# American Horticulturist

Volume 55 Number 4 Summer, 1976

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American
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Volume 55 Number 4 August, 1976



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

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**OUR COVER PHOTO** — A Buttery-Yellow Pansy by Guy Burgess.

Production Coordination, John Simmons

AN EDITORIAL

# Plant Safety

The safety and usefulness of having plants within one's living space is being questioned by concerned persons. The basic problem is as old as botany—how to use plants for their maximum benefits while avoiding their potentially hazardous components. Most plants are safe and useful sources of food, fiber, foliage, and serve as environmental beautifiers. Some plants have traditionally been avoided because of their well-established toxicities. Folk lore, followed much later by clinical and pathological documentations have helped us to identify plants that are dangerous. Due to the relatively low incidence of problems with plants, little recent information has been acquired. However, a healthy concern for reducing the incidence of potentially hazardous situations has caused a rebirth of efforts to determine toxicities of plants, particularly those used for landscaping and interior use.

*I have become aware of the following:*

The use of the words "lethal foliage" for such plants as privet and wisteria.

Statements such as "Every garden is a death trap", or "any plant, eaten in sufficient quantities, can be fatal."

Personalities without any training in botany are being quoted as authorities on safe use of plants.

Broadening of poison plants to include those which traditionally have never caused any problems.

Confusion of uses of plants containing hallucinogenic compounds with those selected solely for decoration.

Interest in the safe use of plants has never been greater. The variety of plants offered for sale has been expanded to include many species that have never been distributed to consumers before. They are also being placed in locations where they become the major space design element and are exposed to frequent handling and human contact. This increases their chances of being ingested, abused, mangled, and destroyed. Plants are being vandalized and pilfered because of their value and symbolic use in the community.

An educational program backed with credible information is needed to present the actual situation before the public. Information must be drawn from all sources, correlated, and presented in forums where every consumer will understand its full meaning, actual and implied. *It is only when consumers have trust in the safety of plants that irresponsible reports will be viewed as exceptions rather than an indictment of plant material as a whole.*

To achieve this significant change in view, certain steps of education must be provided to people who are involved in the day-to-day handling of plants. Additional information must become available to the people who administer the diagnosis and remedial action for suspected plant toxicity. The information needed consists of the following:

- Survey of literature—ranking of usefulness of printed material.
- Directory of research workers with access to scientists with specific information on particular groups of plants.
- Directory of Poison Control Centers—review procedures for reporting incidences, separate circumstantial and hazardous acts.
- Guide for store operators (any plant outlet) to answer questions about plant safety.
- Suggested labelling statement to include information on safe use.
- Develop questionnaires for the detection and ranking of potentially hazardous plants; develop plan to obtain valid research information, interpret it, and make recommendations for safe use of plant material.
- Discover, within a species with documented toxicity, selections or closely related species which can be used as a substitute for potentially hazardous plants.

**TASK FORCE**

Under the identified leadership of the American Horticultural Society, a task force committee is being considered. The Society would serve as the credible forum for all consumers—working with the support of many organizations, but with the voice of the gardener-consumer. The committee would:

- Identify and report potential problems of safety with plants.
- Follow-up reports to obtain specific information useful for all committee members.
- Serve as spokespersons to help release positive and realistic facts about plant safety to the media.
- Develop practical mechanisms to involve Federal and State governments in researching and publishing information about plant toxicity.

Dr. Henry M. Cathey. President

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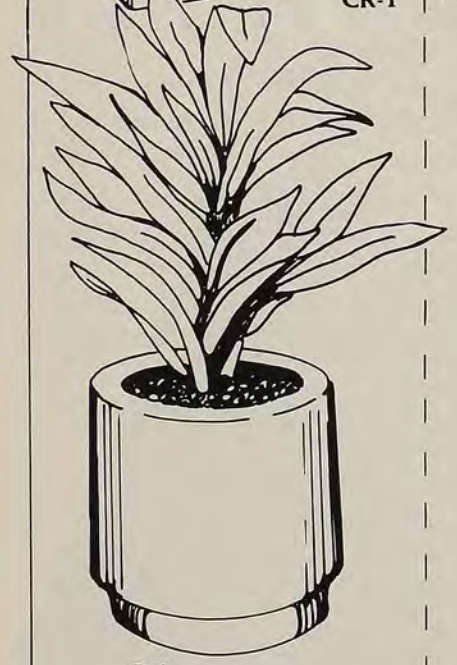

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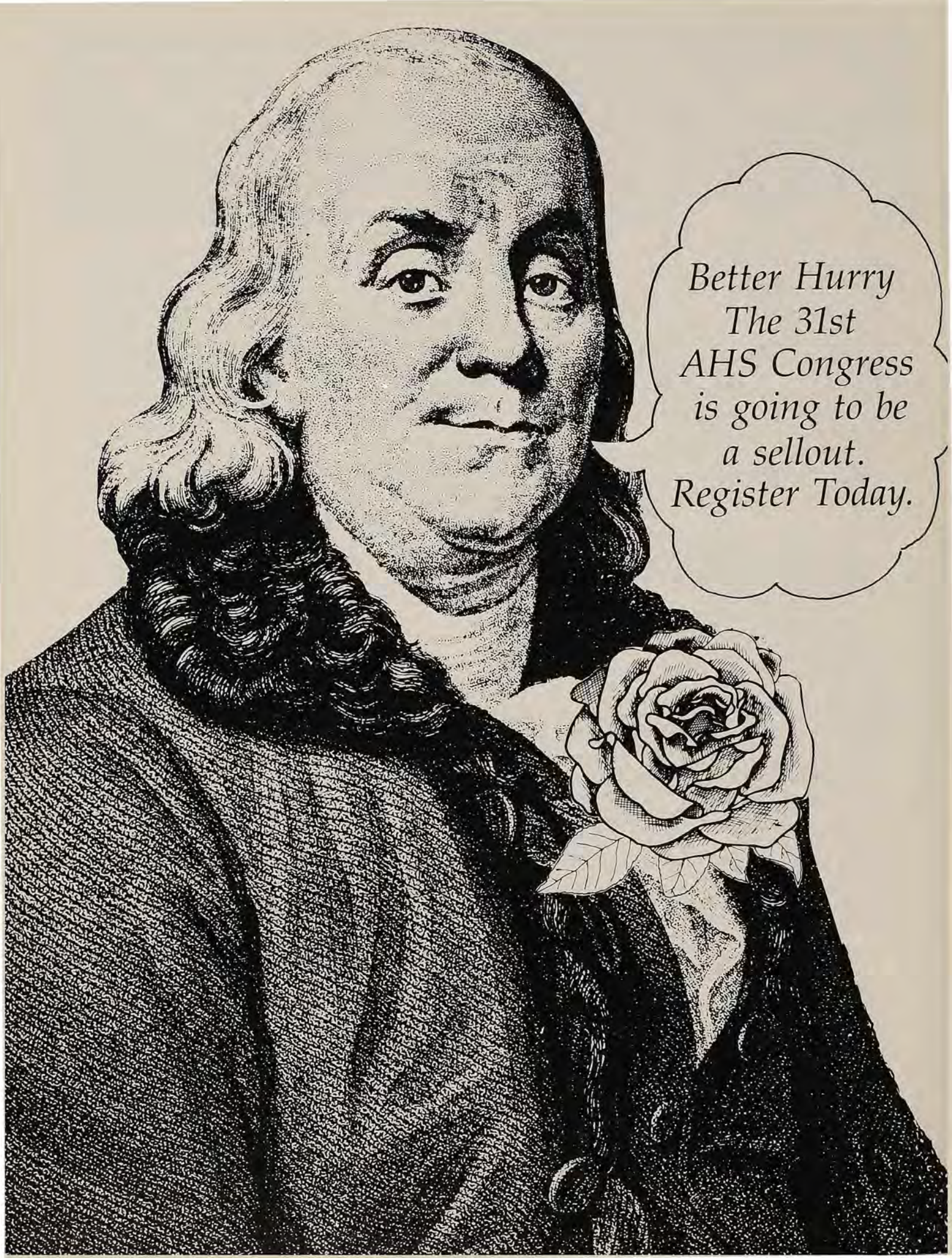
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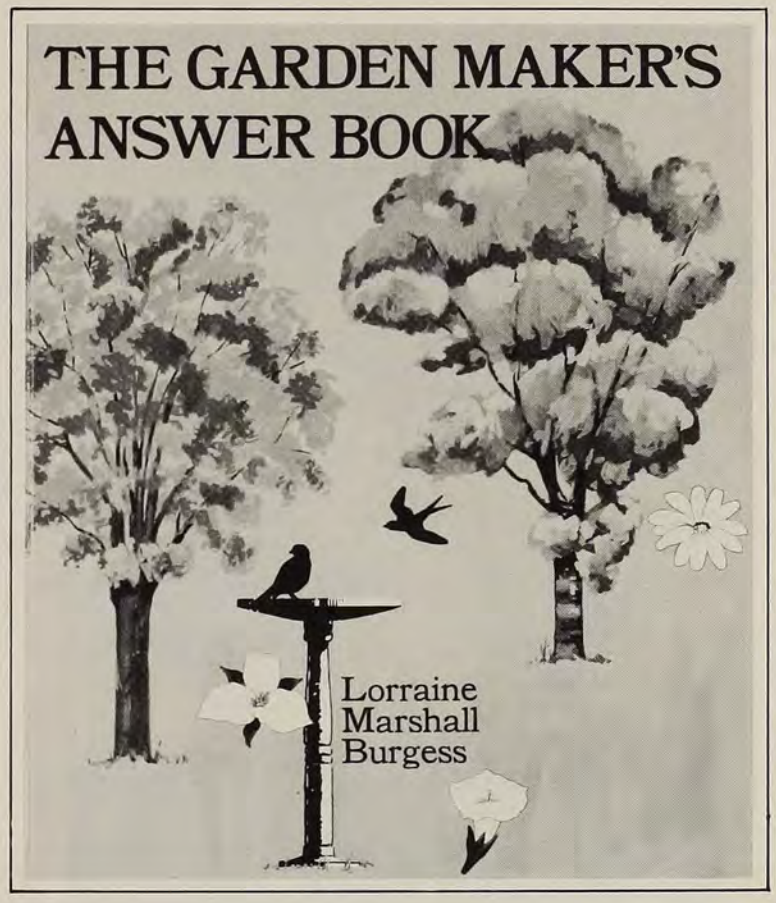


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# Flowers As a Natural

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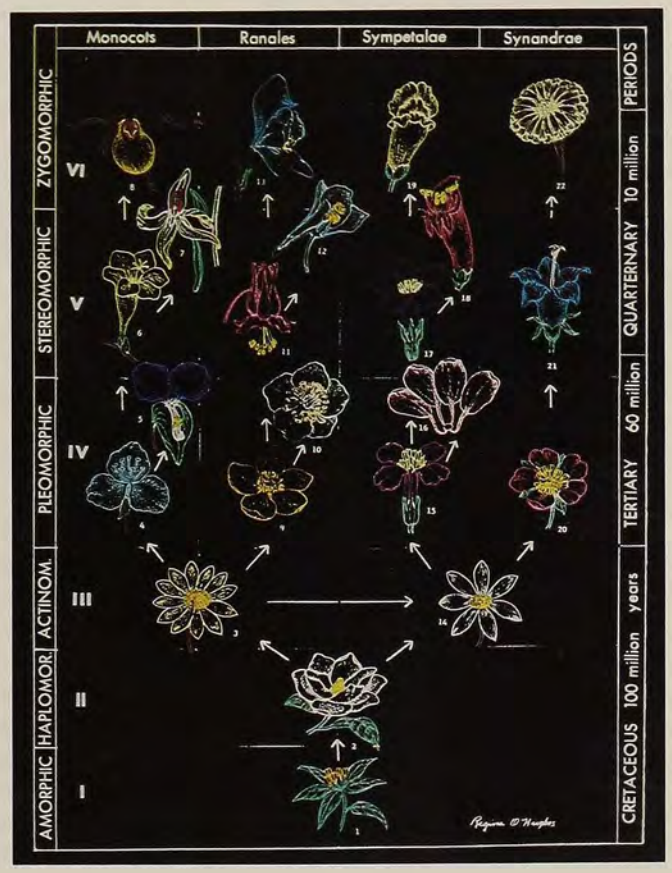
# Source of Beauty.

6

Regina V. Hughes

LEFT-Reconstruction of flowers whose fossil pollen has been found and identified from the Shanidar, Iraq, graves of early Neanderthal cavemen of the Paleolithic period, about 60,000 years ago. 1. Yarrow, or milfoil, *Achillea millefolium* L. 2. Blue-bottle, *Centaurea cyanus* L. 3. Knapweed, *Centaurea scabiosa* L. 4. Grape hyacinth, *Muscari botryoides* L. Mill 5. Ragwort, *Senecio jacobea* L. 6. Marshmallow, *Althaea officinalis* L.—These drawings represent the common species of corresponding genera, whose occurrence in Iraq during late Paleolithic period appears most likely.

BELOW-Historical development of flower types during the evolution of angiosperms in the last 100 million years.-I level: *amorphic* flower types.-II level: *haplomorphic* types.-III level: *actinomorphic*.-IV level: *pleomorphic*. V level: *stereomorphic*.-VI level: *zygomorphic* flowers. Arrows indicate the successive floral evolution in main phylogenetic groups of angiosperms (Monocots, Ranales, Sympetales, Synandrae). Explanation see in text. Rearranged scheme from an earlier report (Leppik, 1972).



# Flowers As A Natural Source of Beauty

Man has always adored flowers for their mysterious beauty and has used them in social and religious observances. Even so, many art students were surprised when R.S. Solecki discovered abundant pollen grains in the burial caves of Neanderthal man, who lived in the Paleolithic period, about 60 thousand years ago. In soil samples taken from a cave in Shanidar, Iraq, pollen grains occurred in clustered groups around buried bodies, as residuum from archaic "bouquets" or "funeral wreaths".

From these pollens, 28 species were identified, predominantly Compositae, including: Yarrow, or milfoil *(Achillea)*, blue bottle *(Centaurea)*, ragwort *(Senecio)*, wormwood *(Artemisia)*, grape hyacinth *(Muscari)*, Marsh-mallow *(Althaea)*, and *Ephedra*. Except for *Ephedra*, these genera have flowers of brilliant colors, such as pure white, blue, pink and yellow.

The suggestion that Neanderthal man might have brought flowering plants into burial caves for their herbal and medicinal properties is unconvincing and unprecedented. Although most of these plants are known to possess such qualities, it is difficult to imagine that primitive man had much knowledge or experience with their every-day use. In such a case, they might also have supplied the dead with fruits, leaves, roots or other plant parts with curative properties, instead of flowers. The more plausible theory is the use of flowers for funeral rites. All Shanidar cave flowers would well fit any present-day funeral ceremony or grave decoration. Solecki suggests that the presence of flowers in burials indicates that Neanderthal man must have had a concept of spirit and must have practiced funeral rites.

### Flowers may have Stimulated the Beginning of Paleolithic Art

About the same time that the early caveman became aware of floral beauty, the first elementary paintings appeared on cave walls. These paintings belong to a time before the oldest civilization and the earliest agriculture, the Upper Paleolithic period at the end of the last continental glaciation. More than 100 decorated caves exist in France and Spain, and thousands of engraved or sculptured objects have been found from the Urals to the Atlantic. These artifacts indicate that early man had a full range of human feelings and aesthetic responses to nature, which elevated him above the animal level. However, some of these cave pictures are supposed to be the work of Cro-Magnons, who are classified as *Homo sapiens*, the true human species.

Because Paleolithic man was mainly a hunter, wild animals dominated contemporary wall paintings. Nevertheless, there is considerable evidence that edible fruits, seeds, and plant roots were collected for food and that flowers were used for decoration.

Man did not and could not influence the evolutionary development of wild flowers. All existing flower types were perfected long before man. Early man found himself surrounded with brightly colored wild flowers, and in this environment he presumably began to develop his own sense of beauty. Of natural objects, none was so well adapted for the stimulation and cultivation of aesthetic senses in man as were flowers. It is no wonder, therefore, that the development of Paleolithic Art concurred with the evolution of intelligence and awareness of floral beauty in the early man.

### The Purpose of Brightly-Colored Flowers in Nature

Most floroecologists today agree that colored perianths (sepals and petals) of flowers have evolved in response to the selective activity of food-searching insects, which act as plant pollinators. Provided with perfect senses for perception of colors, odors, and floral symmetry, pollinating insects, birds, and some bats can distinguish flower types. In a continuous search for better food sources, skilled pollinators unconsciously select for more attractive colors and odors, thereby making very important selections among flower types. In fact, the inherited instincts of pollinators determine which plant gets pollinated for seed production and which remain without offspring.

Insects cannot see the translucent nectar and hidden pollen from a distance as they look for food. In this respect, their food-searching habits differ radically from those of animals and man. Other animals directly view their food, but insects locate it with color, odor, form and symmetry. Their senses must be more perfected than those of higher animals and man, who seldom find food from flowers. Thus insects have been closely associated with flowers for at least 200 million years. Man has been interested in flowers only since prehistoric time, and not as a food source. During this long period insects obviously developed their panesthetic senses and instincts to relatively high levels in comparison to the same instincts of other animals. Higher animals, except

anthophilous birds and some bats, are disinterested in floral beauty.

Recent investigations show that a close association exists between flower form and sensory perception in the different classes of insect pollinators. It is well established that insects and flowers have been closely and mutually interrelated in evolution as reciprocal selective factors. The historical sequence of origin and development of flower types under the selective pressure of pollinating insects lends support to the

theory that this relationship existed during the whole period of evolution of angiosperms.

This concept resolves the mystery of colored flowers and enables us to better evaluate this natural source of beauty. With this perspective we can judge the relative sophistication of flowers in their evolutionary sequence.

### Evolutionary Correlation of Flower Types with the Sensory Development of Pollinators

The following six "type classes" are proposed for the classification of flower types according to their morphological characteristics, I: amorphic; II: haplomorphic; III: actinomorphic; IV: pleomorphic; V: stereomorphic; and VI: zygomorphic.

I. AMORPHIC LEVEL. Amorphic flowers in the primitive stage of development are without special symmetry and without particular colors. They consist of an unrestricted number of stamens and pistils, frequently surrounded by a number of bracts or discolored upper leaves. Most pollinators need no special sensory abilities to distinguish such primitive flowers from common leaves of plants.

II. HAPLOMORPHIC LEVEL. Haplomorphic flowers are characterized by hemispheric arrangements of semaphylls (mostly petals) and by their simple colors such as white, yellow, greenish, or pink. They are freely accessible to all insects, but are visited mainly by beetles, flies, bugs, and other unskilled pollinators. *Magnolia, Liriodendron, Nelumbo, Nymphaea,* and other phylogenetically primitive genera of the order Ranales have flowers of such simple structure.

III. ACTINOMORPHIC LEVEL. Actinomorphic flower types have an outspoken radiate symmetry with stamens, pistils and semaphylls (mostly petals) in one level. They are freely accessible to all visitors.

There is substantial evidence that actinomorphic flower types evolved from haplomorphic flowers by rearrangement of petals on one level. Imprints of actinomorphic flowers are known from the Cretaceous and pre-Cretaceous periods.

IV. PLEOMORPHIC LEVEL. Pleomorphic flower types can be easily derived from actinomorphic flowers by reduction of the number of petals (or semaphylls) to definite lower series such as 10, 8, 6, 5, 4, 3, 2, and 1. Such numeral patterns in flowers are easily distinguished by their symmetrical arrangement and, therefore, are called "iconic or pictorial numbers".

V. STEREOMORPHIC LEVEL. Three dimensional stereomorphic flowers retain their formal pleomorphic pattern in front, but extend a long tube or spur for nectar. Such floral structure requires in their pollinators an ability to distinguish three dimensional patterns and a long enough proboscis to locate and reach the concealed nectar in the depth of the flower. Only skilled pollinators of higher evolutionary levels can exploit stereomorphic flowers.

VI. ZYGOMORPHIC LEVEL. Zygomorphic flowers represent the highest level of floral evolution with many particular types adapted to special pollinators. In spite of their great variability zygomorphic flowers are easily distinguishable from all other types. They have distinctive bilateral symmetry, variegated, but harmonious, combinations of colors, and finest odors. According to present knowledge, this superior level of floral evolution corresponds to the highest stage in sensory development of anthophilous insects. Pollinators of zygomorphic flowers must necessarily possess the ability to distinguish bilateral symmetry, harmonious combinations of colors, and orient themselves in a three-dimensional space.

### Flowers Provide Food for Sustenance of Insects, which are Needed for the Pollination of Field Crops and Fruit Trees

Beyond their decorative value, flowers and ornamentals help to maintain populations of important crop pollinators. Many of our garden and field crops that need insect pollination bloom for a short period, but require armies of insects for pollination during their short blooming season.

Increasing flower cultivation in gardens and towns and on highways and turnpikes, in addition to the aesthetic appeal, provides food for pollinators and increases the land productivity. Anyone can be easily convinced of this fundamental truth by taking a few minutes to watch how many insect visitors

seek food from a blooming flower bed.

Our present flower breeding and garden architecture is exclusively man-oriented, ignoring the importance of outdoor flowers as food sources for pollinating insects. Most of our fashionalbe flower cultivars, such as 'Spoon' and 'Spider' chrysanthemums, 'Shasta' daisies, hybrid marigolds, some tulips, and pansies are inaccessible to pollinating insects. On the contrary, other cultivars, such as 'Red Mischief' chrysanthemum, have a strong pleasant odor and a rich supply of nectar. 'Red Mischief' is intensively visited by honeybees, wild bees and many other pollinators during the late fall when other flowers are scarce.

### Flowers and Ornamentals for Landscape Architecture

After extensive extermination of natural vegetation and wild flowers in cities as in the areas of intensive farming, man soon began to long for trees, green lawns, flowers and birds. This most natural urge is a part of the development of human intellect, characteristic of all nations and civilizations. The incentive to landscape decoration is in full expansion in all countries. The number of professional landscape architects is increasing, and the demand for plant material for scenic purposes is persistent.

Further stimulus for landscape decoration has been developing from various official and semi-official environment and beautification projects. Their objectives require exploration and introduction of new material.

### Flowers for Turnpike Decoration

Our rapidly expanding interstate highway system urgently needs landscaping. For this purpose a tremendous volume of flowering plants that are adapted to specific environments is necessary. New opportunities are open, both for commercial flower breeders and nurserymen. New material is needed for mass plantings under various climatic conditions to help travelers in jeopardy of "highway psychosis", considered to be a reason for highway accidents. If we consider the enormous capital invested in the construction of highway systems and the millions of travelers who will benefit from them, the idea has some economic basis. Highways landscaped with flowers are common in European states.

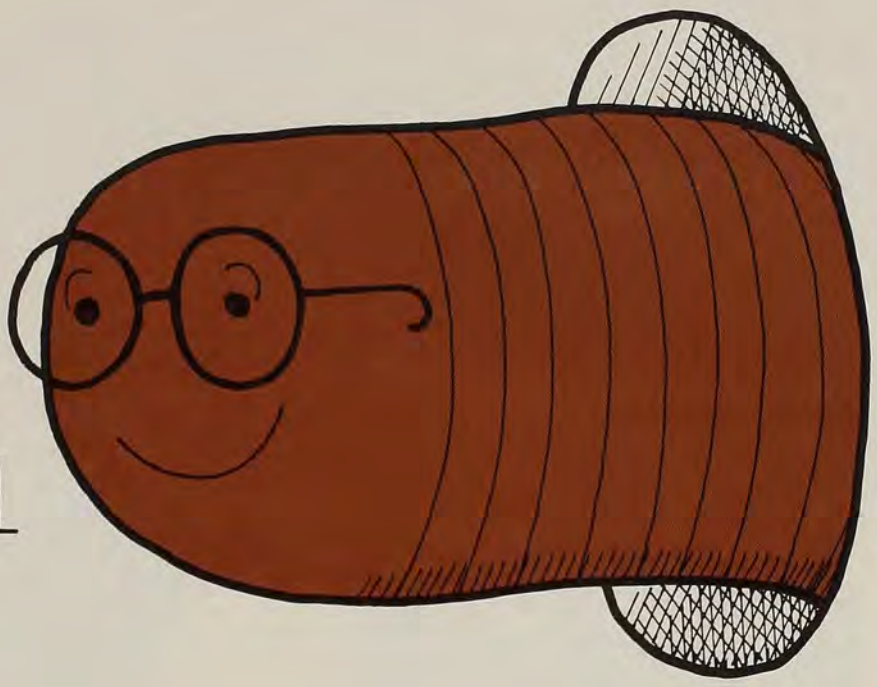
### Conclusions

Flowers provide motifs and material for artists, painters, poets, writers, gardeners and landscape architects for highly diversified creative work. In flowers, we find excellent combinations of form, symmetry, harmony, brilliancy of colors, and pleasant odors. All of these properties are united into well-proportioned entities.

Acquaintance with wild flowers and their introduction into human environment has enriched many facets of our lives with spiritual values and aesthetic satisfaction. The study and use of these living, self-perpetuating sources of beauty help to maintain close contact and intimate communion with nature.

Early intelligence in man and his elementary ability to recognize beauty very likely evolved in an environment harmoniously ornamented with wild flowers. Later, man started to grow flowers in his closest surroundings. He planted them in gardens, flowerbeds, parks, greenhouses, and window boxes and he even brought them into his house. The present high level of human art and architecture is almost unthinkable without flowers. The further development of human culture will equally depend on the use of this essential source of beauty. Horticulturist and gardener have the solemn duty to maintain and safeguard these living sources of beauty for our own needs as well as for those of succeeding generations.

# Does The Worm Turn?



*R. Milton Carleton*
*322 North Garfield Avenue*
*Hinsdale IL 60521*

Perhaps no agency in gardening is more sacred to the dedicated organic gardener than is the earthworm. For the past several decades, it has been credited with being the source of all fertility, a magical organism which by its very presence can turn any soil, from sterile sand to stubborn clay, into rich gardener's loam. To destroy this Avatar with a stroke of the pen seems brutal, yet in the end an understanding of the true nature of the earthworm will end an error which has cost gardeners more than it is worth.

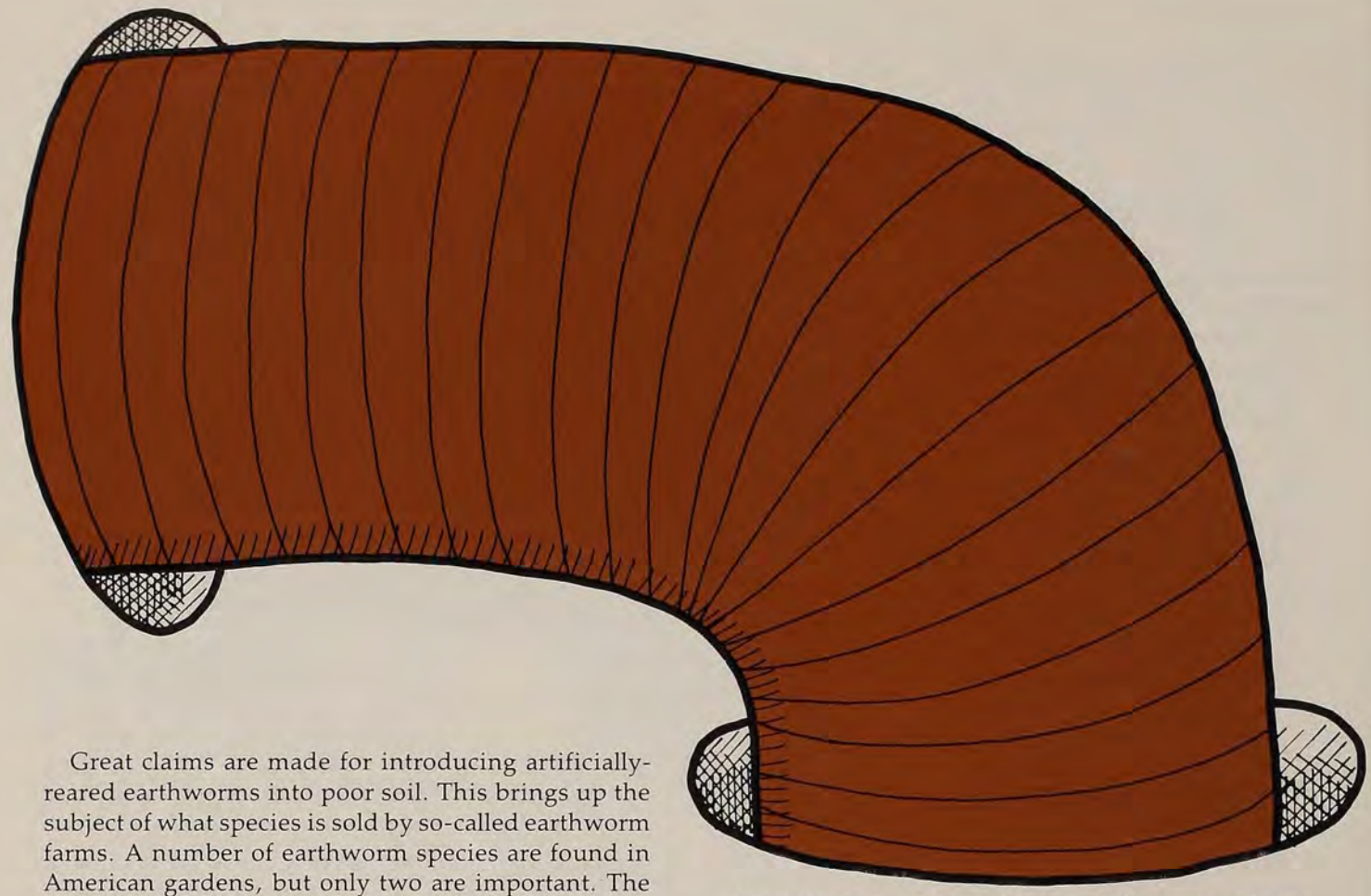
The original error behind this idea can be laid upon the grave of no less a scientist than Charles Darwin, whose book "The Formation of Vegetable Mould," is one of the sacred books of the organic gardening fraternity. Of that error, more later.

As every high school student of biology learns early in his study of that discipline, only plants are capable of capturing energy from the sun and storing it as starches and sugars—the fuel on which all living animal life depends. What is important to understand is that earthworms are not plants, but belong to another kingdom, admittedly far down the ladder of evolution, yet at the same time a creature that *consumes* energy (i.e. fertility) but is incapable of creating it. To survive, they must draw on the energy reserves already in the soil for energy.

As well-known to scientists, but overlooked by gardeners, is that earthworms are incapable of surviving in low grade soils deficient in organic matter. The fact that they are found only in rich soils has confused cause with effect and credited them with creating fertility rather than consuming it. To feed themselves, they must pass relatively-undecomposed (or intact) organic matter through their digestive systems.

True, in doing so they degrade complex organic materials into simpler forms and so assist in the formation of humus. However, they exact a price, leaving behind less fertility than was contained in the original complex substance. They are not alone in this and are far less effective than are microorganisms such as fungi and bacteria. In fact, theoretically there would be more nutrition (energy for these more efficient organisms) if earthworms were not present. The amount of organic matter passed through earthworms is not insignificant: Darwin and others estimated that in a year's time, in rich soils they turn over about 15 tons per acre.

As large as this may seem, it adds up to about one-tenth of an inch per year. They do not confine their activities to this thin upper layer, since they tunnel quite deep at times, particularly in winter. This credits them with more soil than is actually moved, since at times, they must mull over the same materials they moved in previous years. In any case, they would need from 70 to 100 years to turn over and mix as much earth as a gardener can do in an hour with a rotary tiller.



Great claims are made for introducing artificially-reared earthworms into poor soil. This brings up the subject of what species is sold by so-called earthworm farms. A number of earthworm species are found in American gardens, but only two are important. The first is *Lumbricus terrestris*, a dark red worm found in soils high in organic matter. The second is *Allolobphora calignosa*, a grayish-pink species that can survive with somewhat less fertility, but not in poor sands or stiff clays.

In both species the body is composed of interlocking segments, interrupted at about one third of the length by a smooth, unsegmented area called the girdle. Both propagate readily in garden soils. We would expect to find one or the other species in packages supplied by earthworm farmers but this is usually not the case.

To speed up propagation, many earthworm farmers use cultures that contain relatively high amounts of protein compounds added to manure or humus. As protein breaks down, it releases large amounts of ammonia, a substance which can be fatal to the two common species just mentioned. For this reason, most earthworm farmers propagate the manure worm, *Eisenia foetida*, which is able to survive ammonia. To raise worms for fishing, I have grown this species under wire chicken roosts in a six inch layer of peat moss. Anyone familiar with poultry can testify how much ammonia a few hens can generate. Unfortunately for the organic gardeners who buy these cultured worms, they can only survive in soil that has been manured recently. Once the manure has been reduced to humus, they die out.

Much is made of the ability of earthworms to bring up subsoil fertility. This may be true for shallow-rooted plants such as alyssum and petunia, but most crop plants are capable of sending roots as deep as most earthworms burrow. Another weakness in this theory is that their burrows are lined with a near-water-tight coating of lime. In the vegetable garden, this is broken as the soil is tilled, but in the perennial border there is little exchange of fertility.

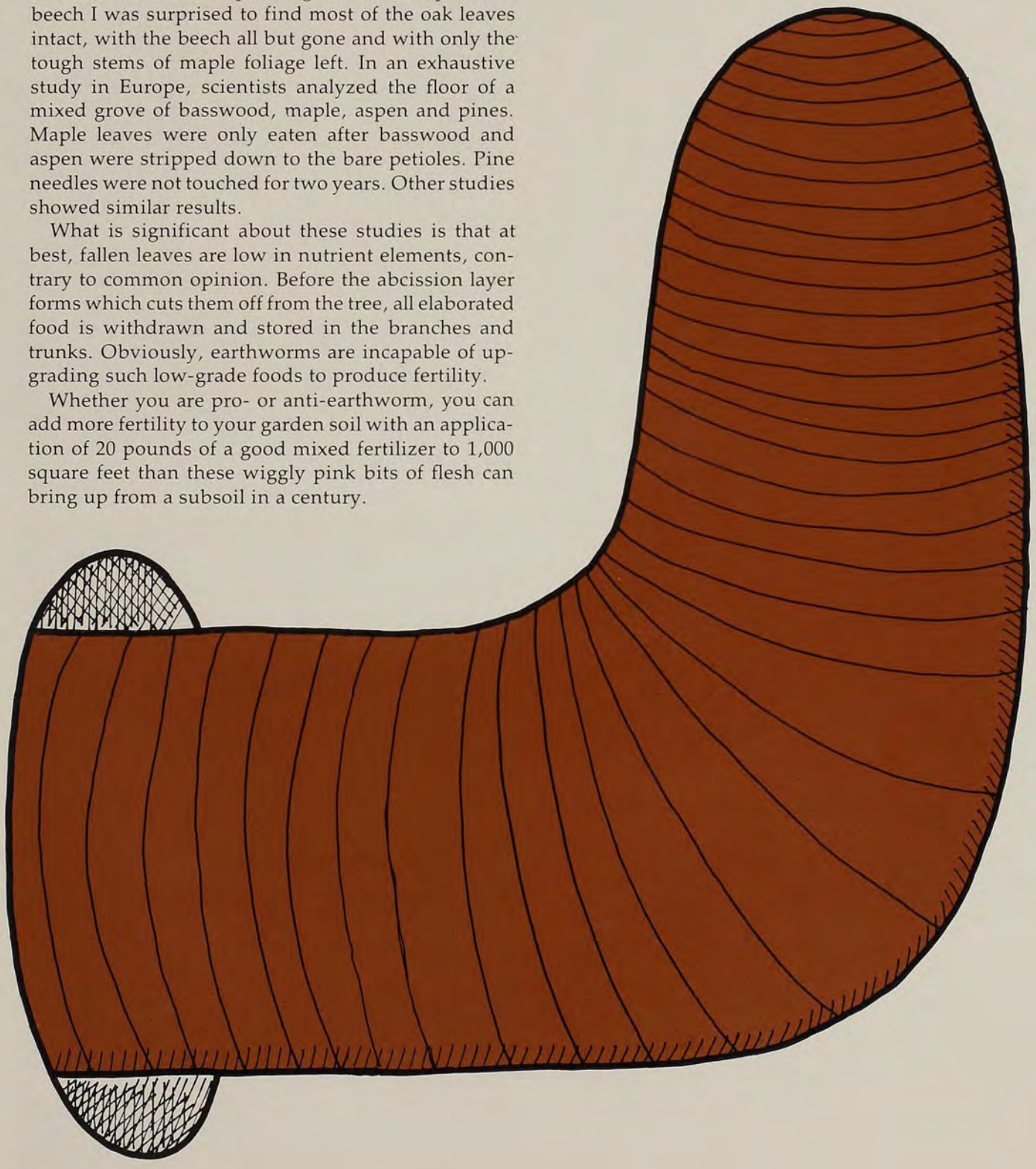
Recently, there has been less talk about "hybrid earthworms" but they are still mentioned. Although hybrids may exist, in most common species, a type of parthenogenesis makes their occurrence highly unlikely. In sexual matings, only species with identical organization of the body segments can copulate. Since worms are hermaphrodites, mating pairs fertilize each other. Or they may change sex at different stages of growth. To add hybridity to this complex sex life seems hardly fair.

A great deal of fuss is made about the richness of earthworm castings. This is a myth so absurd that it is difficult to understand how it got started. I have had laboratory tests run on commercial packages of such castings: the "NPK" contents were lower than the water of a creek in our village. In one typical test of a one-pound package, the nitrogen content was 5/1,000ths of an ounce. At $1.00 a pound for the package, that gave a cost of $200 an ounce for this one element.

The low fertility value of castings is not surprising when the feeding habits of worms are studied. Even in lawns, worms prefer feeding on grasses, which they pull down into their burrows. They by-pass clovers and other more nutritious organic substances. Most surprising is their feeding on fallen leaves in woodlands. They are quite selective. In brushing over the litter in a mixed planting of oaks, maples and beech I was surprised to find most of the oak leaves intact, with the beech all but gone and with only the tough stems of maple foliage left. In an exhaustive study in Europe, scientists analyzed the floor of a mixed grove of basswood, maple, aspen and pines. Maple leaves were only eaten after basswood and aspen were stripped down to the bare petioles. Pine needles were not touched for two years. Other studies showed similar results.

What is significant about these studies is that at best, fallen leaves are low in nutrient elements, contrary to common opinion. Before the abcission layer forms which cuts them off from the tree, all elaborated food is withdrawn and stored in the branches and trunks. Obviously, earthworms are incapable of upgrading such low-grade foods to produce fertility.

Whether you are pro- or anti-earthworm, you can add more fertility to your garden soil with an application of 20 pounds of a good mixed fertilizer to 1,000 square feet than these wiggly pink bits of flesh can bring up from a subsoil in a century.



# A Japanese Garden in Colorado

*Color Photos: Guy Burgess*
*B/W photos and data: Lorraine Burgess*
*202 Old Broadmoor Road*
*Colorado Springs, Colorado 80906*

Working in thoughtful and careful ways, over a period of twenty years, the Morris Esmiols of Colorado Springs have designed and built a handsome garden inspired by Oriental design concepts. Mr. Esmiol is the family's horticulturist and Mrs. Esmiol (Lucille) the garden's designer. This spry and still young couple has been gardening together for over 57 years. They do have garden and household help but they remain in charge of their lifetime garden projects. They consider their preoccupation with Japanese garden theories a 'recent' enthusiasm of the last two decades, occurring with their move to their present home on a six acre plot.

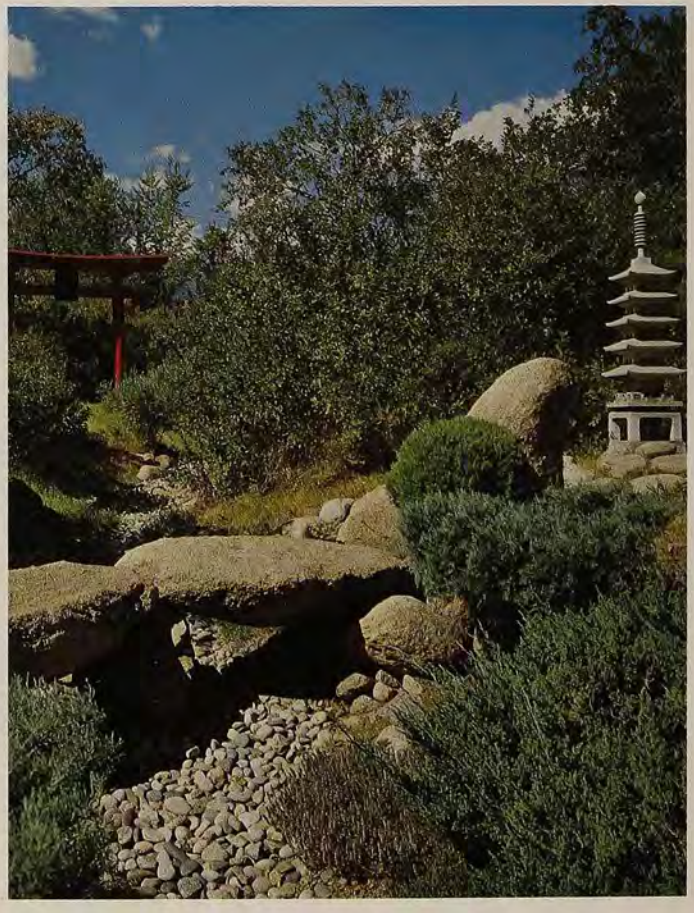
Their retirement garden is on a choice piece of land in a wooded valley beside a gently-moving stream, and surrounded by glorious mountain peaks. Through the years they have used the natural gifts of the land well, taking daily pleasure in each large stone in this boulder-strewn landscape, in the native cover of scrub oak *(Quercus ilicifolia)*, Colorado blue spruce *(Picea pungens)*, and soaring pine *(Pinus ponderosa)*.

While on world travels they discovered the merits of the theories that govern Japanese design, and realized how these principles might apply to their own garden land. They returned to Colorado bringing with them a few authentic Oriental ornaments to mark their discoveries, and with this a new kinship, to set about developing their own garden treasures. Today they generously give each other credit for the success of their garden project.

They have designed wisely for their retirement years, relying in large part on natural rainfall to sustain the plants. Their orchard is still the joy of their lives with fruit trees espaliered onto wire fence supports for easy harvesting. Their plot is large but many

RIGHT-Esmiol's 'Nikko' bridge spans Cheyenne Creek. It is a copy of the Emperor's bridge in Nikko, Japan.

BELOW-A dry creek bed in Colorado is traversed with a two-stone Japanese bridge. The torii gate is in traditional red, the pagoda replica a pathway ornament.



A roofed gate divides the dry stream garden from the orchard area. In Japan the roofs are generally made with thatch. Here bamboo fencing and bamboo poles are combined to give a similar effect.

of the theories they have followed to achieve low-maintenance are applicable on far smaller plots.

Entry to the garden is up a winding private road, along which the native cover has been embellished with wild currant, decorative grasses, and mountain wildings. The first distinguished feature is a Zen garden where with a sparsity of elements the landscape is arranged around a grouping of handsome boulders, inset in a native ground cover, encircled by white river pebbles, and enclosed by the twisting trunks of scrub oak.

At a clearing further up the road a waiting bench is installed. Here visitors are expected to ring a bell and wait in the shade until they are invited further. Then as the road nears the house it follows a broad circle around two other groupings of large boulders. Beside the house a dry creek bed has been surfaced with polished river pebbles and planted with creeping evergreens. The creek bed is spanned by a stone bridge leading to the orchard area. Another path parallels the creek bed upstream, through the torii gate and into a honey bee and wilding area. The traditional torii arch was used beside temples as a perch for birds offered to gods. But with the introduction of Buddhism the temple significance was lost. However, the post and beam structure is still featured as a decorative ornament in large gardens today.

All of the Esmiol paths meander out from the terrace lawn which offers a longer view of the mountain peaks. One path crosses the "Nikko" bridge to the far side of the running stream, travels along the water's edge and back to the house by a second crossing. The Esmiols are proud of their replica bridge, fashioned by local cabinet makers from drawings, reference photos, and a miniature scale model brought back from Nikko, Japan, the home of the original Emperor's bridge.

Lucille Esmiol's enthusiasm for Japanese design is durable and contagious. She advises new practitioners to use the natural beauties of their own environment—running water, stones, skylines, and low-maintenance native plant material. She says rocks and stones are fine, but not enough. We must study their size and relationship, one to another. Never use less than three large stones and, if you have them, use many more—like ships going out to sea. Seek the essence of your surroundings and emphasize these elements. Describe and define routes out and around your garden as tour paths for your guests. Include surprises along the way, an unexpected small sculpture, a special flowering tree, a longer garden vista. Seek out and enjoy these quiet family pleasures. They are in fact universal garden delights.

Lorraine Marshall Burgess is the author of The Garden Maker's Answer Book, published this spring by Association Press, N.Y. ($6.95)

# Environmentally Tolerant Plant List Now Available to Members


The Educational Horticultural Committee of the American Horticultural Society has conducted a nation-wide survey and produced a list of environmentally tolerant plants for all ten U.S. hardiness zones. The 30-page compilation, titled "Environmentally Tolerant Trees, Shrubs and Ground Covers", was made possible in part by a grant from the Founders' Fund of the Garden Club of America. The listing was produced by the American Horticultural Society Plant Science Data Center.

According to Mrs. Pendleton Miller, co-Chairman of the AHS Educational Horticultural Committee, "The plant listing is designed primarily for use by public planting agencies who must maintain areas subject to high pollution levels as well as heavy human and animal traffic". Mrs. Miller comments that: "Many plants are faced with surviving unavoidable environmental stress: the weakening factors of air pollution, general traffic abuse and pedestrians, automobiles and pets." Further, one must consider that public planting agencies must function under their own financial limitations. Funds are rarely available for providing other than minimum drainage, soil preparation or maintenance. Realistically, this adds up to the necessity of using plant species which can not only survive a combination of environmental stress/abuse, but at the same time be given minimum growing conditions and maintenance.

Mrs. Miller emphasizes that these plants do exist and we should both accept and use them. If you wish a copy of this valuable AHS publication, fill in coupon and mail today.

**American Horticultural Society**
**Mount Vernon, Virginia 22121**

YES! I would like to order the Environmentally Tolerant Plant List.

☐ $2.95 check enclosed ____ additional copies at $2.95

Name _____

Address _____

City _____ State _____ Zip _____

# More than Zinnias, Earlier

If there is one extravagant, opulent, self-indulgent appurtenance worth reviving from the great country places of earlier days, it is the cutting garden. Filling one's own house with flowers, arriving at a friend's gate with an armful of tulips, or surprising a neighbor who doesn't even know you with a doorstep basket of dahlias is the kind of self-enrichment no gardener should have to forego.

Such profligacy cannot come, sensibly, from carefully composed herbaceous borders, patterned spring pictures, or color grace notes for the driveway or doorway overture. The kind of feeling described in the popular song line "flinging popcorn and pearls" can only be reached when the hands that planted the Golden Yarrow can pick all the blooms to hang upside down in the garage to dry, with no one to complain that yellow was needed against the steel-blue of the globe thistle flowers.

A cutting garden should span the seasons; July and August are not enough. Tulips and Columbine can precede the annuals—with giant fall daisies to follow. The garden should be its own place, designed behind a strong space divider, so that one is not ever tempted to consider it as part of the landscape scene. It should have practical rows and divided beds as vegetable gardens do, with no nonsense about decorative edgings or ground covers. Cutting flowers should be grown as crop plants, with perennials, biennials, bulbs and annuals ruthlessly separated for ease of soil preparation at the appropriate times. Paths should be practical—bare soil where tillers must be run each season, wood chips between perennials that must be thinned frequently, hard surface materials only where they need not be moved or muttered at. Such a work garden can have its own neat compost bin, pit or heap as the gardener prefers, an outdoor work table and rubbish basket as needed without apology. An appropriate storage cupboard may be the ultimate convenience. Gardens grown for production of cut flow-

Snapdragons, Zinnias, and Cosmos

Pink Cascade Petunia

# than Marigolds

*Jane P. McKinnon*
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ers are like fine kitchens used by a serious cook—workspaces, tools and storage facilities, if well-organized and neatly kept, are handsome in themselves.

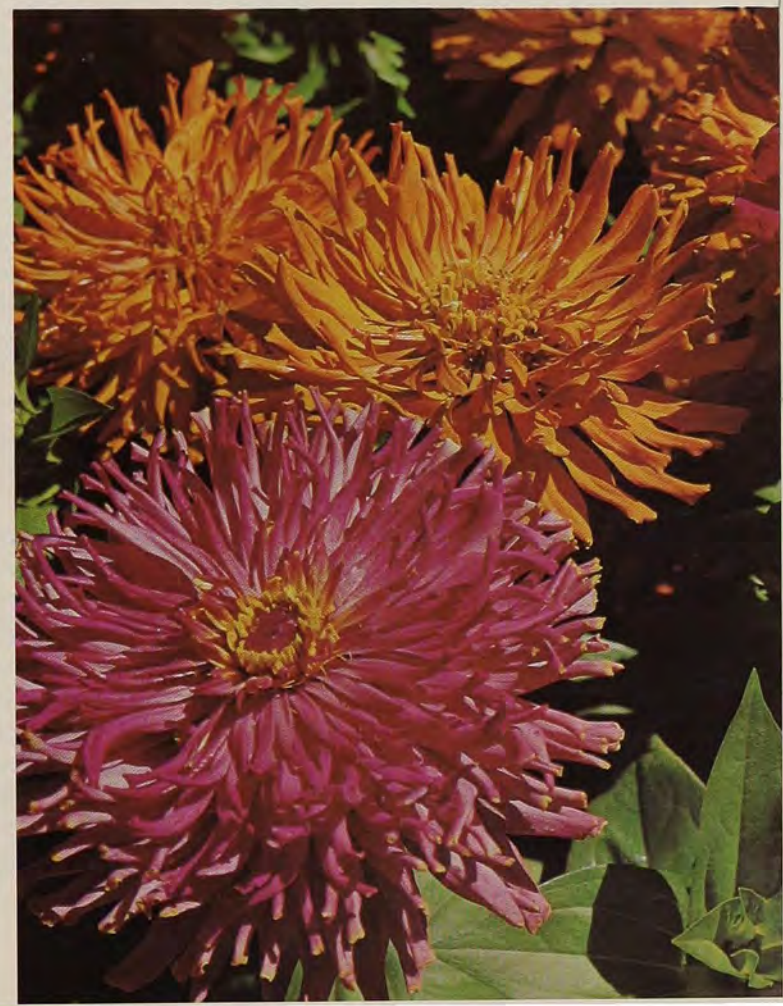
To begin this kind of gardening experience, select a site in full sunshine, with good drainage and access to water. Cut flowers seen at close view must be reasonably unblemished, and they ought not bring crawling visitors to the table. Plan a calendar for planting, beside a list of flowers by blooming dates. Have the soil tested at a professional laboratory. Land-grant universities in most states will perform this service for a modest fee.

And next, pay attention to what the soil test says. Gardens in the East and South may need an entirely different combination of N-P-K, lime and micro-elements from those in the Midwest and West. Gardens where the pH is high and the rainfall is low will have requirements for soil preparation with little relation to good practices for Massachusetts or Mississippi. If soil structure is wrong for easy cultivation to good tilth, amendment should be made at the beginning. Perhaps the only common denominator nationwide is the need for incorporating organic matter at first tilling and during each year's cultivation, unless one puts a cutting garden in a peat bog. Nothing else can be assumed, no matter what one reads. Local information for fertilizing is just as essential as local information for planting dates. Cutting gardens are grown for their crops, and fine blooms on sturdy stems will need all the elements essential for plant growth. If soils lack available iron, it must be supplied. If phosphorus is low, fertilizer should remedy the deficiency. As nitrogen leaches away in frequent rains and watering, monthly applications will be necessary for hungry plants such as dahlias or petunias.

This is not to say that all good cutting flowers need the same soil conditions, as every experienced gardener knows. There is no substitute for studying requirements

Orange Rocket Snapdragons

'County Fair' Zinnias *Photos: Guy Burgess*



of plants one selects, and grouping those of like needs together so that appropriate cultural practices can be managed without difficulty. Marigolds and Zinnias needing modest amounts of nitrogen during the summer should not be planted next to Chrysanthemums being continuously fed. Trollius, grown almost wet, cannot be in the same square with Iceland Poppies, ready to rot at the first hint of sogginess.

Within these mentioned restrictions, there are blessedly many freedoms. Cutting gardens can have any selection one likes without the need to grow single colors or blend gentle drifts. Mixed Cactus-flowered Zinnias can afford different color combinations for every room in the house. Neither need one worry about alternation and combination of spikes and round-headed flowers or hiding stakes or opening blank spaces to replant a section for later season production. The enclosing fence or hedge sets aside the work-space, and inside it, horticulture rules.

Flowers chosen for a cutting garden should be a personal list, but here is a sampling of ideas to suggest a collection more expansive than the annual list in seed catalogs. Further, so much recent attention has been given to shorter, stockier cultivars of familiar bedding plants used for landscape purposes that one may forget how hard it is to arrange Thumbelina Zinnias or Floral Carpet Snapdragons.

For early spring, when it is easy to have branches of apple blossoms or lilacs cut discreetly from landscape plantings, Darwin Hybrid Tulips ready for picking in a cutting row are the most exciting selection in the spring boutique. These tulips are big, splashy when they open, large as two folded hands when they close. Dover, Gudoshnik, Jewel of Spring—all are lovely.

A cutting garden should have enough spring perennials to wake the house before July. Some flowers in the borders have enough blooms to pick a few without diminishing the spring effect. Violas, Coral Bells, Bearded Iris, Feverfew and Columbine always seem to spare blossoms without impoverishment. But masses of Shasta Daisies and Peachbells ought to be left for their once a year display, with a back-up supply ready for cutting. Peonies are a special case; expert flower arrangers often like different cultivars from those favored by garden designers. 'Walter Faxon', a sparkling coral-pink double variety, is beautiful and long lasting indoors. 'Krinkled White', the long-popular single, is airy enough to blend with other flowers or to use in bouquets of moderate size.

Every cutting garden needs a few peony plants to strip at will—someone might have a wedding! One end of the perennial row should include a few clumps of Astilbe, not only for the plumy blooms before annual flowers are available, but also for its fine foliage to use all summer. This section will need extra watering, and can include a few Spuria and Siberian Iris, Globeflower and Swamp Milkweed for its long-lasting pink clusters. Another row where divisions are made more frequently should include plants of Shasta Daisies just for the house. The first blooms are like the king berries on strawberries, biggest and finest, and one hardly can cut them from a drift in the terrace border. A mass of Peachbells supplies clear blue or pure white for the time of mock-orange and shrub rose sprays. Perennial sections of the cutting garden should be planted the same way one plants asparagus and rhubarb in the vegetable garden—to grow in their own spaces without interfering with the management of the annual plants.

There are annuals for bean pots on the kitchen table, and annuals for silver bowls set on pastel linen.

Godetia-A fall annual and old fashioned garden favorite; also known as 'Satin Flower'.

There are annuals for unusual new combinations for contemporary room design, and flowers to echo old nosegays. There are brilliant plumes and delicate spikes, the choices are as exciting as a child's Christmas dreams.

Zinnias and Marigolds may be the most familiar cut flowers for summer harvest and recent introductions have widened the choices from both. Jubilee Hybrid Series Marigolds have four inch blooms in shades from yellow to orange at midsummer. Plants are about two feet high, but stems are long enough for picking. 'Happy Face' is an even earlier blooming hybrid, of the same hedge type growth habit, with large flowers. The tallest and longest stemmed hybrid Marigolds are the Climax Hybrids, with blooms to five inches. These usually flower later than hedge types, but bloom is profuse and showy enough to make impressive bouquets. 'Primrose Climax' is especially pretty for its creamy yellow color, more subtle and delicate than most Marigolds.

Zinnias offer almost every color variation known to floriculture and sizes suitable for use in tea cup arrangements to wedding reception centerpieces, as was done by a sophisticated hostess when she made enormous bouquets of white zinnias with other white flowers from her home garden. The stunning cactus flowered F-1 Hybrids, 'Carved Ivory' and 'Wild Cherry', deserve their popularity as cut flowers, but seed is often hard to come by. The Zenith mixture makes it possible to have the whole color range of these five-inch blooms on their strong stems. 'Scarlet Ruffles' and 'Pink Ruffles' are the first of a new series of the pumila (intermediate) size, with excellent resistance to mildew, the zinnia-spoiler. Another favorite is the unusual 'Envy', a cool green used with great pleasure at summer flower shows. 'Polynesian' is a free-flowering, coral colored variety; 'Nectarine' is a newer one, a coral-pink Fantasy type.

Not all summer effects are made with Zinnias and Marigolds, however. One hostess prides herself on her ephemeral bowls of Petunias in soft colors to compliment the decor of her reception rooms. Petunias must be picked with care, fresh for the occasion, and handled gently from garden to display. 'Champagne' is an especially handsome grandiflora, with five-inch ruffled blooms on clean green foliage. This petunia can resist summer diseases while weaker varieties die beside it. The delicate Petunia fragrance is another reason to grow a row in the cutting garden.

Fragrance is the first reason for growing 'Marine' Heliotrope or the delightful 'Sweet Sultan'. Either of these flowers tuck into a bouquet to perfume a room with the scent of summer. Sensation Nicotianas are not often thought of as cut flowers, but they are graceful additions. Nicotiana has the added remarkable quality of being extremely resistant to cool nights in early fall, so that there are flowering tobacco spikes to add to last pickings.

Snapdragons have long been summer favorites, and to grow the dramatic Rocket Snaps one must be prepared to stake each spike carefully. It is worth the effort for largest and finest flowers, but the Carioca series offers a similar color range on stockier, many-spiked plants without staking. Flower stalks will be shorter, 8 to 12 inches, but charming on a smaller scale. The newer open-flowered hybrids, Wedding Bells mixture and Madame Butterfly, are ruffled and frilly, a new form in Snapdragon colors.

There are no blues in Snapdragons, Marigolds, or Zinnias, but cutting gardens can include two of the fine blue Salvias. 'Royal Blue'

*Continued on page 32*

# Understanding LETTUCE

*Thomas W. Whitaker Plant Geneticist P.O. Box 150, La Jolla, CA 92038*

The lettuce plant is poorly understood even by many experienced gardeners. Here are some little-known facts that will increase the appreciation and enjoyment of those who grow and consume this best of all salad plants.

Commercial lettuce production in the U.S.A. is truly in the category of "big business". In 1973, the last year for which figures are available, the crop had a value of $277,320,000, and was planted on 219,080 acres. The volume was 48,054,000 cwt., which works out to a production of over 400 railroad carloads daily; truly a prodigious number of salads are consumed by the American public.

It is indeed a poor vegetable garden that does not include at least one or more varieties of lettuce. For the backyard gardener, lettuce is easy to grow on well-drained, reasonably fertile soil. Furthermore, it will produce an abundance of tasty leaves rapidly, with minimum effort. For this reason, it is an eminently satisfactory item for most vegetable gardens. Lettuce comes from a large group of plants generally known as the *Compositae* or Sunflower family. A quick look at its small, yellow flowers establishes its affinity with the sunflower, dandelions, chicory, tarweed and other Composites.

Modern lettuce was derived from a species indigenous to the Mediterranean Basin. The evidence at hand suggests that lettuce was first domesticated in Egypt, probably for the seeds which were used as a source of oil. From Egypt, its culture spread to Greece, Italy, and other countries bordering the Mediterranean. Lettuce was readily accepted, and became popular in Greek and Roman cultures. From the Mediterranean, lettuce spread rapidly to Western Europe, and reached the Americas as early as 1565. Sixteen varieties were listed in McMahon, an American seedsman, in his first catalogue published in 1806. The astonishing proliferation of varieties at an early date in the U.S. is documented by the New York Agricultural Experiment Station Report of 1885. Here 87 varieties are described.

A gardener who understands the classification of lettuce can do a much better job of selecting varieties for specific locations and seasons. With this rationale in mind, we learn that cultivated lettuce is divided into 4 main types; a fifth type, the so-called "Chinese Stem" lettuce is used for the thick, enlarged, edible flower stalk, but at present is relatively unimportant in this country. Seed of the varieties listed can be obtained from many reliable seed firms.

**Leaf Lettuce**—varieties in this category produce a rosette, with a loose bunch of leaves. It never forms a head. Leaves can be harvested as the plant continues to grow. If harvested in this manner, the gardener will have a succession of fresh, palatable leaves over a lengthy period, perhaps as long as a month. Varieties of this type are most satisfactory because they can be raised successfully when temperatures are too high for culture of other varieties.

In the bins of supermarkets, leaf lettuce is usually represented by Prizehead, a variety with a tinge of red, normally around the margins of the leaf. The red pigment makes an attractive plate decoration for meat or other dishes. Much of the lettuce grown under glass or plastic belongs to the leaf type. Another popular variety used for this purpose is Grand Rapids.

**Butterhead**—this type of lettuce is distinguished by the soft, oily or buttery texture of the leaves. The leaves are positioned in a tight ball, but do not overlap to form a true head. Varieties of this type when grown under favorable conditions, have extremely high quality. The leaves are soft and tender, with excellent flavor. Bibb lettuce

Photo: Alex Berry, taken in garden of Virginia and Edgar Dare, Washington, D.C.

| Types | Representative Varieties |
|---|---|
| 1. Leaf | Prizehead, Oak Leaf, Black-Seeded Simpson, Grand Rapids, Slobolt |
| 2. Butterhead | Big Boston, White Boston, Bibb, Buttercrunch, May King |
| 3. Cos or Romaine | Parris Island, Valmaine, Paris White, Dark Green |
| 4. Crisphead | Empire, Climax, Vanguard, Calmar |

in the butterhead category is the "Rolls Royce" of salad plants.

Unfortunately, butterhead varieties require optimum conditions of culture if they are to produce an attractive product. They are extremely sensitive to excessively high and low temperature. For example, a sudden elevation of temperature, combined with high humidity, can poduce tipburn that may destroy the crop. Likewise, they are damaged by low temperatures that would not harm other varieties. Finally, the soft, tender leaves are easily bruised. Hence, they require careful handling at harvest, and are not adapted to long distance transportation. However, for the gardener with a gourmet taste butterhead varieties have much to offer.

**Romaine or Cos**—produce loose, elongated, loaf-shaped heads with an upright growth habit. The spatulate leaves tend to over-lap, and are formed into a loose head. The leaves are coarse with a heavy mid-rib, but they are sweet, tasty and of good quality. Normally, they lack the bitter flavor sometimes associated with other varieties. As an ingredient of the tossed salad, the Romaine varieties are unexcelled.

**Crisphead**—the commercial lettuce industry is based on varieties of the crisphead type. They are characterized by the almost brittle character of the leaves, and a firm head. The head is almost spherical, and is formed by the overlapping, tightly folded leaves of a rosette. It is often more than 6 inches in diameter and very solid. The development of this structure is probably the single most important feature of the crisphead type.

The amateur is well advised to omit crisphead varieties from his garden because of exacting requirements for soil, fertilizer, photoperiod, and moisture. A great deal of experience is required to successfully produce a crop of crisphead lettuce. For the gardener with limited space, varieties in this class occupy too much space and are difficult to grow. Furthermore, when home-grown, they are likely to be less rewarding at the table than other varieties.

The crisphead types are the workhorses of the lettuce trade. When found in the bins of supermarkets, head lettuce may not be as attractive as butterhead or romaine, but it is crisp, clean and dependable. With a good salad dressing, a delectable dish usually results.

### Maturity

When we look at the young lettuce plant, we see a rosette of closely grouped, flattened leaves. As the plant approaches market maturity, a head appears made up of bunched and overlapping leaves. The plant at this stage is far different in appearance from one that is sexually mature and producing flowers and seed. Lettuce, like several other vegetables, has two different maturities, vegetative or market maturity, and sexual or seed maturity.

Obviously, the gardener is primarily interested in market maturity. These stages (maturities) follow each other in sequence, but for the same plant, may be as much as two months apart. Under normal growing conditions, most butterhead, Romaine, and crisphead varieties do not immediately produce a seed stem following market maturity. Production of a visible seed stem and differentiation into

an inflorescence may be delayed for a time after market maturity, depending upon environmental conditions.

At seed maturity, the lettuce plant is a leafy-stemmed, branching, many-flowered annual. The small, yellow, perfect flowers are arranged in a loose panicle, with a flattened top. The stems when cut produce an abundance of milky juice.

The leaf varieties, like those in other groups, also form a rosette, but immediately produce a seed stem. As the stem elongates, the younger leaves are harvested for table use. The stem continues to elongate, producing fresh leaves for a continuous harvest.

I hope I've interested you enough to try some home-grown lettuce. Plant some in late August and enjoy a fall crop.

# Perennials for Summer Bloom

*Herbert C. Fordham*
*Extension Horticulturist*
*Suburban Experiment Station*
*Waltham, Mass. 02154*

In the perennial garden as with most large landscape plantings there is usually a certain amount of trial and error necessary to find those plants which are going to thrive under given conditions. In order to lengthen the list of plant species to be included it is often necessary, and yet practical, to alter the soil to meet the needs of specific groups of plants. It is almost routine practice to add some form of organic matter to improve the soil structure, and to correct the pH and nutrient levels. Greater limitations may be imposed by the amount of sun or shade, temperature extremes and occasionally drainage problems.

There are substantial lists of reliably hardy, long-lived perennials which can contribute to an easily maintained garden. Large segments of such lists are composed of the long-time favorites such as peonies, iris, oriental poppies, bleeding heart and delphinium. Most bloom during May and June before the heat of summer.

A great deal of thought must be given to planning a perennial garden in order to have it provide continuous color throughout the growing season. Since the majority of perennial species have only a two to three week period of bloom, it will require a number of varieties to achieve the desired effect.

Keep a watchful eye on plant species which have been recently introduced to the garden. What may have been a well-behaved plant in one situation could become an overpowering menace under new circumstances making endangered species out of less vigorous favorities.

There are a number of good candidates worth trying for extended periods of summer bloom in the garden. It should be noted that the selection should be based not only on the color of the flower or quality of bloom, but on the foliage effect as well. Various shades of green and foliage textures are important points of interest in any garden.

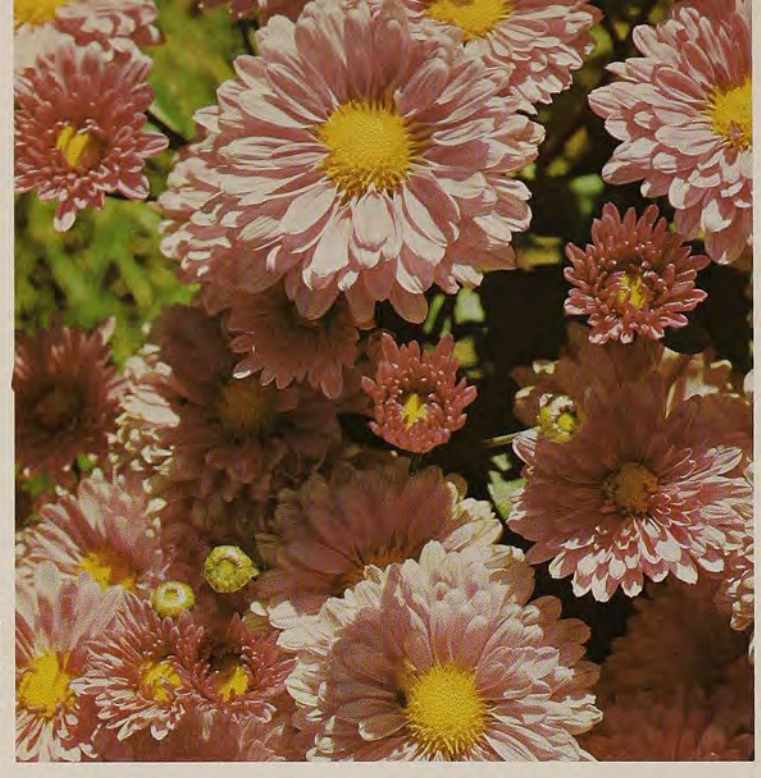
Some of the following perennials deserve prime consideration:

*Achillea hybrid 'Coronation Gold'* bears large convex umbels of bright yellow flowers atop rigid 3-foot stems. Its foliage is a soft gray-green and has a finely dissected fern-like texture. The extended period of bloom from June through August ranks it high with summer blooming perennials. Full sun and a well drained soil are its primary requirements. Although easily grown, it is unlike a few of its weedy relatives in that it does not become overly possessive in the garden.

*Achillea ptarmica var. 'Angel's Breath'* shows little if any similarity to A. 'Coronation Gold'. Its loose clusters of pure white double flower heads are borne on 2-foot high stems during July and August. The foliage is moderately fine in texture. As with most Achilleas, this one is easily grown and trouble free. Although a little more aggressive than some species it seldom becomes weedy. Achilleas have excellent keeping qualities as cut flowers.

*Chrysanthemum maximum—Shasta Daisy* is a must for any perennial garden. A striking effect can be had by using clumps or masses of these pure white daisy-like flowers repeated throughout the perennial border to contrast with the vertical lines of such plants as delphinium, veronica and foxglove.

To assure continued bloom through the summer, select such varieties as 'Aglaya', a large double white frilled flowered type which grows about 2 feet high and blooms through most of the summer, or 'Mt. Shasta', which is fully



Photos: Guy Burgess

ABOVE-'Stardom Masterpiece' mum is a daisy-like pink with butter-yellow centers, blooming indoors or out in the late summer-fall.

BELOW-'Spring Song' Columbine-hybrid giant

ABOVE RIGHT-Sunlight drama in the Felicity Ann daylily.

BELOW RIGHT-Double Shasta daisies.

double and has a high, white crested center. If the more typical single flowered type is preferred, try the very large ever blooming varieties 'Victor' or 'Mark Riegel'.

Shasta daisies thrive in a rich, well-drained soil. Although full sun is preferred, they will tolerate light shade. To insure vigorous growth, divide the clumps at least every second year.

*Monarda didyma 'Granite Pink'* is one of the loveliest of the Bee Balms and easiest to combine with other summer blooming perennials. The large flower heads set atop 30-inch stems. The color is best described as a soft but bright rose pink. Its creeping root stock may have a tendency to move into the territory of adjacent plants, but seldom to the point of 'taking over'. Being somewhat shallow rooted, Bee Balm is easily weeded out if necessary. This handsome member of the mint family tolerates a variety of soil conditions as well as light shade. To keep plants in vigorous growing condition, divide and reset clumps every 2-3 years.

*Geranium sanguineum var. prostratum*—Cranesbill will produce compact 12-inch high plants and does not have the tendency toward legginess which many of the hardy geraniums acquire as the summer progresses. This little charmer has an abundance of clear pink flowers with dark red penciled veining and can be expected to bloom throughout most of the summer. A well drained, loose soil seems to suit the hardy geraniums best and if given full sun they give years of enjoyment with a minimum of care.

*Inula ensifolia*—Sunray Flower is one of those rare mid-summer blooming perennials suitable as an edging plant or for the rock garden. This delightful small hardy perennial produces a compact mound-like habit of growth about 15 inches tall. From June into August the plants bear bouquets of miniature golden yellow sunflowers. Inula is not very demanding in its

soil requirements other than good drainage and moderate fertility. To keep plants in top growing condition provide a sunny location and divide the clumps about every 3 years.

*Penstemon barbatus var. 'Rose Elf'*—is among the more reliably hardy penstemons for New England gardens. Its deep salmon-rose tubular flowers are produced on 15-18" spikes from June through August. For a striking color effect, try a companion planting of *Nepeta mussini*. Penstemon is somewhat more sensitive about its growing conditions than many perennials. A loose, friable soil is preferred and above all good drainage is essential to avoid winter-killing. Although tolerant of light shade, sturdier plants are produced where they receive at least a half day of sun.

*Physostegia virginiana var. 'Summer Snow'* is a clear white selection of the old familiar rosy-pink False Dragonhead. Its tubular flowers are closely set spikes borne on rigid 24-30 inch stems which bloom from July through August. This easily grown plant may help fill the need for reliable bloom during the mid-summer months. Although less invasive than its more vigorous pink counterpart, it may need watching in some situations.

*Platycodon grandiflorum mariesii* produces large, violet blue, open, cup-like flowers on 15 to 18 inch stems. Platycodons have a long period of bloom extending from late June into early September. Although they require a little more care in getting started, once established they are trouble free. The plants have thick fleshy roots, the crowns of which should be just barely covered. A loose, well drained soil is almost essential and they are tolerant of light shade. Since new growth is late starting in the spring, clumps should be carefully marked to avoid damaging the crowns.

Some very noticeable omissions have been made among the summer blooming perennials, in particular the hemerocallis and lilies. Both groups of plants have long lists of noteworthy introductions developed in recent years.

Modern daylilies scarcely resemble the old familiar coppery-orange *Hemerocallis fulva* still found growing in ancient gardens and occasionally naturalized along the roadside. Color choices now range from intense reds through pastel pinks, soft yellows, lavender and melon tones. Selections in height may vary from 18 inches to 4 feet and the season of bloom from June into September.

With the true lilies a similar miracle has happened. Recent breakthroughs in hybridizing have brought about a whole new spectrum of colors, shapes and sizes of flowers plus disease resistance. Varieties more beautiful than ever are now within reach of every backyard gardener and specialty catalogs should be consulted for the latest introductions.

# You Can Grow Your Own Giraffe

*Donald Wyman*
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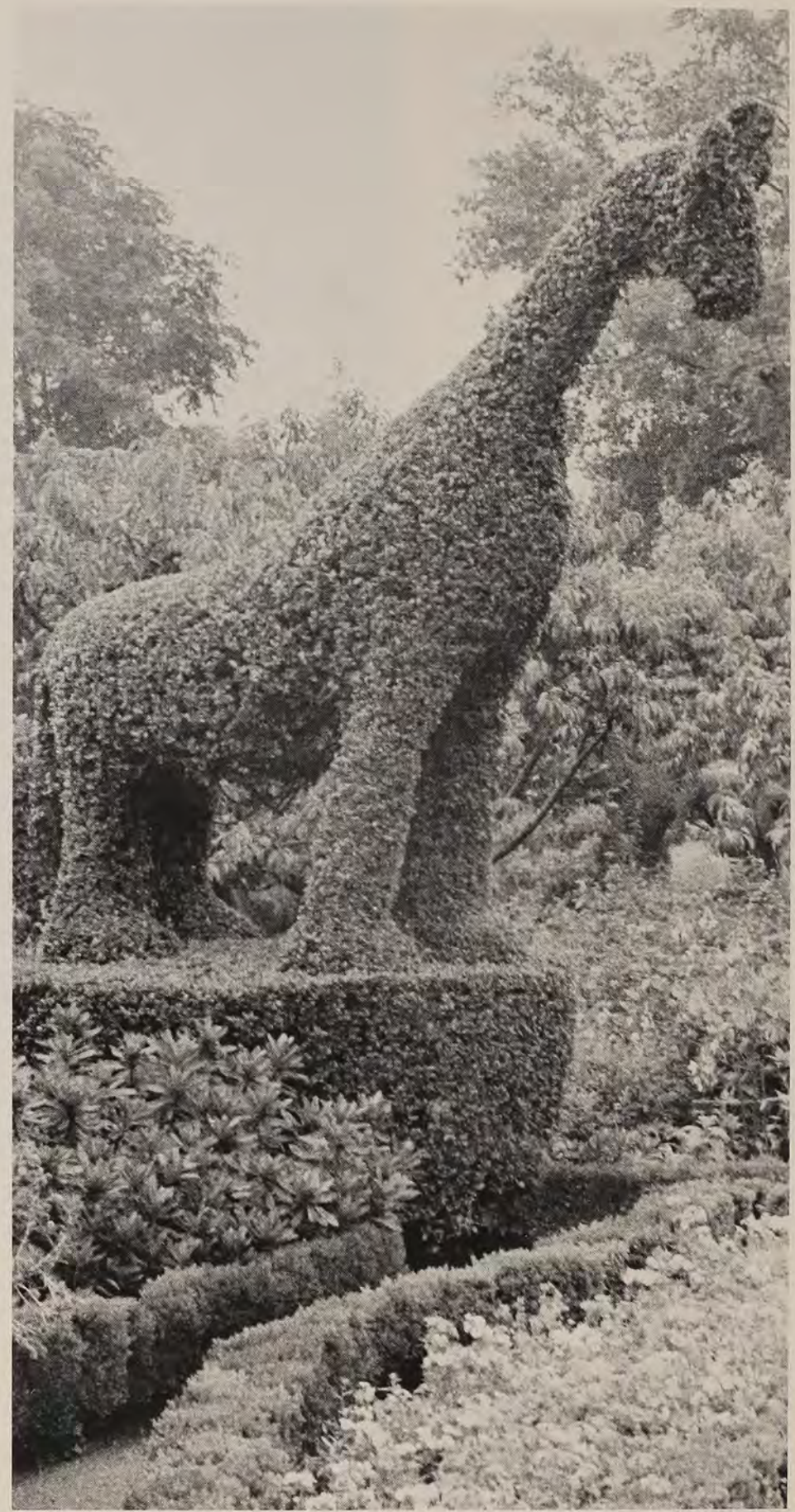
While visiting gardens in Great Britain one frequently sees interesting objects of topiary work, shrubs sheared into geometric figures, or animals or ships. In the past, especially in Europe, this was a fascinating hobby for hundreds of years. Today, there are not many examples of the art left. Normally the American gardener is too much in a hurry to take the time necessary to painstakingly prune and shear shrubs into specific figures. Yet, it can be done. If you have patience, you can coax and force a plant to grow in a certain way to portray a giraffe, fox, man, ship or even some geometrical figure. The resulting object is often humorously interesting.

The only problem is that it can't be moved around to another place in the garden—it is always there—hence it should not be in a too conspicuous place. Then, too, the individual who does the shearing must have a good eye for creating the proper shape in the right proportion. There is nothing quite as distracting as a figure that has grown awry. A geometric figure like a pyramid, or a round ball on top of a square base, should be exactly congruent on all sides.

The Japanese have acquired an interest in bonsai, and indeed this is proving popular to a number of Americans. It requires painstaking



California Privet, "Green Animals" at Portsmouth, Rhode Island

Photos by author.

care in the shaping of the plant. Shaping topiary figures is also an art requiring a knowledge of plant growth.

Topiary effects are best obtained with box, yew, privet, arborvitae, incense cedar, Eugenia, pittosporum and rosemary. Large-leaved plants are not usually satisfactory. Privet grows fast but does not show up well in the winter. Box and yew are better choices. They retain their foliage all year. They also grow faster than hemlock and spruce and do not have the unfortunate habit of easily dying when they are slightly broken or when the wire holding the branch to the support becomes too tight.

A solid geometric shape like a cube, column, ball, pyramid or variations thereof, is the easiest. Figures of animals and people are extremely difficult to shape. In order to obtain them, one must work carefully for years to get just the right proportions. If the figures are large, they must be firmly attached to a foundation of pipes or stakes properly hidden on the inside of the object.

Privet, especially California privet, grows faster than the evergreens and is the easiest shrub to use. A dead or broken branch can be quickly replaced by properly training a new one. Evergreens are much more difficult, but of the evergreens, yew is probably the best to train in topiary objects. One should remember that there are several varieties of yew, some tall and upright, some wide and branching, others low. Please don't contemplate forming a giraffe out of a low-growing dwarf variety.

Study the eventual form desired. For instance, if it is to be a horse, are all feet to be on the ground? If so, then one starts with four plants. If, on the other hand, the horse is to be rearing on its haunches, then only two plants are needed. Make a rough outline of the animal desired out of heavy wire or pipes, and tie the first forming branches to this

English Yew at Crathes Castle, Scotland

form to get them growing in the right direction. Certainly if the animal is large and only has two feet on the ground, a permanent scaffold should be made. A firm basic structure is usually a necessity.

Small shapes can be moulded out of chicken wire. One simply has to shear the branches just above the frame. Be careful about tying the branches to the frame. Ties too tight can easily girdle the branch and cause it to die or break. Ties should be made loosely with heavy string and inspected every year or so. If possible avoid the use of wire. Pruning or shearing can be done any time except in the early fall. Late pruning may force new growth which will not have sufficient time to mature before freezing temperatures kill it.

Large-leaved plants like rhododendrons are too coarse for topiary. Rhododendrons do not easily send out new buds and branches wherever they are pruned as do privet and yew. The ability to form new buds easily is an essential prerequisite of a good plant for topiary work. Rosemary and small-leaved English ivy are frequently used for small topiary indoor figures. Sometimes, ¼ or ½ inch wire mesh is moulded into appropriate figures, and the plants are trained to grow over them.

For those who wish to try this old-fashioned art it is helpful to first observe what can be done with topiary figures. Geometric shapes can be seen in the gardens at Williamsburg, Virginia, and at Longwood Gardens, Kennett Square, Pennsylvania. Some of the best animal figures (made of California privet) to be seen anywhere are at "Green Animals", Portsmouth, Rhode Island. This is an old estate now operated by the Preservation Society of Newport County, and open to the public (for a nominal fee) from mid June to the end of September.

Growing topiary figures takes extreme care, and many long hours of careful shearing. Most American gardeners like to observe such figures—when *others* grow them.

# The Rocky Mountain Columbine

*William G. Gambill, Jr. Director, Denver Botanic Gardens Denver, Colorado*

Perhaps you have had the experience while hiking along a shady trail somewhere in the Rockies of coming upon a moderately tall plant with fern-like leaves, nestled in dappled shade against the pale trunk of a quaking aspen, bearing regal, long-spurred flowers with heavenly blue petals contrasting strikingly with snowy white sepals and anthers of gold. Possibly you caught your breath with surprise at the sheer elegance and grace of these flowers growing against a background which seemed almost planned for them. You may have knelt down to examine more closely and drink in deeply the majesty of the Rocky Mountain columbine, *Aquilegia caerulea* James, the much-admired state flower of Colorado.

Can this wildling with all its charm be brought into the garden where you can enjoy it yearly without having to seek it in its native haunts? The answer is—most certainly. Like many others of the forty-odd species of *Aquilegia,* the Rocky Mountain columbine can be grown fairly easily in cultivation. To maintain it permanently requires an understanding of its growing requirements, and its life cycle.

Most columbines can be grown from Hardiness Zone 3 southward into Zones 8 and 9. *A. caerulea,* being a native of the cooler western mountain regions, fares better as a garden plant in the more northerly part of this range—from southern Canada into the northern and central states, and southward along the Rockies into New Mexico. It has long been a favorite rock garden plant in the northeastern United States as well as in England and Scotland.

Rocky Mountain columbine seed can be obtained from many vendors of wild flower seeds, particularly in the western part of the country. Gardening friends should not be overlooked as a good source, too. The seed germinates rather slowly (three to four weeks) and requires cool temperatures for this process. Seed sown in the ground or in a cold frame in early spring will produce plants which generally will not blossom until the following season. If the seeds are sown in the greenhouse in October, by the following spring the plants will be six to eight inches tall. Then they can be set outdoors, and they will bloom that same season. Seedlings should be placed nine inches to a foot apart. Individual plants appear to live on the average not more than three years. This poses no great problem in continuity if the plants are allowed to seed themselves.

A well-drained sandy loam, with plenty of organic matter to insure a moderate but constant soil moisture content is best for growing. Garden soil for these plants should contain considerable amounts of compost or well-rotted barnyard manure. Use of a mulch, especially in the dryer regions of the West, such as dry leaves, hay, straw, pine needles, wood chips or even sawdust during the growing season will keep the soil cool and moist. During the winter it will protect the crown and new leaves. These plants need considerable shade, particularly of the type cast by trees with a canopy that permits passage of a fair amount of sunlight. In the absence of such shade Rocky Mountain columbines should be grown on the north side of a building, or on the shady side of a large rock or garden wall.

Plants of *A. caerulea* are seen to excellent advantage when placed in groups in a woodland garden with ferns, polygonatums, or other wild plants. They do not need conspicuous floral competition. These are regal creatures which like to reign in solitary splendor. It is best to keep them away from other columbines, for they will hybridize freely with many species. Flowers of hybrid plants, of course, will often be quite inferior to those of the pure form, and plants producing them should be weeded out immediately. If there are other varieties of columbines in nearby gardens, hybrids are almost sure to appear, but if the parent plants are kept from setting seed, this problem can be controlled.

Gardeners living in or near the Rockies are fond of maintaining pure beds of this long-spurred beauty, and have found that this is relatively easy to do if the plants are allowed to produce seed freely. Older plants will die away, but new seedlings are always springing up to take their places. Rocky Mountain columbines can be used very effectively with other garden plants such as thalictrums, Siberian irises, wax begonias, varieties of *Impatiens* and *Viola* and other plants which prefer a moderately shaded habitat. The charm of this columbine is not lost totally even when it is deliberately mixed with numerous quite different varieties from other parts of the world to produce a rainbow-hued bed of sparkling aquilegias.

If you are successful in growing the Rocky Mountain columbine, and you really can be, the unusual beauty of its flowers will be reward enough. When a cluster of them is enjoyed, it is difficult to escape the feeling that nature has endowed this plant with a sylvan charm which surely reflects the splendor and serenity of the mountain heights where it is at home.



Photo: L. Yeatts

Columbine, Yankee Boy Basin

*Continued from page 21*

# More Than Zinnias, Earlier Than Marigolds

and 'Catima', a French introduction, hold color well and flower vigorously all summer. Plants must be started early indoors in climates where frost occurs, since these plants are perennials in mild climates.

Another cooler for summer bouquets is the popular Bells of Ireland, and a combination of its green bells with spikes of blue Salvia suggests a temperature drop at a summer luncheon table. Annual Poinsettia, Mexican Fire Plant, is an excellent green foliage annual subtly sparked with red.

Nothing is more contrasting, however, than the flaming Celosias. 'Forest Fire' is taller than 'Crusader', both a shouting red, and 'Golden Triumph' is taller than 'Golden Torch'. Choose height to suit your taste, and remember that all the Celosias make fine dried flowers if picked when the blooms are just coloring.

Unless the gardener has freedom of fields and roadsides on many summer days, a cutting garden should include flowers grown for drying. The native perenials Pearly Everlasting, Golden Yarrow, Chinese Lantern, Lunaria, Strawflower and Globe Amaranth make the Thanksgiving house a happy scene. If a fence surrounds the garden, plant some ornamental gourds, trellis space is too useful to lose.

None can forget the favorite three that come first to mind for lavish bouquets. Gladiolus, Dahlias and Chrysanthemums share a need for fertile soil, full sunshine, faithful watering in dry weather, and careful pest control. "Best varieties" change from garden to garden and section to section. Chrysanthemums are sensitive to the length of the day, and northern gardeners must choose those bred for the long summer days and short nights. Richard Widmer of the University of Minnesota, along with other northern breeders, has introduced many beautiful selections for the far north. 'Golden Fantasy', 'Minn-White', and the older deep red 'Vulcan' are three.

Gladiolus and Dahlias have their champions and specialists. Consider the smaller blossomed kinds, easy to use in home-sized arrangements. 'Snow White' is a charming small Dahlia, flowers like big white daisies with golden center, blooming by the dozens on each plant. The Minature Gladiolus are becoming more popular each year, and are so fool proof that it is worth investing in the two 1976 All-America Selections, 'Lambkin' (white) and 'Rudolph' (red), along with other favorites for color choice.

One last suggestion for the well-tempered cutting garden: find a corner for a patch of the pretty daisy with the ugly name, *Chrysanthemum uliginosum*, Giant Fall Daisy. One autumn day these flowers will light up the fading border as dramatically as a theatrical spot—cool, white, yellow centered, to hold the summer for another week or two. If they are in the cutting garden, you can pick them for the bean pot along with the last of the Monarch Daisies and Pacific Calendulas. A sprig or two of Dark Opal Basil will season the mixture for a kitchen bouquet.

Beyond these practical features, cutting gardens should be personal. Each gardener knows the color of summer curtains in the house, patterns in the floors, depths of old glass pitchers and

*Continued on page 43*

# About the Bees and the Flowers.

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*Weston, MA 02193*

Every gardener is familiar with "perfect" flowers, that is, flowers that have both pollen-bearing stamens and pistils which bear fruit when pollenated. In normally good seasons, these plants fruit well. Some, like the Japanese barberry, can be counted on to fruit well year in and year out. The flowers are what might be called "self fertile", that is, the pollen of a single flower is all that is needed to fertilize the pistil of that flower, and being close to the pistil, the pollen is easily distributed by a slight motion of wind or twig.

However, it all isn't that easy on many plants. Even though lilacs have perfect flowers, they are known to produce good crops of flowers one year and poor crops the next year. Many fruit varieties behave the same way. This is known as alternate bearing. The homeowner, with his lilacs, can help this situation a bit by cutting off all the flowers as soon as they have wilted, to prevent the formation of seed. Theoretically, the nutrients which would have gone into seed formation are then available for flower bud formation for the next year. With plants grown chiefly for their fruits, this is a more difficult problem to handle.

Inclement weather at flowering time also can cause complications. This can occur as rainy or very cold weather. Bees, for instance, do not fly much when the temperature is below 57°F, and bees are a very important pollen carrier for many plants. In New England sometimes there is a very poor crop of holly berries. If the weather records for the preceding June are checked you probably will find that at the time the small holly flowers were open, the weather was either extremely wet or cold. Both situations reduce the activity of bees and other insects.

There also is always the possibility that the flower buds, or the opening flowers themselves, can be killed either by winter freezes or late spring frosts. Both situations occur in the peach-growing areas of the southeastern United States. This is always widely publicized, but the same thing can happen to some of the choice ornamental shrubs and trees in our gardens.

Fruit growers, who have been studying the fruit production on many types of fruit trees, know

that certain varieties are "self fertile", that is, an entire orchard can be planted with the one variety and all the trees will fruit normally. Such varieties as the 'Stanley' plum and the 'McIntosh' apple are in this category. On the other hand, there are varieties like 'Stayman' and the 'Winesap' apples which are mostly self sterile. In order to fruit well the flowers of these varieties need to have pollen from other apple varieties. Over the years orchardists have found that 'McIntosh' and 'Delicious' are good pollinators and so are included in orchards where many self sterile varieties are grown.

We have not been studying ornamental plants as carefully as our economic crops, yet, bit by bit we are picking up helpful information about their fruiting habits. *Viburnum dilatatum,* the linden-leaved Viburnum, fruits much better when several seedlings are grown together, rather than with a group of plants that have been asexually propagated from one clone. The Chinese Chestnut, now becoming a popular replacement for the American Chestnut, also fruits better when several seedlings are grown together, rather than a group of trees all propagated asexually from one named clone.

A few years ago, an elderly gentleman wanted to show his grandchildren what chestnuts growing on a tree looked like, for he remembered collecting them when he was a boy. He had a splended Chinese Chestnut, which bore flowers every year, but never fruited. I suggested he cut blooming branches from one of our seedlings, place them in a bottle of water, hang them in his tree and let the wind and insects do the rest. Lo and behold, that season his tree produced many fruits.

Finally, and most important in this story of non-fruiting plants, there are many genera which produce male (pollen-bearing) flowers on one plant and female (fruiting) flowers on another. Both types of plants must be present in reasonable proximity for the fruiting plant to fruit. Some of our best ornamentals are in this category: hollies, bittersweet and yews. There may be individuals with both types of flowers on one plant, but in general one can not count on this. Sometimes, a certain species, like *Ilex cornuta,* will bear fruit without the seed ripening, but there are not many. These should not be confused with plants like the oaks, firs, pines and begonias which have both male and female flowers with both types always present on the same plant.

Bittersweet vines are usually dioecious (male and female flowers on separate plants) but I have found an occasional plant that is polygamodioecious (flowers of mostly one sex but with a few of the other sex). Usually this is not enough to affect its over-all fruiting habits.

How far apart can dioecious plants be spaced? We don't always know. If they are wind-pollinated, they might be within a few feet; if insect-pollinated, they might be a quarter of a mile, or even farther. If you are planting yews, for example, and your next door neighbor has yews that fruit well, chances are that if you buy fruiting varieties (and remember that some yew varieties are strictly male) your yews will also fruit. If you are not certain, plant a male yew near the ones you know are female and your females should set fruit.

With the female bittersweet, which blooms in June, place a small male vine in the same planting hole, or graft on a branch from a male plant, or cut flowering branches from a male plant when the flowers are ready to open, place them in a bottle of water and hang it up in the female vine. This should bring results. Ginkgo trees are now sold by sex, because the fruiting trees have ill-smelling fruits, thus males are most popular. Many nurserymen are now growing dioecious plants with the sexes separated, so that one can knowingly purchase a male and a female to insure the fruiting of the latter. Some of the woody plants with sexes separated are:

| Botanic Name | Common Name |
|---|---|
| *Acer* (some species) | Maples |
| *Actinidia* | Actinidia |
| *Ailanthus* | Tree of Heaven |
| *Aucuba* | Aucuba |
| *Baccharis* | Groundsel-bush |
| *Brousonettia* | Paper-mulberry |
| *Celastrus* | Bittersweet |
| *Cephalotaxus* (Mostly) | Plum-yew |
| *Cercidiphyllum* | Katsura-tree |
| *Comptonia* | Sweetfern |
| *Cotinus* (some) | Smoketree |
| *Diospyros* | Persimmon |
| *Eucommia* | Hardy Rubber-Tree |
| *Garrya* | Silk-tassel |
| *Ginkgo* | Ginkgo |
| *Helwingia* | Helwingia |
| *Hippophae* | Sea Buckthorn |
| *Idesia* (some) | Idesia |
| *Ilex* | Holly |
| *Juniperus* (many) | Juniper |
| *Leitneria* | Corkwood |
| *Lindera* | Spicebush |
| *Maclura* | Osage-orange |
| *Morus* (some) | Mulberry |
| *Nemopanthus* (some) | Mountain-holly |
| *Orixa* | Orixa |
| *Phellodendron* | Corktree |

| | |
|---|---|
| *Podocarpus* (usually) | Podocarpus |
| *Populus* (mostly) | Poplar |
| *Rhus* (often) | Sumac |
| *Ribes* (some) | Currants |
| *Ruscus* | Butcher's Broom |
| *Salix* (some) | Willows |
| *Schisandra* | Magnolia-vine |
| *Securinega* | Securinega |
| *Shepherdia* | Buffalo-berry |
| *Skimmia* | Skimmia |
| *Smilax* | Briars |
| *Taxus* | Yews |
| *Torreya* | Torreyas |
| *Vitis* (some) | Grapes |
| *Zanthoxylum* (some) | Prickly-Ash |

# The English Cottage Garden

*Patrick M. Synge V.M.H.*
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The typical English cottage garden is peculiarly national and now, alas, is becoming rather a rare phenomenon. However, when one does see a really good example one tends to stop and look over the fence. The effect usually depends on the small size and the mass of varied colour, apparently uncontrived to any particular scheme or pattern. If it is backed by an old Tudor cottage with the original beams, or even a small Georgian one, so much the better. Perhaps a narrow paved or gravel path leads up to the door with low pinks, sweet alyssum or white arabis spilling over it. When one sees such a picture on the cover of a box of chocolates one tends to regard it as sentimental but when one sees it as a living garden the effect can be altogether charming. It is not usually a specialist's garden but rather that of a lover of flowers, nor will one find rare plants there but rather the well tried and free-flowering stalwarts that flower over a long season.

Quick colour can be derived from annuals and biennials which can be raised in boxes at the back and put into place nearly on the point of flower, antirrhinums, sweet scented stocks and marigolds with occasional dahlias and sometimes a fine clump of the white madonna lily undisturbed over the years. This and, in Scotland, the deep orange-red *Lilium pyrenaicum rubrum* seem to be two species found often in cottage gardens and often doing far better there than in the larger and more tended garden of the bigger house. No-one has ever explained why but it is certainly a fact; good cottage gardening is very intensive gardening since there is little space, none can be wasted or left bare. When an annual or biennial has finished flowering it is quickly taken out and something else

planted straight away to fill the gap.

In one lovely example which I used to pass often there was a lone structure of dwarf conifers and other small trees with yellow and coloured foliage. The occasional golden yew with its fastigiate form takes up little space and is bright through much of the year. They are kept clipped and under six feet tall. The various forms of *Euonymus* and *Hebe* with grey or yellow foliage are also delightful and fit in well to such a scheme, while their upright or spreading forms make contrast to the other more formless but more colourful plants. Clumps of sweet peas trained over pea sticks or climbing roses trained over a tripod of poles or a short rustic length of pergola are features often seen.

In the best kind of cottage garden there seems to be a haphazard luxuriance, a riot of bright colours yet being on a small scale it does not offend for its blatancy or gaudiness or even for a clash of colours. Labour-saving is not generally a problem where the garden is small and the owner keen. It is rather a place where he or she can potter, replacing one plant with another to make a continuous effect, constantly trimming and removing dead wood and foliage; there are daffodils and wallflowers, white arabis and aubretia and pink thymes falling over the paths and in the wall. Later, pinks take their place and helianthemums and silvery santolinas and, further back, sweet william and, later, white marguerites, delphiniums and even a few dahlias. For later summer a few michaelmas daisies and Japanese anemones, white or pink, and even a few nerines near the wall of the cottage. The possibilities are endless.

It is not surprising to find a few vegetables intermingled with the flowers in the true cottage garden and with present prices of vegetables this tendency is increasing. Near the back of the border may be small circles of runner beans growing up a neat wigwam of poles, perhaps alternating with little patches of sweet peas, the seedlings having been raised early on the window ledge of the living room. Lettuces can look very decorative near the front and can quickly be replaced when eaten with young seedlings, while the coloured curly kale can be both decorative and edible. A few herbs also are usually grown, parsley and dill, sage and rosemary and for those who like it a little garlic. It is heartening what the enthusiast can do in a small space.

One of the most famous cottage gardens in the country, however, was made at a castle, Sissinghurst Castle in Kent, by the late Miss V. Sackville West. The Castle consisted of a single tall tower and two wings on each side of the tower but the rest was largely walls, excellent backgrounds for good plants. At the end of the paths leading through the superb collection of old roses one came to a small house in which she had her room. It was known as the cottage and the garden in front, the cottage garden, because it was a glorious medley of colour and planted in the cottage style. It can still be seen. The wall is completely smothered with roses, the lovely white 'Mme. Alfred Carriere', right up to the eaves and with hundreds of blooms, while in the corner is the bright yellow climber 'Lawrence Johnston'. Near the old oak door is the dark maroon red rose 'Souvenir de Dr. Jamain' with its wonderful scent. She took particular pride in this since she had retrieved it from an old derelict nursery. Beside the door is a seat and a brick path leads away from the door to a large and ancient copper cauldron, blue-green with age and verdigris and filled in summer with the apricot-yellow form of that charming musk *Diplacus glutinosus* overflowing all round. It is placed in the middle of the garden where the two paths join and where the bricks widened into a circle. Along the paths are helianthemums, shrubby potentillas and flag irises, decorative in foliage when not in flower. The beds around are full of annuals and herbaceous plants while a few bushes such as the graceful late summer-flowering *Genista aetnensis*, more roses brought from Persia by her, the silver-leaved *Cytisus battandieri* from Morocco whose flower spikes smell so gloriously of pineapple, and a few others complete the picture. In the spring there are yellow tulips and the yellow peony *P. mlokosewitschii*, named after a Russian general, with, for us an unpronounceable name. Later brilliant *eschscholtzias* and *Venidio-arctotis* and the yellow *Tropaeoleum polyphyllum*, ramble over the ground so that no earth is left bare. All was in fact very carefully chosen, I am sure, but the effect is very natural, a bubbling miscellany of colour, both flower and foliage, and the very essence of a cottage garden.

My wife tells me that I must not write about cottage gardens without quoting Matthew Arnold's 'Thyrsis' and though it is unusual to find poetry in a horticultural paper his words are very appropriate and so here they are. They are part of a longer poem written to commemorate the death of a friend, detailing the delights he has lost.

*Soon will the high Midsummer pomps come on,*
*Soon will the musk carnations break and swell,*
*Soon shall we have gold-dusted snapdragon,*
*Sweet-William with its homely cottage-smell,*
*And stocks in fragrant blow;*
*Roses that down the alleys shine afar,*
*And open, jasmine-muffled lattices,*
*And groups under the dreaming garden-trees,*
*And the full moon, and the white evening-star.*

# JADE

## MAKES A GREAT HOUSEPLANT

*By Gordon DeWolf, Horticulturist, Arnold Arboretum, Harvard University*

One of my earliest memories is of the collection of plants in my grandmother's living room bay window. I remember the *Pelargoniums* and the *Impatiens* leaning toward the light, and the spectacular displays of *Zygocactus* and *Epiphyllum*. One plant stands out in my memory—a huge specimen of the common Jade Plant *(Crassula portulacea)*. My grandmother's plant exists no more, but on my dining room window sill I have my own modest reminder.

The common Jade is surely one of the most popular house plants. Though it seldom flowers under household conditions, unless subjected to high light intensity, it will survive and even thrive under a wide range of conditions. It tolerates low levels of illumination and survives repeated desication. It propagates readily from cuttings, which grow quickly to respectable size. Given the opportunity, it will live as long as you or I. It makes a wonderful gift for a beginning window gardener for it almost surely will succeed and provide encouragement to try other plants.

Although the Jade is probably one of the oldest of our commonly cultivated house plants, its date of introduction and original source are unknown. What *is* certain is that the Jade Plant ranges in South Africa from Worcester on the West to Port Elizabeth on the East and northward into the Transvaal.

The Cape of Good Hope was discovered in 1487, but it was not until the early part of the 17th century that ships began regularly putting in to Table Mountain Bay on their way to and from the East Indies. The ships of the Dutch East India Company began using Table Bay as a stop for fresh water and meat about 1616. In 1652 Jan van Riebeeck and 70 men were sent out from Holland to establish a town and set up gardens to supply the East India Company's ships. They landed where Cape Town now stands.

Although agriculture was the prime business of the port, the governor, van Riebeeck, was interested in plants. However, the demands of establishing a "going" farming operation in the wilderness left little time for more frivolous interests. It was not until the last quarter of the century that collections of living plants and seeds were sent back to Holland in large quantities. Beginning in the 1680's expeditions left from Cape Town to explore the coasts and interior. Soon expanded shipments of plants and seeds began to arrive in Holland. When the French naturalist Jean Baptiste La Marck described the Jade Plant in 1786 he recorded that it had been growing in the Jardin du Roi, in Paris, "for a long time," and he believed it came from Africa.

The common Jade Plant produces a fleshy stem covered with a brown or grayish "bark". The green fleshy twigs bear thick egg-shaped leaves, with the narrow end toward the base where it passes into a thick petiole. Leaves are 1-2 in. long, ¾-1¼ in. wide and ⅛-¼ in. thick. They are borne in opposite pairs. The twigs branch frequently and a small plant soon becomes a miniature tree. The Jade Plant will tolerate low light, a dry, hot atmosphere, and little water. Naturally a much healthier plant is produced in a sunny window, with an adequate water supply. Under such conditions an old plant may cover itself with clusters of pale pink blossoms.

Over the years the Jade Plant has been confused with three other shrubby species of Crassula, viz. *C. arborescens*, a shrub or small tree with larger, differently shaped, leaves; *C lactea*, a prostrate sub-shrub; and *C. obliqua*, a medium sized shrub. To further complicate matters both *Crassula obliqua* and *C. portulacea* have been called *Crassula argentea*, a name of uncertain application.

In the early years of its cultivation the Jade Plant was confused with another South African fleshy shrub or tree, the Spekboom or Elephant's Food, *Portulacaria afra*. In contrast to the Jade Plant, which is related to the Sedums, Spekboom is a Portulaca relative, related to our common garden weed, Purslane. Like Purslane it is edible and is an important plant in parts of Africa. The common name "Spekboom" means literally "Pork Wood", a reference to the edible twigs.

In deference to those readers in the frost free areas of the United States, both Jade Plant and Spekboom will grow out of doors if planted in well drained soil. Combine this with adequate sunlight and you may be lucky enough to have flowers regularly!

Photo: Murray Keene

# BOOKS

*Reviews by Tom Stevenson*

**THE LAUREL BOOK**

*By*
*Richard A. Jaynes*
*Macmillan Publishing Co., Inc.*
*New York — 1975*
*180 pages, well illustrated, $10.95*

At least one variety of the seven species of laurel (Kalmia), all native plants, will thrive in any garden in the continental United States, says the author. Mountain laurel, the favorite garden laurel, is thought by many to be the most beautiful flowering shrub in North America. It is the state flower of both Connecticut and Pennsylvania.

Dr. Jaynes, the author, is associate geneticist at the Connecticut Agricultural Experiment Station, New Haven. He has written several other books and was the editor of a fine book, "North American Nut Trees," published in 1969 by the Northern Nut Growers Association. He is the recipient of the Evelyn Mooney Certificate for Creative Horticultural Achievement from the National Council of State Garden Clubs, the Bronze Medal of the American Rhododendron Society, the Jackson Dawson Memorial Medal from the Massachusetts Horticultural Society for achievement in plant propagation and hybridization, and other awards and citations.

The Massachusetts citation states that he is "probably the country's foremost worker in the development of blight-resistant selections of American chestnut." It also said he has developed a wide range of flower colors and plant forms in his work with mountain and sheep laurel, several of which should be fine additions to a garden.

Perhaps the best evaluation of "The Laurel Book" is provided by Dr. David G. Leach, past president of The American Horticultural Society, and himself a leading authority on Kalmia (laurel) as well as rhododendrons.

"This is the first book ever published on Kalmia," he says. "The book reflects the author's authority which springs from intimate acquaintance with these fascinating plants.

"It deals especially and concisely with every conceivable aspect of its history, propagation, cultivation, toxicity, pests, hybridizing and inheritance. Most readers will be astounded to learn of the diversity in the laurels, in flower size, color, stature, season of bloom and other characteristics important to their garden effect.

"Those who have found the pallid pinks undistinguished will be captivated by the descriptions and photographs of the forms with glowing red buds opening to rich rose blossoms and by the giant whites.

"Dr. Jaynes has produced an intensely interesting book on laurels written with unusual clarity in an easy non-technical manner; at the same time it constitutes a primer for the planting and care of their near relatives, rhododendrons, azaleas, pieris and other ericaceous plants."

*Two Translations from the English*

**GARDENING WEEK BY WEEK**

*By*
*Xenia Field*
*Crescent Books*
*New York*
*1975–128 pages–$5.98*

**COLOR GUIDE TO AMERICAN GARDENING**

*By*
*Arthur Hellyer*
*Bounty Books*
*New York*
*1975–192 pages–$10.95*

It is unfortunate that the publishers of British gardening books feel compelled to provide special editions for the American gardener. The addition of an American consultant and the inclusion of the inevitable plant-hardiness zone map does not make an American edition of a previously published English gardening book.

*Gardening Week by Week* is a chatty book which provides weekly instructions for working with garden flowers, indoor plants, shrubs, greenhouse, fruit and other similar subjects. The generalities about the seasonal weather and regional differences within the United States, which are offered in this book, seem quite ingenuous and are better suited to an explanation aimed at the British audience rather than a clarification to an inhabitant of North America. The excellent photographs in large format make this a pretty book but add little to the information content. Generalized statements such as "keep the night temperature of your greenhouse at 45°F" are quite meaningless without consideration of the specific plant material concerned. The week-by-week guide to garden chores might be useful to the beginning gardener.

*Color Guide to American Gardening* has many of the same problems. It is an excellent beginner's guide to all phases of gardening, both in the mechanical aspect of starting a garden as well as in the selection of plant material. Many of the plant recommendations are unsuitable for growing in the New York area in spite of the comments of the American editors to the contrary.

Both of these books are by well-known and competent English gardening writers. Presentation to the American gardening public in a partially translated form, however, will confuse more than help the reader. The advanced American gardener has always looked to the British for ideas and inspiration with the full knowledge that he must adapt what he reads to conditions in America. Both of these books imply that this has been done for the beginning gardener by the American consultant—this simply isn't the case.

Gilbert S. Daniels

**FERN GROWERS MANUAL**

*by*
*Barbara Joe Hoshizaki*
*Alfred A. Knopf, New York, New York*
*256 pp., illustrated. $15.00*

Most observers of the current horticultural scene will agree that there has been a great increase of interest in plants in recent decades, particularly among young people. Plant boutiques have proliferated and in the trade there has been a trend toward the use of more pot plants such as ferns, bromeliads, chrysanthemums and poinsettias in place of cut flowers. This cultural trend has been accompanied by the proliferation of popular horticultural books.

John Philip Baumgardt commented on this trend at the 1975 Longwood Seminar of the Graduate Program in Ornamental Horticulture which is operated in cooperation with the University of Delaware. In this recent meeting at Longwood Gardens, he stated: "We

have proved, thus far, that some quality horticultural writing is going on these days: books are being published that will endure—books that will be highly regarded, in all probability, many years from now."

"But these books are in the great minority. For every good book that appears today some dozen of no good ones are strewn across the face of the country. Where do they come from? How do they come to be written? What are the publishers thinking of to publish books of dubious merit? Why are so many incompetent authors being published while knowledgeable authors scarcely set words on paper?"

"The Fern Growers Manual" is definitely one of permanent value. It is a fern library in miniature and a contribution by a very well qualified author, profusely illustrated, with some color.

This book is definitely horticultural rather than botanical in orientation and the cultural needs of all species currently available are fully treated, including methods of propagation, hybridization and pest control. The price is modest considering present costs. The only additional feature which we would like to have had is a simple key to the main genera, using vegetative and soral characters. We suggest this for inclusion in a later edition.

The time would appear to be ripe for a botanical manual of the ferns of the world, presenting full descriptions and keys to species. The author is well qualified to prepare such a volume. The potential market might be more limited and this might have to be published by some university press. Doubtless there would be some sales to fern collectors and commercial nurserymen as well as to botanists. At least there is now sufficient interest to support some professional and amateur societies devoted to ferns. "The Fern Growers Manual" will doubtless foster and amplify this interest.

Vernon Stoutemyer
Professor Emeritus
Biology Department
U.C.L.A.

## THE NATIVE ORCHIDS OF THE UNITED STATES AND CANADA EXCLUDING FLORIDA

*By*
*Carlyle A. Luer*
*New York Botanical Garden*
*Bronx, New York*
*1975–363 pages–$40.00*

As a consequence of the excellence of content and production of *The Native Orchids of Florida*, published in 1972, this companion volume for the orchids of the remaining states of the United States and Canada has been eagerly awaited. The anticipation was justified, and the new work deserves equal compliments. The colored photographs, distribution maps, and line drawings of floral details all add to the excellent descriptions and general ecological discussions regarding each species. The three native species and four introduced species of orchids which are found growing wild in Hawaii are included as well as all species of orchids growing in Alaska. In addition, *Cypripedium irapeanum*, a native of Mexico, is also included in order to provide completeness for the genus, for this is the only species of the genus which occurs on the North American continent outside of the geographical area covered by the book. Although 25 of the species already covered in *The Native Orchids of Florida* are also included in the new publication because of their range throughout other states, it is unfortunate that a balance of 14 additional species, mostly occurring along the southern Atlantic coast and the Gulf Coast as far west as Texas, have not been included in the present work. This is regrettable because anyone living in the southeastern states outside of Florida will require both works in order to identify all orchids which might possibly occur in his home area. Among the 14 excluded species are *Epidendrum conopseum*, which occurs from Florida north to southern North Carolina and west to Louisiana; *Malaxis spicata*, which occurs from Florida north to Virginia; and *Habenaria repens*, which has a range completely circling the Gulf of Mexico and north to North Carolina along the Atlantic coast. While the *Malaxis* is at least included in the key to the genus, no mention is made in the book anywhere of the *Epidendrum* or the *Habenaria*. Aside from this deliberate omission, this book is highly recommended both for its specific content and as a model for specialized regional floras.

Gilbert S. Daniels

## THE COMPLETE HANDBOOK OF PLANT PROPAGATION

*by*
*R.C.M. Wright*
*Macmillan Publishing Co.*
*New York — 1975*
*190 pages, well illustrated, $12.95*

The plant propagation techniques shown and described in this book make it possible for almost any gardener to grow favorite plants, including rare and expensive ones, at great savings, and with considerable satisfaction.

There are specific guidelines and professional tips when to raise seeds under glass; sow seeds outdoors; propagate plants by division, cutting, grafting, budding and layering; grow plants by recently developed techniques, such as mist propagation and hormone root propagation; and, refine your own hybrid plants. The handbook is one of the most comprehensive and up-to-date works on plant propagation.

R.C.M. Wright, the author, is particularly well qualified to write a practical handbook on plant propagation. He worked for many years for Samuel McGrady and Sons, world-famous rose growers, and subsequently for the late F. A. Secrett on vegetable production. He also worked for a number of years at the John Innes Horticultural Institution and as an adviser to the British Ministry of Agriculture and Fisheries, primarily on methods of plant propagation.

Can the average gardener save seeds from his own garden and get good results from them?

This has been done successfully in certain cases, says the author, but there are complications, and with some kinds of plants it is definitely inadvisable.

The chief difficulties are as follows: Firstly, in small gardens there is insuf-

*Continued on page 43*

# GARDENER'S MARKETPLACE

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*Continued from page 32*

## More Than Zinnias, Earlier Than Marigolds

widths of pewter bowls, dark tones of the library-office needing a brilliant bouquet to bring the room to life. Complimenting interior design is not the most rewarding use for cutting flowers, however. Every gardener remembers flowers from occasions; Peonies at a daughter's birthday, Daffodils splashed over a hilltop at a revisited house, pale lavender Gladiolus sent by a music teacher when one missed lessons during a hospital stay. These intimate memories belong to every person, as silent reminders are part of the poetry and music of living. Sharing such thoughts is even deeper. To send Chrysanthemums to one's American-Japanese friend, or daisies to a Sunday altar for a lost young acolyte, or Rain Lilies to the apartment dweller who serves tea in pink cups on a cool day—these are a person-to-person message difficult to express in other ways.

## BOOKS *Continued*

ficient room to allow any space being set aside specially for seed production. Secondly, in many districts it is impossible to secure proper ripening and drying owing to moist weather in the autumn. Thirdly, there is always the risk of indiscriminate cross pollination giving rise to worthless hybrids.

If one attempted to save seeds from cabbages and Brussels sprouts growing side by side, very likely some or all of the seedlings would be a cross between these two vegetables. All the brassicas are prone to crossing in this way, and even if only one type is grown, there is always a risk of cross-pollination from a neighbor's garden or elsewhere.

Moreover, the varieties of most vegetable plants set seed readily with other varieties of the same kind, and in a private garden it is rarely possible to provide adequate isolation.

Seed saving of vegetables in private gardens should usually be limited to those vegetables that normally set seeds with their own pollen; in other words, they are self-fertile. Even then there is a risk of some cross-pollination unless one variety only, of each of the vegetables attempted, is grown.

It is also advisable to restrict home seed-saving to vegetables that ripen their seed early and are relatively easy to harvest; such crops include peas, broad beans, runner beans, string-beans, lettuce and tomatoes.

In saving seed from vegetables, as far as is possible select only those plants that are healthy, true to type and conform to the general standard of the variety.

It should be emphasized that any improvement in plants or their productivity which is due to good cultivation is not passed on to their offspring, the author says.

# New AHS Horticultural Medal


A special medal for the American Horticultural Society has been executed by Viktor Schreckengast, a nationally known sculptor and industrial designer from Cleveland, Ohio. This new medal is to be given for horticultural excellence at regional shows put on by plant societies who are members of AHS. The gold medal requires 15 species or cultivars of blue ribbon quality, the silver medal 8 species or cultivars. The medal measures one inch and a half across with a sling attached, so it can be worn on a chain or ribbon.

AHS plant society members may write to River Farm, Mount Vernon, Virginia 22121 for application blanks.

Mrs. Benjamin P. Bole, Jr., Chairman
AHS Awards Committee

# Gardener's Questions

*By Tom Stevenson*

**Q:** I couldn't grow grass under my Norway maple so I gave up on it and used gravel to make it look better. Now weeds are coming up through the gravel and I'm afraid to use a weed-killer on them because it might endanger the tree. Is there a solution?

**A:** Laying black polyethylene plastic over the soil surface before spreading the gravel can eliminate the weed problem. The plastic shuts out light. It is necessary to punch small holes in the plastic every two feet or so to allow for drainage. An ice pick can be used for this.

Your best bet at this point is to pull up the weeds as they appear. They should not be hard to pull. Sooner or later they will stop coming up.

**Q:** My wisteria vine is taking over the place. Can it be pruned and if so when? I love it when it is in bloom and don't want to harm it.

**A:** The Chinese wisteria can be pruned severely and blooms as well or even better than if left unpruned. The Japanese wisteria blooms better if left unpruned.

The Chinese variety is extremely fragrant, the Japanese only slightly so. The blossoms on the Chinese open before the leaves appear while on the Japanese they develop with the unfolding leaves.

The Chinese wisteria can be pruned immediately after it blooms or pruning can be delayed three or four weeks. Early pruning tends to cause summer flowering without decreasing the number of blooms the following spring.

The shoots of Chinese wisteria can be cut back to the trellis.

The severe pruning causes development of many new long shoots and these tend to develop flower buds at all leaves except the small basal ones.

Fall pruning is likely to remove a lot of flower buds.

**Q:** My dwarf apple and peach trees which I am growing on the lawn look anemic. They have fruit on them but it doesn't look normal and the foliage doesn't look healthy. Should they be fertilized? I have never done it, assuming it was unnecessary.

**A:** Fruit trees growing in permanent sod on the lawn should be fertilized every year. Give them 10-6-4 fertilizer, at the rate of three to five pounds per tree, spread evenly on the ground and then watered in. Keep at least a foot away from the trunk of the tree.

The best time to fertilize them is in the fall after most of the leaves have dropped. Fertilizer applied at that time will be taken up by the roots and be in place to push vigorous new growth in the spring.

**Q:** I have tried repeatedly to grow clivia house plants from seed which I get from a large plant I have, without success. Obviously, I don't know how. Can you help me?

**A:** You probably are taking the seed and planting them before they mature. It takes close to a year for the seed to ripen on the plant.

At first green, the fruit containing the seed gradually changes to dark red when ripening. Each fruit

# and Answers

usually contains one to three seed. Not many should be allowed to mature on the plant because it weakens the plant materially. Plant the seed immediately after ripe. Potting mixtures sold at garden centers are satisfactory.

**Q:** What time of day is best for watering the lawn?

**A:** There are three fallacies about lawn watering. One is that the grass should never be watered when the sun is shining; another is that the grass will die from drought if not watered, and the other is a little water every day is the best system.

If there is any best time to water it is probably early morning. Watering in early evening may make the grass more susceptible to diseases because it will stay wet all night. Watering when the sun is shining will not harm the grass if water is needed.

Grass turns brown when the soil is very dry, but a drought severe enough to kill most lawn grasses is not likely, especially where a lawn is given halfway decent care.

In a controlled experiment to study lawn irrigation in the northern humid region of the United States conducted in Ohio, after three years the sod was better in terms of density and freedom from weeds where no irrigation was applied.

Proper irrigation will keep a lawn looking nicer but will not basically improve an otherwise well-managed Kentucky bluegrass or red fescue lawn.

Turfgrass specialists agree that when a lawn is watered, it should be thoroughly soaked at infrequent intervals (about every 10 days or two weeks).

**Q:** We have a beautiful oak tree that had an infestation of oak galls last year. The gall was a light colored parchment-like ball, a little smaller than a golf ball, empty inside. If it happens again this year, what damage will it do to the tree and is there any practical way to prevent it?

**A:** The gall you describe is the oak apple gall. It is caused by the cynipid wasp. The immature insect is a legless white larva, the adult a 4-winged wasp. This gall and most other galls cause little or no damage to the tree, although with a heavy infestation it may somewhat affect the appearance of the tree. The only way the galls could be prevented would be to eliminate the insects that cause them and that would not be very easy to do and it is seldom practical.

**Q:** My candytuft didn't bloom very well this year. What can I do to perk it up?

**A:** The best treatment for perennial candytuft is to cut it back to about six inches soon after the flowers fade in the spring. Hedge shears can be used to do the pruning.

If candytuft isn't sheared, the flowers go to seed and a lot of energy is used up in the process, often resulting in poor flowering the following spring.

Don't cut back below six inches, because it may seriously damage the plant. After pruning the candytuft, fertilize it with 5-10-5 fertilizer at the rate of five pounds per 100 square feet of area.

**Q:** Can you please tell me how to take care of wax begonias?

**A:** The wax begonia (Begonia semperflorens) needs very good light to bloom continuously. Outdoors in the garden full sun is o.k. but when used as a house plant morning sun only is best.

Do not over-water, they are succulents. A succulent is a plant that stores water in thickened leaves and stems for use in periods of dryness. Water only after the soil has become fairly dry and then water thoroughly.

In the garden outdoors light fertilization weekly will help them to keep blooming. Indoors, once a month is adequate.

**Q:** I planted a golden locust tree nearly two years ago, it is about 12 feet tall, has beautiful golden leaves, but the trunk is much too spindly. How do I prune this tree to keep it growing tall but stronger?

**A:** The problem with the golden locust and other plants with leaves mostly yellow or white is the leaves do not have very much chlorophyll and that means low food production.

New growth of roots, trunk and limbs is largely from food produced in the leaves. A dark green leaf can produce more food than a yellow one; a normal leaf more than one damaged by insects and diseases.

To help promote growth of the tree, to help it become more sturdy, do not prune it at all. When you remove a healthy leaf, you lose a food producer. Do not even remove the leaves growing along the trunk.