanical Garden is truly an oasis in an urban city—a joy to visit. •

—Barbara Pesch

Members of the American Horticultural Society who will be attending our 1980 Congress in St. Louis from September 16-20 will have an opportunity to spend a full day at the Missouri Botanical Garden on a guided tour and an evening in the Climatron as the guests of the Garden for a cocktail reception.

A Few Words of Praise

Your magazine is an excellent one! I recommend it and the American Horticultural Society at every opportunity. I do like the high quality of your material and your high editorial standards.

—Rebecca Broyles
Princeton, West Virginia

The postman delivered my first copy of *American Horticulturist* today. I must tell you how glad I am that a friend recommended it to me. Both the illustrations and the layouts of the magazine are beautiful.

Four of the articles are of special interest to me.

1. "A Maintenance Guide for Perennial Herbs" because I will share it with fellow members of the Nebraska Herbal Society.

2. "The Art of Dying Wool" because I have been experimenting on my own with natural dyes.

3. "Strange Relatives—The Rue Family" because the relationship of various members of each plant family has always fascinated me and (even more so), because:

Until this summer I had no special reason for growing *Ruta graveolens*, except for its distinctive foliage that is an attractive addition to any herb garden. I wonder how many of your readers know that it is also a favorite larval diet for the swallowtail butterfly (*Papilionidae*)?

In August we discovered four weird little larvae of the orange-dog swallowtail (*Papilio cresphontes*) chomping away on the rue leaves. Watching them grow and examining their little monkeylike false faces, seeing the brilliant scarlet antennae (equipped with a vile aroma) popping out whenever they were frightened, then following them through a metamorphosis from this animated caterpillar to a mummylike chrysalis opened a new world for our family.

4. "Country Gardens" on the President's Page because I, too, have an aversion to manicured lawns. In my plant-loving family, the only purpose for a lawn was to provide a soft area where children could play or where adults could relax and enjoy the birds and other little creatures that visited the flowers and shrubs.

I wish I could invite everyone from today's synthetic world into the garden of my aunt and uncle that I remember from long-ago childhood. The lawn was never

luxuriant because too many old trees spread their shade over it, but to walk down the drive on a hot, sultry summer day was like entering a different world. No concrete here, just pebbles to cover the car ruts. The ferns grew waist high where earlier wild columbine, violets, tiny Dutchman's breeches and pompous Jack-in-the-pulpits had each made a stand of color.

Turning the corner, you would come to the back door tucked under an arbor of sweet peas. No need to have gone to the front door first; my aunt and uncle would be among the flowers, or just relaxing in the shade while enjoying their little world.

You would find my uncle in bib overalls, his hair in ringlets from the humidity, looking more like a little boy than an aging man.

Seeing us coming, my aunt would hurry inside for a pitcher of cool lemonade or iced tea. Her dress, faded by the summer sun that shone on the garden where she spent most of the day, would be no competition for the background of flowers, where it seemed a fairy wand must have sprinkled bits of color everywhere.

You would know this was a garden built with love to be enjoyed.

Thank you for helping me recall these happy memories and for an enjoyable publication.

—La Vern Rush
Lincoln, Nebraska

Heavenly Bamboo

In Martha Prince's article, "Bright Berries for Fall," she writes, "So far as I know, nandina is the common name also." This is in reference to *Nandina domestica*. Out here in California we call it heavenly or sacred bamboo. It is very popular in gardens and even curb-side plantings in the Los Angeles area.

The Sunset Western Garden Book lists 11 varieties that are grown on the West Coast.

—Bill Watson
Santa Monica, California

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

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A GUIDE TO GROWING WINTER BLOOMS FROM SEED

Seeds are the age-old, infallible mechanism which plants have evolved to assure their eternity. Growing your own plants from seed presents many obvious advantages, as well as many challenges. From an economical point of view a seed packet is still undoubtedly one of the world's greatest bargains, for it would require a much larger expenditure to buy the number of plants able to emerge from one small envelope. For the gardener who enjoys growing plants from seed, there is also the sense of awe and excitement he feels at contemplating the miracle of birth and life wrapped up in these tiny specks of organic matter. And, unless the seeds are hybrids, the outcome of seed germination, due to the variation seed propagation allows among the progeny, provides its own form of excitement.

But sowing seed is only one step in the germination process. Before beginning to grow plants from seed indoors, one must be careful to provide the right growing conditions and to have the right equipment for the project on hand.

A sunny, cool windowsill or enclosed porch is ideal for that crucial moment when the seedlings outgrow their nursery and must be given a new environment for continued growth.

Equipment necessary for successful seed sowing can be very simple. Have available a sterile, quick-draining growing medium, small containers such as plastic flats used by retail outlets for bedding plants, and clean plastic for covering the flats of sown seed.

There are as many opinions about which is the best sowing medium as there are gardeners. I prefer the readily available sterile mixes which can be bought in small quantities at any commercial garden supply store, but I like to add one cup of sharp sand to every bushel of mix. These soilless mixtures must be thoroughly wet before sowing seed in them. One simple watering method is to make a small split in the top of the bag of growing medium and pour in at least eight cups of water per bushel. Hot water will mix easily and effectively.



Illustration by Pat Morrison

1. Gather your materials: sterile, quick-draining growing medium and small containers such as plastic flats used by retailers for bedding plants are necessities.
2. Sow the seeds thinly and as evenly as possible. Many seeds are so fine and dust-like that you should not cover them at all but merely press them into the soil with your fingertips.
3. Many growers advocate adding a thin layer of sterile sphagnum moss or vermiculite to the top of the mix to help prevent disease.
4. After watering, cover the flats with a plastic bag (over the top only) to help them retain moisture.

Knead the bag thoroughly until every particle is moistened. Some gardeners prefer to mix their own seeding mediums. The usually recommended formula consists of equal parts of loam, peat and sand.

To prepare the flats, lay a sheet of paper towels in the bottom of the small plastic flat, then a layer of pebbles or small stones

for drainage, then fill to overflowing with the mix. Tamp down firmly using another flat of similar size, fill up again and tamp until the mixture is one-quarter-inch from the top. A lower surface for the seed bed inhibits air circulation and produces conditions conducive to rot or fungus diseases, especially the dread damping off,

which is a fungus that can obliterate a whole row of seedlings overnight.

Many growers advocate adding a thin layer of moist, screened sphagnum moss to the top of the mix. This sterile product has been found helpful in the prevention of disease.

Sow the seeds thinly and as evenly as possible. Think thin at this step, for the emerging seedlings should never crowd each other. The depth to sow seed varies with the size of the seed, but never sow deeper than the seed's own diameter. Many seeds are so fine and dust-like that you should not cover them at all, but merely sprinkle them on the surface and press them down with your fingertips. It is important at this point to label each row with variety name and the date of planting.

Next, soak the flats by putting them into several inches of water in a pan until the first moisture appears on the surface. The importance of a firmly packed medium becomes apparent here. It assures capillary action which will bring water up to the top level. Remove the flats at once, drain, cover them with a plastic bag (over the top only, not underneath, and suspended over the soil in such a way that the plastic doesn't rest on the medium), and put them in the spot chosen for the germination process to take place.

Applying bottom heat to the sown seed flats is such a help at this time that it might be considered essential. Thermostatically controlled, cable-heated mats are easy to find and are inexpensive. By placing the flats on one of these mats you can hasten germination. Soaking large seeds overnight before sowing also speeds the germination process.

When seeds are at this stage of development, the flats do not need sun; in fact, the emerging seedlings will prefer a low-light situation. Examine them daily; seeds vary enormously in the time required for germination. Some sprout in as little as a week, while others can take many weeks or months. Certain of the hardy primulas, for instance, can remain in a seed flat well over a year before breaking their seed dormancy, so never be hasty in discarding a flat which may appear to have failed.

After germination the flats should be gradually moved into full light. If a windowsill is the only available spot, put them as close to the glass as possible. Place a sheet of aluminum foil on the room side to help reflect the light and allow the seedlings to achieve even growth. In order to

produce sturdy plants, turn the containers frequently. Otherwise they will have a definite lean toward the light source.

Fluorescent lights are of great benefit, especially at this stage, and it is a good idea to use them if you can. Put the emerging seedlings directly under fluorescent lamps with the soil surface four inches from the light, moving the plants farther

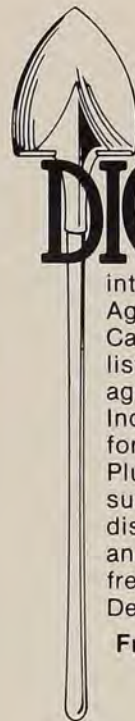
Without question, the most satisfactory of plants for indoor winter bloom are the many varieties of primroses.

away with time to accommodate their increasing height.

If you are growing seedlings in a greenhouse, place the seed flats close to the glass. Even here the flats should be turned frequently. For strong growth, keep the temperature on the cool side, supply the plants with plenty of fresh air and water them regularly.

When the second set, or "true" leaves appear, it is time to transplant the seedlings. Have ready other flats, firmly filled with either the same soil mixture or with equal parts of loam, sand or peat moss, plus a small amount of organic fertilizer. With a small tool, such as a slotted wooden label, gently lift the tiny plants with as little disturbance to the roots as possible. With pencil or finger, make a small hole in the soil in the new flat, and gently but firmly set in the seedlings, being sure the roots are in contact with the soil. Place the little plants in rows and allow approximately two inches between plants and between rows. Water in gently, place the flats in a cool, shady spot for a day or two to help the plants recover from the shock of being transplanted, and then return them to their original light and sunny situation.

As soon as the leaves begin to touch, the time has come for the next potting. Shift each small plant into an individual pot, well crocked in the bottom to provide drainage. This potting on process should be repeated as the plants continue to grow and roots show through the drainage hole. It is extremely important not to let the plants become pot-bound at this stage when they are growing so vigorously. Depending on the ultimate size of each species,



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THE INDOOR GARDENER CONT'D

Pansies delight in a cool situation, are easy to grow from seed and are a colorful addition to the window garden. Shown here, 'Pansy Imperial Blue', a 1975 All-America Selection.



All-America Selections

they can go from a three-inch to a four-inch, and sometimes even to a six-inch pot.

At this stage, light, air, regular watering and fertilizing in strict accordance with the manufacturer's directions should culminate in the ultimate flowering toward which all your efforts have been directed.

Now that you know how to grow most plants from seed, it's time to indulge in the fun of deciding what to grow. The light conditions you can provide for growing, and the amount of space available are the only limiting factors. Always keep in mind that most, if not all, of your seeds will germinate. What fills one small flat at germination may need dozens of large pots in six months.

Herewith are listed some of the species which have proved both attractive and satisfactory for indoor winter bloom. It is best to start with annuals, as they are quick and nearly foolproof. One word of caution: all of these plants need every bit of light you can possibly give them; without it they will be spindly, sickly specimens.

Alyssum is not only first alphabetically, but it is also an excellent choice for quick bloom and delicious fragrance. Lobelia is a delight and in a hanging pot will soon become a total ball of brilliant blue. Brodiaea, taller and slower, is a must because of its gorgeous blue color. Several plants in a hanging basket are an unforgettable sight. Forget-me-nots are another good blue not to be omitted.

Best sown in early summer for bloom the following winter are: cineraria, mounds

of daisy-like blooms in dazzling colors ranging through blues, pinks and reds, and dependable and cheerful bloomers in the dullest winter months; slipper flower (*Calceolaria*), with quaint, pouch-shaped flowers in yellow and orange tones; butterfly flower (*Schizanthus*), also well named the poor man's orchid and covered with clouds of dainty little blooms in white and pinkish shades; Cretan bear's-tail (*Celsia arcturus*), which produces attractive yellow mullein-like spikes; and the florists' begonia (*Begonia semperflorens*), an old reliable which blooms quickly and always adds a bright spot of color to any room.

Geraniums are great grown from seed, too. They germinate easily and almost immediately produce tiny leaves which are unmistakably true to the species. There are many new developments among geranium species which can be depended upon for obtaining a speedy display.

Some of our best winter bloomers may be treated as perennials. The newest sensations are the Cape primrose (*Streptocarpus*) hybrids which are appearing in bewildering numbers. Work with them continues so that we may expect even further developments in these beautiful and satisfactory house plants. Easy and quick from seed, there are many exciting color variations and different growth habits from which to choose. Many other species of the fabulous gesneriads can easily be grown from seed and are a winter delight under the right conditions of light, warmth and humidity.

Without question, the most satisfactory

of plants for indoor winter bloom are the many varieties of primroses. *Primula kewensis*, with continuous umbels of yellow bloom, will rebloom in successive years as the crowns can be divided and repotted each summer. *P. obconica* will bloom in seven or eight months from seed and will continue all winter, as long as it has cool conditions. This beauty from China comes in a wide range of colors: white, pink, reds and blue. Another Chinese gem is *P. malacoides* in newly improved forms which send up spike after spike filled with dainty little blooms. Here again, this plant will bloom continuously throughout the winter months under cool conditions. *P. polyanthus*, the rugged garden perennial, can be sown in spring, subjected to cold conditions in an outdoor frame and then brought indoors for early forcing of its endearing blooms.

Pansies delight in a cool situation, are easy to grow from seed and are a colorful addition to the window garden. The cheery faces of nasturtiums and their pungent odor also add a bright note on the windowsill.

They can be trained to climb upward or will adapt well to a hanging basket. Their large, vigorous seeds almost always germinate.

The florist cyclamens may be grown from seed, but they require a long period to bloom, often a year and a half. Most satisfactory are the miniature varieties. They will bloom in half the time and remain in bloom for an even longer period. They also are more tolerant of home conditions. Their dainty pink, red or white blossoms, poised like butterflies, are a continued delight, and the handsome marbled foliage is an added bonus.

Jerusalem cherries (*Solanum pseudocapsicum*), while grown for their fruit rather than their flowers, along with many of the small ornamental peppers (*Capsicum*), are very decorative additions to any winter garden. Sow them in early summer, pot on as needed and plunge the pots outdoors for the summer. They may be brought indoors in the fall, ready to reward you with a dazzling display. Try *Solanum* 'Christmas Cherry Jubilee' and *Capsicum* 'Red

Missile' or 'Holiday Cheer'.

Not to be overlooked are the self-sown seedlings which you may lift from the fall garden and pot up for winter bloom indoors. Florists' begonias, impatiens, browallia, calendula, forget-me-nots and many others are most generous with their offspring and are well worth seeking out before putting the garden to bed for the winter.

Growing your own pot plants from seed is a reliable source for the varieties which have special appeal to you personally. They give you the tremendous satisfaction of bringing a plant into bloom right from its very beginning, and, with careful choice, this method assures you of an economical and brightly blooming display all winter long. ♠

—Elizabeth Corning

Some seed sources: George W. Park Seed Company, Inc., Greenwood, SC 29647; Thompson & Morgan, P.O. Box 100, Farmingdale, NJ 07727; Kartuz Greenhouses, 1408 Sunset Drive, Vista, CA 92083 for gesneriads.

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THE MULBERRY FAMILY

Do you remember a children's singing game with the refrain,

*Here we go round the mulberry bush,
The mulberry bush, the mulberry bush,
Here we go round the mulberry bush,
So early in the morning.*

It was when I discovered that figs and mulberries came from the same family, which was involved with silk and an absorbing slice of U.S. history, and that family was the mulberry family, that I decided to delve further into the facts of life of this group of plants.

The origins of the words and the tune are probably lost in time, but the mulberry bush, which has endured in cultivation for centuries, is still very much with us. It is a member of an economically important and scientifically interesting family and has given its name, *Morus*, by which the Romans knew it, to this large group of plants, Moraceae, the mulberry family.

There are three well-known mulberries, the white, black and red—*Morus alba*, *M. nigra* and *M. rubra*. All have edible fruit, similar in appearance to blackberries, rather sweet in flavor, but with poor keeping quality and unsuited for shipping; they are, however, used locally for jellies and preserves.

Besides mulberries, figs, osage orange and breadfruit belong to this family. A motley crew! Differences in flowering parts and remarkable variation and complexities of fruit structure can confound even the specialists. Male and female flowers are separate. The fruit is formed from amalgamation of the ovaries of several flowers—a sort of collective fruit, the fleshy parts of which are produced by the swollen receptacle in which the seeds are embedded. The character which distinguishes the mulberry family most clearly from other closely related plant families is the presence of milky sap containing latex.

However, botanical problems need not becloud the economic and historic interest of the mulberry family.

A glorious spree of agricultural speculation occurred in America between 1825 and 1840, following importation of the first trees of *Morus multicaulis* (now



Illustration by Alice Tangenni

thought to be a variety of *Morus alba*, the white mulberry, of which more later). It was said to have originated in China where its extra-large leaves furnished excellent food for the silkworms from which the famous China silks were obtained. In the New World it grew rapidly, sprouted vigorously and seemed perfectly acclimated. Nurserymen had a flourishing business producing these plants. In all parts of the country where peaches could be grown, mulberries were planted. For two decades silk culture was a major topic of conversation. There were four monthly magazines given over to mulberries and silk. Nursery catalogs gave more space to mulberries than to any other fruit. Books and government publications were numerous. But *Morus multicaulis* proved to be less hardy than the peach and, even worse, an

uncontrollable disease destroyed many plantings. Finally the severe winter of 1844 wiped out the few remaining plantations, and the silk industry bubble in the United States burst.

The white mulberry, *Morus alba*, native of China, was introduced to the Mediterranean region during the 12th century, together with the silkworm which feeds exclusively on its leaves. It became a characteristic feature of Italian landscapes as the silk industry spread. And the similar *M. multicaulis*, already mentioned, made its contribution to agriculture and the economy in America.

Morus alba and its several varieties is the only mulberry species now used as an ornamental in America. Its fruits are edible but bland; they are attractive to birds and the resultant litter is often objectionable.

The black mulberry, *Morus nigra*, known from earliest recorded history, was supposedly brought to Europe from Persia. It is reported that mulberries were introduced to England about 1605 by royal edict to encourage the rearing of silkworms. Free packets of seed were offered; unfortunately, the seeds distributed were of the black mulberry which the silkworms will not eat.

The black and white mulberries are now commonly grown in England where *M. nigra* is valued for its succulent, deep-crimson fruits and *M. alba* as an ornamental.

The native American mulberry is *Morus rubra*. It ranges naturally from Massachusetts and Florida west to Kansas and Nebraska. It is not often grown as an ornamental plant but is frequently seen in dooryards, farm gardens and vacant lots, where it has been spread by birds which devour the fruits. In some rural areas its fruits have been used as hog and poultry food. Early settlers in America tried to establish silkworm culture with it, but the silkworms refused it. Such a discriminating palate the silkworm has!

The paper mulberry, also a family member, is not *Morus* but is *Broussonetia papyrifera*. It was brought to the United States from China in colonial times and has escaped from cultivation in some areas. It is durable but not especially ornamental. In Japan, paper for umbrellas and lanterns has been made from the plant's bark fibers.

The osage orange, *Maclura pomifera*, is a vigorous native American tree with stout, inch-long thorns. It, too, has played a role in American agriculture. In the early days wire fences were unknown. Farmers in the prairie states found hedges cheaper than wooden fences and more durable. Two vigorous, thorny plants were most suitable: osage orange and honey locust, the former being the favorite. In the mid-19th century osage orange was almost the only fence farmers could afford. It grew like a weed and millions of plants were set out. By 1860 there were thousands of miles of osage orange fences growing in America, sheared to a handsome shiny-leaved hedge, impenetrable to cattle. It also turned out to be a very effective windbreak in the great open spaces.

Maclura pomifera, named for William Maclure, an American geologist (1763-1840), was one of many valuable plants collected in Indian territory by the Lewis

and Clark expedition. The flowers, male and female borne on separate trees, are inconspicuous, but the fruit is definitely not. In size and general appearance, this inedible fruit resembles a large, greenish-yellow orange when it matures in August and September. Its rather rough surface is evidence of its being made up of a number of small fruits coalesced. Milky juice, the family trait, oozes from the slightest wound. The sap produces a type of dermatitis for some sensitive individuals. The wood of osage orange is a brilliant orange color. A dyestuff, morindin, is extracted from both the wood and the bark.

Now, let's take a look at the figs. Books could be, and have been, written about the vast panoply of economically and horticulturally important figs. For this reason, the scope of this sketch of the mulberry family cannot possibly give adequate coverage to these chiefly tropical trees, shrubs and vines which enter into the economies of various countries in differing capacities and degree.

Like the mulberry, the fig branch of the family bears the name used by the Romans, *Ficus*. The common edible fig, *Ficus carica*, is cultivated in this country commercially in California and for home use on the Gulf Coast; there also are varieties that can be maintained successfully outdoors as fruiting plants as far north as Zone 5. Wherever it grows, the size, symmetry and foliage of this fig make it a choice tree for beauty and shade.

From the earliest settlements in the Gulf States and northward to Virginia and Maryland, fig culture was carried on with great optimism, but efforts to dry the figs for commercial production failed because of the humidity. It was only in the 20th century that fig culture moved to California with importation of varieties and methods practiced in Asia.

Ornamental figs include the rubber tree, *Ficus elastica* and its varieties, fiddle-leaf fig, *F. lyrata*; benjamin tree, *F. benjamina*; and hug-me-tight vine, *F. pumila* and its varieties. All are warm-climate or greenhouse plants and are increasingly prominent in interior landscaping. *F. elastica* was once an important source of rubber and still yields a product known as India rubber.

Also among the figs are the Bo tree, *F. religiosa*, revered by the Hindus, the banyan, *F. benghalensis*, and *F. retusa*, the India-laurel fig, an elegant street tree.

The figs, other than fruit of *F. carica*, are inedible. All types have the characteristic milky sap.

Other fruits in the mulberry family are the tropical breadfruit and Jackfruit, *Artocarpus*; these warty or spiny edible fruits, on first sight, seem like much enlarged (10-pound) osage oranges.

Castilla elastica, Mexican rubber tree, a Central American plant, is an important source of rubber when the product from *Hevea*, the leading rubber plant of the world, is high priced. In 1493 Columbus reported "white milk" oozing from trees being felled by his men, and it is believed that this tree (*Castilla*) was the source of latex balls bounced by the natives to the consternation of Spanish explorers. The tree is named for a Spanish botanist, Juan Castillo y Perex.

Perhaps hemp and hops should be called "poor relations," for it is with these two that taxonomists have difficulty deciding whether or not these plants have a right to inclusion in the mulberry family. They are different from other family members in flower structure, and they do not have milky sap, but on other technical points they are similar; consequently, the two are sometimes relegated to a family of their own. However, they are worth mentioning here because they are often still listed among the Moraceae and in themselves are strange relatives.

Hemp is *Cannabis sativa*, best known as an illegal narcotic in many jurisdictions and often called hashish or marijuana. It is a strong-smelling herb with an almost woody stem from which the hemp fiber is derived; it is widely grown as an agricultural crop for this use in warm regions. The sticky gum found among the flower clusters is the source of hashish and marijuana.

Hop is *Humulus lupulus*, a temperate zone perennial vine, which produces fruit covered with enlarged bracts dotted with resinous glands used for imparting distinct flavor to beer. It is grown as a commercial crop, chiefly in Oregon.

Thus we find that the mulberry of children's rhyme belongs to a family that has enriched our world through numerous economic and horticultural ramifications. Though these "strange relatives" may be individually familiar to us, we cannot help being surprised to discover that they all belong to the same family. ☉

—Jane Steffey

CONTRIBUTORS

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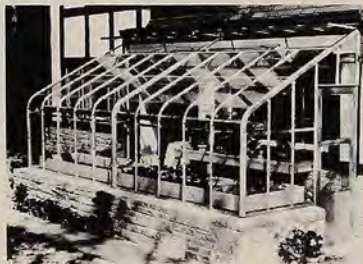
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Jane Steffey is a graduate of Hood College with a major in botany. She is the current horticultural advisor to the American Horticultural Society, handling member inquiries. A long-time gardener herself, she has recently specialized in indoor plants and for a number of years wrote "The Indoor Gardener" for the *Washington Post*.

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In Praise Of Double Flowers

TEXT AND PHOTOGRAPHY BY MRS. RALPH CANNON

What causes flowers to double is something of a mystery. Possibly a genetic mutation causes some organs of the flower to be transformed into petals forming double flowers. According to Lyman Benson, a botanist from Pomona College of California, "this transformation is due to the broadening of the filaments or anthers of all or most of the stamen. Broadening of the filament may be accompanied by ultimate nondevelopment or opening, broadening and modification of the anther and assumption by the stamen of the form and color of a petal." In some double flowers the petals are known to shade off gradually into sepals. In others, a transition from sepal to petal occurs, and from petal to stamen, emphasizing the interrelationship of these three floral parts.

The doubling of the petals may result in the total loss of reproductive organs. Obviously, this trait causes the plant to become sterile and therefore unable to produce seed. Then again, the petals may multiply, leaving stamens and pistils functional and able to produce seed. If this happens, a strain of plants bearing double flowers may be produced.

This doubling of petals in flowers is a most unusual development. It is not confined to garden plants, because double forms are found in a number of wildflowers. However, a larger number do appear to be found in plants under cultivation rather than in the wild; possibly this is because they are just more likely to be noticed. Occasionally, the number of petals on plants that have a tendency to produce double flowers will also increase if given especially good care.

There are many flowers that are more attractive in their single form than in their double form—the increase in the number of petals may cause the flower to become top-heavy or gross looking. Still, there are countless charming double forms from which to choose, so many, in fact, that I have difficulty picking among my favorites.

In the spring several wildflowers with double forms make nice additions to the garden. One, an aquatic, is the marsh marigold, *Caltha palustris* 'Monstruosa'. This plant grows well in or beside a pond or any place that can offer water to its roots; it will even flourish in the mud. I have seen it growing where rivers rise in the spring, spreading its golden glory in

large colonies. If you find a double one, its rich, yellow, but-tercup-like flowers bring sunshine to any planting. *Caltha palustris* has compact growth. Even after the blooms fade the shining green leaves of six to eight inches across enhance a waterside planting.

Another attractive double wildflower is *Sanguinaria canadensis* 'Multiplex'. The single form of this snow-white flower blooms for only one day. After the flowers are pollinated the petals fall, but others will open on the morrow. 'Multiplex' loses nothing in the multiplication of its pure white petals on its six-inch stems. The flower is like a small, marble gardenia, sterile and a desirable woodlander. In this case, the double form is superior to the single. Unlike the single form, the double form likes plenty of sun, and the flowers generally last more than one day. A well-flowering clump presents a picture of the greatest vigor and fleeting beauty. In a peaty soil which is full of humus, this plant will produce attractive lobed leaves after the double flowers shatter into a snowstorm of petals. Planted on a woodland fringe, it looks its enchanting best.

Double flowers which have a pompon or globe effect are particularly charming. One of the most popular is the herbaceous peony. Its gleaming, satin-like petals encircling full-featured puffs are a delight if rain does not shatter the velvety, fragrant blooms. In peonies, double versus single is mostly academic. Both peony forms are beautiful. Doubles may be pink, red, crimson, white or yellow in color, and all deserve a place of honor. The single forms have stiffer stems and are not as easily shattered by rain drops.

Spring produces another pleasant pompon with the symmetrical double form of the monotypic *Kerria japonica* flower. A Chinese shrub named after William Kerr, it will grow in any soil and tolerate almost any garden situation. Its yellow button blossoms, one to three inches across, are especially attractive against a backdrop of evergreens. The single form of *Kerria* has bright-yellow, four-petaled flowers. Both forms can be propagated by cuttings or suckers.

Clematis are lovely in their double form, too, even though most hybridizing of this flower has been done on the single form. Since Gerard referred to clematis as "Traveller's Joy" in 1597, great advances have been made. In the 19th century the large-flowered single clematis came into being. These showy flowers have no petals but, instead, four to eight colored sepals.

Continued on page 42

Double flowers which have a pompon or globe effect are particularly charming. One of the most popular is the herbaceous peony.

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TEXT AND PHOTOGRAPHY BY BARBARA HESSE EMERSON

Calibration is the most important single factor to keep in mind when applying selective weedkillers. The recommendations on the label are based on *a given amount of chemical for a specified area*. The amount of water for making a growth-regulating herbicide solution can be varied, but never the recommended proportion between chemical and area to be covered. Continued on page 34.



Pennsylvania smartweed (*Polygonum pennsylvanicum*). Annual. Native to North America, it has features common to numerous other members of the buckwheat family. A membranous sheath, or ocrea, surrounds the thickened stem at each leaf base. The tapering leaves and beadlike pink or whitish flowers resemble those of two similar smartweeds. Native pale smartweed has whitish hairs beneath the lower leaves. Ladysthumb, from Europe, has a reddish triangular smudge in the middle of its leaves. Winter's cold moisture breaks the dormancy of smartweed seeds, which can then germinate throughout the gardening season. Control seedlings in gardens with cultivation, mulch or chloramben-applied preemergence; in newly-seeded lawns, with bromoxynil.

Spotted spurge (*Euphorbia supina*). Annual. This North American and its close relative *E. maculata* typify objectionable characteristics of weeds; prolific reproduction by myriad tiny seeds that are produced until frost and can sprout throughout the summer . . . survival in wet or dry soil, in fertile gardens or cracks in paving . . . successful competition by smothering mats that escape mowing, and possible allelopathy. Milky juice oozing from cut roots, stems or leaves can be irritating or poisonous. Leaf size and stem habit vary with growing conditions, but oval leaves of both spurges have a reddish blotch in the center. Control in gardens by cultivating, mulching or preemergence chloramben applications; in lawns, use dichlorprop, mecoprop or a mixture containing dicamba.

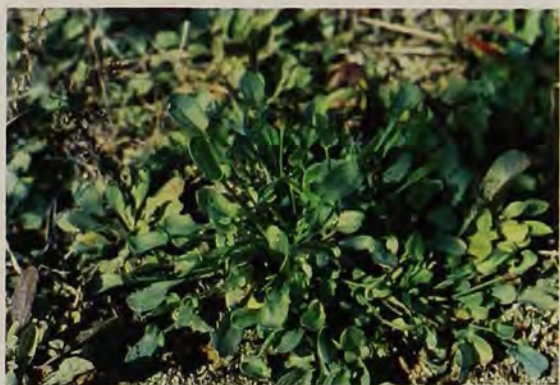


Purslane (*Portulaca oleracea*). Annual. An Asian or North African brought from Europe as a potherb, now spread throughout the United States and most of the rest of the world. Smooth, fleshy leaves and stems are edible, but enormous seed production—10,000 seeds counted from a single plant—makes it a formidable invader. Its succulent habit helps it survive cultivation; disturbed plants can continue to flower and ripen seed several days after cultivation, and may reroot. Mature seeds are produced a week or two after flowering begins, and may germinate immediately. Although purslane may help in building soils up, it is an alternate host for certain nematodes and several viruses. Control in gardens by mulching, or preemergence treatment with chloramben, trifluralin or DCPA. In lawns, use mixtures with 2,4-D, dichlorprop or mecoprop, and dicamba.



Goosegrass (*Eleusine indica*). Annual. Resembles crabgrass but doesn't creep and its rosettes are tougher. Leaves are silvery at the base, giving it its other name of silver crabgrass. Frequently appears in compacted soils in paths, driveways and tennis courts. Germinates later than crabgrass. Like crabgrass, its seeds need light for germination, so the shading of thickened turf discourages invasion. In lawns, preemergence treatment with DCPA, bensulide or benfenin, or postemergence with DSMA, MSMA or calar are recommended as for crabgrass, but are usually not as effective. Postemergence treatment is satisfactory only during the seedling stage, or with a non-selective grasskiller such as amitrole. Trifluralin can be used to prevent emergence in gardens.

Yellow nutsedge (*Cyperus esculentus*). Perennial. Crisp shiny leaves are 3-ranked around a triangular stem, instead of 2-ranked like the grasses it resembles. Found increasingly from the equator to Alaska. Shoots are easy to pull, but leave behind nutlike tubers which assure survival and multiplication, augmented by viable seeds. Experimentally, within one year a single tuber spread to a patch 40 inches wide with 1,900 plants and almost 7,000 tubers! Details of rhizome and tuber behavior are complex and fascinating, varying with soil depth and moisture, temperature and time of year. Reduces crop yields (ivory-like rhizome tips grow right through potato or dahlia tubers) but is also grown for food in some countries. To help control nutsedge in gardens, cultivate soil continuously or apply EPTC. In lawns, crabgrass killers DSMA, MSMA and calar kill the tops.



Red sorrel (*Rumex acetosella*). Perennial. Also known as sheep sorrel and sourgrass. Easily recognized by its arrow-shaped leaves, usually lobed at the base, which are broad and succulent in fall, narrower and thinner in spring, taste sour and are edible. Its presence may indicate soil too acid as well as too low in nitrogen. Shallow but tenacious roots spread horizontally, becoming tough and making patches with new shoots. Unisexual; reddish seed-producing and yellowish pollen-producing flowers are on separate plants. Pollen may cause hay fever. Control in gardens by cultivating, fertilizing and (except under acid-requiring ornamentals such as rhododendrons) liming. For lawns, repeat applications of a broadleaf herbicide mixture (2,4-D, dichlorprop or mecoprop, and dicamba), fertilize adequately and lime.

Florida pusley (*Richardia scabra*). Annual. Introduced from tropical America. Now found on sandy soils from Florida to southern Texas and up to coastal North Carolina. Member of a mostly tropical family which also includes teeny weeny Quakerladies (*Houstonia caerulea*) and coffee trees (*Coffea spp.*). This ground-hugger's spreading, much-branched habit smothers turfgrasses and crops with which it grows. Stems and flat, distinctively opposite leaves are covered with soft hairs. Clusters of little tubular white flowers are borne above the leaves at the tips of the branches. Preemergence applications of DCPA, trifluralin or EPTC control it in gardens. 2,4-D plus dichlorprop has controlled it well in turf.



Hawkweed (*Hieracium pratense*). Perennial. Several hawkweeds have immigrated here from Europe and are seen mostly in the northeastern states and Canadian provinces. *H. pratense* is the most abundant species. They all reproduce by seeds and creeping rootstocks or runners and have basal leaves that are simple and hairy. Their flowers, borne at the end of leafless stalks, are like small versions of dandelions except that those of *H. aurantiacum* are orange instead of yellow. Hawkweeds are characteristically found on dry, sterile, sandy or gravelly, mostly acid soils, indicating the importance of proper fertilizing and liming to discourage them. Reseed lawns if hawkweed elimination leaves bare spots. *H. aurantiacum* may also grow in rich soil.



Canada thistle (*Cirsium canadense*). Perennial. Brought from western Asia and Europe with crop seeds; not from Canada. Established throughout northern U.S. and into Canada. Outlawed in 37 states. Spreads rapidly and causes severe crop yield losses. Food reserves allow it to survive repeated cultivation, and pieces of root can start new plants. Flowers are small, usually light purple. (Bull thistle—*C. vulgare*—with dark purple flowers is only a biennial.) Leaf outlines, spineyness and color vary among clones or ecotypes. Staminate and pistillate flowers are usually on separate plants, sometimes resulting in sterile colonies. Seed viability is high. Repeated cultivation delayed each time until eight to 10 days after new shoots emerge is effective if all shoots are removed. 2,4-D is effective applied at the bud stage and repeated in September to control regrowth. Amitrole-T, dicamba and glyphosate are also effective.

Mugwort (*Artemisia vulgaris*). Perennial. Naturalized throughout the northeastern quarter of the U.S. and along the Pacific Coast. Related to western sagebrush. A freebie no one wants. Frequently infests nurseries and is automatically distributed on the roots of balled stock. Deeply divided foliage fools people into thinking they have chrysanthemums, but white woolyness under the leaves, lack of showy flowers and its aroma confirm the disappointment. The short rhizomes by which it spreads must be grubbed out mercilessly if solid stands of it are to be avoided. Amitrole-T can be used for control in hardwood nurseries if care is taken to keep the spray off nursery stock foliage.



Goutweed (*Aegopodium podagraria*). Perennial. A European member of the same family as celery and Queen Anne's lace. Found from Newfoundland to Michigan and south to North Carolina. Probably a garden escape. Has compound dark-green leaves similar to those of celery, but shorter and without thickened stalks. The characteristic umbels of white flowers are borne above the leaves. Its spaghetti-like rootstocks rapidly form a dense groundcover which has a neat appearance but is so dense nothing grows through it. A minor problem in terms of acreage but a major one if it happens to be yours, especially in the shaded places it prefers. Control is difficult, indeed. A variegated form with white margins, familiar as an edging in old gardens, is less aggressive.

Water milfoil (*Myriophyllum spp.*). Perennial. Partly or wholly submerged aquatic plants, usually found in still or slow-moving water. At least one of about a dozen species, resembling each other closely, is found in every state. The leaves are whorled and finely divided in submerged portions, opposite and simple or divided in emerged portions. The slender stems root readily from lower nodes. A form from Brazil is the "parrot's feather" used in aquariums. Controlled by diquat, endothall or a special granular formulation of 2,4-D that sinks to the critical rooting zone. Unintentional damage to other vegetation and fish kill due to oxygen depletion by decaying weeds must be prevented. Application permits should be obtained from state agencies such as the Department of Conservation and Sport Fisheries or the Department of Public Health.



Hedge bindweed (*Convolvulus sepium*). Perennial. A twining vine that drapes itself on any nearby support or on the ground. Another Eurasian traveler, belonging to the morning-glory family as the pretty pink or white funnel-formed flowers attest. Its leaves are approximately heart-shaped or triangular. Although the roots are extensive, they are shallower than those of the more seriously invasive field bindweed (*C. arvensis*) with smaller leaves and flowers. By seed and fleshy rootstocks, hedge bindweed has spread to cultivated areas, thickets, roadsides and similar waste places in the eastern half of the U.S. and in the Pacific Northwest. Herbicides that control bindweed (2,4-D, dicamba and glyphosate) are also likely to injure or kill desirable plants on which it grows, so digging roots out as much as possible and constantly removing all sprouts to exhaust food reserves is the most practical way to ultimately eliminate it from gardens.



Japanese honeysuckle (*Lonicera japonica* var. *halliana*). Perennial. *L. japonica* is a woody twiner first discovered in Japan but brought from China to England and thence to America early in the 19th century. The varieties *halliana* and *chinensis* differ by small details and climatic preference. All have escaped from gardens and now blanket woodlands, roadsides and “anything that stands still,” especially from Maryland southward. They are semi-evergreen and have marvelously fragrant tubular flowers. However, they grow so vigorously that their value as ornamentals or soil stabilizers has been destroyed by the way they overwhelm and strangle supporting hosts. Stems above and below ground root freely, and birds help distribute the seed. Honeysuckles are now common pests in all but the coldest parts of eastern U.S. and into southwestern Texas. Amitrole, dicamba, 2,4-D and dichlorprop kill them, but possible injury to vegetation with which they are growing must be considered. The stems of vines climbing trees can be cut at groundline and the cut stems treated or later regrowth sprayed for control with minimal hazard.

Pacific poison oak (*Rhus diversiloba*). Perennial. An erect or spreading shrubby native found from British Columbia, western Washington and Oregon, California, and Baja California to Arizona and Mexico. It is reported to be more widely spread in California than any other shrub, occurring up to elevations of 5,000 feet. The shiny, three-parted leaves can vary in shape and size and are sometimes a beautiful red. As with its close relatives poison ivy (*R. radicans*), poison oak (*R. toxicodendron*), pictured, and poison sumac (*R. vernix*), all parts of Pacific poison oak contain an oil which is a rash-forming skin irritant. Since the oil is non-volatile, before inflammation can be induced there must be direct contact with it on the plant or materials that have brushed against it. Pacific poison oak and poison ivy are readily controlled by amitrole and by 2,4-D plus dichlorprop or mecoprop.



Allegheny blackberry (*Rubus allegheniensis*). Perennial. One of over 300 species of bramble growing throughout the U.S. Habits vary from upright to creeping. They may or may not have thorns, prickles or bristly hairs, but usually do have five-petalled flowers that mark them as members of the rose family, and produce fruit that is an aggregate of drupes commonly called a berry. They multiply by seeds (thanks to hungry birds!), by suckers or by branches which root when they reach soil. Canes have two stages of development; flowers and fruit are usually not produced until the second year, after which those canes die. Allegheny blackberry occurs in a horseshoe-shaped area extending from Nova Scotia to Tennessee and back up to eastern Minnesota. Salmonberry (*R. spectabilis*), grapeleaf blackberry (*R. vitifolius*), evergreen blackberry (*R. laciniatus*) and Himalaya blackberry (*R. procerus*) are species troublesome along fences and ditches in the West and sometimes in fields. All can be controlled with amitrole, with glyphosate, or with dichlorprop alone or combined with 2,4-D.

Japanese bamboo (*Polygonum cuspidatum*). Perennial. Introduced as an ornamental plant from eastern Asia. Not a bamboo at all, in spite of the suggestive hollow, rather woody stems that appear to be jointed. Instead, it belongs to the buckwheat family, just as smartweeds do, with a conspicuous ocrea or membranous sheath around the stem at the base of each leafstalk. Although the stalks die to the ground each winter, in spring new ones grow very rapidly from the heavy rhizomes which are the primary means of reproduction. The numerous tiny, cream-colored flowers have a dainty appearance; seed is seldom produced. The early and rapid growth is an asset that soon becomes obnoxious as more and more stalks with their large, heart-shaped leaves appear and become harder and harder to discourage. Exhausting the root reserves by unrelenting mowing is the way to discourage this obstreperous nuisance until a herbicide is registered for the purpose.



Bitter nightshade (*Solanum dulcamara*). Perennial. A rather weak woody climber or trailer, from Europe. Frequently becomes established in planting of ornamental shrubs as well as in fencerows and thickets, perhaps when birds perch and drop seeds. The slender gray-green stems may grow to be six feet long, and wind casually through any branches nearby. Often overlooked because its leaves (some lobed and some not) are dark green. However, purple flowers, similar in shape to those of tomatoes, and bright-red berries, are conspicuous and call attention to its presence. Belongs to the same family as potatoes, tomatoes, eggplant and Jerusalem cherries, and may contain toxic alkaloids although this has not been proven. Caution is advised. The roots spread and overlap each other, but are so shallow that it is easiest to just pull them from ornamental plantings.

BLUEBERRIES

BY JOHN H. ALEXANDER III



George Taloumis

The blueberry plant not only produces tasty fruit, but it also exhibits such a pleasing color and shape that it functions well as an ornamental in the garden. The plant above is a hybrid blueberry in fruit. To the right are examples of wild varieties, often called huckleberries, growing near Mt. Shuksan in the Cascade Mountains of Washington. In the fall, both wild and cultivated blueberry plants have attractive red foliage.

Most of us are familiar with the fruit of the native highbush blueberry, but few of us appreciate the plant that supplies the fruit. A member of the heath family, Ericaceae, the blueberry has small urn-shaped flowers very similar to those of the heaths and heathers. The flowers are white, often tinged pink, and may occur in such profusion that we should consider the plant for its floral display. The fact that the highbush blueberry blooms in late May when so many plants with larger blossoms are flowering probably explains why it has been overlooked as a flowering shrub.

In the autumn the leaves of the blueberry bush turn from dark green to yellow and red before dropping. The stems color, too, and stay red until spring. Together, these attributes make the blueberry bush one of the most attractive native shrubs in the fall and winter landscape.

Regardless of its ornamental attributes, the fruit is without doubt the major reason for cultivating this plant. Wild blueberry bushes usually produce small fruits less than one-half-inch in diameter. Cultivated selections can produce fruits up to one inch in diameter and larger, but usually average slightly over three-quarters of an inch.

Early in this century Dr. Frederick Coville of the U.S. Department of Agriculture became interested in the improvement of the wild highbush blueberry. With Elizabeth White, a New Jersey cranberry grower, he began selecting large-fruited plants from the wild as a base for breeding. These selections included the species *Vaccinium australe*, *V. corymbosum* and *V. lamarckii*, and have, through several generations of hybridization, given us the cultivars that are available today.

The fruit of these highbush blueberry cultivars represents a crop of major economic importance in Michigan, New Jersey, North Carolina and Washington. Maine has long been one of the largest producers of blueberries, but there and in southeastern Canada it is the existing wild,

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Researching A Pioneer Garden

TEXT AND PHOTOGRAPHY BY ELIZABETH SCHAEFFER



“The thickly standing oak, the poplar, the beech, the maple, and the ash stood closely intertwining their limbs. When clothed in their summer verdure, a shade so deep and dark was produced as to shut out the sun from May to October.”¹

These were the words of a young pioneer woman coming to her new home in Indiana in the early 1800’s. The forest she described stretched massively across Indiana, Ohio, Kentucky, Michigan, Wisconsin and a portion of Illinois east of the great prairie. This forest frontier was very different from the land along the eastern coast and Piedmont. It was only natural that the gardens these pioneers would soon plant within the boundaries of this new frontier would be different as well. And it is only natural that we 20th-century gardeners should be curious about them. What did they look like? What sort of plants were grown there? It was my job to find out after accepting the task of recreating a typical pioneer garden at Spring Mill State Park in southern Indiana.

Unfortunately, while a considerable amount of information existed about the gardens of the original colonies during the 18th century, it was difficult to locate and decipher much of the information available concerning pioneer gardens of the 19th century. Apparently, many historians accepted the idea that gardens anywhere in the United States during the early 1800’s were more or less carbon copies of the coastal-colonial gardens of the century before. This assumption was a myth, I discovered, as I uncovered the truth with a little detective work.

The evidence was there, but it was hidden in the back pages of county histories and state historical collections; in early geological surveys; in lists of medicinal herbs compiled by the pioneer doctors who used them; in early botanical floras (lists of plants with the Latin names); in dusty diaries and collections of letters—some of them reprinted locally by later members

of the family; and even at the sites of the old cabins where the plants themselves can still be found growing under the shade of reforestation and between the cracks of urban concrete. These sources all made fascinating sites to dig for clues.

Before I looked for evidence, however, I decided to limit my search to gardens of flowers, herbs and useful plants that were grown close to the house. I decided not to include the plants grown in the fields, but I did want to include both the plants brought from earlier homes and plants

brought in from the wild to be planted in the garden.

I chose the time frame of 1760 to 1860 to cover the pioneer period; 1760 was early enough to include the first settlement in Indiana, and 1860 marked the beginning of the era of introduction of new plants directly to this country from the Orient.

It was not really surprising that I found some of the most fascinating evidence of these early pioneer gardens to be in the writings of the pioneers themselves—in



LEFT: Clockwise from the top: a portion of the Hamer Pioneer Garden in Indiana; lilac (*Syringa vulgaris*); star-of-Bethlehem (*Ornithogalum umbellatum*). RIGHT: Clockwise from the top: detail of stone wall in Hamer Pioneer Garden; double buttercup (*Ranunculus repens*); mock orange (*Philadelphus spp.*).



letters back home, and later, in reminiscences written for their grandchildren. Here are some excerpts:

*"Many of them brought flower seeds with them and as soon as they possibly could do so, planted them around stumps in the clearing. A plot of ground was given over to the women and girls for a garden. Many kinds of vegetables were grown there, as well as some of the old-fashioned flowers. The sweet William, the poppy, and the hollyhock were favorites."*²²

*"Near the house were flower beds decorated with roses, marigolds, hollyhocks, pinks, black-eyed Susans and other varieties of old-fashioned flowers."*²³

I noted a consistent reference to "old-fashioned" flowers in my research, even from the reference point of the pioneers themselves. In the dark and threatening forest, the pioneers evidently found comfort in traditional things. Their "old-fashioned" flowers were planted in patterns unchanged for centuries.

Henry Ward Beecher described such an "old-fashioned" garden in Mt. Meridian, between Terre Haute and Indianapolis, in 1842:

*"In going to Terre Haute last summer I stopped at a small, poverty-stricken little town called Mt. Meridian; shackly houses, huts and hovels, pale faces and ragged children gave no great expectation of refinements. Putting up at the best tavern (at the West, no matter how small the town, there are always from two to five or even eight taverns to choose among), I soon retired to bed as the easiest way of reaching next morning. On rising and going into the rear of the building for washing water . . ., I found the well standing in the middle of a very beautiful little flower garden—neat beds full of flowers, cleaned walks, trimmed borders. I could hardly trust my eyes. From the rear of the grounds I could almost throw a stone into the primeval forests, whose fragments yet lingered in parts of the garden. . . ."*²⁴

The description of this little garden showed clearly the two most important forces shaping the pioneer garden of the forest frontier—the preference for traditional gardening patterns handed down through generations and the extreme isolation of that domesticated space within the wilderness. Those traditional design patterns echoed the design of the cloister gardens of the Middle Ages. In both the Mt. Meridian garden and a typical cloister garden the plants were around the well for ease of watering; the beds were bordered by paths for ease of weeding; and the whole

was surrounded by walls or stout fencing for much-needed protection.

Beyond that fence, the dark surrounding forest contrasted strongly with the garden's bright colors, underlining its significance. As I read the pioneers' own words, I began to realize that the bright patches of flowers in the small clearings were symbols of civilization and of a firm determination to stay where those gardens were planted.

Possibly the best single image of a pioneer garden I located came from Senator
Continued on page 38



LEFT: yellow water flag (*Iris pseudacorus*).
RIGHT: Clockwise from the top: black-eyed Susan (*Rudbeckia hirta*); cornflower (*Centaurea cyanus*); rose verbena (*Verbena canadensis*).

The Fine Art Of Fleurage



Photography by Stein Studios, Inc.

Most of the flowers in Harry White's garden in Jamaica Plain, Massachusetts end up between the pages of a telephone book before they finish blooming. Fortunately, they don't stay there long. Within weeks they will more than likely be spread across his work table ready to be positioned in one of his flower paintings, an art form he describes as fleurage. The technique, which he developed out of his love for flowers and art, has brought him a great deal of recognition as an artist in the past few years. His work has been exhibited at the Arnold Arboretum, the University of Georgia, the University of Maryland at Baltimore, and most recently at the National Arboretum in Washington, D.C.

White's unique art form had its beginnings in a childhood fondness for flowers. "I began growing flowers when I was 11 and planted a wisteria vine from seed," he says. But one look at his work makes it obvious that he has more than a gardener's curiosity about growing plants. He also sees flowers as a medium for artistic expression. Says White, "I first encoun-

LEFT: "Self Portrait." 16" x 20". 1979. Every facial feature and bit of clothing in this self portrait of the artist, Harry White, is made with plants and flowers. The face is cosmos; the hair is delphiniums and columbine; the buttons are dogwood; the jacket is made of balloon flowers, red and black tulips and roses; the eyelashes are poppy stamens; the hat is made of carnations, gerberas and pansies. RIGHT: "Untitled." 11" x 14". 1979. This fleurage is adapted from a water color by Ellen Tikkanen of a road in Maine. Among White's choices of plant material for this work are maple leaves, lettuce, coleus and spinach leaves, sweet peas, cosmos, roses and delphiniums.





ABOVE: "Fear." 8" × 10". 1980. Made with cineraria and crocus and Red Emperor tulips from White's garden. RIGHT: "Laundromat II." 8" × 10". 1980. This fleurage includes parts of black tulips from White's garden as well as 'Buttercrunch' lettuce, roses, pansies, cosmos, delphiniums, crown of thorns and Christmas cacti.



*A fleurage may take White a full day
or a full six months to make.*

tered pictures made with pressed flowers in a furniture store at age 16. At 17 I began to experiment with the idea. Pressed flower pictures were my primary form of expression with the medium until January, 1975, when I decided to do a picture without thinking about it. 'Oil and Water' was the result—my first fleurage, and I discovered the capacity for communication with this medium as a fine art in the form of a collage."

Though White's technique is now recognized as fine art, it is one for which he received no formal training. He studied to become an interior designer, receiving a degree from the University of Connecticut, but even then flowers preoccupied him. "Throughout my life there have been reoccurring moments when I knew, without understanding why, that I would work with flowers," he says. "Other people occasionally would notice that I had an intensity with flowers and would remark that I had a way with them."

Now, when he isn't gardening or traveling to show his work, White works at home making fleurages. "I use telephone books and facial tissue to press," says White. "The time involved and the manner in which I press a flower is different for each type of flower, depending upon the desired result and the climatic conditions. Sometimes I will purposely texture the petals in the process of pressing for a desired result."

A fleurage may take White a full day or a full six months to make. "Sometimes the idea has to sit in my mind for a number of weeks before I am able to envision and execute the image," he says. "At other

times the expression flows with a wonderful immediacy. It is a unique experience with each piece. I feel that one of the unifying elements behind all my work is a desire for completion. I like to give the illusion of perfection."

White works with a simple set of tools: an Exacto knife, a cork-backed straight-edge ruler and other curved edges for different effects, white glue (polyvinyl adhesive), a paintbrush to apply the glue, and a glass palette which works well as a surface for the application of the adhesive.

The list of plants he enjoys working with is long, but he admits his favorite flower is the blue delphinium because of its glorious color. He also likes the white, purple and pink varieties and pansies, forget-me-nots, apricot-colored roses, pink dianthus, nemesia, tulips, iris, daffodils and morning glories, although he cautions that the latter are difficult to handle.

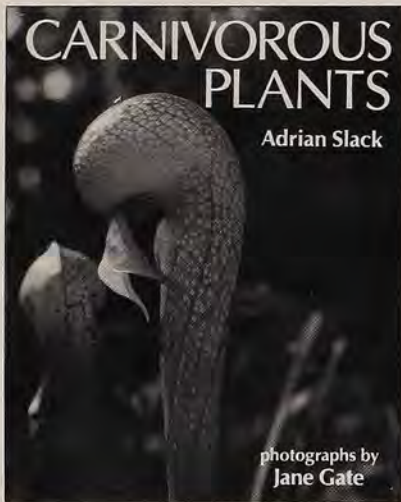
Over the years he has learned a great deal about what works best in drying and preparing plants for his work. "The natural pigment in the petal is best obtained when the flower is newly opened and pressed under dry conditions," he advises. "When the radiator is on in the winter, the results are usually good—but what blooms in the winter?" White separates the parts of "complicated" flowers and arranges them according to type and size on an open page of a book. "Iris, for example, contain a good deal of water and need more room than delphinium petals," he explains. His formula for growing the flowers is "good old tender loving care and water every other day." He tries to

avoid using pesticides on the petals, but he has a good-natured approach to the damage Japanese beetles can inflict on his pansies and roses. "I will employ the exquisitely chewed lines and well-positioned holes as a part of my design and say, 'Thanks for the help.'"

White has a unique relationship with his garden. He gardens for his art and his art, in its way, perpetuates his garden. Sometimes he grows flowers for a particular artistic goal. "This year I hope to reap a good harvest of Emperor tulips," he says. "My experience with them is that they retain much of their natural pigment and hold up well over a long period of time in a finished work. I planted 130 tulips in the garden in a crescent shape. Yellow blends into orange, into red, into pink, into white, and all end in a planting of another type of black tulip."

Perhaps luck does play a part in White's work. But it is evident that there is also a great deal of talent displayed in every piece. Flower petals and parts swirl with almost visible movement to suggest fear in his work by that name. In another work, his pressed flowers take on the whimsical images of a utilitarian laundromat, and delphiniums and pansies, disguised as sheets and towels, perhaps, tumble dry on what must surely be the permanent press cycle, if we may anticipate the pun. In yet another work—a copy of a water color White admired—his flowers and leaves become a picture within a picture within a picture and simultaneous images of themselves. Luck, perhaps, but talent—most definitely. Another enchanting marriage of nature and art. ●

CARNIVOROUS PLANTS. Adrian Slack. MIT Press. Cambridge, Massachusetts. 1980. 240 pages; hardcover, \$19.95. AHS discount price, \$17.21 including postage and handling.



Although not the easiest plants to grow, most gardeners are fascinated with the special adaptations carnivorous plants make to supplement their "diet." Detailing both the natural history of these strange plants, as well as their individual cultural requirements, this beautifully illustrated book is a worthwhile addition to the rather sparse literature on this plant group. The discussion of carnivorous seeds and fungi was new to me, and the lists of hybrids in *Sarracenia* and *Nepenthes* I found particularly useful. This book is definitely a step above any other work on the subject which has been published in recent years.

TWO TECHNICAL WORKS FOR THE GREENHOUSE GROWER

GREENHOUSE MANAGEMENT (2nd Edition). Kennard S. Nelson. The Interstate Printers and Publishers, Inc. Danville, Illinois. 1980. 252 pages; hardcover, \$14.60. AHS discount price, \$12.93 including postage and handling.

CONTROLLED ENVIRONMENT GUIDELINES FOR PLANT RESEARCH. T. W. Tibbitts and T. T. Kozlowski (editors). Academic Press. New York, New York. 1980. 413 pages; hardcover, \$25.00.

Neither of these books is for the amateur gardener, but the information in them is certainly worth browsing through if you

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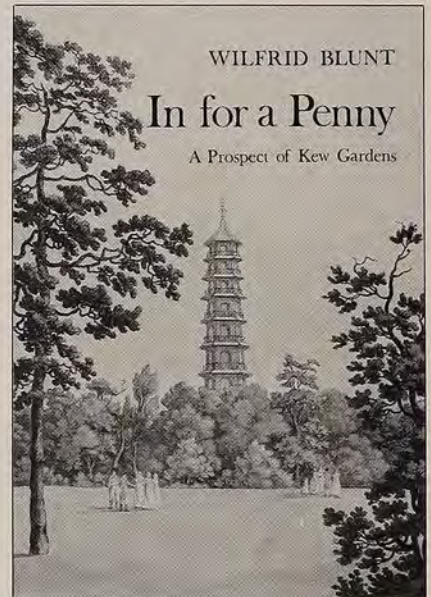
are a serious amateur. *Greenhouse Management* is about exactly what the title states. It is a textbook for the professional horticultural student and as such, it can be easily assimilated by the serious amateur interested in better operation of his greenhouse. *Controlled Environment Guidelines for Plant Research* is the report of a research conference held at the University of Wisconsin. The papers are technical, but they bring together in one place the latest thinking on all facets of the controlled growing environment and plant response to it.

KNOW AND GROW VEGETABLES. P.J. Salter, J.K.A. Bleasdale, et al. Oxford University Press. Oxford, England. 1979. 160 pages; hardcover, \$11.00. AHS discount price, \$11.15 including postage and handling.

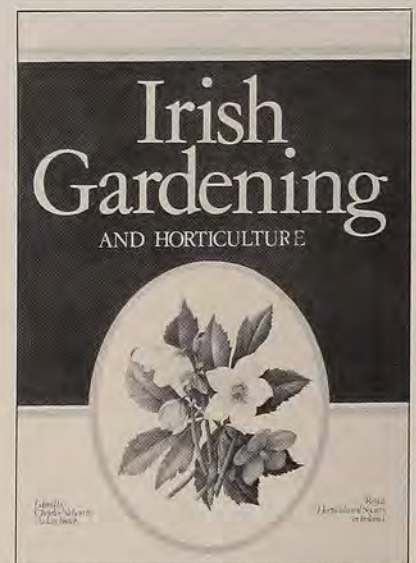
This is a little book with a great deal to offer. The authors are all members of the research staff at the Vegetable Research Station, Wellesbourne, England, and the results of more than 25 years of research in commercial vegetable production have been condensed here into some very significant conclusions for the home gardener. The first chapter, "Space to Grow," discusses optimum spacing of vegetable plants in the garden and explains exactly why the plants should be neither too close nor too distant. Detailed information is given for nearly all vegetables of concern to the home gardener. Each of the other five chapters is equally informative, and the titles are self-explanatory—Sowing and Planting; Plant Foods and Feeding; Watering Vegetable Crops; Insect Pests; and Diseases of Vegetables. Without question, this is one of the most important and most useful books for the American home vegetable gardener to have been published in recent years, and it's an English import at that.

A VISIT TO ENGLAND AND IRELAND

IN FOR A PENNY—A PROSPECT OF KEW GARDENS. Wilfrid Blunt. Hamish Hamilton. London, England. 1978. 218 pages; hardcover, \$22.50. AHS discount price, \$19.25 including postage and handling.



IRISH GARDENING AND HORTICULTURE. Charles Nelson and Aidan Brady (editors). Royal Horticultural Society of Ireland. Dublin, Ireland. 1979. 250 pages; hardcover \$16.00, softcover \$12.00, plus \$3.00 postage. Please allow three months for delivery.



The gardener traveling in England cannot omit a pilgrimage to the Royal Botanic Gardens at Kew. Certainly one of the world's great public gardens, if not the greatest, it had its origins as a royal park at the end of the 18th century. Since one is surrounded by history as well as beautiful flowers when visiting Kew Gardens, *In for a Penny* provides an excellent guide to the past for the present-day visitor. Filled with anecdotes about royalty, the great explorers and the botanists who have all contributed over the years to make Kew what it is today, the visitor to Kew will have a greater pleasure and an enhanced perspective from having first read Wilfrid Blunt's book. If you can't travel to England, it still makes good reading. The title, incidentally, refers to the entry fee, which has only recently been raised.

Irish Gardening is an excellent discussion of the land, the climate and the people and institutions who have contributed to horticulture in Ireland. The plants which flourish there and how they came to be introduced are also part of the story. Enjoyable reading if you're just interested in gardening, and an obligatory introduction if you are planning to travel in Ireland.

RODALE'S COLOR HANDBOOK OF GARDEN INSECTS. *Anna Carr.* Rodale Press. Emmaus, Pennsylvania. 1979. 241 pages; hardcover, \$12.95. AHS discount price, \$12.25 including postage and handling.

If you want to know what is eating your garden, this book will tell you. Excellent color illustrations, combined with easily used introductory keys, make insect identification easy. Where appropriate, eggs and larval stages also are illustrated. A brief description of the insect, together with information on life cycle, host plants and general feeding behavior further increase the utility of this work. The host plants are listed in the appendix together with their common individual predators so that you also can approach the identification of pests by knowing which plant they are feeding on. The one shortcoming of this book is its restriction of control information to nonchemical methods. While these methods often work well, they are not always as immediate nor as convenient as the use of chemical insecticides.

MORE ORCHID BOOKS!

AN ILLUSTRATED TREASURY OF ORCHIDS. *Frank J. Anderson.* Abbeville Press. New York, New York. 1980. 157 pages; hardcover, \$17.95. AHS discount price, \$23.25 including postage and handling.



THE ORCHID FLOWER INDEX—VOLUME 2. *Robert M. Hamilton.* Published by the author. 9211 Beckwith Rd., Richmond, British Columbia, Canada V6X 1V7. 1979. 107 pages; softcover, \$15.00. AHS discount price, \$14.00 including postage and handling.

The following are all facsimile reproductions published by Earl M. Coleman. Stanfordville, New York. 1979:

DRAWINGS OF FLORIDA ORCHIDS. *Blanche Ames* (reproduction of 2nd Edition of 1959). 191 pages; hardcover, \$15.00. AHS discount price, \$13.25 including postage and handling.

ORCHIDACEAE: VOL. IV, THE GENUS HABENARIA IN NORTH AMERICA. *Oakes Ames* (reproduction of the original edition of 1910). 288 pages; hardcover, \$25.00. AHS discount price, \$21.25 including postage and handling.

ORCHIDS IN RETROSPECT—A COLLECTION OF ESSAYS ON THE ORCHIDACEAE. *Oakes Ames* (reproduction of the original edition of

1948). 172 pages; hardcover, \$15.00. AHS discount price, \$13.25 including postage and handling.

FERTILIZATION OF ORCHIDS BY INSECTS. *Charles Darwin* (reproduction of the original edition of 1862). 365 pages; hardcover, \$27.50. AHS discount price, \$23.25 including postage and handling.

REFUGIUM BOTANICUM—VOL. II (ORCHIDS). *W. Wilson Saunders* (editor). (Reproduction of the original edition of 1869-1882.) 71 plates with descriptions; hardcover, \$27.50. AHS discount price, \$23.25 including postage and handling.

HISTOIRE PARTICULIÈRE DES PLANTES ORCHIDÉES RECUEILLES SUR LES TROIS ILES AUSTRALES D'AFRIQUE. *A. DuPetit-Thouars* (reproduction of original edition of 1822). 32 pages and 110 plates; hardcover, \$15.00. AHS discount price, \$13.25 including postage and handling.

An Illustrated Treasury of Orchids is a picture book with excellent reproductions of old color plates of orchids. Short descriptions of the species illustrated, together with historical notes and brief cultural instructions, make this a good book for the orchid beginner. Don't believe the publisher's comment on the dust wrapper that no greenhouse is required to grow the plants. With the fine quality of the reproductions, it is also unfortunate that no reference is given for the original publications from which they were reproduced.

The Orchid Flower Index—Volume 2 is a continuation of the author's earlier publication, which listed all colored illustrations of orchids published from 1736 to 1966. The present work covers illustrations published from 1966 to 1979. The excellent bibliographies which accompany these two compilations make the work even more valuable. For those who missed out on Volume 1, it has now been republished.

Earl M. Coleman's publications are always examples of the very finest facsimile reproductions. The present series of orchid classics is no exception. For the collector of orchid books, the cost of original editions has become prohibitive, even if they can be found. Thus the availability of ex-

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BOOKS CONT'D

cellent facsimiles is a real blessing to anyone seriously in search of the literature. The titles in the present group are rather a mixed bag and will not be uniformly of interest to all orchid growers. They do, however, cover a wide range of the variation which is found in this very large plant family, and no matter what your orchid specialization, there is probably at least one title you will find worth buying.

ROOT CELLARING. Mike and Nancy Bubel. Rodale Press, Emmaus, Pennsylvania. 1979. 298 pages; hardcover, \$11.95. AHS discount price, \$11.41 including postage and handling.

With increasing interest in home vegetable production and the increasing cost of energy, *Root Cellaring* offers the gardener some timely advice—how to store fruits and vegetables without the use of fossil-fuel power. In addition to plans and discussions about various types of root cellars, the book also discusses suitable crops and related methods of preservation. As a return to the past, the root cellar has a great deal to offer the future.

A DICTIONARY OF BOTANY. R. John Little and C. Eugene Jones. Van Nostrand Reinhold Company. New York, New York. 1980. 400 pages; hardcover, \$18.50. AHS discount price, \$16.05 including postage and handling.

The language of botany (and horticulture), as in all science, utilizes many words that are not in the general vocabulary of the average gardener. This is not because the botanist is trying to be obscure in his language. On the contrary, the description of plants and how they grow requires concepts for which there are no words in ordinary English. This botanical dictionary covers all aspects of the plant sciences. For the serious amateur (or indeed the professional) who wants to be able to use all of the literature, this dictionary is an essential reference work. ☉

—Gilbert S. Daniels

Orders for books available at a discount to members of the Society should be sent to the attention of Doty Sowerby, American Horticultural Society, Mount Vernon, VA 22121. Make checks payable to the Society. Virginia residents, add 4% sales tax.

WEEDS CONT'D

Continued from page 18

Be sure you understand the selectivity and persistence of the herbicide you want to use. Optimum time for herbicide treatment may vary with species and compound. Preemergence treatment, intended for application of clean-cultivated soil only, controls weed seedlings as they germinate, but not established weeds. Beside the broadleaf weeds specified, remember that grasses are especially sensitive to amitrole and glyphosate. Avoid direct contact or drift of particles to sensitive non-target plants. Soil type, moisture, temperature and organic matter content influence microbial activity and thus the rate at which most herbicides are broken down.

Only compounds and uses approved by the U.S. Environmental Protection Agency may be used legally even though other effective uses or materials are known. Each state's Cooperative Extension Service recommendations can be obtained from County Agricultural Agents, who are also prepared to help with weed identification and advice based on local conditions.

Herbicides cited in this article are identified by the official common name, which usually appears in the label's ingredient statement, as does the full chemical name. The manufacturer's product (trade) name is the most conspicuous one on the label, but may not tell you what is inside the container, so check the ingredient statement for that information. For example, 2,4-D is the common name for 2,4-dichlorophenoxyacetic acid, which can be formulated several ways and be an active ingredient in different products, each with its separate manufacturer's trade name and registered directions for use.

A good deal of effort is going into determining satisfactory biological controls for weeds. There is a beetle that seems to prefer a diet of hedge bindweed, and Canada thistle has several natural enemies. Whether these or other organisms are selective enough for safe use must be proven. At present, none can be unreservedly recommended for homeowner use. In the meantime, cultural, mechanical and chemical techniques remain the standard tools for eliminating weeds.

Weed seed can remain viable for years, awaiting proper conditions for germination. When controlling weeds mechanically, try to "get 'em while they're young." With herbicides, heed advice that is both amusing and serious: IF ALL ELSE FAILS, READ THE LABEL. ☉

A GUIDE TO PRUNING AND TRAINING FRUIT TREES

What are the major reasons for fruit tree pruning? Why not let them grow at will? In brief, we prune fruit trees to keep them small, fruitful and manageable so that we can pick and enjoy quality fruit which is free of insects and diseases. This article will cover many of the pruning methods which have been accepted as most effective over recent years, but for purposes of this discussion the methods will be limited to those for non-citrus fruit trees only.

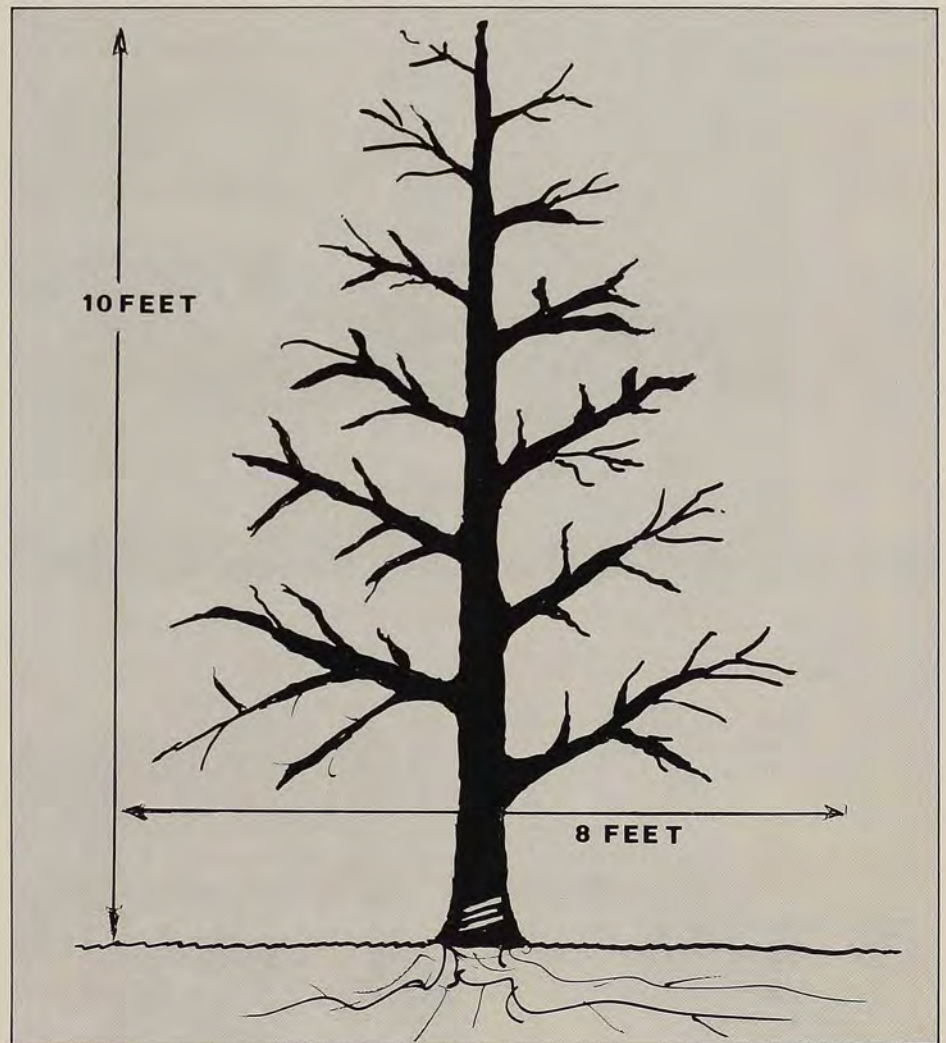
There are many beneficial effects of pruning fruit trees. The old saying "pruning is dwarfing" is still true because, when done properly, it reduces tree size. Another saying often used, "pruning is invigorating," is also true, although it seems to contradict the first principle. For example, cutting the top three feet from a 10-year-old apple tree reduces or dwarfs the tree, but it also invigorates the tree because, in nature, the tree likes to grow upward and can do so more easily after having been pruned.

"Tree training," another term in modern fruit growing, also affects tree growth and fruiting. This involves, in most cases, maintaining a central tree leader (trunk) and spreading branches by means of cutting and coaxing branches into desired directions with braces, guy-wires or other devices. This method will shape and dwarf the trees and allow sunshine to reach the branches, which causes them to be more fruitful.

Each fruit crop—apple, peach, pear and so on—due to differences in growth patterns and fruiting, requires somewhat different tree training and pruning approaches. These various approaches will be categorized below by fruit type.

Apple:

The apple tree is the most interesting for pruning and training because it can be treated roughly, and it responds equally well to different growing and tree management systems. It can be trained on a trellis, into espalier forms and into free-



Apple trees may be trained and pruned into a variety of shapes. One of the most common is the Christmas tree or "New Standard" shape. Pear and tart cherry trees also can be trained and pruned into this form. The height of modern fruit trees of any kind should not be over 10 feet tall and eight feet in spread.

standing Christmas tree shapes. Since each system requires detailed manipulations, we will only describe the latter system here, the free-standing form.

Training and pruning for most satisfactory results must begin when the apple tree is planted and should continue throughout the life of the tree. Most trees when purchased either have a few weak branches or, as in the case of 'Delicious', no branches

at all (these branchless trees are called whips). If the tree is branched, keep two or three of the best branches, remove the weak ones, and cut about 12 inches from the top, which is called the "central leader." This leader should be maintained throughout life, just as a Christmas tree has a leader with several side branches. If the tree is a whip, cut off the top one-third of the tree. These simple prunings should



ABOVE: A close-up view of well spread branches showing a central leader and a cut where a crowding branch was removed. RIGHT: A tree-top view of a tart cherry tree in which the central leader and side branches were cut back to form V-shaped branches for tree compactness, dwarfing and increased fruit area.



be done either prior to or immediately after planting the tree. These may seem to be severe measures in a tree so young, but your efforts will literally and figuratively bear fruit later.

During the growing season of the first year, select three to four side branches of the apple tree and spread these nearly to a horizontal position by putting braces made of clothespins or toothpicks in the trunk-branch crotch. The aim, of course, is to force the branches to grow horizontally and thus achieve a Christmas tree shape. In the second, third and fourth years

select more branches, spaced about eight inches apart on the trunk (central leader), and spread these horizontally from the leader with stronger stick braces. These spreaders can be made from lath strips which have been cut with a V in each end. Cut out branches with poor position or those growing vertically. Do not cut the ends of the remaining branches until later years, when tree-size control is practiced by heading or cutting some branches back to a sublateral branch. Always remember to shape the tree so that it is wide at the bottom, tapering to a narrow form at the

top. This allows for maximum sunshine into the tree, which will in turn produce better fruit color and quality.

The most important thing to remember in training and pruning central leader fruit trees during the first six years is always to maintain the leader. To prevent the leader from being damaged as you attempt to strengthen it over the years, pick the small fruit from the top before fruit set develops. Otherwise, fruit set developed on the top of the leader branch will bend it or even cause it to break. When the tree has obtained a height of eight feet, cut the leader back above a small branch near the top.

Pear:

Pear trees can be treated in a manner similar to the method described for apple trees. However, most cultivars of pear are prone to have more upright-growing branches than the apple tree. Hence, place major emphasis on spreading the branches outward at a 60° angle rather than a 90° angle from the central leader. A fruit load on these branches will then bring them to near horizontal position. Once the tree form (with eight to 10 branches on a central leader) has been established, limit pruning to annual clean-up of crowding and perpendicular branches and shoots, and occasional heading back of branches to control tree size.

Peach:

Most of the fruit on a peach tree is borne on one-year-old shoots; therefore, it is important to keep the tree growing well and not to remove young, fruiting branches. When planting a peach tree, select three strong, wide-angle branches and cut out the weak, sharp-angle ones. Cut the top shoot above the topmost side branch. If branches are small and weak, cut out all of them and start with a whip. New, strong branches will develop during the summer.

Since it is difficult to develop a peach tree with a central leader form, it is best to grow an open center one with three main branches, each having several fruitful lateral branches. These main branches should originate at least six inches apart on a short, two-foot trunk. These must not have sharp angles or they might split from the trunk.

Renewal-type pruning serves to keep new peach shoots growing behind renewal pruning cuts. To do this, cut back about one-third of the outer end of the main

branches. Sometimes a vigorous shoot in the tree's center can be bent outward and formed into a fruiting branch. By doing this annually, peach trees can be maintained with vigorous, fruitful branches.

Most pruning is done during the winter months and training in the summer. Prune the stone fruits last, preferably in March, April and May.

These pruning practices tend to prolong tree life and make them easy to spray and harvest.

Plum and Apricot:

These fruit crops share similar growth habits and respond to the same pruning methods. Again, it is important to get young trees off to a good start by selecting, spreading and maintaining strong scaffold (or main lateral) branches.

Both plum and apricot trees grow long branches with few lateral branches. To encourage more side branches, reduce the length of branches by pruning off the outer 25 percent of the main scaffolds. This will make the tree more compact and fruitful.

Most of the fruit should ideally be in the bottom six feet of the tree. To achieve this desired growth habit, prune-in the top, that is, remove entire long, overlapping branches, leave the smaller ones, and cut them back to proportionate lengths. In other words, do not allow the top of the tree to overshadow its lower part.

Sweet and Tart Cherry:

The sweet cherry cultivars tend to develop multiple leaders or upward-growing branches. Avoid this condition by removing some of the branches and cutting back others to a side branch, thus allowing only one to dominate the lead upward.

Young trees, if properly trained the first few years, are easily maintained, whereas older, overgrown, nonattended trees can be a problem. Keep in mind that sweet cherries are vigorous trees and, therefore, the tops and vigorous side branches should be cut back to dwarf the tree.

The tart cherry can be trained and pruned into a central leader tree similar to the method described for apple trees if this

process is begun at planting time. Prune out branches with narrow crotch angles or they will break or split from the leader trunk as a result of heavy cropping or wind storms. In later years, reduce sides and tops by pruning them back to smaller branches. This will keep the cherry tree small for easy care.

When to Prune and Train

Most pruning is done during the winter months and training in the summer. Prune the stone fruits last (peaches, apricots, plums and cherries), preferably in March, April and May. If the stone fruit trees develop cankers, black knot, mummy fruit or other problems, prune out the affected area and burn the branches.

When trees produce too much shoot growth in the season, some of this lush growth can be pruned out in August or about three weeks before harvest. By cutting off some of the current season's growth outside the fruit zone, you can obtain better quality fruit.

Pruning Tools

Proper tools make pruning easier and more effective. A pair of hand shears is sufficient while the trees are small and also for summer pruning. Loppers with 24-inch handles are almost a must when several trees need pruning. These are also handy for pruning shade trees and shrubbery. An eight- or 10-inch hand pruning saw is best for removing branches larger than one inch in diameter. The pole-pruner, which comes in various lengths, is also very useful for pruning the top portions of trees.

Handling Major Cuts

Make all major pruning cuts flush with the trunk and those cuts on a lateral shoot flush with the lateral branch. Never leave a stub. When removing a large branch, first make a one-inch undercut, then saw from the top about an inch or two away from the trunk. Next cut the stub flush with the trunk.

Paint cuts larger than two inches in diameter with a quick-drying latex outdoor paint or a grafting compound to prevent them from drying out prior to healing. Smaller cuts will heal on their own.

By using these relatively simple pruning and training techniques on a timely basis, you can achieve a more bountiful, good-tasting crop. Happy harvesting. ☉

—Robert F. Carlson

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Continued from page 27

David Turpie's description of his family's homestead on Sugar Creek in the 1830's: "Our house-yard and garden contained about an acre, which was inclosed by rough split pickets or palings. The garden was soon plowed, harrowed and planted with the ordinary vegetables. Their growth in this virgin soil was rapid and luxuriant, especially that of the vines. These had been planted by way of precaution close to the western boundary of the garden. They ran riot toward the latter part of the season; they climbed over the fence, spread away beyond it, and cucumbers, gourds, and squashes hung upon the pailings outside. Besides the vines and the vegetables, my mother had a bed in the garden, prepared under her own eye, which she called the health-plot. Here were found such old-fashioned herbs as sage, mint, rue, cummin, lavender, anise, thyme and basil—each in its own row. The more hardy herbs, the hoarhound, catnip, tansy, and horseradish, were banished to the fence corners."

This description gave me a wealth of information. First, I learned that the garden was surrounded by a picket fence. Fences were essential and were found around all gardens. It was not a split rail, snake or Virginia fence, however. The close-set pickets were necessary to keep out the rabbits, woodchucks and other wild animals that would make short work of any pioneer garden not well enclosed. The vines growing on the fence also were typical of pioneer plantings. They often were grown on the house itself. One pioneer wrote of the "inevitable morning glories which climb over the windows and around the doorways."⁵ Another described the vines on one house in this way:

"A trellis of poles supported the honeysuckle (trumpet) vine that transformed the door into a bower. Gourd seeds planted at each corner not only helped decorate but the fruits were extremely useful."⁶

Gourds were plentiful. Aside from their usual service as bowls and dippers, gourds were used to entertain the baby, to mend socks, to guide the scissors in giving the boys a haircut and to store seeds and anything else that needed to be kept high and dry. "Sugar in the gourd, sugar all about—it's hard to get it in, and hard to get it out." So goes a song of pioneer Indiana.

Gourds were surely common in every frontier garden.

The list of herbs Turpie included in his description was a good one for a typical pioneer garden of the forest frontier. I noted again the use of the word "old-fashioned." Cumin, anise and lavender might not have

Lawns were important because, without the interference of trees and underbrush, settlers had an unobstructed view of the surrounding wilderness.

lasted long in Indiana winters, but the other herbs mentioned show up again and again in pioneers' descriptions of their gardens.

After tabulating evidence from many sources, my results indicated that the following herbs might well have been a part of any pioneer garden:

Tansy most often mentioned with 16 references; then catnip, spearmint, peppermint and hoarhound, each with 14; sage 9; elecampane 8; horseradish 7; yarrow 5; feverfew, thyme, chamomile, comfrey, red pepper and saffron crocus, each 4; wormwood, motherwort, rue, summer savory and anise 3; basil, caraway, hyssop and lavender 2; borage, fennel, dill, rosemary, chives, angelica, marjoram and wild sweet Cicely, each 1. The small mention of dill surprises me. Even the early pickle recipes seldom mention it. Pickling was more often done with salt—and in at least one case farther north, with whiskey.

From another passage, I learned even more from Turpie:

"The earth was not disturbed at all near the cabin. Nothing grew around the house except the grass, which was kept short by the scythe. The house-lot being cleared of weeds and brambles was soon covered by a turf of bluegrass, which seemed indigenous to the soil."

It would seem that even the pioneers had lawns. Lawns were important because, without the interference of trees and underbrush, settlers had an unobstructed view of the surrounding wilderness. Lawns were as protective as a fence—a fence

nothing and no one could hide behind. Lawns also let in the welcome sunshine and free air necessary for the comfort of the cabin and for the growing of the garden next to it.

These lawns may seem quite modern to those of us accustomed to using a lawn mower, but a man handy with a scythe—and it took considerable skill—could mow a lawn neatly and smoothly. The old pictures of Father Time or Death with his scythe came from the then-familiar sight of an old man mowing the graveyard with his scythe, slowly and cleanly, never nicking a stone, never missing a weed.

"The ready bloomers, such as the sunflower, the ragged sailor, and the hollyhocks were planted round the well, not too close to it, where they grew tall, flowered profusely, and in summer made a gaily colored screen for the curb and the iron-bound bucket."

The well, where the flowers could be watered easily if need be, and the outhouse, where they seldom needed to be watered at all, were favorite places to plant the "ready bloomer" and what gardeners call gross feeders, like the sunflower and the daylily. This practice was so common that the pioneers had another name for the daylily—the outhouse lily.

I noted that the well had what we now call "foundation planting" while the house did not. There were two reasons for this, both of them good ones. Following Liberty Hyde Bailey's advice, or rather, preceding it, the pioneers planted their grounds to be seen from the house. They planted flowers so they themselves could see them and not to please the passers-by, since there were none. Also, the house as often as not had no foundation. The floor was supported by cornerstones, and the free air flowing between the ground and the rough puncheon logs of the floor kept the floor dry and the logs sound.

"The choice flowers were planted in a bed made in the front yard. Here grew pansies, pinks, marigolds, four-o'clocks, touch-me-nots, the larkspur with the blood-red poppy and the peony."

Most pioneer homes faced south to catch the sun—and incidentally, to tell time by the noon-mark on the front door threshold. This meant that the flower garden was usually south of the house and surrounded by the lawn. Notice that most of the flowers were sun lovers.

You may not recognize all the names

of flowers Turpie mentions. Herein lay a problem in searching for evidence in the writings of the pioneers themselves: they did not always use the same names we do. Sometimes the names changed, and sometimes the flowers themselves changed. The "ragged sailors" growing by the well were probably *Polygonum orientale*. This flower also was called ladies' fingers by other pioneers, and prince's-feather by still others. Ragged sailors also could have been chicory, which was grown in gardens at this time. Either would be authentic, but we'll never know exactly which Turpie meant.

When Turpie wrote about pansies in the front bed, he probably meant what we call Johnny-jump-ups. Our pansies were derived from these, but not until after the pioneer period. Our present garden pansies were a Victorian invention. The marigolds mentioned here and in the other pioneer gardens as well might possibly have been the French or African marigolds, but these flowers had a long journey to make from the new world to Africa and France, to England, and back across the ocean to Indiana. They would have made it in time for the pioneer period, but barely. The possibility is far greater that Turpie meant the pot marigold or calendula, which was simply "marigold" to many of the early settlers. The pot marigold still was used medicinally as an antiseptic up to the Civil War and beyond. Any flower with medicinal uses was doubly valued by the pioneers.

Turpie mentioned four-o'clocks. Many Indiana pioneers called them pretty-by-nights. The latter name seems more cheerful. Touch-me-nots were the garden balsam, *Impatiens balsamina*. Two other flowers which Turpie didn't mention, but which do present name problems, were the bleeding heart, which could usually be translated to wild columbine since the *Dicentra spectabilis* had not yet been discovered in the Orient, and the bachelor's-button, which could be *Centaurea cyanus*, but was more often a double form of *Ranunculus*, either *R. repens* or *R. acris*. *Centaurea cyanus* was more often called cornflower. In solving problems like these, I found the early botanical lists to be very useful. They usually listed the Latin name together with a description and the common names used in that region at that time.

Finding the plant itself growing by an

old cabin site was another good piece of evidence. In studying the old cabin sites, I found it important to know not just when it was built, but also when it was last inhabited. A home site abandoned even in this century might look ancient if the area was going back to forest.

Fences were essential and were found around all gardens. Close-set pickets were necessary to keep out wild animals that would make short work of any garden not enclosed.

After reading all the reference material I have located so far, but omitting names of plants found on actual home sites (because of the difficulty of determining a last-lived-in date), I was able to come up with this list of typical pioneer plantings. The numbers refer to the number of times I located a reference to the flower: hollyhock 11; morning glory and bouncing Bet 10; lilac 9; pinks and periwinkle 8; lily-of-the-valley and orange daylily 7; marigold (with the previous caveat), larkspur, star-of-Bethlehem (*Ornithogalum umbellatum*), sweet William, all 6; coral (trumpet) honeysuckle, grape hyacinth, portulaca, cypress spurge, phlox, stonecrop (*Sedum acre* and *S. telephium*), columbine, Johnny-jump-ups, all 5; peony, four-o'clocks, cornflower, celandine, red poppy (*Papaver rhoeas* and *P. somniferum*), all 4; yellow water flag, yellow daylily, daffodil (both *Narcissus poeticus* and *N. pseudonarcissus*); snow-on-the-mountain, prince's-feather (either *Polygonum orientale* or *Amaranthus spp.*), perilla, ground ivy, opium poppy, blackberry lily, matrimony vine, shoo-fly plant, mock orange, all 3; forget-me-nots, touch-me-nots, rose verbena, cockscomb, coreopsis (*Coreopsis tinctoria*), old man (*Artemisia abrotanum*), creeping phlox, love-in-a-mist, yucca, barberry, gardener's-garters, sunflower, blue squills, snowball bush, sweet shrub, all 2; and crown imperial, Maltese cross, sweet rocket, black-eyed Susan's, wisteria, white lily (probably *Lilium candidum*) snowdrops,

and creeping Charlie (*Lysimachia nummularia*), each 1.

My research is by no means over. I suspect iris, rose yarrow, honesty and garden loosestrife, among others, are all hidden in dusty pages or old cabin sites somewhere, but they have not yet come to light.

Based on the evidence, then, pioneer gardens did exist along the forest frontier, and they had a design and meaning all their own. Turpie, looking back as an old man, wrote in 1903,

*"It is not likely that many of these old plants and flowers may be found in our modern gardens or conservatories, but they may all be found in Shakespeare, Milton, or Isaac Walton. They are Anglo-Saxon classics. They have now become exotics, not of another clime, but of a former age. Yet their very names are redolent of the mother-tongue, and since they were strangers in the new place where we settled, they deserve the courtesy of mention."*⁷

To the pioneers these gardens were symbols of the continuity of civilization and of their own determination to establish a new home in the wilderness. To us they are an important part of our heritage. Truly, they deserve the courtesy of mention. ♠

A highly informal bibliography: The quotations in the article are taken from the following sources:

¹Mrs. Chadwick writing her pioneer reminiscences for the *History of Shelby County*.

²H.S. Bartholomew writing in the *Pioneer History of Elkhart County, Indiana*.

³Mr. Kemper writing about his home in Richland Township, Rush county, Indiana. Printed in the *Indiana Magazine of History*, Volume 19, 1928.

⁴Henry Ward Beecher writing in letters to friends in the East from Indianapolis in 1843. Printed in the *Indiana Magazine of History*, Volume 3, 1907.

⁵Noah J. Major writing about his homestead in Morgan County, Indiana. Printed in *The Pioneers of Morgan County*, by the Indiana Historical Society.

⁶Logan Esarey writing about his family's homestead in southern Indiana, printed in his excellent book, *The Indiana Home*, recently rereleased by the Indiana University Press.

⁷All the quotations from David Turpie came from his book *Sketches of My Own Times*. The Bobbs-Merrill Company; Indianapolis, 1903.

Continued from page 22

lowbush plants that are cultivated and carefully managed to yield their best crops. Lowbush berries are picked with rakes that are very similar to cranberry scoops. Highbush blueberries are picked by hand, but machines have been developed to pick both and are being used by some growers.

Growing your own blueberry bushes can be a pleasant and rewarding pastime. Blueberries do well under conditions similar to those enjoyed by azaleas. To get the best crops, grow plants in full sun. Proper soil conditions are probably the most important single factor affecting the plant's growth. The soil should have an acid reaction with a pH between 4.0 and 5.2. A high percentage of organic material in the soil and good drainage are essential. Sandy loams are ideal, but other soils may be modified to provide the above requirements.

It is wise to thoroughly prepare the planting site, because the soil provided at planting is that which the plant will be left with throughout its long life. Humus in the soil holds moisture which it transfers to the plant at an even rate. An organic mulch also will help maintain the moisture content of the soil and, as it decomposes, will add humus to the soil. In periods of drought, better crops will result if the plants are irrigated. Blueberry bushes can tolerate flooding in the winter but not during periods of active growth. Then, their roots can be seriously damaged by submersion for more than about 12 hours.

The highbush blueberry is not generally considered to be hardy much below -20°F, depending upon the cultivar. Because of a required winter chilling period, it also does not do well very far south of North Carolina. Hybrid selections of *Vaccinium ashei*, the rabbit-eye blueberry, have short chilling requirements and are adapted to growth in the South and as far north as North Carolina.

In the home landscape, blueberries are not usually troubled by any serious insect or disease problems. The major pests are wildlife. Rabbits will eat the new growth off at ground level, deer will browse on the tops, and birds will eat the berries even before they are ripe. Unless you are planting blueberries for wildlife habitat, fence or spray the plants with repellents for protection. Keep birds from eating your fruit crop by covering the plants. Construct a framework onto which you can attach

netting or poultry wire. Be sure to secure the netting at ground level or the birds will go under to feast. Construct lightweight, portable frames to go over each bush, or hang netting over wires stretched between poles. These and other covering systems can be designed for use as the fruits are maturing and can be stored out of sight the rest of the year.

Highbush blueberry plants are most easily transplanted as two- or three-year-old plants. Space them five to eight feet apart in the row and eight to 10 feet apart between rows. Don't allow new transplants to fruit the first two years after transplanting; allow only limited production the next two to three years. Prevent fruiting by

pruning off or rubbing off the fruit buds. Fruit buds are formed near the ends of the branches, are plump, and are much larger than leaf buds. Bushes reach maturity at about eight years and should then produce two to four quarts of berries each year.

New shoots or whips arising from the roots may grow three feet in a season. These whips should be encouraged, and some of the oldest stems should be cut off at ground level to make room for the new growth. This pattern of growth and pruning maintains the plant in a healthy and vigorous growing condition. Prune in the fall and winter when the structure of the plant can be most easily seen. After removing some of the oldest growth at the

Some of Our Family's Favorite Recipes:

Blueberry Scallop

- 1 C. flour
- ½ C. butter
- ¼ C. brown sugar
- ¼ C. white sugar (optional)
- 4 C. blueberries
- Dash of cinnamon
- 2 Tbs. water or lemon juice

Arrange berries in shallow baking dish, sprinkle with water and cinnamon. Combine flour, butter and sugar into crumbly mixture and spread over berries. Bake at 375° for 45 minutes. Serve hot with whipped or ice cream.

Blueberry Hurry-up Pudding

- 1 Qt. blueberries
- ½ C. water
- ⅔ C. sugar
- 1 Tb. butter
- ⅛ tsp. salt
- Dash cinnamon
- 2½ C. one-inch bread cubes with crusts removed

Place berries in saucepan with water, bring to boil. Simmer 5 minutes uncovered. Blend in sugar, butter, salt and cinnamon, fold in bread. Serve warm or chilled.

Blueberry Slump

- 2 C. flour
- 4 tsp. baking powder
- ½ tsp. salt
- 2 tsp. butter
- ¾ C. milk
- 4 C. blueberries
- 1 C. sugar

Sift together flour, baking powder and salt. Work in butter. Slowly add milk. Place berries in saucepan with water to barely cover. Bring to boil. Drop dumpling mix in small quantities into berries, cover, steam for about 12 minutes. Remove dumplings, add sugar to berries and bring to good boil. Butter dumplings and serve with the sauce.

ground, work upward, pruning out old and twiggy growth; leave the new, more vigorous branches. Pruning this way should maintain a mature bush about five to six feet high and four to five feet wide, depending on the cultivar. Rejuvenate old, neglected plants by cutting the whole plant to the ground; three years later they should again be in full production.

It is a good precaution to burn or otherwise dispose of all prunings to prevent the possible transmission of disease. If you suspect any growth of harboring disease, prune it back to good wood and sterilize your tools in alcohol between cuts.

Commercially, new plants are propagated by softwood cuttings under intermittent mist and by hardwood cuttings taken in the spring. If you need only a few plants, propagate blueberry bushes by simple layering.

Any good fertilizer recommended for use on rhododendrons and azaleas may be used on blueberry bushes. Cottonseed meal is a good source of nitrogen for those who prefer organic fertilizers. A mulch of pine needles, sawdust or wood chips will keep down competing weeds and keep the soil cool and moist.

It is important to pick the fruit when it is ripe, for it is sweetest at this stage. Blueberries are not ripe until they are completely blue. The last part of the berry to turn blue is the area right around the stem. Red-backed berries are tart and do not make the best dessert fruit, but they are good for use in pies and other baked goods. Ripe berries pick with the least resistance and are best picked by a rolling action of the thumb and first two fingers. Avoid putting the berries in deep containers as you harvest them because the berries on the bottom are likely to be bruised. Pint fruit boxes offer the most protection for your berries.

The easiest way to preserve blueberries is by freezing them. First, pick out any imperfect berries and stems by rolling them around on a napkin or paper towel placed in a dinner tray or cookie sheet. Then, without washing them, roll them into freezer containers and immediately freeze them. If you wash the berries before freezing them, they will come out of the freezer as a solid block. By freezing them dry, each berry freezes separately and is not stuck to its neighbor.

One complaint many people have about blueberries concerns the flavor of culti-

vated blueberries as compared to that of wild berries. It *was* true that cultivated berries were not as flavorful, but that is no longer the case. All of the recommended cultivars on the list below taste very good. But even with good-tasting fruits, one's taste buds can be dulled by eating berries from only one cultivar.

In the home landscape, blueberries are not usually troubled by any serious insect or disease problems. The major pests are wildlife.

Plants of a cultivar all originated from one plant and have been propagated by cuttings. They are all genetically the same, and all the berries of a cultivar taste the same, unless they are at different stages of ripeness. To stimulate your taste buds, try mixing the fruits of several cultivars. This simulates what happens when you pick wild blueberries. Then, every bush is different genetically and by taste.

Most of the cultivars listed below are generally available. To ensure good pollination, choose at least two different cultivars. If your area is to have late spring frosts, avoid the early fruiting cultivars; if you often have late summer frosts, do not plant the later maturing berries.

'Berkeley' has one of the largest berries. It ripens about mid July in the Boston area. It has beautiful, light-blue color, good flavor, is vigorous, very productive and keeps well. The plant has a broad, spreading habit.

'Bluecrop' is vigorous, productive and fruits earlier than 'Berkeley'. The large, sweet berries hold well so that 90 percent of the crop may be harvested in one picking. It is one of the hardier cultivars.

'Bluetta' ripens very early, is tolerant of spring frosts and has light-blue color and medium-sized fruit on a compact shrub.

'Blueray' is noted for its hardiness and productivity. It has large, firm, light-blue fruits that hold well on the bush.

'Coville' holds its flavor well and is recommended for freezing, shipping and cooking. It is late ripening, vigorous and productive, and may be tart if picked before it is fully ripe.

'Earliblue' is hardy and productive. It fruits just after 'Bluetta' and has light-blue, firm,

sweet berries that hold on the bush without dropping.

'Elliott' was introduced by the U.S.D.A. in 1974 and is still difficult to obtain. It has medium-sized, light-blue fruit on an upright, vigorous bush. It is the latest fruiting cultivar currently available, and it is resistant to mummy berry disease.

'Herbert' fruit is dark blue and is among the largest and best tasting of the cultivars listed here. It is late, vigorous, consistently productive and very hardy.

'Northland' is noted for its hardiness and tolerance of late spring frosts. The branches are flexible and will bend under a heavy snow without breaking. A small shrub, it is about four feet tall at maturity. It bears about the same time as 'Blueray' and has firm, medium-sized, good flavored fruits.

'Top Hat' is an ornamental hybrid blueberry that produces fruit. It is a cross with *Vaccinium angustifolium*, the lowbush blueberry. It makes a small, round shrub about 18 inches square, is self-fertile and has been recommended as an attractive container or patio plant.

Order of fruiting: 'Bluetta', 'Earliblue', 'Blueray', 'Bluecrop', 'Berkeley' (mid-season), 'Herbert', 'Coville', and 'Elliott'.

Blueberry bushes can make an interesting and useful ornamental planting. They offer attractive flowers in the spring, delicious fruit in the summer, brilliant autumn color and attractive, red winter stem coloration. Planted four to five feet apart, they can be used as a hedge, perhaps along a property line shared with neighbors. As a foundation planting, they should be as easy to care for as azaleas. Blueberry bushes also can make attractive tubbed patio plants, but they need a cold period of winter dormancy. If you leave them outside, protect the rootball with a heavy mulch on the top and sides, or bury the pot in the garden. ❁

Sources for blueberry plants: Alexander's Nurseries, P.O. Box 309-J, Middleboro, MA 02346; Brittingham Plant Farms, Salisbury, MD 21801; Buntings Nurseries, Selbyville, DE 19975; Dean Foster Nurseries Company, Hartford, MI 49057; C&O Nursery, P.O. Box 115, Wenatchee, WA 98801; Wayside Gardens, Hodges, SC 29695; Henry Field Seed & Nursery Co., Shenandoah, IA 51602; Gurney Seed & Nursery Co., Yankton, SD 57079; Kelley Bros. Nurseries, Dansville, NY 14437; and Spring Hill Nurseries, Peoria, IL 61632.

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The double forms are still my favorites, however. Their blooms last in beauty twice as long as do their single-flowered relatives. 'Duchess of Edinburgh', which resembles a gardenia, is dazzling in the purity of its white flowers. This gracious lady adorns a vine of eight to 10 feet during June. 'Vyvyan Pennell', a recent introduction, produces large, double, deep violet-blue blooms suffused with carmine and purple and enhanced by golden stamen. It blooms on the old wood of the previous year's growth, making pruning unnecessary. These double clematis may flower a second time in late summer on new growth. If so, they will produce single blooms of evenly spaced sepals.

Begonias are an important group horticulturally, offering the gardener a choice of many fine foliage plants and long-blooming bedding plants. The tuberous rooted begonias with large double flowers in a wide range of brilliant colors are the ones in which gardeners are most interested today. They are used as bedding plants or in hanging baskets. The flowers may be picotee-edged, frilled or ruffled. The plants need organic soil with plenty of peat and moist humus. They also like dappled shade. A little weeding now and then and plenty of water is about all they ask. Start plants each spring from dormant tubers. At the end of the season allow a period of growth following flowering in order for the tubers to build up their resources for the coming dormant period. Keep plants growing normally as long as foliage remains green. When the foliage begins to turn yellow, dry the tubers and store them in dry soil, not peat, until the following spring. Remove the two small female flowers which flank each male bloom when plants are grown for display. These female blooms not only detract from the male flowers but also waste the plant's energy.

Iris kaempferi may produce many double flowers, the petals of which appear to have been molded from porcelain. This often happens with the Higo strain. To my mind, they are the most beautiful of all iris. They are moisture loving and, above all, dislike lime. They require water during their growing and blooming stages, but they like dry conditions during their rest period in winter. The increase in the number of petals in the bloom definitely adds to its romantic beauty. Some of the hybrids may be blue, purple, white, pink or red in single and double forms. Their blossoms

may be solid in color, blotched, stippled or striated. In full sun a bold clump will give imposing effects of beauty to the whole garden. They grow two to three feet in height and are easily propagated by division of roots or from good seed (see "A Colony of *Iris Kaempferi* from Seed," *American Horticulturist*, Volume 57, Number 2, Early Spring 1978).



Some ornamental plants are of special botanical interest as well. *Houttuynia cordata* is such a plant. The genus is a monotypic member of the family Saururaceae. *H. cordata* exists in the single and double flower form. This Japanese plant was found by Thunberg growing in ditches along a road. It is a plant that wanders over an area by underground stems but is never a nuisance. Its broad, blue-green, heart-shaped leaves with a purple flush will beautify any location. The bright red stems, which carry the inflorescences, are about nine to 12 inches high. These inflorescences consist of an erect spadix bearing closely-packed, small, white flowers surrounded by a whorl of four bracts or four petal-like pure white leaflets. The life of a flower is short, while the bract, which is more leaf-like, tends to last longer.

Houttuynia cordata 'Flore Pleno' is the double form of this plant. Its spadix broadens into a cone of perfectly double, white leaflets which look like rosettes. It flowers in July and, though a comparative newcomer, has won many laurels, such as a 1965 Award of Merit from the Royal Horticultural Society.

There are many bulbs that have double flowers, too. Flowering in early spring, the common snowdrop, *Galanthus nivalis*, has a couple of exquisite double forms. One is plain and the other has fascinating green

tips on its outer segments. Some people find growing snowdrops difficult because the bulb does not like being planted after having been lifted and stored for long periods. The best time to transplant is immediately after flowering, or even when it is still blooming. Mr. E. A. Bowles of England was a great connoisseur of snowdrops. He recommended the planting of the whole seed pod when it became yellow at the tip.

Double daffodils are another spectacular bulb, especially those hybridized by the late Mrs. Nell Richardson. Older double cultivars seemed to set buds and then blast before they opened. I have planted several Richardson doubles, among them 'Acropolis', 'Tahiti' and 'Gay Challenger', and these have never blasted.

The double colchicum 'Water Lily' is a beautiful sight in the fall when growing among ajuga for groundcover. Its large white blooms are a lovely addition to the fall scene. Another autumn plant you can depend on is the double-flowered *Rudbeckia laciniata* 'Goldquelle'. It is columnar in habit, grows three feet in height and can stand proud at the back of a border. The chrome-yellow double flowers, about three inches across, are carried on two-foot stems. These sturdy plants like compost and will remain happy for years, never reverting to the single type.

With such a range of double flowers available, it is not difficult to have a fine display in the garden throughout the growing year. Double flowers can certainly be classified as "treasures worthy of a trial" in anyone's garden, even though they are really genetic aberrations. ♣

Sources: Begonias: Park Seed Company, Greenwood, SC 29647; John Scheepers, Inc., 63 Wall Street, New York, NY 10005. Peonies: Gilbert H. Wild and Sons, Inc., H-380 Joplin St., Sarcoxie, MO 64862. Clematis, *Kerria* and *Iris kaempferi*: Wayside Gardens, Hodges, SC 29695. Bulbs, Daffodils: Grant E. Mitsch, P.O. Box 960, Canby, OR 97013. Daffodils, Snowdrops and Colchicum: de Jager Bulb Co., Inc., 188 Ashbury St., South Hamilton, MA 10982. Wildflowers: Rocknoll Nursery, 9210 U.S. 50 East, Hillsboro, OH 45133; Putney Nursery, Inc., Box 8-H3, Putney, VT 05346; The Rock Garden, Marjorie Welsh, RD2, Litchfield, ME 04350. *Houttuynia cordata*: Perry Hardy Plant Farm, Theobald Park Road, Enfield, Middlesex, England.

PRONUNCIATION GUIDE

Guide to Botanical Names in This Issue

The accent, or emphasis, falls on the syllable which appears in capital letters. The vowels which you see standing alone are pronounced as follows:

i—short sound; sounds like i in “hit”
o—long sound; sounds like o in “snow”
a—long sound; sounds like a in “hay”.

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

Aegopodium podagraria

ee-go-PO-dee-um po-do-GRAR-ee-ah

Amaranthus

am-ah-RAN-thuss

Artemisia abrotanum

ar-tem-EEZ-ee-ah ab-ro-TAN-um

Artemisia vulgaris

ar-tem-EEZ-ee-ah vul-GA-ree-ah

Artocarpus

ar-tow-CARP-us

Begonia semperflorens

be-GOAN-ee-ah sem-per-FLOR-enz

Broussonetia papyrifera

brew-son-ET-ee-ah pa-py-RIF-er-ah

Calceolaria

cal-see-o-LAIR-ee-ah

Calendula

ka-LEN-dew-la

Caltha palustris

CAL-tha pah-LUSS-tris

Cannabis sativa

CAN-i-bis sa-TY-va

Capsicum

CAPS-i-kum

Castilla elastica

kas-TILL-ah ee-LAS-ti-ka

Celsia arcturus

SELL-see-ah ark-TUR-us

Centaurea cyanus

sen-TAW-ree-ah sy-AN-us

Cirsium aurantiacum

SIR-see-um aw-ran-TY-ah-kum

Cirsium canadense

SIR-see-um can-ah-DEN-see

Cirsium vulgaria

SIR-see-um vul-GA-ree-ah

Coffea

KOFF-ee-ah

Convolvulus arvensis

con-VOL-vev-lus ar-VEN-sis

Convolvulus sepium

con-VOL-vev-lus SEE-pee-um

Coreopsis tinctoria

kor-ee-OP-sis tink-TOR-ee-ah

Cyperus esculentus

sy-PAIR-us ess-kew-LENT-us

Dicentra spectabilis

dy-SEN-tra spec-TAB-i-lis

Eleusine indica

el-yew-SY-nee IN-di-ka

Euphorbia maculata

yew-FOR-bee-ah mack-yew-LAY-ta

Euphorbia supina

yew-FOR-bee-ah sue-PY-na

Ficus benghalensis

FY-kus ben-gal-EN-sis

Ficus benjamina

FY-kus ben-ja-MY-na

Ficus carica

FY-kus CARE-i-ka

Ficus elastica

FY-kus ee-LAS-ti-ka

Ficus lyrata

FY-kus ly-RAY-ta

Ficus pumila

FY-kus PEW-mi-la

Ficus religiosa

FY-kus ree-lidge-ee-O-sa

Ficus retusa

FY-kus ree-TOO-sa

Galanthus nivalis

ga-LAN-thuss ni-VAL-is

Hevea

HEEV-ee-ah

Hieracium pratense

hy-er-ACE-ee-um pray-TEN-see

Houstonia caerulea

hew-STONE-ee-ah see-REW-lee-ah

Houttuynia cordata

who-TY-nee-ah cor-DOT-ah

Humulus lupulus

HEW-mew-lus LEW-pew-lus

Impatiens balsamina

im-PAY-shunz ball-sa-MY-na

Iris kaempferi

EYE-ris KEMP-fare-eye

Kerria japonica

CARE-ee-ah ja-PON-i-ka

Lilium candidum

LIL-ee-um can-DEE-dum

Lonicera chinensis

la-NISS-er-ah chi-NEN-sis

Lonicera japonica

la-NISS-er-ah ja-PON-i-ka

Lysimachia nummularia

ly-sa-MACK-ee-ah numm-u-LAIR-ee-ah

Maclura pomifera

ma-CLUR-ah pom-IF-er-ah

Morus alba

MOR-us AL-ba

Morus multicaulis

MOR-us mul-tee-CALL-is

Morus nigra

MOR-us NY-gra

Morus rubra

MOR-us REW-bra

Myriophyllum

meer-ee-o-FY-lum

Narcissus poeticus

nar-SIS-us po-ET-i-kus

Narcissus pseudonarcissus

nar-SIS-us SUE-doe-nar-SIS-us

Ornithogalum umbellatum

or-ni-THOG-ah-lum um-bell-A-tum

Papaver rhoeas

pa-PAV-er RO-ee-us

Papaver somniferum

pa-PAV-er som-NIFF-er-um

Polygonum cuspidatum

po-LIG-o-num cusp-i-DAY-tum

Polygonum orientale

po-LIG-o-num o-ree-en-TAL-ee

Polygonum pennsylvanicum

po-LIG-o-num pen-sil-VAN-i-kum

Portulaca oleracea

por-tew-LACK-ah o-ler-A-see-ah

Primula kewensis

PRIM-yew-la kew-EN-sis

Primula malacoides

PRIM-yew-la mal-ah-COY-deez

Primula obconica

PRIM-yew-la ob-CON-i-ka

Primula polyanthus

PRIM-yew-la pol-ee-AN-thuss

Ranunculus acris

ra-NUN-kew-lus A-cris

Ranunculus repens

ra-NUN-kew-lus REE-penz

Rhus diversiloba

ROOS dy-vers-i-LO-ba

Rhus radicans

ROOS RAD-i-kanz

Rhus toxicodendron

ROOS tox-i-co-DEN-dron

Rhus vernix

ROOS VER-nix

Richardia scabra

ri-CHARD-ee-ah SCAY-bra

Rubus allegheniensis

REW-bus al-i-gen-ee-EN-sis

Rubus laciniatus

REW-bus la-sin-ee-A-tus

Rubus procerus

REW-bus pro-SER-us

Rubus spectabilis

REW-bus speck-TAB-i-lis

Rubus vitifolius

REW-bus vit-i-FOL-ee-us

Rudbeckia laciniata

rood-BECK-ee-ah la-sin-ee-A-ta

Rumex acetosella

REW-mex ah-see-toe-SELL-ah

Sanguinaria canadensis

sang-gwin-AY-ri-ah can-ah-DEN-sis

Schizanthus

shy-ZAN-thus

Sedum acre

SEE-dum A-cree

Sedum telephium

SEE-dum ta-LEFF-ee-um

Solanum dulcamera

so-LAN-um dull-CAM-er-ah

Solanum pseudocapsicum

so-LAN-um sue-doe-CAPS-i-kum

Streptocarpus

strep-toe-CARP-us

Vaccinium ashei

vack-SIN-ee-um ASH-ee-eye

Vaccinium australe

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