This man created gardening history in 1855 . . .

by compiling the first of the now world famous Thompson and Morgan Seed Catalogs.

With an unbroken annual publication it now lists over 4000 varieties of flower and vegetable seeds, a contribution to gardening acknowledged by the 1977 "Guinness Book of World Records", by offering more seed varieties than any other company in the world, since when, many hundreds of new varieties have been added. It is truly a remarkable gardening reference, not only of the old favorites but of unusual and exotic varieties that have taken T&M years to collect. The search for new and exciting subjects carries on the policy laid down by William Thompson, himself a world authority and recipient of the "Gold Award" of The Royal Horticultural Society, a fact known by Charles Darwin who regularly sent William seeds of his many discoveries. More recently T&M sponsored the search and discovery of the "Blue Amaryllis" and have saved many varieties from extinction. They have also joined in the campaign by "Kew Gardens" to protect and save many endangered plants.

Seeing is believing! and we invite you to send for the 1985 edition now, as unfortunately supplies are limited. You won't be disappointed, for example . . . you get 220 pages (6" x 9") containing an alphabetical list of over 4000 varieties, fully described with nearly 1000 beautifully illustrated in full color. The when, where and how of growing related to states and a "Green Fingers" guide to advise the degree of experience needed to achieve perfect results.

Acclaimed by gardeners throughout the world, order your copy by calling (201) 363 2225 anytime, or use this coupon. It's still FREE! 1984 Customers will be mailed their new copy automatically!

Thompson and Morgan Inc., Dept AD50, PO Box 1308, Jackson, New Jersey, 08527

Please send my FREE copy to:

Name
Address
City
State Zip

Thompson and Morgan

THE SEEDSMEN EST. 1855

Suppliers of seeds to the Royal Families of virtually every country in Europe.
Overlooking the Hudson River and the Palisades of New Jersey—and just minutes from midtown Manhattan—is a garden that is beautiful at any time of year. Join Peter Loewer for a tour of Wave Hill on page 24.
Help Save America's Threatened Wildflowers

Many of America's most treasured wildflowers—including the beautiful lakeside daisy, *Hymenoxys acaulis* var. *glabra* (above)—are threatened with extinction. In fact, experts estimate that one-tenth of the species and varieties native to the United States are in jeopardy. Over 50 taxa have already disappeared. Help save our endangered wildflowers by purchasing the American Horticultural Society's 1985 Endangered Wildflowers Calendar. Funds raised from sales will be used to support conservation projects. To order your calendar, turn to page 9.
“Response to the Calendar and to the Wildflower Rediscovery Project has been overwhelming, and I’m happy to see the Society make this big step forward into plant conservation efforts.”

Q. What comes to mind as the most exciting project the Society has initiated in your first year as Executive Director?
A. I’d say the Endangered Wildflowers Calendar is the most tangible new project. Response to the Calendar and to the Wildflower Rediscovery Project has been overwhelming, and I’m happy to see the Society make this big step forward into plant conservation efforts.

Q. The Society’s membership has grown quite a bit in the last several years. What kinds of changes can members expect to see in membership programs?
A. We’re continuing to promote membership aggressively, and I’m always looking for members in good standing to help us do more of that. One of the greatest changes we’ve made in terms of membership is the revamping of our membership categories. In recent months, we’ve created new membership categories with additional benefits for membership levels above the basic dues rates. This should give members more of a sense of AHS as a society—a group of people across the nation who share the same interests and who can help us achieve some of our goals—promoting local and regional horticultural activities, improving horticultural education, preserving endangered and threatened plants. I’m also happy to report that we’ve changed our renewal program to avoid the difficulties advance notices cause some of our members. Although our renewal rate has always been very good, we’re hoping to keep more members on board through the improved renewal system, and that’s an important part of our long-term growth.

Q. AHS is upgrading its computer facilities. How does that tie in to the long-term growth you’re referring to?
A. The Society has been providing computer services to other horticultural organizations for some years, keeping membership and plant records for them. To my knowledge, the service is unique, and has helped plant societies and botanical gardens with their administrative and scientific needs. Now that we are able to upgrade our computer capabilities, we can serve more organizations, and provide them with better, more responsive service. Our improved computer resources will also be essential to the long-term success of our Gardener’s Information Service. It’s critical that we keep constantly updated information on horticultural resources and events throughout the country, and the computer is the only way to do this efficiently.

Q. Now that you’ve had the opportunity to attend an AHS Spring Symposium and an Annual Meeting, what’s your view of these national-level events?
A. I was extremely pleased with both of this year’s meetings. The San Antonio Annual Meeting, with its focus on native plants and their usefulness in cultivated settings, represents the Society’s interest in promoting horticultural trends of importance to the nation and of value to the gardener—and of course it enabled us to highlight the unique horticultural resources of the San Antonio area. I see the meetings as an opportunity to showcase horticulture in different parts of the country, while members learn how they might apply horticultural know-how from, say, the tropical parts of this country to their own locales. For example, with the Spring Symposium in Miami, there was much to learn about the care of what non-Floridians know as indoor plants. We’re trying to hit topics on the cutting edge of horticulture in our meeting programs and bring our members in touch with the experts on these topics. The Spring Symposium in Los Angeles will focus on the use of drought-resistant plants, among other important subjects, and I think that’s an important item to have on the Society’s national agenda, given the increasing concern everywhere about the availability and quality of our water resources.

Q. We don’t really have space to cover all of the Society’s activities in this interview. I’d like to conclude by asking you where you see the Society going in the near future.
A. For all of our good efforts to serve the general needs and interests of horticulturists throughout the country (and, indeed, we are well represented by our members in all 50 states and territories), I believe that we could help make everyone better informed about the great value and variety of horticultural resources, particularly places of horticultural information and learning, and sources of horticultural goods and services, that exist throughout this vast and varied land of ours. Currently, the staff and trustees of the Society are developing a sponsoring membership program that will help bring these resources together. With this new program, more communication between horticultural organizations will be possible, and this will certainly benefit the home gardener as well as the professional. We’re excited about offering this program to botanical gardens and arboreta, landscape and nursery firms, garden clubs and plant societies, and other horticultural organizations throughout the United States, so that we might begin serving them better. This way, we will be able to benefit not only them but the American public as well.
ACCORDING TO CHINESE LEGEND, GINSENG WAS CULTIVATED IN HEAVEN BY THE GODS AND BROUGHT TO EARTH TO HELP EASE THE SUFFERING OF MANKIND. AT ONE TIME, ONLY THE EMPEROR HAD THE PRIVILEGE OF COLLECTING THIS ROOT, RENOWED FOR ITS FANTASTIC POWERS OF ALLaying FATIGUE, INCREASING MENTAL CAPACITIES, PROLONGING LIFE AND DISSOLVING TUMORS. FOR THOUSANDS OF YEARS THE ROOT OF THIS HERB WAS REFERRED TO IN ORIENTAL MEDICINE AS THE "ELIXIR OF LIFE" AND THE "HERB THAT CURES ALL." IT HAS BEEN CREDITED WITH HEALING INNUMERABLE AILMENTS, AND, IN SOME QUARTERS, IS CONSIDERED BOTH A JUVENATING ANTIDOTE TO IMPOTENCE AND A SEXUAL STIMULANT.

The earliest complete Western description of Chinese ginseng can be found in an eleventh-century herbal. P. Jartoux, an eighteenth-century Jesuit missionary in China, was perhaps the first westerner to witness the gathering and use of ginseng in Manchuria. He was also the first to furnish a detailed description of the plant, which he published in transactions of the Royal Society of London in 1714. This communication created tremendous interest in the Western world and aroused speculation that the valuable root might be found elsewhere, particularly in areas of the world with a climate similar to that of Manchuria, such as Canada. Father Joseph Francis Lafitau, a Jesuit missionary who worked with the Iroquois Indians in Canada, was also fascinated by the reports about ginseng. Lafitau observed the Indians' use of a remarkably similar root in the treatment of stomach disorders and as an aphrodisiac. After searching for several months, he discovered American ginseng near Montreal in 1716.

Linnaeus gave ginseng the name Panax, in reference to the plant's miraculous healing powers. Panax is derived from the Greek word panakes, meaning panacea. Best known of the species in this genus is Panax pseudoginseng (also called P. ginseng and P. schinseng). American ginseng is P. quinquefolius, a name assigned by Linnaeus in 1753.

The species of ginseng found in North America is only slightly different from the plant from the Far East. P. quinquefolius

is native to shady slopes of ravines in hardwood forests from Quebec to Manitoba, and from Maine and Minnesota, southward to the mountains of Georgia, Arkansas and Louisiana.

P. quinquefolius is a fleshy-rooted perennial herb, 10 to 20 inches tall. Its stems bear a single whorl of palmately divided leaves with five leaflets. A solitary stalk bears an umbel of greenish-white flowers, followed in September by bright red fruit about the size and shape of wax beans, each containing two or three seeds. Birds, mice and chipmunks are fond of the seed.

Another species, P. trifoliatus, groundnut or dwarf ginseng, is found from Nova Scotia to Wisconsin and south to Georgia. It differs from P. quinquefolius in that it is smaller, has three leaflets, and produces yellow berries. It is not desirable commercially.

Samples of American ginseng root were sent to China for examination soon after the plant's discovery. Once the Chinese confirmed that the quality was satisfactory, the French in Canada began collecting ginseng from the Indians for export. Demand for ginseng grew so quickly that it became an important article of commerce in Montreal. Soon, American colonists became enthusiastic about collecting the roots. Gathering and marketing, which began on a small scale, picked up momentum when the extent of ginseng's range in the colonies became known, and the collection and sale of American ginseng became a highly profitable venture. Ginseng was first exported to China from the colonies in the mid-eighteenth century, by way of the East India Company in England. A shipload of 55 tons of ginseng sailed from Boston to China in 1773. In 1782, John Jacob Astor made the first direct shipment of American ginseng to China.

The supply of wild ginseng was much depleted during the nineteenth century because of the constant and heavy demand for the root by Chinese the world over. In addition, the plant's woodland habitat was greatly diminished by lumbering operations and by settlement.

Great quantities of ginseng roots were dug in the wild, without consideration given to the age of the plants or for replacing them, and American ginseng nearly became extinct in the wild. Ultimately, cultivated plants grown in various parts of the country became available.

Under the Endangered Species Act of 1975, the status of ginseng was considered on a nationwide basis. Lawmakers decided that the overall situation was not grave enough to warrant federal listing of ginseng as a Threatened or Endangered Species. However, under the Convention of International Trade in Endangered Species...
**STRANGE RELATIVES**

*Fatsia japonica*, commonly called Japanese fatsia or Formosa rice tree.

Beverly R. Counts

(CITES), export of both wild and cultivated American ginseng is still regulated on an annual basis. Exporters must have a federal permit, as well as state documents that certify that the roots were legally harvested. Much of the American ginseng that is harvested is cultivated in shaded farms or wooded areas, then exported.

The U.S. Food and Drug Administration permits the import and marketing of Chinese ginseng roots and other ginseng products provided that no nutritional or therapeutic claims are made on the labels of the products. Ginseng tea, extracts, tablets and capsules imported from three countries—Korea, the USSR and China—are sold in some American drugstores and Oriental food stores as food, not as drugs.

Since 1950, the People’s Republic of China has produced the root under government supervision. Chinese and Russian researchers report having isolated five ginseng chemicals that they believe act as stimulants, tranquilizers or painkillers. Russian studies also conclude that ginseng diminishes the harmful effects of radiation; Western scientists tend to refute such claims.

Ginseng and its relatives are members of the Araliaceae, the aralia or ginseng family, which consists of 84 genera of herbs, shrubs and trees that are distributed throughout the world in both temperate and tropical regions. The chief centers of distribution are India, Malaysia and tropical America. Various vegetative and floral characteristics—for example, simple or lobed leaves, and pinnately or palmately compound leaves—distinguish the most important genera. The juvenile forms of leaves and growth often differ markedly from the adult forms. When grown as ornamental pot plants, many different species remain in similar juvenile stages and are difficult to identify. These features contribute to the horticultural interest and value of many species.

The plant stems of aralia family members are pithy, and frequently bear spines or prickles. Leaves are usually alternate, and are often large and variously compound. Hairs on the leaves are distinguishing features of some species. In species of climbing habit, aerial roots on the stems enable the plant to cling to supporting structures. Some leaves and roots are aromatic.

Small, greenish or whitish flowers are arranged in clusters. In some instances, the sexes are on separate plants. Generally, there are five to 10 petals; occasionally, there are four. The petals are free or partially fused. There are from five to many stamens. The fruit is a drupe.

Thirty species of herbs, shrubs and trees in the ginseng family are botanically classified in the genus *Aralia*. Several of these are nearly or fully hardy in USDA Zone 5, including such woody plants as Hercules’-club, Japanese angelica tree and Chinese angelica tree.

*Aralia spinosa*, Hercules’-club or devil’s-walking stick, is a clump-forming North American shrub or tree that grows to 30 feet or more. It is thickly armed with stout spines. The two common names allude to the vicious spine-covered clubs or canes that can be fashioned from the stem or trunk. The bark of *A. spinosa* has been used for medicinal purposes. Hercules’-club is hardly a species you would think of planting as an ornamental, but the great inflorescences of creamy-white flowers the plant produces in July give it an almost exotic beauty. It is even more ornamental in the fall, when berry-like fruits of crimson or reddish-purple hues cover the plant. The suckering habit of this species may be a detraction in the garden, but *A. spinosa* can make a majestic addition to a mass of lower-growing shrubs, or can serve as an effective barrier plant.

The angelica trees—*A. chinensis* from China and *A. elata* from Japan, Korea and Manchuria—are also prickly trees. They are very handsome, with large, hairy flower clusters and large foliage. Some of the more ornamental cultivars of the two angelica trees (there are several variegated ones, for example) are more commonly grown than the species.

*Aralia cordata* is a spineless, perennial herb that grows about nine feet tall. Commonly called udo, it is grown on many truck farms in Japan. Its brilliant white, crisp, fiberless shoots have a slight turpentine flavor, suggestive of pine. The young shoots are peeled, cut into shavings and soaked for an hour in ice water in preparation for use as a salad green. Udo is also cooked somewhat as is asparagus. It is ready for eating extremely early in the spring. This hardy herb is not commonly grown in the United States.

Herbaceous wild relatives of udo in the United States are wild sarsaparilla and the spikenards, *A. nudicaulis*, wild sarsaparilla, produces one long-stalked compound leaf and a naked flower stalk that arises from the underground stem. The flower stalk has three clusters of greenish flowers, which are followed by purplish-black berries. The creeping, aromatic rootstock is used in homemade root beer, and was once used medicinally as a stimulant and diuretic. Udo roots have also been used in this way. The name sarsaparilla comes from the Spanish sarza, meaning bramble, and parrilla, or little vine.

The two spikenards—*A. racemosa* and *A. californica*—differ in leaf size and in the number of flowers to a cluster. Berries of *A. racemosa* are used to make jelly; the plant’s aromatic root is used medicinally or as an ingredient in homemade root beer. The name spikenard alludes to a fragrant ointment, mentioned in the Bible, that has become associated with this *Aralia* species in modern times.
$5.00 off your first order!

Send for this FREE catalog today.

BRAND NEW ROSES! Featuring MILESTONE, a rose with unique color-changing ability, along with the exquisite color and bloom form you expect from our Rose of the Year®. You’ll see SHOWBIZ, the 1985 All-America Rose Winner — the only rose to receive AARS recognition for '85. LAS VEGAS is a sure bet to be spectacular — a bright new bicolor and available exclusively from J&P. You’ll find classic hybrid tea roses and roses specially hybridized for use as landscaping accents — including dramatic All-America floribundas from the company that invented the floribunda. This catalog offers page after page of dramatic and exclusive roses...

ALL GUARANTEED TO BLOOM IN YOUR GARDEN!

EVEN MORE — fragrant hybrid CRABAPPLES...easy to grow BERRIES and GRAPES...EXOTIC FLOWERS...flowering and shade TREES...lots of planting and landscaping ideas, in the most asked-for garden catalog in the world! It's yours FREE.

Mail your postage-paid card today — or use the coupon to the right.

Jackson & Perkins Co.
World's Largest Rose Growers and Nurserymen
45 Rose Lane, Medford, Oregon 97501
©1984, Jackson & Perkins Co.
The Pleasure of Flowers...

- QUALITY TOOLS
- BEAUTIFUL CONTAINERS
- ACCESSORIES FOR YOUR GARDEN AND TABLE
- UNIQUE GIFTS
- AND, OUR

NEW CATALOG
brought to you by the
DISTRIBUTORS of the
ORIGINAL STEM STRIPPER...

The Keth Company
Box 645, Dept. PH-3
Corona del Mar, California 92625
PLEASE SEND $1.00
REFUNDABLE ON YOUR FIRST ORDER

The Pleasure of Flowers

- QUALITY TOOLS
- BEAUTIFUL CONTAINERS
- ACCESSORIES FOR YOUR GARDEN AND TABLE
- UNIQUE GIFTS
- AND, OUR

NEW CATALOG
brought to you by the
DISTRIBUTORS of the
ORIGINAL STEM STRIPPER...

The Keth Company
Box 645, Dept. PH-3
Corona del Mar, California 92625
PLEASE SEND $1.00
REFUNDABLE ON YOUR FIRST ORDER

Strangely Relatives

Most of the plants florists call "aralia" belong to another genus of the ginseng family, Polyscias. Polyscias species are trees from Africa, India and the Pacific Islands, and range in height from eight to 25 feet. In the North, these plants are grown as greenhouse foliage plants, and usually reach three to six feet in height. In the tropics and subtropics, they are used outdoors as hedges and for other landscape uses. There are about 80 species; cultivated species and their numerous cultivars appear under such familiar names as Balfour aralia, fern-leaf aralia, ming aralia and geranium-leaf aralia. Generally, these plants are spineless, and are known for their fine foliage. The aromatic, compound leaves vary from species to species in size, shape and color; some are plain green, while others are variegated with white and cream motting or margins. Flowers are rarely produced on cultivated plants. The name Polyscias is from the Greek words for "many" and "shades," in reference to the abundant foliage and the shade provided by the foliage.

False aralia, Dizygotheca elegansissima, is a straight-stemmed, willowy plant that is frequently used in interior landscaping and as a house plant. There are about 15 species in the genus, all of which are spineless shrubs or small trees. When used as an indoor tree, false aralia attains a height of three to six feet. It retains its juvenile characteristics—finely divided, red-brown leaflets that are wavy-edged and slightly lobed—under these conditions. The whorled leaves are borne at the ends of long stems.

Braasia is a genus of about 40 species of trees or shrubs native to India, the Malay Peninsula, the Philippine Islands, northeast Australia and Hawaii. B. actinophylla—Australian umbrella tree, Queensland umbrella tree, or octopus tree—is a 40-foot evergreen. Its glossy, compound leaves may be two to four feet long; seven to 16 leaflets radiate umbrella-like from a central stalk. Flowers are small, red and crowded in clusters arranged in long, erect spikes that stand out above the foliage. The fruits that follow are purplish-red. B. actinophylla is a superb house plant known as schefflera. (The so-called dwarf schefflera, Schefflera arboricola, is in a different genus altogether, and is so new that it is not yet listed in some references.)

For generations the Japanese have been growing a sturdy plant we know as fatsia. It is Fatsia japonica, now a very popular plant in the West as well as in the East. In areas where winters are mild and temper-
have both juvenile and adult foliage forms. In the juvenile forms, leaves are palmately lobed. Flexuous stems produce aerial roots, which the vine uses to cling to any available support. The vine does not flower in its juvenile state. Irvies become shrub-like or tree-like at maturity. In the adult stage they have stiff, non-climbing, rootless stems, and the leaves are elliptic or ovate, not lobed. At this stage, ivy produces clusters of small, greenish flowers on Bushy branches; rooted cuttings of this adult form produce an erect shrub, not a vine. The fruit of ivy is a small, poisonous, black berry.

Chief among the five species of Hedera are H. canariensis, Algerian or Canary Island ivy, which is much cultivated in the subtropics; H. colchica, Persian or Colchis ivy, which is native to regions south of the Caspian Sea, and has large, heart-shaped, dull green leaves that produce a resinous odor when crushed; and Hedera helix, English ivy, a woody vine native to Europe, North Africa and western Asia that is cultivated in temperate zones of the world.

Most cultivated irvies are H. helix. It is the most variable of all hederas, and many cultivars have arisen. Juvenile shoots mutate freely, giving rise to various foliage forms and growth habits. Such mutations are unstable and frequently revert to the original form with age. H. helix is now much more than a ground cover or wall drapery; ivy specialists and hobbyists have produced over 100 cultivars by propagating choice mutants.

English ivy is hardy, even in many parts of Zone 5. Moreover, ivy is an almost perfect foliage house plant. The wealth of varieties of foliage has attracted many admirers and collectors.

Not all “ivies” are ivy. A number of plants from other families carry ivy in their names, presumably because they are climbing or trailing plants. Some of these are Boston ivy, Parthenocissus tricuspidata; devil’s ivy, Epipremnum aureum; Swedish ivy, Plectranthus species; and grape ivy, Cissus species.

An ages-old panacea, historic commercial ventures, and ornamentation of modern gardens are all seen in a review of the ginseng family. All of these plants contribute to the leafy greenness of our planet and to the cycle of life on it. —Jane Steffey

Jane Steffey retired last year as the Society’s Horticultural Advisor. She is now an active AHS volunteer and serves as Editorial Advisor to American Horticulturist.

---

**Endangered Wildflowers 1985 Calendar**

Help save our endangered wildflowers by purchasing the American Horticultural Society’s 1985 Endangered Wildflowers Calendar. Funds raised from sales will be used to support conservation projects.

- 18 full-color photographs of endangered American wildflowers
- Information on all plants pictured
- Large 8½” by 11½” format
- Space for notes and appointments

REWARD OFFER: Owners of the calendar are encouraged to rediscover populations of plants that are possibly or probably extinct in this country.

---

**To Order Calendars:**

Send $5.95 per calendar ($5.35 for AHS members), including postage and handling, to Jeanne Eggeman, American Horticultural Society, P.O. Box 9105, Mount Vernon, VA 22121. Virginia residents, please add 4% sales tax.

Name _______________________________
Address _______________________________
City __________________ State ______ Zip ______

Enclosed $ ________

Total # Ordered ________ Amt. Enclosed $ ________

---

Holbrook Farm & Nursery

Rt. 2, Box 223B 5017, Fletcher, NC 28732
Book Reviews

HERB GARDEN DESIGN.

This book is based on the premise that an herb garden should be both functional and aesthetically pleasing. More than 50 different garden designs—based on herb gardens located throughout the country—are presented. Their level of complexity varies from the very small and simple to the very large and complex. A plan is given for each garden design, including dimensions, details of construction and lists of plants. If you have ever wanted an herb garden of your own, one of these designs will certainly work for you. If you already have an herb garden, the many ideas illustrated in this book should inspire you to change or improve your design. In addition to many specific designs, Herb Garden Design includes an introductory chapter describing many different garden structures, as well as a final chapter that details the actual planning and installation of a sample garden.

SHRUBS IN THE LANDSCAPE.

The landscape architect who wrote this book is well known not only for the quality of his designs, but also for his extensive knowledge of landscape plants. About one-quarter of the book is devoted to basic cultivation and design principles, while the remainder is divided into three sections on needle evergreens, broadleaved evergreens and deciduous shrubs. A brief history of the use of each species in cultivation is followed by a description of growth habits and outstanding features. Where applicable, cultivar lists give further descriptive detail. An appendix with lists of plants for special applications is also very helpful. This would be a good basic reference work on shrubs were it not for the rather bad photographic reproductions included. The plates with their postage-stamp-sized illustrations might better have been eliminated altogether by the publisher and the price reduced accordingly.

ROSES FOR AN EMPRESS.

Empress Josephine was a lover of roses, and the flowers that bloomed in her garden at Malmaison were immortalized in the paintings of Pierre-Joseph Redouté. This is the story of Josephine Bonaparte, told through her own letters and those of her contemporaries, and illustrated with the color paintings of her roses by Redouté. This very attractive book is the perfect Christmas present for a rose lover or anyone interested in the history of gardening.

Origin of World Famous "AFRICAN VIOLETS"

- Home of the first double pinks
- Reddest reds
- Miniatures & trailers
- Exotic house plants

Shipping available to all 50 states from May 1st to Nov. 1st, weather permitting!

Send $1.00 for our latest color catalog to:
Lyndon Lyon Greenhouses, Inc.
Dept. AH 14 Matchler St.
Dolgeville, NY 133290249

This extensive guide is essential for anyone who visits Scottish gardens. I can vouch for its value, having recently returned from a garden tour of Great Britain, which included many choice locations in Scotland. The book contains a brief introduction to the history of gardening in Scotland, as well as stories of travelers who were responsible for the many plant introductions from all over the world. The descriptions of individual gardens are arranged geographically. While many of these are still privately owned, nearly all of them are open to the public at some time during the year. The number and beauty of Scottish gardens may not be appreciated by many travelers; this book should quickly correct that oversight. Of particular interest is a chapter devoted to the problems of maintaining a large estate garden in modern times.

BOTANY IN THE FIELD. Jane Scott. Prentice-Hall, Inc. Englewood Cliffs, New Jersey. 1984. 165 pages; softcover, $8.95; hardcover, $16.95. AHS discount price, $8.90 (softcover), $15.50 (hardcover) including postage and handling.

The title of this book is misleading. Botany in the Field is not a guide to the conventional study of plants in the field; rather, it is a guide to plant communities—the study of plant ecology in the field. A brief introduction regarding the effects of man on the natural succession of plants is followed by four major chapters devoted to the interrelationships of plants in four basic communities: the various kinds of deciduous forest, as well as open lands, wetlands, and dry lands. This is a clear and well-written introduction to plant ecology intended to inform the amateur naturalist about what he sees around him and why. It would make an excellent text for an extension course in plant ecology, or simply interesting and informative reading for the inquiring nature lover.


The Book of Edible Nuts is an in-depth study of 42 different kinds of nuts. "Nuts," in this case, range from walnuts, Brazil nuts and cole nuts to sunflower seeds and water chestnuts. The history, folklore, commercial development and harvest of each crop are discussed at length. Also included is a selection of recipes that describe the basic preparations necessary to make the nuts edible. Written in the same style and with the same authority as the author's earlier The Book of Spices, this is an enjoyable book to expand your knowledge. In addition, it is a valuable reference work covering all aspects of nuts, with the exception of details of actual cultivation in the home garden. — Gilbert S. Daniels

Gilbert S. Daniels is the Immediate Past President of the American Horticultural Society.
The accent, or emphasis, falls on the syllable that appears in capital letters. The vowels that 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”

Abies mariesii  AY-beez mare-EES-ee-eye
Acacia  AY-kaY-see-ah
Acrobates pygmaeus  a.kay-PYG-me-ee-eye
Acrolophus cinereus  a.kro-loF-YOOS-ee-eye
}

Acanthus

Abies mariesii  A Y-beez mare-EES-ee-eye
Abelia  ah-BEE-lee-uh
Abies concolor  A Y-beez kaw-NOL-er-uh
Acacia  ah-KA Y-see-ah
Acopia  ah-COH-pee-uh
Aci cline  ah-SY-klin
Acrolophus pygmaeus  a.kro-loF-YOOS-ee-eye
Acrolophus doriae  a.kro-loF-YOOS-ee-eye-DOH-ree-eye
Aegopodium

Abies mariesii  A Y-beez mare-EES-ee-eye
Abelia  ah-BEE-lee-uh
Abies concolor  A Y-beez kaw-NOL-er-uh
Acacia  ah-KA Y-see-ah
Acopia  ah-COH-pee-uh
Aci cline  ah-SY-klin
Acrolophus pygmaeus  a.kro-loF-YOOS-ee-eye
Acrolophus doriae  a.kro-loF-YOOS-ee-eye-DOH-ree-eye
Aegopodium
Nematanthus wettstei
Nerium oleander
Nymphaea tetragona
Oenothera deltoides
Panax ginseng
Pennisetum alopecuroides
Phlomis peniculata
Pinus strobus
Plectranthus
Polemis
Pterocarya rhoifolia
Quamoclit pennata
Rhus typhina
Ricinus communis
Saintpaulia
Sasa
Schefflera arboricola
Seemannia latifolia
Sinningia caemens
Sinningia speciosa
Smithiantha
Streptocarpus saxorum
Tetrapanax papyriferos
Tilia japonica
Tiha cordata
Tsuga diversifolia
Wisteria

USE THIS COUPON FOR FREE INFORMATION ON NUTRIPONICS®
New Hi-Tech Indoor Gardening

Please send free information on Nutriponics to:
Name ____________________________
Address __________________________

Inexpensive kits available. 50-page color-illustrated instruction book included in all kits. With this simple method, you can grow Tomatoes, African Violets, Geraniums, etc. Plants are self-watering. This unique discovery is better than hydroponics—developed primarily for indoor plants.

WINDOWSILL GARDENS
Grafton, New Hampshire 03240

PARK SEED
Big New 1985 CATALOG

Enjoy beautiful, carefree blooms and better tasting, higher-yielding vegetables in your garden this spring. Thousands of items to choose from — 124 color pages! Exciting NEW introductions plus your proven all-time favorites. Satisfaction guaranteed.

Grow High Performer™ Flowers and Vegetables

Send My Full Color Catalog to:

Name ____________________________
Address __________________________
City ____________________________ Apt.
State ____________________________ Zip

PARK SEED
Cokesbury Road, P.O. Box 46, Greenwood, S.C. 29648-0046

Use This Coupon
FOR FREE INFORMATION ON NUTRIPONICS®
New Hi-Tech Indoor Gardening

Please send free information on Nutriponics to:
Name ____________________________
Address __________________________

Inexpensive kits available. 50-page color-illustrated instruction book included in all kits. With this simple method, you can grow Tomatoes, African Violets, Geraniums, etc. Plants are self-watering. This unique discovery is better than hydroponics—developed primarily for indoor plants.

WINDOWSILL GARDENS
Grafton, New Hampshire 03240

PARK SEED
Big New 1985 CATALOG

Enjoy beautiful, carefree blooms and better tasting, higher-yielding vegetables in your garden this spring. Thousands of items to choose from — 124 color pages! Exciting NEW introductions plus your proven all-time favorites. Satisfaction guaranteed.

Grow High Performer™ Flowers and Vegetables

Send My Full Color Catalog to:

Name ____________________________
Address __________________________
City ____________________________ Apt.
State ____________________________ Zip

PARK SEED
Cokesbury Road, P.O. Box 46, Greenwood, S.C. 29648-0046

USE THIS COUPON FOR FREE INFORMATION ON NUTRIPONICS®
New Hi-Tech Indoor Gardening

Please send free information on Nutriponics to:
Name ____________________________
Address __________________________

Inexpensive kits available. 50-page color-illustrated instruction book included in all kits. With this simple method, you can grow Tomatoes, African Violets, Geraniums, etc. Plants are self-watering. This unique discovery is better than hydroponics—developed primarily for indoor plants.

WINDOWSILL GARDENS
Grafton, New Hampshire 03240

PARK SEED
Big New 1985 CATALOG

Enjoy beautiful, carefree blooms and better tasting, higher-yielding vegetables in your garden this spring. Thousands of items to choose from — 124 color pages! Exciting NEW introductions plus your proven all-time favorites. Satisfaction guaranteed.

Grow High Performer™ Flowers and Vegetables

Send My Full Color Catalog to:

Name ____________________________
Address __________________________
City ____________________________ Apt.
State ____________________________ Zip

PARK SEED
Cokesbury Road, P.O. Box 46, Greenwood, S.C. 29648-0046

USE THIS COUPON FOR FREE INFORMATION ON NUTRIPONICS®
New Hi-Tech Indoor Gardening

Please send free information on Nutriponics to:
Name ____________________________
Address __________________________

Inexpensive kits available. 50-page color-illustrated instruction book included in all kits. With this simple method, you can grow Tomatoes, African Violets, Geraniums, etc. Plants are self-watering. This unique discovery is better than hydroponics—developed primarily for indoor plants.

WINDOWSILL GARDENS
Grafton, New Hampshire 03240

PARK SEED
Big New 1985 CATALOG

Enjoy beautiful, carefree blooms and better tasting, higher-yielding vegetables in your garden this spring. Thousands of items to choose from — 124 color pages! Exciting NEW introductions plus your proven all-time favorites. Satisfaction guaranteed.

Grow High Performer™ Flowers and Vegetables

Send My Full Color Catalog to:

Name ____________________________
Address __________________________
City ____________________________ Apt.
State ____________________________ Zip

PARK SEED
Cokesbury Road, P.O. Box 46, Greenwood, S.C. 29648-0046
From inside the Plexiglas bubble of a helicopter, a typical residential area of southern California looks like a miniature railroad landscape. Stands of trees and shrubs blend together like patches of multicolored green shag against a background of drought-browned native scrub—the color and texture of particle board. The sparse greenery, confined to areas around buildings and to moist valleys, appears to be the work of a miniature railroader who ran short of allowance and left most of his train table bare.

The limiting factor here is water. The patches of green are mostly exotic vegetation that is too water-thirsty to exist here on its own and survives only because it is within reach of hoses and sprinkler systems. These bluegrass lawns, bamboo hedges and marigold borders—well suited to the moist East Coast but foreign to the arid Southwest—consist of the plants people brought with them when they moved west to enjoy the perennially fair weather. Fair weather means little rainfall, so keeping the imported jungle luxuriant requires the regular hiss of lawn sprinklers, the chatter of Rainbirds atop water pipes and the trickle of drip irrigation systems. Irrigation requires water, and southern California imports water by the riverful—from the north via the California Aque...
Adaptations to Drought

The southwestern United States and other arid regions abound with plants that are drought-resistant and beautiful. These little-noticed species fill the landscaper’s knowledgeable palette with a variety of sizes, shapes, colors and textures. Gardening with water-conserving plants may one day become very popular in the Southwest—and with good reason.

Climate

Why is the Southwest, including southern California, so dry? Circling the globe at approximately 35 degrees north and 35 degrees south of the equator are two permanent bands of high atmospheric pressure, dubbed the “horse latitudes” by sailors in times past, since the lack of wind often stranded sailing ships and forced the crew to sacrifice livestock. These high-pressure regions tend to exclude storm systems and help create the continually fair weather of the world’s deserts. The southwestern United States falls within the horse latitudes part of the year, as do many other well-known arid regions: the Sahara Desert, the Gobi Desert, the Mediterranean region, South Africa, much of Australia and part of South America.

Mountains, with their “rain shadow” effect, also help exclude storms. As air rises, it becomes cooler and cannot hold as much moisture; as storm systems pass over mountains, they cause most of the rain to fall upwind of the mountains, leaving the downwind sides dry. Many deserts fall not only within the horse latitudes but also downwind of mountains. For example, California’s Mojave Desert, home of the Joshua tree, lies downwind of the San Gabriel Mountains.

Adaptations to Drought

How do plants of arid regions survive with little water? Of all the water absorbed by a maple tree, approximately 90 percent passes directly through the plant, evaporating from the leaves. Although this process—called transpiration—cools the leaves, it uses lots of water. If you have ever been unable to hold onto a car door handle in the hot sunlight but pinched a cool sprig of mint in the same hot sun, you can appreciate the cooling value of transpiration.

Plants native to arid regions cannot afford to transpire as much water as their northern cousins. In order to preserve this limited commodity, they have evolved various adaptations for storing water, reducing water loss, increasing water uptake, or growing only when water is available.

Storing Water

Succulent Plant Habit. A thin leaf, like that of a maple, has a large surface but little tissue inside. This allows it to absorb carbon dioxide rapidly, transpire water and cool itself efficiently, and thus grow quickly. On the other hand, thick, succulent leaves, like those of a jade plant, contain much more tissue in relation to the enclosing surface. Unlike the maple leaf, they are “small on the outside,” reducing the surface from which water evaporates, and “big on the inside,” where water is stored. (Ecologists call this a low “surface-to-volume ratio.”) Therefore, a jade plant stores more water and loses less of it than a maple tree. This adaptation allows a jade plant to grow in areas that are too dry for maples.

In addition to jade plant, Crassula argentea, there are many other members of the Crassulaceae, or stonecrop family, with succulent leaves, including sedums and echeverias. The mesemb family, such as ice plants (Mesembryanthemum spp.) and livingstones (Lithops spp.), are succulent plants in the Aizoaceae, or carpetweed family.

Aloe dichotoma, a tree aloe from South Africa, growing in the University of California, Riverside Botanical Garden. It is one of many drought-tolerant leaf succulents in the family.

Aloe spp. and Haworthia spp. are also examples of succulent plants.

When the whole plant—not just the leaves—is succulent, it can store even more water and lose less of it. “Stem succulents,” such as the cacti, have evolved so that their stems have greened and taken over photosynthesis. In many cases, these plants have lost their leaves. The ribbed structure of many stem succulents allows them to expand as they take up and store water, and to contract as the water is used—all without damaging the plants. In addition to the cacti family members, which are from the Americas, many of South Africa’s succulent Euphorbia species and carnion flowers (from the Asclepiadaceae) exhibit this type of plant habit.

Other desert plants that are not succulent have a low surface-to-volume ratio. The Southwest’s palm verde tree, Parkinsonia aculeata, whose common name is Spanish for “green stick,” has green branches and twigs but only tiny leaves.

Reducing Water Loss. Desert plants have evolved a variety of seemingly clever adaptations for reducing water loss that involve stem and leaf surfaces.

The waxy covering on the leaf and stem surface, called the cuticle, is thicker and waxier in desert plants than in plants of moister environs. The cuticle seals the leaf, ensuring that water transpires only through the leaf pores or stomates.

Leaf hairs, spines and other projections act like windbreaks, by slowing the wind. (Wind makes water transpire faster.) They also help create a layer of stagnant air around the leaf, called a “boundary layer,” which helps retain water as if the leaf were enclosed in a plastic bag. Oleander, Nerium oleander, exhibits a slightly different adaptation. It has leaf pores or stomates that open into sunken areas on the leaf surface, called “stomatal crypts,” which shield the stomates from wind.

Some plants also have light-reflecting adaptations that provide protection from the sun. Light-colored hairs, waxes or scales on leaves and stems all serve to reduce the amount of sunlight that strikes a plant. Since reflecting reduces heat buildup, plants that exhibit this adaptation need less water to transpire for cooling. Light-reflecting adaptations, which are found in many species, are notable in Mexican blue palm (Brakea arnate), California brittlebush (Encelia farinosa) and old-man cactus (Cephalocereus senilis).

Wilt—a common problem in hot, dry climates—can cause permanent damage in plants. Many shrubs and trees native to arid regions have protected themselves by developing leaves that are too stiff to wilt. California lilac (Ceanothus spp.), man-
zanita (Arctostaphylos spp.), Australian mimosa (Acacia spp.) and proteas (Proteaceae) all have these "sclerophyllous" leaves of hardened tissue. These hard, stiff leaves have very thick-walled cells and reduced intercellular spaces.

Almost all succulents, as well as many non-succulent plants from arid regions, have evolved a mechanism for opening their stomates and absorbing carbon dioxide—the raw material of photosynthesis—at night; accomplishing this vital process when the air is cool and damp minimizes water loss. These plants store carbon dioxide as more complex compounds than do most plants. During the day, when light is available, the stomates close and the plant photosynthesizes the stored carbon dioxide. This adaptation, called carboxylic acid metabolism (CAM), is found in many unrelated plant families.

Increasing Water Uptake. Instead of forming the typical root ball associated with most plants, many cacti have shallow roots that fan out just beneath the soil surface. Thus, they can rapidly absorb water when an occasional quick shower falls on the desert.

Other plants, such as mesquite (Prosopis spp.), desert willow (Chilopsis linearis), and cottonwood (Populus), grow in desert washes where subsurface water may be far beneath the surface. They grow long taproots that allow them to sip subsurface water.

Seasonal Growth. Many plants grow only when conditions are favorable. Seasonal growth is a strategy exhibited by many desert shrubs, which turn brown and may look dead in the summer but turn a verdant green after extended rains. These include many scrub and chaparral plants like the sages (Salvia spp.), brittlebushes (Encelia spp.) and monkey flowers (Mimulus spp.). The spindly, thorny ocotillos (Fouquieria spp.) of the Southwest shed their leaves during times of drought but quickly grow new ones after sufficient rainfall. Leaves are a plant’s biggest water-loser, and these "drought-deciduous" species conserve water by shedding their leaves in dry weather.

Like ostriches with their heads in the sand, many bulbous perennials go underground during the driest part of the year. The members of the Amaryllidaceae, or amaryllis family, are just one example. An underground bulb of stored food and water sustains them until the rainy season, when leaves sprout and the plant flowers.

Another kind of plant “lives” only when conditions are favorable. As it living on borrowed time (actually, previous rainfall), desert annuals grow, flower, set seed quickly and die. The seeds of these plants—which include the desert evening primrose (Oenothera deltoides), sand verbena (Abrotria villosa) and many others—contain germination inhibitors that prevent sprouting; only when sufficient rainfall leaches out these inhibitors (sometimes after several years) do the seeds germinate.

Design Use

These forms and adaptations of drought-resistant plants bring to mind various possibilities in the water-conserving landscape: a bed of bulbous perennials—a riot of color in spring—disappearing into dormancy in the dry summer; a cactus garden with year-round interest and water economy, occasionally surprising the visitor with its colorful flowers; a hedge of background of sclerophyllous-leaved shrubs, blooming and remaining green throughout the summer; a shade tree of velvet-leaved Fremontodendron californicum, which survives all year on natural rainfall, or of Fremont cottonwood (Populus fremontii), which reaches with deep taproots for subsurface water.

Some nurseries, garden centers and landscape architects in the Southwest can help in the design of a water-conserving landscape. The main rule in such a design is to minimize lawns and emphasize water-conserving ground covers, shrubs and trees.
son? What are a plant's problems? Aggressive roots, messy fruit drop, insect or disease susceptibility, or others? How will one plant harmonize with another aesthetically and culturally? Do all plants need the same amount of water (for example, those watered by the same sprinkler)? You can find the answers to these questions by reading books and catalogues, looking at pictures in magazines and references, and visiting nurseries and botanical gardens to see live specimens.

Culture

Planting. Nursery stock is available in convenient containers and sometimes as economical bare-root stock. Plant in the fall to ensure the greatest chance of survival. Unestablished plantings, even of drought-resistant plants, may require watering every day in the summer.

A layer of mulch over soil helps save water, keeps plant roots cool and controls weeds. It also helps preserve soil structure, which tends to be broken down by sprinkler spray.

Drainage. Most water-conserving plants do poorly or die in waterlogged soils, and therefore, need good drainage. A well-drained soil will absorb at least half an inch of water per hour.

On level sites, poor drainage may be caused by an impervious layer in the soil—a subsurface “hardpan.” To get good drainage, break through the hardpan with deep planting holes, make dry wells or plow deeply. Or, mound up well-drained soil several feet high for planting.

Clayey topsoil may be poorly drained, but clay can be flocculated into larger-sized particles by adding gypsum and long-lasting organic matter such as fine pine or fir bark. The subsoil must be well drained.

Sandy soils, which can be too well drained, will hold more water if you add organic matter, such as peat or fine bark.

Watering. Your irrigation can easily be halved by landscaping with water-conserving plants. Apply water slowly and evenly to avoid run-off and evaporation. (Drip irrigation systems water deeply and thoroughly while saving water.) Water only when the plants need moisture, rather than on an automatic schedule. Check the sub-surface soil for moistness, and look for any wilted plants.

Weed Control. Weeds that cannot grow under dry conditions may be a problem in an irrigated garden, even if it is conservatively watered. Pre-emergent herbicides have recently been developed that prevent the germination of seeds without affecting established plants (when applied at the proper rates). These herbicides are useful in beds of ground covers or plantings of succulents where weeds are hard to control. Sold in granular or wettable-powder formulations, pre-emergent herbicides last several months.

For controlling established weeds, post-emergent herbicide sprays save labor in weeding and hoeing. These chemicals kill all higher plant life with which they come in contact; even unseen, drifted spray can damage desirable plants. Special wick applicators make it easier to treat weeds in ground covers.

The American Horticultural Society’s Spring Symposium, to be held March 20-23 in Los Angeles, will feature drought-tolerant plants and gardens, among other topics of interest to Sunbelt gardeners. For more information on the program, write to Robin Williams, American Horticultural Society, P.O. Box 0105, Mount Vernon, VA 22121.

Richard M. Adams, II, is a former curator of the University of California, Riverside, Botanic Gardens. He is a frequent contributor to American Horticulturist.
One Day in the Mountains

TEXT AND PHOTOGRAPHY BY DR. JOHN L. CREECH

The United States Department of Agriculture's plant-collecting team had just ended a 2,200-mile trip through Hokkaido, Japan's northern-most island. They had been gathering seeds and plants that would be of particular value in the development of improved trees and shrubs for the colder parts of the United States. I had just completed a visit to Sapporo, capital of Hokkaido, where I had been gathering information on Louis Boehner, a little-known horticulturist who worked for an American mission in Hokkaido in 1872.

Before we left the U.S., we had arranged to meet and make a short collecting stop at Mt. Hakkoda. We met at the port of Hakodate on Hokkaido and were ferried over to Aomori, a city on the northern tip of the island of Honshu. At Aomori, we rented a van and met our Japanese colleague, Dr. K. Mochida, head of the Hakkoda Botanical Laboratory of Tohoku University. The team now consisted of Dr. Mochida; Dr. Max Kawase of the Ohio Agricultural Research and Development Center, who served as leader of the expedition; Dr. Frederick G. Meyer, botanist, and Mr. Sylvester G. March, horticulturist, both of the U.S. National Arboretum; and myself, retired director of the U.S. National Arboretum. The date was October 8, 1982—about the peak of the seed-collecting season at Hakkoda-san. (Japanese mountains are usually given the honorific title san.)

Hakkoda-san, our destination, is a 1,600-meter-high (about 5,200 feet) mountain to which many foreigners have come to collect plants over the years. Professor C. S. Sargent of the Arnold Arboretum, and Charles Maries, a British plant explorer, collected here in the late nineteenth century, and E. H. Wilson of the Arnold Arboretum visited in 1914. I had collected on Hakkoda-san in 1955 with the famous Japanese botanist H. Takeda, and again in 1961. For the other members of the team,
it was the first visit. But Meyer, March and I had worked together in similar mountain habitats in Japan on several earlier occasions. In addition, Kawase, Meyer and March were fresh from their collecting work in Hokkaido. There was plenty of experience on the team.

Dr. Kawase had established a number of target species for collecting, including Abies mariesii, a handsome, high-mountain fir; Tilia japonica, a fine, round-headed shade tree species not cultivated to any extent in the United States; and Rhododendron japonicum, a red-flowered azalea whose northern limit of natural distribution is Hakkoda. (More and more, collectors and plant breeders are recognizing the importance of collecting from various preselected localities within the total range of a promising species. This method of collecting enables breeders to take advantage of the individual variation within a species—such as unusual cold hardiness at the northern portion of a plant’s range—when developing plants for landscape purposes.) We also planned to collect other species we encountered if they were fruiting and looked promising.

Hakkoda-san is part of the Towada-Hachimantai National Park, and consists of eight dormant volcanoes that are covered with mixed conifer-deciduous forests and alpine bog communities. There are numerous hot springs and spas in the area, the most famous and probably the largest of which is Sukayu, a meandering collection of buildings on several levels, complete with restaurants, shops, overnight accommodations and large communal hot spring baths. Although we stayed at the nearby botanical laboratory, we ate and bathed at the Sukayu Onsen. Meals were also brought over to us. Sukayu operates during the spring and autumn months, but closes down in winter when the snows reach impassable depths. However, this was a weekend at the peak of the fall color, so everything was operating at full capacity, and the road from Aomori was clogged with cars.

On our drive to Hakkoda-san, we jotted down notes on places where the collecting promised to be rewarding. It was afternoon when we reached the laboratory, so we stowed our gear and made a survey of the area. In a nearby bog called Suirenuma, we gathered seed of flex crenata, the common Japanese holly; I. sugerokii, an evergreen holly similar to I. crenata but with red fruit; and Alnus pendula. Lower down at Tsutanuma (numa means bog—in this case, tsuta, or ivy bog), we found plenty of seeding plants of I. crenata var. radicans (a decumbent form of Japanese holly), Magnolia hypoleuca (formerly M. obovata) and Aucuba japonica var. borealis—all of interest either for direct use or for breeding. When we returned to the laboratory at dusk, bad news awaited us: a typhoon was now off the coast of northern Honshu, and rain and high winds were forecast for the next day.
Saturday, October 9, dawned with the expected leaden skies, some wind, and rain showers, but the weather was not bad enough to halt our fieldwork. We loaded the van and descended to Kayankogen, a parkland, where we had observed *Tilia japonica* the previous day. This linden is a close relative of the European linden, *T. cordata*. The Japanese linden is a handsome, round-headed tree that should be more desirable than the European linden, because it reaches only 60 feet at maturity. (The European linden grows to 90 feet.) Nurserymen are always interested in small trees for residential landscaping. *T. japonica* grows in temperate forests throughout Japan, but we were in the northern part of its range, so the plants collected here would be more cold-hardy than plants from farther south. In Japan, the linden is used for building material, and in earlier times, the tough inner bark was woven into rope. An excellent honey tree, it is admired for its fragrant flowers and golden fall color. Unfortunately, the Japanese linden is not available in American nurseries at this time.

So here we were, an eager team in a parkland naturally landscaped with scores of specimen trees of *T. japonica*, at just the right time for a bountiful seed crop. At first we were apprehensive, because the closest trees were barren, but as we moved deeper into the park, the trees were well fruited. The park was a curious sight that day; it was occupied by scores of student land surveyors carrying out practical examinations. Campsites, transit lines, tapes, judges' tables and hundreds of surveyors were everywhere. Wandering through this confusion were five plant collectors snipping branches with pole pruners, stuffing seeds in canvas bags and wrapping herbarium specimens in newsprint. But we respected each other's purposes, and our team was rewarded with an excellent crop of *T. japonica* seed.

We retraced our route to the top of Hakkoda-san, stopping at several sites along the way to collect specimens. One such site was Kanzuigawa, at an altitude of 730 meters (about 2,400 feet). We dispersed to collect in the sparse woods bordering the road. Dr. Meyer returned with a number of specimens, including both fruit and cuttings of a great find: the yellow-fruited form of *Lindera umbellata*. This species, a relative of our native spicebush, *L. benzoin*, is the only Japanese species of this genus found in northern Japan. Like all

TOP RIGHT: Pine, holly, azaleas and *Vaccinium* sp. display brilliant autumn color at the edge of Mt. Hakkoda's bogs.

BOTTOM RIGHT: Team members had to use a telescopic pole pruner to reach and collect seed.
to be rather unproductive), so we stopped
along the roadside at the edge of a wooded
site near the river. Here, we gathered seeds
of the Japanese wingnut, *Pterocarya rhoi-
fola*, a tree that grows to 75 feet and bears
winged nuts in long, necklace-like catkins.
We then made our way to the river. Collec-
ting here was out of the question, how-
ever, as the water was bordered by tall
hemlocks and beech, oak and ash trees, so
we decided to head back to Hakkoda.

"Skip" March wanted to collect the
diminutive water lily with white flowers,
*Nymphaea tetragona* var. *tetragona*, for
the National Arboretum's water plant
collections. We had seen it the previous day,
and although we had full authority to col-
collect, it would not have created a good
impression to do so in front of the public.
So at dusk, as the cold fog began to settle,
we stopped the van near the vast sphag-
num bog below the laboratory. Dr. Mochi-
da knew of several interior pools in the
bog where we could find the plant. Reach-
ing these pools required sloshing through
the bog and across holly-rhododendron
thickets for several hundred yards. The light
had faded quickly, and the sounds of the
highway had ceased. If any of us had lost
our way here, it could have been quite
serious, as the temperature was barely above
freezing. When we arrived at a pool, which
was perhaps eight feet across, it was im-
possible to reach the plants. Dr. Mochi-
da stripped to his underwear, slipped into the
icy water and extracted some roots from
the mud. He quickly dressed and led us
back to the now-darkened road. After re-
turning to the laboratory, we accompanied
Dr. Mochida to the Sukayu hot spring bath
to soak away the chills. As we bathed, we
praised Dr. Mochida for his courage.

Work was, of course, still far from fin-
ished. The plants we had collected had to
be washed free of soil, cuttings needed to
be prepared and wrapped in damp sphag-
num moss, and seeds had to be cleaned of fruit
required special handling; acorns, for ex-
ample, must be shipped in moist moss,
because they usually germinate en route.
In addition, the field notes had to be com-
pleted for each collection, and labels—with
names, appropriate field numbers, and
special instructions for the propagators at
the Arboretum—had to be prepared. (Ul-
timately, all living collections were sent by
air mail to the USDA Quarantine Facility
at Beltsville, Maryland.) Meanwhile, Dr.
Meyer worked on his herbarium material,
completing his field notes and drying the
specimens, which would be sent to the Uni-
versity of Tokyo Botanical Garden for fi-
nal processing and shipment to the Na-
tional Arboretum. All these tasks had to
be completed every evening of every day
there was fieldwork, and no one left for
bed until they were all finished.

On the final day, October 10 (Sunday),
we scheduled our departure for early after-
noon. First, however, we had to collect the
fir *Abies mariesii* and the hemlock *Tsuga
diversifolia*, both of which occurred at the
summit of Tamovachidake (at 1,300
me ters or about 4,200 feet). By now, the wind
had died down, so we took the ropeway.
We could see a solid stand of fir and hem-
lock below the cable car, but from the
summit we had to work our way down to
the trees. Penetrating shoulder-high *Sasa*
bamboo—still partially iced—proved to be
a real struggle. Everyone tripped and fell
down the slope to where the conifers dom-
inated the bamboo thickets. Then we had
to crawl along the slanted moss floor or
resort to aerial acrobatics on the interlaced
hemlock branches. Occasionally, we had
to pop up like ground squirrels to keep
track of each other. Despite the difficulties,
we discovered many hemlock cones and
managed to gather an ample supply. We
returned to the summit by pulling and
thrashing our way up through the bam-
boo, to the amusement of sightseers look-
ing down from above.

At the summit, we found a number of
fine specimens of *Abies mariesii*, with cones
still not shattered. These trees yielded to
the climbing skills of March and Mochida.
Thus having fulfilled our objectives, we
returned to the laboratory, completed the
necessary final packing, and took some
photographs of the scenic green, gold and
scarlet vegetation for which Hakkoda is
famous. We then drove down the moun-
tain, held a farewell dinner with Dr. Mo-
chida, and boarded the night express from
Aomori to Tokyo. We were typical ex-
amples of what the Japanese call *hema
gaijin* (strange foreigners), carrying our 25
pieces of baggage in relays to the train.
In all, we had gathered some 52 collec-
tions of significant plants, together with 44 her-
barium collections, at this short stop at
Hakkoda-san.

The results of our trip will be shared
with the sponsoring institutions—the U.S.
National Arboretum, the Chicago Botan-
ic Garden, and the North-Central Re-
gional State Experiment Stations. The suc-
cess of our "one-day-in-the-mountains"
may not be immediately apparent, but it
will no doubt be revealed in the years to
come.

Dr. John L. Creech is a past president of
the American Horticultural Society and former
director of the U.S. National Arboretum. A
world-renowned authority on azaleas, he is
cos-author of the recent Japanese reprint of A
Brocade Pillow: Azaleas of Old Japan.
The night before our first visit to Wave Hill was spent fighting a traffic jam on the Henry Hudson Parkway and driving in circles for what seemed like hours in search of a place to park for the night. Next, my wife and I stepped nimbly around mounds of garbage that lined many Manhattan streets, and partially digested an overpriced and unusually tasteless meal in a Greenwich Village restaurant. The damp heat rose from Parkway that lined many Manhattan streets, and the sounds of traffic and low-flying airplanes had been soaking up the sun for months, and this September night lacked both breathable air and cooling rain.

After a mostly sleepless night filled with the sounds of traffic and low-flying aircraft, we picked up the car. Soon we were directly involved in the New York City rush hour, playing a three-dimensional video game with a bumper-to-bumper line of cars, all searching for a way to drive on what’s left of the West Side Highway. Eventually, we moved up, passed the George Washington Bridge, north on the Henry Hudson Parkway and over the Harlem River. Leaving the Parkway at 254th Street, we turned left at the stop sign, left at the traffic light, and then right at 249th Street. Following discrete green and white signs labeled “Wave Hill,” we finally reached the gate.

I’ve always had a problem with things mechanical—a lack of patience on my part. It was inevitable that the first thing to occur after parking the car was the jamming of the trunk lock. After five minutes of jiggling, the lid suddenly snapped up, narrowly missing my beard. At the same instant, I dropped my camera bag, and five boxes of film wound up under the car. My temper was short.

After gathering my equipment, notebook and pen, we walked through the gate, noting that at ten-thirty in the morning, the parking lot was almost full.

As we walked through the gate, 50 years slipped away. Traffic stopped, planes ceased to fly, and a sky of cerulean blue displayed just enough puffs of cloud to contrast perfectly with a golden sun and the free-wheeling sea gulls gliding above. The Hudson River flowed gently by, and the breeze that swept up the immaculate lawns smelled of the sea. (The waters of the Atlantic sometimes move up the river.)

Wave Hill is in the northwest corner of the Bronx, one of five boroughs that make up the whole of New York City, in an area called Riverdale. Its 28 acres overlook the river and beyond to the Palisades of New Jersey—great rock cliffs that bear evidence of the might of geological change—but the mid-morning haze veiled the views of upstate New York far to the north and the George Washington Bridge just to the south.

Today, Wave Hill is a public garden landscaped to perfection. There are two houses: Glyndor, with administrative offices, and Wave Hill House, which includes galleries, a gift shop, the Learning Center and the Toscanini Archives. There is also a large greenhouse, an alpine house, the Herb Garden, the Wild Garden, the Aquatic Garden, a shaded garden (under development), and woodland nature trails.

Wave Hill House was built on 15 acres in 1843 by the jurist William Lewis Morris as a summer home for his young wife. It was to be a place far from the heat and noise of a growing city. It is rumored that the name originated with Mrs. Morris; as Mr. Morris carried his new bride up the hill from the river—no mean feat even for someone in perfect health—she saw the hill and exclaimed, “It looks like a wave.”

By 1849, when the railroad was introduced, the area was only 30 minutes from midtown Manhattan, and more people came. Two planned villa communities were soon constructed—one to the north of the Morris house in 1852, and one to the south in 1856. Then in 1866, William Henry Appleton, of the famous publishing house, bought Wave Hill. He cut a road to join the villa developments, and the community of Riverdale was begun.

Appleton changed Wave Hill into a grand Victorian estate. He built a greenhouse and stable, made extensive landscape plantings (silver maples, Norway maples and copper beeches), and imported exotic plants from the world’s four corners. The estate became an intellectual center of the day; such luminaries as William Thackeray and T. H. Huxley were known to stop by for tea.

In 1903 George W. Perkins bought the Appleton property and created an 80-acre estate with several houses, including Wave Hill and the neighboring manor house of Oliver Harriman, called Glyndor. Perkins then hired a royal landscape gardener from Vienna, Albert Millard, to help him design and develop a garden that would be worldly...
and charming, and that would also conform to the natural topography of the area.

After Perkins died in 1920, his widow continued to manage the estate. In 1926 she hired a Scottish gardener, John Sutherland, to replace Millard, and in that year, 20 men worked on the grounds, while three more worked in the greenhouse. For the next 40 years, both family and tenants continued to live on the estate. During this time, Mrs. Perkins donated two houses to the Riverdale Country School, as well as land to New York City for a Park-Along-the-River. The transition from public to private estate was completed in 1960, when Wave Hill House and Glyndor, along with 28 acres, were donated to the City. In 1963, Wave Hill, Inc. was formed to manage the property and plan the course of its development. With city funds and private donations, the public gardens have continued to grow under the skilled leadership of Marco Polo Stufano, director of horticulture, and a dedicated and sophisticated staff of gardeners.

We walked along a paved path, past Glyndor and under a vine-covered pergola with an unobstructed view of the river and the Palisades beyond. Here was a garden made entirely of annuals, but so perfectly done that it looked more like a perennial border. A mix of pink and white spider plants, Cleome hassleri, stood among vast stands of dahlias. These flowers were, in turn, jostled by the strands of love-lying bleeding, Amaranthus caudatus. Brightly-colored nicotianas sparkled against a backdrop of the giant leaves of the castor bean, Ricinus communis. The nicotianas and castor beans were guarded by tall cosmos, both pink and white.

We then passed through the Herb Garden—whose orderly paths divided dozens of different plantings—and climbed steep steps to the pebbled walks of the Wild Garden. This area, developed on a natural slope that overlooks the two houses below, features an overgrown summerhouse at its peak, a cool and dark spot with one chair that looks through a screen of living brush to the garden.

This garden is wild in plan only. It is not an English-style garden with neat groupings of plants all contained and fettered, but rather a staggering collection of stems and flowers, tints and textures—more like the blur of an impressionistic painting than a landscape by Gainsborough.

Near the center is a staghorn sumac, Rhus typhina, its main trunk bounded by smaller suckers. The whole effect is one of gnarled age far in excess of the plant's actual 50 years. And all along the garden's winding paths, grasses grow next to cacti, ferns touch annuals, and sunflowers hobnob with thistles.

I stopped to put down my weighty camera bag and marvel at the burgeoning seed pods of some mature cannas, Canna × generalis. In this garden, cannas are not ripped up after blooming but left to seed in a natural way.

"What are you doing?" asked an elderly gentleman who carried a folded copy of the New York Post and a small plastic bag with two peach pits while he held a third peach, half-eaten, in his hand.

"I'm writing an article on the park," I replied.

"That's too bad," he said. "It's such a beautiful place that once you know of it, you want to keep it private. I don't mean that in a selfish way, but it's almost too fine for people.

"I don't entirely disagree," I answered. "Do you come here often?"

"As often as I can. There's always something happening in this garden, whatever the time.... It's even beautiful in the winter. The gardener is a nice man, and the young people who work here are wonderful. Once you get dirt under your fingernails, I guess you become a different person."

We wished him a good day and continued along, gingerly stepping around a sprinkler that arched high above our heads and covered the waving plumes of a blooming ornamental grass with drops that
sparkled like diamonds.

We soon reached the Aquatic Garden, where a formal lily pool was surrounded by more wondrous mounds of ornamental grasses—Calamagrostis arundinacea var. brachyticha, Pennisetum alopecuroides, and species of Miscanthus. At one end was a healthy planting of the sacred lotus, Nelumbo nucifera, its huge, rippled leaves set above the water on stout stems. A small child, first enchanted but soon bored, was dishing up handfuls of water and tossing them at the leaves to watch the droplets shimmer and fall back into the water like quicksilver, repelled by the surface of the leaves.

A middle-aged couple was watching a green heron artfully dive for fish in the pond.

"He's been here for days," said the man. "If you don't move too fast, he'll ignore us."

A dragonfly darted from one water lily to another. High above, a jet bound for Europe left a white trail in the sky but was so quiet it did not intrude on the scene. We watched the bird in its quest.

"Do you come here often?" I asked.

"Every day that we can," answered the woman. "We live at the other end of the Bronx and come by bus. This is such a beautiful and peaceful place."

We left them and walked on, behind the pool and under a cool and dark-tunneled pergola festooned with annual vines; gourds, morning-glories, moonflowers (some shriveled and dead, others ready to open that night); cardinal climbers (Ipomoea × multifida, formerly Quamoclit × sloteri) and cypress vines (I. quamoclit, formerly Q. pennata) all fought for air, their leaves and tendrils a maze of twisted green strings against the shadow of the noon sun. Through a break in the leaves, we looked back upon the pool with the couple watching and the heron still fishing.

We soon reached Wave Hill House, Stopping at the sales desk, we picked up a guide to the Conifer Walk. Out of 54 genera of conifers growing on earth, 24 are found at Wave Hill; two additional genera native to a warmer climate are in the greenhouse.

The well-designed guide gives a natural history of the conifers and, with the help of drawings, shows the distinctive characteristics of the individual species. The walk carries you over most of the grounds: from an aged white pine (Pinus strobus) just to the rear of the house, to a grouping of Douglas fir (Pseudotsuga menziesii); past a magnificent Japanese cedar (Cryptomeria sp.), then on to a giant sequoia (Sequoiadendron giganteum) and a huge China fir (Cunninghamia sp.), which, from its arched top, must offer a superb view of the river.

Next we passed the new alpine house (then still under construction) that would house choice rock garden and alpine plants. When covered by the snows in their high-mountain habitats, these wild gems are hardened to the worst climates of the world. Subjected to the rigors of a New York climate, however, they need all the protection they can get. The alpine house is called the T. H. Everett Greenhouse, in honor of the senior horticulturist-specialist at the New York Botanical Garden just a few miles away.

As we walked back along the path to Glyndor, I remembered another aspect of Wave Hill: the new and permanent home of the Toscanini Collection, consisting of all of the maestro's commercial recordings and tapes of approximately 150 concerts, most of which have never been released to the public.

Back on December 1, 1980, a demolition crew—without warning—began tearing down one of Riverdale's historic treasures: Villa Pauline, the former mansion of Arturo Toscanini. Concerned members of the community did not sit idly by. Remembering that Toscanini had once rented Wave Hill for four years and would have purchased the estate had it been up for sale, this group of people suggested that Wave Hill could be the new home for the collections and the memorabilia.

On November 10, 1981, the Toscanini Collection was dedicated, and 50 tapes of NBC concerts were incorporated in the Wave Hill Library. Today, 137 of the 231 broadcasts the maestro led with the NBC Symphony Orchestra are on file and tape.

We stopped to talk with another couple. The man turned out to be the retired registry clerk at the Riverdale Post Office who sometimes substituted as a carrier whenever the office was shorthanded.

"Those were wonderful days around here," he said. "So quiet ... Why, the British government leased this as the home of the British Ambassador to the United Nations in the early '50s. Madame Chiang Kai-shek stayed in the neighborhood. And Toscanini. . . . I remember when he would walk his dog before concerts, all dressed up in top hat and tails."

Later that afternoon, my wife and I returned to Wave Hill to attend the Annual Garden Party given by the Friends of Horticulture at Wave Hill. Shadows from the sun setting over the Palisades lengthened across the river under a clear sky. Two musicians—a violinist and a cellist—sat next to a giant clump of ravenna grass (Erianthus ravennae) and played Mozart. The night was cool, and the air had lost its humid feel. We talked with visitors and many of the staff about the gardens of today and of the future.

"We have many plans," said Mr. Stefano. "The Shade Garden, the Monocot Garden. . . . But I guess the biggest problem is to keep up the quality of care that we give to the gardens while still having the means to expand their scope."

As twilight deepened, lights came on along the walkways leading guests to dinner at Glyndor. The sky turned purple, and over the garden's rise the lights that string the George Washington Bridge came on and twinkled in the river's slight haze. New York seemed far, far away.
FAR LEFT: A sculpture by Mary Frank stands above the ornamental grasses that surround the pool.

ABOVE: Water lilies and papyrus add an ornamental touch to the Water Garden. LEFT: Colorful autumn leaves and the blue and green foliage of evergreen conifers highlight the Wild Garden.
When it's cold and gray outdoors, among the cheeriest of indoor sights are potted cyclamen from the local florist. The color range of these undeniable beauties includes flamboyant crimsons and fuchsias, as well as more subtle pinks and lavenders, not to mention whites as pristine and lovely as new-fallen snow. I've always loved the upswept, strongly-reflexed petals of these plants, so perky and graceful, and so strongly reminiscent of the flowers of shooting-star. What's more, cyclamen's heart-shaped leaves—as mottled as trout—are, by themselves, fetching, and call to mind Gerard Manley Hopkins' joyous outcry, "Glory be to God for dappled things."

But I've always had more than my share of problems with the florist's cyclamen, *Cyclamen persicum*, which has been hybridized for generations. *C. persicum* is a tender species native to the eastern Mediterranean. It's finicky about both temperature and moisture; it dislikes direct sunlight and temperatures of more than 68°F during the day or less than 55°F at night. The books on house plants all offer the not-very-specific advice that it will bloom for two or three months provided its soil is kept "moist, but not too moist."

Over the years, I have had a consistent pattern with these temperamental charmers: I've never been able to meet their needs. Each time around, after much indecision about which color to get, I bring one home with high hopes. But the story has always had, until quite recently, the same sad dénouement: a couple of weeks after acquiring the latest in my long line of cyclamen, I come downstairs for breakfast and discover that its flowers are sprawling, its buds dropping, and its leaves turning a sallow yellowish-brown.

But now there's a happy ending. Last year I did not buy a cyclamen; someone gave us one just before Christmas, and it was still blooming, if looking a little peaked, when I threw it away after Memorial Day. This fall I bought four cyclamen.
men, in four different colors. I liked them so much that I went out and got four more, in slightly different shades. And again, they stayed in full and glorious bloom well into the summer.

I take no credit for my sudden success with these lovely plants, and nothing has changed in the treatment I’ve given them. What has changed are the cyclamen, thanks to the problems that have beset greenhouse operators since the onset of the energy crisis, the ingenuity of plant breeders, and the work of Dr. John Seeley, Professor Emeritus of Ornamental Horticulture at Cornell University. Dr. Seeley realized several years ago that some new and richly promising cultivars of cyclamen were becoming available from hybridizers in Holland, Switzerland, Germany and Japan. These new strains, developed by crossing the old florist’s cyclamen with the much tinier and hardier species C. purpurascens, had a great deal to offer. They appealed to Dr. Seeley, who was convinced that both the interest of the public and that of the floral industry would be well served by developing potted plants so cheap to produce that they could be sold for under $5.

The most immediately obvious feature of these new cyclamen is their small size—less than half the size of the ones I used to buy and then torture to death. These small plants don’t take up much greenhouse bench space. Many more can be grown in a given area than before, so the energy costs per plant are considerably less. And while cyclamen used to take 15 months or more to flower from seed, these new ones can be induced to flower in eight or nine months; therefore, seeds planted in mid-February can be sold in full bloom from Thanksgiving to Valentine’s Day, a busy season for the nation’s florists.

The economic benefits of these new, scaled-down cyclamen to florists and greenhouse operators are obvious, but since I am not in the trade, I find the benefits mildly boring. What does excite me is that these miniature plants are tough enough to survive my less-than-scrupulous care. They can take a little heat in their stride, and they aren’t as persnickety about being kept “moist but not too moist.” The experts still advise keeping them out of direct sunlight, but my plants seem to have no complaints thus far about their location in windows on the west side of the house. They bloom prolifically—and over a long period of time. (In his technical publications on the subject, Dr. Seeley has been conservative in estimating their season of bloom. However, in a telephone conversation he told me he knew of instances in which some had stayed in bloom one solid year.)

Personally, I like the miniature cyclamen even better than the old C. persicum. They’re sold in four-inch pots, not the six-inch ones their bigger brothers require. As a result, they fit easily on windowsills, four or five per sill. In my own kitchen, where I keep them, the sills are high enough that the plants are almost at eye level, so I can look at them in a new way, discovering the fascinations of their architectural structure. The round, flattened tuber of each cyclamen sits above the soil in its pot. Each leaf and flower is borne on its own individual stalk, and all of the stalks are arranged in an intricate and attractive spiraling pattern that I suspect mathematicians would identify as exemplifying that most elegant of numerical arrangements, the Fibonacci series.

Cyclamen, I now discover, are wonderfully suited as house plants for placement on windowsills in groups. If it’s dark outside when I get home from work, the first thing I see is the bright rows of them in both kitchen windows, where they glow with the light from inside. In the mornings, when the sun from the east touches the snowdrifts in the garden beyond the window, the plants become wonderfully translucent with subtle color. I could raise these new, fairly undemanding, and quite marvelous cyclamen from seed, I’m told. But techniques for propagation are somewhat complicated, and I have a lazy streak. Besides, the owners of the retail greenhouse just down the street have been selling them lately for only $2.99. Unless they raise their prices quite a bit, I’ll let them do the work. I’ll still have all the cyclamen’s beauty—and a grateful heart for Dr. Seeley.


Propagation

Seeds of miniature cyclamen, unlike seeds of their hardy kin, require no stratification. Before planting, they should be soaked in warm water (warm to the wrist) for 24 hours, a trick managed by putting them in a Thermos bottle or placing them near the pilot light of a gas oven. Thereafter, they should be germinated in the dark at a constant temperature of 60°F. Dr. Seeley recommends 68°F. The plants require constant moisture from germination, which takes from four to eight weeks, until blossoming finishes. If growth is checked, blooms may not appear.

There is considerable variation in the onset of bloom, even within the same strain. The plants must be pot-bound if they are to flower.

It is possible to save these cyclamen from one season to the next, inducing dormancy during the summer by laying pots on their sides and withholding water. When new growth of leaves first appears (described by some as little, worm-like projections on the tubers that rest on top of the soil), the pots need to be reified and watering should be resumed.

Especially good specimens grown from seed can be propagated vegetatively, if desired, by lightly scooping out the top-center of a tuber with a sterile knife and then painting the cut surface with alcohol. The numerous small pips that subsequently form in the cavity may be planted separately and grown on to maturity.
Sources

THE GINSENG FAMILY
The following companies offer an excellent selection of ivy cultivars and other family members:
Glasshouse Works, 10 Church Street, Stewart, OH 45778, catalogue free.
Logee’s Greenhouses, 55 North Street, Danielson, CT 06239, catalogue $2.50.
Merry Gardens, Camden, ME 04843, catalogue free.
Tropical Growers, 708 60th Street, NW, Bradenton, FL 33528, catalogue free.

DESSERT NATIVES
Seed for water-conserving plants—both native and foreign species—is available from:
J. L. Hudson, Seedsman, PO Box 1058, Redwood City, CA 94064, catalogue $1.00.
International Seed Supplies, Plants native and foreign species—is available from:
Clyde Robin Seed Company, Inc., Rainman Succulent Nursery, DESERT NATIVES Tropexotic Growers, THE GINSENG FAMILY
The following companies offer an excellent family members:
Glasshouse Works, 10 Church Street, Stewart, OH 45778, catalogue free.
Logee’s Greenhouses, 55 North Street, Danielson, CT 06239, catalogue $2.50.
Merry Gardens, Camden, ME 04843, catalogue free.
Tropical Growers, 708 60th Street, NW, Bradenton, FL 33528, catalogue free.

```
Paywall
```

Ends, $2.00 (senior citizens $1.00, children under 14 free). For specific directions to the gardens, information on memberships and a schedule of events, write Membership Secretary, Wave Hill, 675 West 252 Street, Bronx, NY 10471.

MINIATURE CYCLAMEN
Seed for miniature cyclamen is available from:
Geo. W. Park Seed Company, Inc., PO Box 31, Greenwood, SC 29647, catalogue free.
Thompson and Morgan, PO Box 100, Farmingdale, NY 07727, catalogue free. (The Customer Service Department provides detailed information for home growers about the propagation of these plants.)
Readers who enjoyed Allen Lacy’s article may want to order Home Ground: A Gardener’s Miscellany, which was reviewed in the August 1984 issue of American Horticulturist. Home Ground is a series of essays on a myriad of gardening subjects. It is available at the AHS discount price of $13.45, including postage and handling. To order, write Jeanne Eggeman, AHS, PO Box 0105, Mount Vernon, VA 22121.

THE FLOWERING HOUSE PLANT FAMILY
The following companies offer a wide variety of gesneriad family members:
Plants
Buell’s Greenhouses, Inc., PO Box 21818, Eastford, CT 06242, catalogue $2.50.
Country Hills Greenhouse, Route 2, Cornning, OH 43730, catalogue free.
Glasshouse Works, 10 Church Street, Box 97, Stewart, OH 45778, catalogue free.
Kartuz Greenhouses, Inc., 1408 Sunset Drive, Vista, CA 92083, catalogue $1.00.
Laury of Salisbury, Undermountain Rd., Route 41, Salisbury, CT 06068, catalogue $1.50.
Logee’s Greenhouses, 55 North Street, Danielson, CT 06239, catalogue $2.50.
Lyndon Lyon Greenhouses, Inc., 14 Mutchler Street, Dolgeville, NY 13329, catalogue $3.00.
Geo. W. Park Seed Company, Inc., PO Box 31, Greenwood, SC 29647, catalogue free.

```
References
```

```
Ends
```

Ends, $2.00 (senior citizens $1.00, children under 14 free). For specific directions to the gardens, information on memberships and a schedule of events, write Membership Secretary, Wave Hill, 675 West 252 Street, Bronx, NY 10471.

MINIATURE CYCLAMEN
Seed for miniature cyclamen is available from:
Geo. W. Park Seed Company, Inc., PO Box 31, Greenwood, SC 29647, catalogue free.
Thompson and Morgan, PO Box 100, Farmingdale, NY 07727, catalogue free. (The Customer Service Department provides detailed information for home growers about the propagation of these plants.)
Readers who enjoyed Allen Lacy’s article may want to order Home Ground: A Gardener’s Miscellany, which was reviewed in the August 1984 issue of American Horticulturist. Home Ground is a series of essays on a myriad of gardening subjects. It is available at the AHS discount price of $13.45, including postage and handling. To order, write Jeanne Eggeman, AHS, PO Box 0105, Mount Vernon, VA 22121.

THE FLOWERING HOUSE PLANT FAMILY
The following companies offer a wide variety of gesneriad family members:
Plants
Buell’s Greenhouses, Inc., PO Box 21818, Eastford, CT 06242, catalogue $2.50.
Country Hills Greenhouse, Route 2, Cornning, OH 43730, catalogue free.
Glasshouse Works, 10 Church Street, Box 97, Stewart, OH 45778, catalogue free.
Kartuz Greenhouses, Inc., 1408 Sunset Drive, Vista, CA 92083, catalogue $1.00.
Laury of Salisbury, Undermountain Rd., Route 41, Salisbury, CT 06068, catalogue $1.50.
Logee’s Greenhouses, 55 North Street, Danielson, CT 06239, catalogue $2.50.
Lyndon Lyon Greenhouses, Inc., 14 Mutchler Street, Dolgeville, NY 13329, catalogue $3.00.
Geo. W. Park Seed Company, Inc., PO Box 31, Greenwood, SC 29647, catalogue free.
McKinney's Glasshouse, 89 Mission Road, Eastborough, Wichita, KS 67207, catalogue $.75.

Tinari Greenhouses, 2325 Valley Road, Huntingdon Valley, PA 19006, catalogue free.

Village Plants, 5656 Calyn Road, Baltimore, MD 21228, catalogue free.

Zaca Vista Nursery, 1190 Alamo Pintado Road, Solvang, CA 93463, catalogue free.

Seed
Far North Gardens, 15621 Auburdale Avenue, Livonia, MI 48154, catalogue free.

J. L. Hudson, Seedsman, PO Box 1058, Redwood City, CA 94064, catalogue $1.00.

Thompson and Morgan, PO Box 100, Farmingdale, NJ 07727, catalogue free.

Gesneriad enthusiasts may want to write to the following African violet or gesneriad societies for membership information:

American Gloxinia and Gesneriad Society, Inc., Ellen M. Todd, Box 493, Beverly Farms, MA 01915.

Gesneriad Hybridizers Association, Anne Crowley, 88 Maynard Street, Roslindale, MA 02131.

Gesneriad Society International, June Tilley, 1800 Grand, Box 549, Knoxville, TN 37901.

Saintpaulia International, June Tilley, Box 549, Knoxville, TN 37901.

Since so many gesneriad family members are grown indoors in terrariums or under artificial light, the following two organizations may also be of interest:

Indoor Gardening Society of America, Inc., Virginia F. Elbert, 801 West End Avenue, New York, NY 10025.

The Terrarium Association, Robert C. Baur, 57 Wolfpit Avenue, Norwalk, CT 06851.


American Horticultural Society
1800 Grand, Box 549, Knoxville, TN 37901.

We very much hope that you will enjoy your copy of The Wall Street Journal, and should you not be delighted with it, return it for a full refund. Next day shipping.

The Wall Street Journal is a business newspaper — the Number 1 business publication in the country, read every business day by more than six million men and women who look to it for the facts, figures, information and insights they need to excel in their careers. But The Journal is aware that art and culture, too, are essential and enriching parts of the lives of all of us.

That is why The Journal has recently expanded its daily coverage of the arts and cultural events. And that is why we’re extending this offer to you. Why not subscribe right now? American Horticultural Society will benefit. And, with your own copy of The Wall Street Journal in your hand every business day, so will you.
THE AVANT GARDENER
DIFFERENT, EXCITING, GREAT FUN TO READ—for the gardener who wants to get more out of gardening! Subscribe to THE AVANT GARDENER, the most useful, most quoted of all gardening publications. Every month this unique news service brings you the newest and most practical on-going information—new plants, products, techniques, with sources, plus feature articles, special issues, 16th year. Awarded Garden Club of America and Massachusetts Horticultural Society Medals for outstanding contributions to horticulture. Current? Sample copy $1. Serious? $10 full year (reg. $15). THE AVANT GARDENER, Box 4859, New York, NY 10028.

AZALEAS & RHODODENDRONS
LANDSCAPE SIZE AZALEAS: "For gardeners who care"—Exbury, Windsor, Robin Hill, North Tobsdale, Glen Dale, Cible, Natures and FRANTICK YELLOW. Mailorder Catalog $2.00 (deductible). CARLSON'S GARDENS, Box 305-AH71, South Salem, NY 10590.

BONSAI
Bonsai Plants, Pots, Books, etc. Great Gift Ideas. Catalog "AH" $1.00. BONSAI FARM, PO Box 130, Laverne, TX 78121.

BOOKS
DRIED BOUQUETS SO NATURAL THEY LOOK FRESH!!! Two show-and-tell books by Roberta Moffitt. "Step by Step Book of PRESERVED FLOWERS" showing four methods including Microwave, $2.95. "Step by Step Book of DRIED BOUQUETS," (over 285 photos) Williamsburg and Modern Centerpieces, $8.95. Postage $1.50 or both books $12.90 ppd. FREE Newsletter; send stamp. ROBERTA MOFFITT, Box 3597, Wilmington, DE 19870.

VALUABLE VACATION SPECIAL. A GUIDE TO SIGNIFICANT AND HISTORIC GARDENS OF AMERICA, Ray & Nicholls. Order: Garden Club of Georgia, Inc., 325 Lumpkin St., Athens, GA 30602. $8.95, plus $1.50 Postage & Handling.

GARDENERS! We offer useful out-of-print gardening and farming books, affordable prices, and personalized service. . . . Big catalog, $1.00. SUTTLEY HORTICULTURAL BOOKS, 1105 Cherry, Dept. AH142, Centralia, WA 98531.

GARDENING BOOKS: New and out-of-print titles; many British imports; large selection in areas including garden history, garden design, roses, rock gardening, herbaceous plants, bulbs, trees, shrubs, vines, groundcovers, etc. Send $1.00 for catalog. WARREN BRODERICK, 695 44th Avenue (PO Box 124), Lonsdale, NY 12182.

CURTIS' BOTANICAL MAGAZINE including first 12 volumes; send Lodges' Botanical Cabinet, Write for Connoisseur's List #2-84 and Catalog #1 of best orchid books ever published—old-new-rare. McGUIREY ORCHID BOOKS, 5700 W. Salerno Road, Jacksonville, FL 32244.

EXOTICA 4, enlarged to 16,300 photos, by Dr. A. B. Graf. 2,590 pages in 2 volumes, $175. TROPICA-7,000 color photos of exotic plants and trees, $115. EXOTIC PLANT MANUAL—2,400 photos, $37.50. EXOTIC HOUSE PLANTS—1,200 photos, $8.95. Circulated gladly sent. ROCHEWS, Box 125, E. Rutherford, NJ 07073.

BRITISH TEAK GARDEN SEATS
Solid Teakwood Garden Seats—featured in the anteloums & gardens of England. The perfect heirloom gift for church, park, or private garden. Country Casual's newest catalog of "HORTICULTURAL TASTES" offers jewels gifts for men & women who garden. We introduce the stunning British Collection of Chippendale style seating. Two of these Chinese lattice pattern solid teakwood benches were presented as wedding gifts to Prince Charles & Lady Diana.

Choose from other gifts for gardeners; specialty hand tools, lace impressed stoneware wall baskets with Williamsburg floral bouquets, gold floral jewelry—including herb pins & pendants, floral magnets, traditional egg baskets, Colonial oak hangers & shepherd's crook inlaid antique doll ornaments reproduced in pressed wood and resin. For a catalogue send $1.00 to COUNTRY CASUAL "Horticultural Treasures," 17317 Germantown Rd., Germantown, MD 20874.

BROMELIAD CULTURAL INFORMATION
COLORFUL-FASCINATING-EASILY GROWN PLANTS, send 20¢ stamp for cultural information. THE BROMELIAD SOCIETY, INC., 2353B Rusk, Beaumont, TX 77702.

BULBS
GLORIOSA ROTHCHILDIANA (Flame Lily) exotic blooms, three tubers. $10. Postpaid, with growing hints. Rare Bulb List $1. Deductible with order. WILLETTS, PO Box 446, Fremont, CA 94536.

BUSINESS OPPORTUNITIES
$40,000 ON 1/3 ACRE! New Hydroponics—inexpensive, pleasant, practical! Little manual labor! FREE information. CARDIGAN'S, Box 1657, Bremham, TX 77833.

THE BUSINESS OF HERBS
THE BUSINESS OF HERBS. The only NEWSLETTER catering to herb business needs. Trade news, marketing, techniques, supplies. Sample copy $1.00. Dept. 3, PO Box 559, Madison, VA 22727.

CACTI & SUCCULENTS
NOW AVAILABLE! New 1985 Catalog of Christmas Cactus, Easter Cactus, Orchid Cactus, Hoyas, Rattail Cactus. Full-color, 37-page plant/bookshop catalog only $1.00 (deductible). RAINBOW GARDENS, Box 721 AH124, La Habra, CA 90631. Includes $3.00-off winter coupon!
ALL NEW 1985 full color "Flowering Jumble Cactus" catalog $1.00 (deductible) includes $3.00 coupon (expires 3-15-85). Hundreds of Orchids Cacti (epiphyllums), Christmas & Easter Cacti, Rhapis, Rattail Cacti, Hoyas, succulents. Send envelope for FREE Haworthia/Rhipsalis list. Wholesale available to dealers. CALIFORNIA EPI CENTER, Dept. A485, Box 1451, Vista, CA 92083.

"CATALOG OF UNUSAL SUCCULENTS" Discover the largest selection of weird and unusual succulents—over 150 photographs of succulent crests, variegates, living stones, and oddballs. Send $1.00 today. "CATALOG OF UNUSAL SUCCULENTS" Dept. A-12, 553 Buena Creek Road, San Marcos, CA 92069.

Cacti/Succulent plant and seed catalog. $1.00. MESA FLORA NURSERY, N.B.U. 1002, Yucca Valley, CA 92284.


DAYLILIES CHOICE DAYLILY COLLECTION—12 choice labeled daylily varieties (all colors) $35.00 postpaid. Six for $20.00 postpaid. Our current 40-page Daylily and Louisiana Iris Catalog is available for $2.00. It includes the most advanced tetraploid and diploid daylilies and Louisiana Iris available anywhere. LOUISIANA NURSERY, Rt. 7, Box 43, Opelousas, LA 70570.

DWARF CONIFERS Over 170 types of dwarf conifers described by size, shape, color and texture. Many types suitable for bonsai. 30 page catalog $1.00 (refundable). Botanic Plant List FREE. WASHINGTON EVERGREEN NURSERY, Box 388AH, Leicester, NC 28748. (704) 683-4518.

EDUCATION THE NEW YORK BOTANICAL GARDEN SCHOOL OF HORTICULTURE. A program designed to train professional horticulturists through a combination of academic work and practical field experience. Curriculum includes botany, horticulture and landscape design, with work experience at both the Botanical Garden in the Bronx and at the Cary Arboretum in Millbrook, NY. Full-time and part-time programs available. Licensed by the New York State Education Department. For catalogue write: School of Horticulture, Education Building, THE NEW YORK BOTANICAL GARDEN, Bronx, New York 10458. or call: (212) 220-8739.

FLOWER ARRANGING SUPPLIES Carefully selected supplies, equipment and accessories for flower arranging, corsages, houseplants. Illustrated catalog 25¢. Retailers use letterhead. DOROTHY BIDDLE SERVICE, GMS, Greely, PA 18425-9799.

GREENHOUSE BOOKS GREENHOUSE MANAGEMENT—SECOND EDITION by Robert W. Langhams, Cornell University Professor. A book to help you manage and understand the equipment and systems of your greenhouse. Facts on structures, soils, temperature, light, humidity and biological pest control are included. 270 pages, 239 illustrations. Send $21.00 postpaid to HALCYON PRESS OF ITHACA, 111 Halcyon Hill Road, Ithaca, NY 14850.

HARPER HORTICULTURIST SLIDE LIBRARY (PAMELA HARPER) We supply many of the pictures in American Horticulturist. Over 50,000 slides of plants and gardens available. Duplicates $2.00. Lecture sets on many topics $25.00 rental. 1983 catalog $1.50. 219 Robanna Shores, Seafood, VA 23696 (804-898-6433).

HEATHS & HEATHERS COLORFUL HEATHERS shipped UPS. Send SASE for new 100 cultivar descriptive list. HEATHER Growers, Box 850, Elma, WA 98541.

HORTICULTURIST WANTED Major Long Island nursery seeks mature, experienced person to direct the growing of azaleas, rhododendrons and other ornamental shrubs. A minimum of ten years of relevant horticultural experience is required. Salary commensurate with experience. Send resume to: QUALITY PLANTS, INC., 84A Moriches/Yaphank Road, Manorville, NY 11949.


HOUSE PLANTS NEW! Color catalog, 1984-85—$2.00, now lists 2,000 unusual Indoor Plants Begonias, Exotics, Geraniums, Jasminums, Herbs. LOGEE’S GREENHOUSES, A1H, 55 North Street, Darien, CT 06820.

ORCHIDS, GESNERIADS, BEGONIAS, CACTI & SUCCULENTS; Visitors welcome. 1984-85 Catalog $1.50. LAURIUS OF SALISBURY, Rt. 41 (Undermountain Rd.), Salisbury, CT 06076 (203) 433-2263.

HOYA SPECIAL What's a hoyas: six each different hoya cuttings, $14.95 postpaid, $1.00 for descriptive list and growing instructions. Satisfaction guaranteed. SAN LUIS GARDENS, 4816 Bridgecreek, San Luis Obispo, CA 93401.

INDOOR-OUTDOOR GARDENING SUPPLIES "FREE CATALOG" ... "LOWEST PRICES—TOP QUALITY SUPPLIES" ... Plastic pots, hanging baskets, peat pots, etc. . . . 40¢ stamps for postage. PLANT COLLECTIBLES, 103E Kenview Ave., Buffalo, NY 14217.

Better Seeds From the North

At Johnny's Selected Seeds, in up here in Albion, Maine, we develop some of the finest, hardiest vegetable and flower seeds you can buy.

A Decade Of Research

For over 10 years, Johnny's Selected Seeds has been supplying avid gardeners like yourself with seeds... hardy, dependable varieties that perform in the most difficult climates and short growing seasons. Imagine how well these seeds will do in your garden.

Our professional staff continuously tests all of our seeds for viability and germination. Our standards are more stringent than the U.S. Government's, and we guarantee that our seeds will perform in your garden, to your satisfaction.

Famous Catalog

Our catalog, famous for the vast amount of gardening information it holds, is almost more of a manual than a catalog. It will make you a better gardener. Once you see our catalog you'll know why gardeners, beginning and advanced turn to Johnny's Selected Seeds as the most reliable and informed supplier of garden seeds.

Write for your FREE 96-page catalog today!

FREE CATALOG

Please send my FREE copy of Johnny's Selected Seeds 1985 catalog.

Name ________________________________

Address ________________________________

Town ________________________________ State ________ Zip ________

Johnny's Selected Seeds
100 Foss Hill Road
Albion, Maine 04910
INDOOR PALMS
DWARF RHAPIS EXCELSA—ELEGANT INDOOR PALMS Green and variegated varieties, 12"-18" tall, 5'-10' pots. 3-9 years old. Catalog $1. Rhapis Palm Rock $5. ppd. RHAPIS GARDENS, POB 287-A, Gregory, TX 78339.

JASMINES
Grand Duke or Arabian jasmine 4 for $6.00. List 25¢. MRS. B.C. WELSH, Route 3, Box 1700, Madison, FL 32340.

MAGNOLIAS
Choice Magnolia Collection—5 choice assorted Asiatic Magnolias (all different colors) for $60.00 unlabelled or $70.00 labeled. Payment must accompany order. You pay postage when plants arrive. Our large 1985 MAGNOLIA AND ODD PLANT CATALOG will be available shortly for $2.50 per copy. This list will include over 300 Magnolia cultivars plus a large collection of choice companion plants, trees, shrubs, perennials, bulbs, vines, odd plants, fruits and much more. LOUISIANA NURSERY, Rt. 7, Box 43, Opelousas, LA 70570.

MAPLES
MATSU-MOMIJI NURSERY—We specialize in the finest varieties of Japanese Maples and Japanese Black Pines—Catalog $1.00 (deductible), PO Box 11414, Philadelphia, PA 19111. (215) 722-6286.

NEW PERENNIAL POPPIES
Far Superior to existing Oriental Poppy varieties. FREE catalog. MHONS, INC., Box 2301, Atascadero, CA 93423.

NURSERY STOCK
MILLIONS OF SEEDLINGS—High Quality, Reasonable Prices. Over 100 Selections—Christmas Trees, Ornamentals, Windbreaks, Conservation, Wildlife Food and Cover, etc. FREE catalog. CARINO NURSERIES, Box 538J, Indiana, PA 15701.

ORCHIDS

PLANTS—RARE BUT AFFORDABLE

POSITION WANTED
CARETAKER. Expert management of the large estate. Experienced flower grower. Permanent position sought with house on property provided. DEVIN GARRITY, Harris Rd., Bedford, NY 10506.

PUBLICATIONS
EXOTIC FRUIT and VEGETABLES! Grow your own! LIVING OFF THE LAND. Subtropic Newsletter. Sample $1.00—MARIAN VAN ANTA, PO Box 2131A, Melbourne, FL 32902-2131.

Georgi 1985 calendars are offered at a special 15% discount to the readers of American Horticulturist: A magnificent 17" x 24" wall calendar "Botanical Prints from Hortus Eystettensis, 1713," list price $19, and "Redoute Roses" from the collection of Les Roses peintes par Redoute, list price $13.95. Twelve fantastic wall calendar reproductions of the finest quality. Send your prepaid order to GEORGI PUBLISHERS, 35 West 36th Street, #3W, New York, NY 10018, or call for catalog (212) 730-0318.

RARE NATIVE PLANTS
Rhododendron championi, R. australis, R. speciosum, R. serratulatum, R. prunifolia, Magnolia liliiflora (Winterbloom), Magnolia pyramidalis, Stewartia malacodendron. Grown from native seed or cuttings. Write for prices and shipping dates. SALTER TREE FARM, Rt. 2, Box 1332, Madison, FL 32340.

RARE PLANTS
RAREST PLANTS EXCLUSIVELY: otherwise commercially unavailable, houseplants, officeplants, collector's items or landscaping plants. Rare, beautiful, durable, 20 years old, 20 palms, Dwarf Palms (80 varieties), exotic foliage, 180 succulents, 150 Sansevierias, 200 Hoyas, 250 variegates, shrubs, trees, 100 tropical plants, over 2000 varieties, new catalog lists over 175 varieties of imported and heirloom vegetables. Full of historical anecdotes, cultural instructions, recipes and drawings. Send $2.00: TO THE FRAGRANT FAMILY, Dept. AHC5, Box 1308, Jackson, NJ 08527.

FALL PLANTING is most propitious for many flower seeds. Catalogue $1. THE FRAGRANT PATH, Box 328, Fort Calhoun, NE 68023.

RESERVE your 1985 vegetable seed catalog now! Le Marché's new catalog lists over 175 varieties of imported and heirloom vegetables. Full of historical anecdotes, cultural instructions, recipes and drawings. Send $2.00: LE MARCHE SEEDS INTERNATIONAL, Dept. AH, PO Box 158, New York, NY 10001.

TOPIARY
Topiary frames, animal shapes, geometries. Write for brochure. WHOLESALE RETAIL, TOPIARY, INC., 41 Bering, Tampa, FL 33606.

TREE PROBLEMS—BOTANICAL OR LEGAL
For Directory of members of the American Society of Consulting Arborists—the experts in tree care and appraisals for legal matters, write: ASCA, 315(AH) Franklin Road, North Bruns­wick, NJ 08902.

UNUSUAL PLANTS
Baobabs, rare succulents, cactusformis, Sanse­vierias, low light plants, bamboo and other exotics. Profusely illustrated catalog and periodic newsletters $1.50, deductible from first order. SINGERS' GROWING THINGS, 17806 Plummer St., AH, Northridge, CA 91325.

WOODLANDER
RARELY OFFERED SOUTHEASTERN Natives, woody, herbaceous, nursery-grown. Many hardy northern plants newly introduced exotics selected for Southern gardens. Send SASE for extensive mailorder list. WOODLANDERS AH, 1128 Colleton Ave.,阿森, CA 92901.
Virgin Islands Cruise (January 6-13) Tour St. John and the British Virgin Islands, and visit private gardens and famous landscaped resorts.

Carnival in Rio (February 1-22) Cruise to Brazil to experience Carnival in colorful Rio de Janeiro, and tour beautiful Brazilian gardens, including ones designed by Roberto Burle Marx. Tour Leader: Carlton Lees, Retired Vice-President of the New York Botanical Garden.

Barbados Exploration (March 1-9) Explore this small Caribbean island, and tour areas of botanical interest, including Welchman Hall Gully and Andromeda Gardens. Tour Leader: Everett Miller, Former Director of Longwood Gardens.

Hawaii (March 4-16) Tour Hawaii’s experimental gardens and arboretum, as well as unique nurseries, private gardens and estates. Tour Leader: Ernie Chew, Former Horticulturist of the San Diego Zoo.

Spring Gardens of the Southern United States (March 30-April 31) Visit the most beautiful gardens in New Orleans, Natchez, Savannah, Charleston and Atlanta during the spring blooming season. Tour Leader: Mildred Mathias, Emeritus Professor of Botany, UCLA.

Spring in the Mediterranean (April 8-24) Cruise the Mediterranean and stop at ports in Greece, Turkey and Yugoslavia during the height of the spring wildflower season. Tour Leader: Alfred Evans, Assistant Curator of the Royal Botanic Gardens, Edinburgh.

Belgium & Holland by Road & Waterway (April 21-May 4) Visit Brussels and the Royal Botanical Gardens, and see the Tulip Festival in Haarlem and the Florailles in Ghent. A barge trip on the canals of Holland during tulip time is also planned. Tour Leader: Richard Hutton, President of the Conrad-Pyle Company.

England & the Chelsea Flower Show (May 16-30) Tour public and private gardens in England during the spring blooming season, and visit the famed Chelsea Flower Show. Tour Leader: John Clayton, Retired Curator of Horticulture, Royal Horticultural Society.

Waterways of Western Europe (May 26-June 11) Explore France, Portugal, Spain and England aboard the yacht Argonaut. Tour Leader: Dorothy Temple, White House Floral Designer.

Romantic France (June 1-10) Visit the gardens of Princess Sturdza and the Comte de Brogue’s chateau in Normandy. Stop in Giverny for a visit to Monet’s garden and house, and explore Paris.

Fabled Gardens of China (June 10-27) Explore the Chinese garden cities of Suzhou and Hangzhou, and visit the Ming Tombs and the Great Wall in Peking. Tour Leader: Edwin T. Morris, author of Gardens of China.

Tropical Ecology: The Amazon (June 26-July 15) This tour provides an in-depth look at the plant and animal life in remote, undis-}

Gardens of Gertrude Jekyll (July—dates uncertain) Tour the gardens of Gertrude Jekyll during a mid-summer visit to England. Tour Leader: Carlton Lees, Retired Vice-President of the New York Botanical Garden.

South Africa (September 10-29) Tour the Drakensburg Mountains, Kruger National Park, Durban, Kirstenbosch and other public and private gardens. Tour Leader: Ernie Chew, Former Horticulturist of the San Diego Zoo.

Autumn in England (September 11-26) Visit the Royal Horticultural Society’s Great Autumn Show, and tour the rolling, unspoiled English countryside. Tour Leader: John Clayton, Retired Curator of Horticulture, Royal Horticultural Society.

France (October—dates uncertain) Tour the vineyards and sample the wines of Burgundy and Bordeaux. Trip participants will be transported through this picturesque region by barge.

Autumn in the Orient (November 1-20) Visit private gardens in Japan, the temple gardens in Kyoto, autumn chrysanthemum festivals, and gardens in Taiwan and Hong Kong. Tour Leader: Robert Savage, frequent escort of Society tours.

YES! Please send me more information on the tours I have checked below.

- Virgin Islands Cruise
- Carnival in Rio
- Barbados Exploration
- Hawaii
- Spring Gardens of the Southern United States
- Spring in the Mediterranean
- Belgium and Holland by Road and Waterway
- England and the Chelsea Flower Show
- Waterways of Western Europe
- Romantic France
- Fabled Gardens of China
- Tropical Ecology: The Amazon
- Gardens of Gertrude Jekyll
- South Africa
- Autumn in England
- France
- Autumn in the Orient

Name ____________________________

Address ____________________________

City ______ State ______ Zip ________

Mail to: Robin Williams, American Horticultural Society, PO Box 0105, Mount Vernon, VA 22121.
1984 Index

An annual index to articles appearing in American Horticulturist magazine is printed in each December issue. A separate cumulative index has also been published for the years 1922-1971 and is available in paperback for $10. Address inquiries to Jeanne Eggeman in care of the Society. Although no index for the years 1972-79 has yet been published, these back issues have been catalogued by the editorial staff. Back issues (if available) are $2.50 each and may be obtained by writing to Sharon Barnes in care of the Society.

AUTHOR


Carya illinoinensis. September. August 5.

Carya laciniosa. September. August 5.

Carya ovata. September. August 5.

Carya pubescens. September. August 5.

Carya tomentosa. September. August 5.

Carya umbiformis. September. August 5.

Carya virginiana. September. August 5.


Cassia obtusifolia. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.

Cassia xanthocarpa. September. August 5.
The American Horticultural Society is offering to its members this exclusively designed trip, a Mediterranean cruise to explore the flora of the region as well as the wonderful historical architecture and culture. Four countries will be visited - Greece, Italy, Yugoslavia and Turkey.

Fly to London for overnight before heading on to Dubrovnik, boarding Swan Hellenic's ORPHEUS Cruise for two weeks to Athens, Naxos, Patmos, Santorini, Olympia in Greece; see Troy, Pergamum and Ephesus in Turkey; and dock in Venice from where we fly home.

Among the high quality of lecturers and staff on board of historians, artists, and scientists is Alfred Evans, Assistant Curator of the Royal Botanic Garden, Edinburgh, Scotland. A delightful gentleman, he has frequently cruised this area. Also accompanying our group is Harold Epstein, former Board Member of the American Horticultural Society and the American Rock Garden Society.

For your free brochure write to:

The Education Department,
American Horticultural Society,
P.O. Box 0105,
Mt. Vernon, VA 22121.
Or phone (703) 768-5700.

Other Explorations in 1985 include Barbados, China, Spring and Fall England, Fall Orient, and Romantic France.

WATER-LILIES in your garden.

Lilypons catalogue features everything needed for your garden pool, including the pool.

Lilypons Water Gardens

Water-lilies, Lotus, Aquatic plants, Goldfish, Scavengers, Koi, Fiberglass garden pools, PVC pool liners, Sweeps, Filters, Pumps, Lights, Statuary, Books and much more.

New colorful Lilypons catalogue and seasonal mini catalogs, $3.50.

Name: ___________________________  (Please print)  
Address: _________________________  
City: ____________________________  
State: ____________________________  
Zip: ______________________________  

LILYPONS WATER GARDENS
1800 Amherst Road  1800 Lilypons Road
P.O. Box 10  P.O. Box 106
Brookshire, TX 77423  Mt. Vernon, VA 22121
(713) 934-8525  (703) 768-5700

YES, Please send me the new colorful Lilypons catalogue and seasonal mini catalogs. I enclose $3.50.

American Horticulturist 39
African violets, gloxinias, achiemenes, lipstick plants, episcias, goldfish plants and Cape primroses are all familiar names of flowering house plants. Yet the family name that links all of these plants together—Gesneriaceae, or the gesneriad family—is not nearly as familiar as other family names—for example, Orchidaceae (orchids) or Bromeliaceae (bromeliads). Although gesneriads may be less easily distinguishable as a group than orchids or bromeliads, they nevertheless comprise a distinct community and are worthy of our attention. In fact, anyone interested in growing flowering plants indoors should become acquainted with them. Nowhere else in the plant kingdom do we find a family that is so well adapted to bringing color into our homes throughout the year.

The gesneriad family has over 130 genera and over 2,000 species. An amazingly high number of these plants have showy flowers and are—or have the potential of being—superb house plants.

Most gesneriad flowers are slipper-, bell-, pouch- or tube-shaped, and have regularly or irregularly lobed corollas. (African violet flowers have five petals, but they are joined at the base.) Gesneriads are remarkably floriferous, and their blooms are shapely and colorful. However, these features alone do not account for their unique suitability as house plants. Gesneriads also make excellent house plants because of their proven ability to grow and bloom with comparative ease in the warmth and low light that a normal home provides. Furthermore, they can be quickly and easily propagated any number of ways. As a special bonus, several plants in the gesneriad family do not need a dormant period, and are capable of blooming continuously throughout the year. The following is a brief description of these plants, their relative ease or difficulty of culture, the species or cultivars that experience has shown to be the best, and some practical cultural tips for the inexperienced grower.

The modern African violet is a complex hybrid of a number of Saintpaulia species from southern Africa. This well-known plant needs no description; virtually every florist and garden center in the country displays African violets in bloom at all times of the year. They are deservedly the most popular of all flowering house plants. No other plant can compare in carefree culture, continuous bloom and variety of color. I would not venture to recommend any particular cultivar but should warn that not all cultivars are equally dependable, in part due to excessive hybridization. The African Violet Society of America issues a yearly “Honor Roll,” which is the best recommendation available. After about a year of continuous bloom, the plants deteriorate, but they can be easily replaced by propagation. To propagate, remove a leaf with petioles attached, dust the stem tip with hormone powder, poke it into a sterile medium, and keep it warm, humid and moist. The leaves sprout young, rooted
plants very quickly. Older plants that may have developed several crowns can also be divided.

Gloxinia is the common name for a group of hybrids of Sinningia speciosa, a Brazilian plant with slippery-shaped flowers. During the nineteenth century, cultivated plants were developed with a rosette, or wheel-shaped, upstanding flower that plant breeders increased to a spectacular size. Gloxinias had their heyday then, and the names of the finest cultivars still date from that period: 'Emperor William', 'Emperor Frederick', 'Etoile de Feu', 'Blanche de Meru', 'Waterloo' and 'Roi des Rouges'. Of the modern cultivars, Buell hybrids have proven the best.

In recent years, plants sold in the shops have been less attractive and well grown. Gloxinias have become less popular because they require a period of dormancy and have large, brittle leaves that make them difficult to pack and transport. On the whole, they make better holiday gift plants than year-round pleasures. Nevertheless, you should not throw away your gloxinia when it is finished blooming; put the pot away in a cool (not cold), shaded spot, and wait until new growth starts. Then bring the plant into the light, water, and fertilize. Propagate leaves as you would for African violets. Gloxinias are still among the most spectacular of house plants.

In our southern states, members of the genus Achimenes are widely grown in pots or hanging baskets on porches. Blooming from May to June, and again from September to October, they offer large trumpet flowers in an array of colors with interesting, contrasting markings. As indoor plants, though, they are often frustrating. They almost never bloom in urban and industrial centers because they are very sensitive to smog. Their worm-like, scaly rhizomes need to be stored dry from the pot away in a cool (not cold), shaded spot. A. bidebrandii is a shrub with pale, narrow leaves that produces quantities of red-orange, somewhat puffed, tubular flowers from all joints and throughout the year. This species lacks the long, flexible branches and thick, dark green leaves of the other species. It does particularly well under fluorescent lighting.

A. marmoratus, also recommended, has lovely leaves that are barred beneath with maroon. It is an excellent foliage plant for a window or in artificial light. Its flowers are green and unspectacular.

Most species of Columnea present a problem indoors because of their very long branches that may dangle many feet below a hanging basket. Yet amateurs continue to grow them because of their striking beauty. When the plants are in bloom, the branches are covered with vivid red and yellow, three- to four-inch flowers that look like flying fish. Some cultivars and species are decidedly cool-growing, though the majority accept normal house temperatures. Some are definitely seasonal, while others bloom on and off throughout the year. Watch out for the plants that are described in catalogues as "everblooming," such as 'Early Bird' and 'Mary Ann', and make sure that you have the right temperature environment in your home to keep them happy.

Attempts to make columneas more compact have not been very successful. However, the result of one such attempt—'Chanticleer'—is just right. The branches of this cultivar are short and sturdy. The orange flowers, though not very large, are in proportion to the plant and appear at all seasons. 'V. Cover', with short, pink flowers, is also a compact charm, and Kartuz Greenhouses' "Butterball" is a fine yellow of this type.

Episcias, with their trailing habits and richly textured, oval-pointed leaves, are quite different from the plants described thus far. The leaves of episcias are of two principal color types: brown with silver or pink veining (the latter colors become predominant over much of the surface), and

---

**Gesneriads for Beginners**

The gesneriad repertoire is so huge, and so many of the plants are comparatively simple to grow and bloom, that it is difficult to decide which are the best to recommend to a beginner. The following, available from the principal gesneriad nurseries, are my choices, for better or for worse.

**African violets.** Start with the Hupor Roll plants listed by the African Violet Society of America. My individual all-time favorite is Ballet 'Lisa', a pink commercial variety. I've found the plants of Lyndon Lyon Greenhouses remarkably sturdy. See "Sources" on page 32 for the addresses of the firms listed below.

**Aeschynanthus parvifolius.** Vigorous basket plant with flaming, blood-red flowers from long, hairy, nearly black tubes. Spectacular, but not a frequent bloomer.

**Chirita micromusa.** A yellow-flowered annual that blooms quickly and can be planted any time of year. Seed available from Far North Gardens.

**Codanathanthus 'Aurora'.** Handsome basket plant with pink tube flowers. From McKinney's Glasshouse.

**Codanathanthus carnosa and C. crassifolia.** Sturdy, little trailing shrubs suitable for the terrarium, with white flowers and red berries.

**Coltricantha 'Golden Nugget'.** Columnea-type plant with erect branches. Available from Kartuz.

**Columnea 'Chanticleer'.** Compact, everblooming, definitely the best. 'Early Bird' (orange and yellow) and 'Mary Ann' (pink) are compact and floriferous. _C. erythroplaea_ is a large plant with big orange-red flowers.

**Episcia 'Moss Agate'.** An old favorite with large, lush green leaves and brilliant tomato flowers. 'Toy Silver', a new miniature, is charming in a small pot.

**Gesneria cuneifolia.** A superb terrarium plant, everblooming, and spectacular. Requires plenty of light.

**Gloxinia 'Airon'.** Handsome spikes with bell flowers. For fluorescent light or a sunny window. Available from Kartuz.

**Kohleria 'Pamela'.** Best of the recent kohlerias. Red flowers on a compact plant.

**Nematanthus 'Bigou' and 'Castanet'.** Fine basket plants with colorful, dangling, puffed flowers.

**Sinningia.** 'Bright Eyes', 'Freckles', _S. pusilla_, 'Snow Flake', 'Tinkerbell' and 'White Sprite' are all everblooming and are easily grown in a terrarium. Some newer hybrids are more colorful but, in my opinion, not as dependable. 'Cindy' and 'Cindy-Ella' are larger, they are best grown in a terrarium but also do well on the open shelf, especially under fluorescent light.
**THE INDOOR GARDENER**

green and heavily felted. Flowers are small but such a brilliant tomato-red that a few are quite sufficient to light up a plant. There are a few yellow- and pink-flowered cultivars.

Most episcias grow well in pots or baskets. They bloom all year round, require somewhat more light than African violets, and should not be overwatered. Normal leaf size is three to four inches. Some miniatures with one-inch leaves are now appearing and have proved quite charming and dependable.

I believe the finest episcia for bloom is 'Ginny Elbert', a chance discovery at Laurel of Salisbury. Although the flowers of most episcias are borne quite low or are partly hidden by leaves, 'Ginny Elbert' has erect stalks, and the flowers are very visible. Furthermore, flower production from each node is abnormally large; a hanging basket full of these flowers displays a blaze of color for months on end.

Some extraordinarily beautiful sports have turned up among the episcias. The most famous is 'Cleopatra', which has leaves zoned in bands of pink, white and green. Since it is low in chlorophyll, it is a tender cultivar. However, 'Cleopatra' is not at all difficult to grow in terrariums placed rather close to fluorescent tubes. Specimen plants are so colorful that the occasional flowers are superfluous. They are truly among the wonders of horticulture.

**Cultural Recommendations**

Changes in the last 50 years in the home environment as well as soils, fertilizers and equipment have made culture of virtually all of these plants relatively easy. Naturally, individual species and cultivars react in different ways, and there are innumerable ways to produce healthy, long-lasting plants. The following is only a practical summary of basic needs.

**Temperature.** A range of 60°F to 85°F is best. Most gesneriads suffer above or below these temperatures. Exceptions are the true alpines and a number of species that are rather cool-growing. On the whole, however, these plants require warmth in winter and air conditioning or fans in summer.

**Light.** Light requirements range from 400 to 1,000 foot-candles for bloom. This can be translated into partial sunlight or reflected light. Two-tube fluorescent fixtures, fitted with one Cool White and one Warm White tube, provide sufficient light for most of the plants. With high humidity, less light is needed.

**Water.** These plants like even moisture but do not like to be damp.

**Soil.** A porous, well-aerated, partially organic soil is ideal. House plant mixes should include peat moss, perlite and vermiculite. A simple mix can be made at home by combining equal amounts of these ingredients. Add two tablespoons of ground eggshell or one tablespoon of horticultural lime to each quart of mix.

**Fertilizer.** Fertilizer should be high in nitrogen for growth and high in phosphorus for bud formation. Leach soil with clear water every three months to remove excess salts.

**Potting.** Gesneriads usually have rather shallow roots, and they like to be snugly potted.

**Humidity.** Humidity of fifty percent or higher is ideal, but not essential. The smaller and more delicate plants require terrarium culture.

**Hybridizers and commercial growers alike believe that Cape primroses, Streptocarpus spp., may one day become as popular as African violets.**

'Constant Nymph' and related Nymph hybrids are somewhat easier to grow than most hybrids but lack the bright colors and distinct markings of the older Wiesmoo hybrids. All Streptocarpus are seasonal, blooming spring to fall and resting in winter. If breeders find the breakthrough they are looking for, there will one day be Streptocarpus cultivars to meet all of our indoor gardening needs.

The shrubby plants of this genus have fleshy stems and much smaller, less colorful flowers than those of other plants in the genus. The best known of the shrubby types is S. saxorum, which has pleasant, light blue flowers and small, fuzzy, fat leaves. The bushy or shrubby members of the genus Streptocarpus are all best grown in the greenhouse.

Some gesneriads are restricted to the domain of the hobby grower and specialist, only turning up occasionally in commercial nurseries. The variety is astonishing and offers a small world of delightful plants waiting to be discovered by ambitious amateurs.

First in line are the gloxinia relatives, a strangely mixed and fascinating lot. Sinningia pusilla is a tiny plant with half-inch-long, blush-violet flowers. The fuzzy leaves arise from thread-like petioles attached to a small tuber. Despite the tuber, which indicates that the plant goes dormant, S. pusilla is capable of blooming most of the year. There is no finer blooming terrarium plant. A close relative, S. concinna, is a little larger. Its flowers are wider lobed and white flushed with red-purple dots. Crossing of these two relatives has produced a swarm of plants with charming names, including 'Firecrackers' and 'Bright Eyes'. These miniatures have been hybridized with larger Sinningia species having nodding slipper or tubular flowers. The plants and flowers that resulted are larger and suitable for four-inch pots. 'Doll Baby', 'Cindy' and 'Cindy-Ella' are older cultivars that make excellent house plants. They all...
thrive in terrariums and in the open.

Further hybridizing with other sinningias has resulted in the red-flowered 'Tinkerbell' and in the extraordinary Sinningia hybrids often referred to as gloxineras, developed by Ted Bona of Reading, Pennsylvania. The latter are bigger and sturdier, and come in a great range of colors, including a very elegant and unusual tan.

Three other sinningias deserve special mention. S. cardinals has velvety leaves topped with two-inch, red tube flowers arranged like the spokes of a wheel. S. canescens, formerly Recksteineria leucotricha, grows inch-long, pink tube flowers and delightful, woolly-white leaves that look like rabbits' ears. Both go dormant, like gloxinias, but are quite easy to grow in moderate light. Sinningia sylvatica, formerly Seemannia latifolia, is a stemless plant with long, narrow leaves and an orange-red pouch flower set perpendicularly on long, erect petioles. This is also a superb terrarium plant, much neglected at present.

I have had both a red- and an orange-flowered plant of Gesneria cinefolia. Both grew slowly under artificial light, filling five-inch pots and blooming with 30 or more tube flowers every day for five years. 'Lemon Drop', a hybrid of Gesneria citrina produced by Kartuz, was as spectacular. These are truly unique plants. There are a large number of species from Jamaica, Puerto Rico and other Caribbean islands, all of which can be grown in the open or in a terrarium. Such plants do not appear in the shops, since they are too small to attract buyers. Incidentally, they readily produce viable seed.

Nematanthus (formerly Hypocoryta) has charming puffed flowers that earned an early species, N. wettsteini, the common name candy corn plant. To me, it is still the most beautiful of all because of the contrast between the tomato-red and yellow flowers and the brilliant, shiny, green leaves that form a solid curtain around baskets. The gifted hybridizer William Saylor, of Brewster, Massachusetts, has produced many fine cultivars, some with candy-corn-shaped flowers and others with leaves that dangle from thin threads under the branches. 'Aurora' and 'Bijou' are among the few that have been grown successfully in commercial nurseries and sold in florists' shops. They are lovely but are seasonal bloomers that lose leaves in periods of high heat and humidity. Mr. Saylor has also made some attractive hybrids between Nematanthus and Codonanthe. Codonanthe is a charming, trailing shrub with waxy, white flowers. Saylor hybrids are larger and have flushed of pink on the blooms.

Kohleria species are rhizomatous plants with velvety leaves and spires of nodding, trumpet-shaped flowers that are richly colored and spotted. The best known of these is Mrs. Frances Batcheller's fine hybrid, 'Rongo'. There are a number of handsome species and hybrids, including dwarfs. Smithiantha species, commonly called temple-bells, are similar in habit; the flowers tend toward yellows and burnt oranges, and the leaves, rich red. They were extremely popular as holiday gift plants in England a few years ago.

The following are a few of the many other attractive genera in the wonderfully rich gesneriad family.

Agama pyriformis. A big, crawling, semi-woody plant for the warm greenhouse. The upstanding clusters of vibrant red tube flowers, similar to those of Aeschynanthus, are truly startling in beauty.

Bellonia aspera. A lovely woody shrub with little, shiny, serrate leaves and one-inch, five-petaled, white flowers.

Boea hygroscopica. A charming Asian miniature with bright blue flowers for the terrarium.

Chirita sinensis. A species with gorgeous, flat clusters of five-inch leaves that look like leather tooled with a rich design of silver and green. Chirita elphinstoniana is an annual that produces seed readily. Planted at any season of the year, it grows to about a foot in height and bears charming, rich yellow, half-inch flowers.

Chrysanthemum pulchella. A foot-high plant with four-inch-long, serrated leaves and clusters of flowers in the axils. The yellow corollas are short-lived, but the bright orange calyces persist for a long time. The brown-leaved variety is superior in bloom to the green-leaved variety.

Diaspaya. A plant with low, spreading mounds of hairy leaves and small, white flowers with purple spots. There are a number of species.

Gloxinia. The true Gloxinia genus. These plants produce spires of large lilac flowers like short-stemmed Canterbury bells.

Koellekera. A lovely terrarium subject with white, spotted, hairy leaves and hairy stalks loaded with little white and pink flowers.

Nautilocalyx. A sturdy-looking genus of handsome bronze- and red-leaved plants bearing tube flowers in the axils. These plants are of particularly easy culture.

Phinaea and Niphaea. Not true twins. Little Phinaea has white, cupped flowers that are strictly erect. Niphaea is a larger plant bearing five lobed flowers that are somewhat similar to those of Bellonia.

The above is just a small sampling of the enormously rich gesneriad family. Many genera have numerous species and hundreds of cultivars, all of which can be bloomed in the house or greenhouse. The hobbyist who is bitten by the gesneriad bug will never tire of collecting and growing these wonderful plants. —George A. Elbert

George Elbert and his wife, Virginia, have recently completed a revision of The Miracle Houseplants, first published in 1976.
Many gardens are designed for walking—around ponds, along streams, past flower borders, and through woods and herb gardens. The scenes and moods are constantly changing. With so much to see, it is not unusual to find the only seats at some far corner of the garden, placed so the journey can be appreciated in retrospect.

Other gardens, like those of Japanese Zen temples, are for sitting. Here, there is time to witness small events—a leaf falling, or a tree's shadow darkening a bed of moss.

Whatever a garden's style or intent, seats can be used to define an area's use and enhance existing themes. A wooden bench, deep in a corner of meadow grass and wildflowers, becomes an excuse for a picnic, while green bentwood chairs beneath an old apple tree seem to cry out for old friends to take time out for long conversations.

If there is one bench or chair in a garden, chances are it will be used, no matter where it is. But if placed with some thought, seats can be used as design elements to lure people across a lawn or through trees and compel them to linger once they've arrived.

Once you've captured the garden visitor with an invitation to sit down, a bench can focus attention on a scene in the garden, or a view outside the garden can suddenly catch the eye from this vantage point. A seat, perhaps encircled by an arbor of Wisteria, can also become the focal point.

Seating can also be used to highlight an area. For example, a shady and otherwise obscure garden corner can be made bright and inviting, particularly on a hot summer day, by placing a white, wrought iron bench amid hostas and ferns.

Not surprisingly, a lawn is one of the most difficult spots on which to arrange seating effectively. If disassociated from permanent elements like houses, trees or even the shade of trees, chairs—particularly those white, plastic-coated mesh types—invariably look like escapees from the kitchen. But when used as design elements in their own right, variously styled and strategically placed seats can set or reinforce the mood of a garden area, or provide striking contrast.

One lawn chair that is very much in keeping with the mood of an informal

A wooden bench set in a hillside at Dumbarton Oaks in Washington, D.C.
country setting, and very much at home in unkempt grass, is the Adirondack-style chair. Made of simply cut boards that are stained or painted white or green, they look like giant grasshoppers poised for takeoff. Like rustic wicker or bentwood, with their grape-viny look, all of these chairs have an almost organic feel. Their simple, straightforward design makes them seem like the lawn and the land.

The solid English teak garden benches and chairs are successful in a similar way. Like trees, they seem to have grown from the earth. Yet, interestingly, they are entirely appropriate for both formal and woodland gardens. They tend to be a bit more formal if painted white.

A more extreme example of stylistic sympathy between garden and seating occurs in a woodland garden a few miles from my home. There, benches of rough wood, cut from surrounding ash trees and planed on one side, are nailed to stumps sunk beside a stream thick with bloodroot, hellebores and skunk cabbage. This seating is so appropriate to the setting that it seems almost an outgrowth of the woods.

Now that our fancy is attuned to the harmony of site and man's invention, the next seat is all the more unexpected. Through a pine grove, the path turns and the woods open into a beech grove, at the far end of which sits a wild concoction of white marble. A six-foot half-circle, this seat is a tangle of twining grapes and bare-bottomed angels, with scowling gargoyles serving as legs. In short, this is something you'd expect to see in a staunchly formal English garden.

In autumn, walking from the resinous darkness of the pine woods, the beech grove is all crackling gold. At that time of year, the marble bench presents an even more striking picture in its woody setting. It is entwined with ferns and the scarlet leaves of woodbine, Parthenocissus quinquefolia, that echo the leaves of solid marble. The line between the bench's formality and the surrounding wilderness becomes even more finely drawn, and makes for a great bit of garden theater.  

—Margaret Hensel

Margaret Hensel is a landscape designer and writer living in South Lee, Massachusetts.
FICUS TREES IN NUTRIPONICS® WINDOW BOX

See inside page 13 for coupon