Today's Daylilies

by George H. Pride

A Hemerocallis show twenty-five or thirty years ago featured flowers mostly in shades of yellow and orange. Other colors were rarely seen. A modern daylily exhibition has classes for the following colors or color patterns: Near white, yellow, orange, pink, peach, melon, rose, bright red, orange-red, dark red, lavender and purple, polychromes, bicolors, and eyed. True blue and pure white are about the only colors missing. The show includes classes for large-, small-, and miniature-flowered varieties. There is a class for “spider-flowered” types that have long thin floral segments and a class for “double” flowers. A section for dwarf cultivars is usually added for daylilies that normally grow under 24 inches in height. Two recent developments will probably have to be included soon: New cultivars are appearing with deeper colored contrasty margins on the flower segments, a pattern known as “picotee”; and for several years now there have been daylilies with lacy fringing along the edges of the petals creating an attractive and novel appearance.

One reason for the rapid increase in popularity of these new plants is their relative ease of cultivation. They thrive in ordinary garden soil in a location receiving at least a half day of sunshine. Though they can stand long periods of drought, they grow best and have more flowers when they are kept well watered. Few if any serious pests or diseases seem to bother them.

All wild species of daylilies are native to Asia, mainly China and Japan. They have been cultivated in China for hundreds of years for medicine and as vegetables. A translation of an account written in China in 656 A.D. states that Hemerocallis “quiets the five viscera (the heart, lungs, liver, kidneys, and stomach), benefits the mind and strengthens the will power, gives happiness, reduces worry, lightens the body weight and brightens the eye.”

Dr. Shiu Ying Hu, formerly of the Arnold Arboretum staff, and an authority on the taxonomy and lore of these plants, states that the written Chinese character for daylilies is the same as that for “mother love.” The dried buds known as “golden needles,” and available in Chinese stores in most large cities, are used in cooking. The roots and crown of the plants also are used for culinary purposes, and as a pain reliever. A hallucinating effect is said to occur when a lot of young shoots are eaten, giving the sensation of “feeling no pain.” The flavor of the cooked plants is described as like that of creamed onions.
Unfortunately labelled "Tiger Lily" flowers, these are the dried daylily buds known as "golden needles" and used in Chinese cooking. Photo: R. Howard.

Horticulturally, the modern daylilies of our gardens are unique in several ways: A relatively few species have led to a remarkable diversity of types and flower colors; this galaxy was created in a relatively short time; and daylilies are one of the few major garden subjects that originated in China and were not first developed beyond the species stage by the Chinese. (Except for the very earliest work, most of the breeding has been done in the United States.)

Species from which this new race of garden plants has so rapidly developed include *Hemerocallis citrina* from China, whose large fragrant lemon-yellow flowers unfurl in late afternoon, remaining open all night. (In breeding this acts as a dominant characteristic.) *H. middendorfii* is a dwarf plant producing fragrant orange flowers of very firm texture in late spring. *H. thunbergi* from Japan is a robust grower bearing many fragrant lemon-yellow flowers in mid- to late season. It has been widely used in hybridizing. *H. aurantiaca*, also from Japan, with fragrant bright orange flowers sometimes flushed purple helped produce darker colors in the breeding work; it and *H. thunbergi* were used extensively by the early breeders. *H. lilioasphodelus* (*H. flava*), the Lemon Lily, is spring flowering and is still widely grown as a popular garden plant; in 1848, Asa Gray noted that it was "extensively cultivated." *H. fulva*, with tawny-colored flowers,
has been known in the West since 1576. Thomas Nuttall, in 1818, distributed it around Philadelphia so thoroughly that it appeared to be naturalized. It is certainly the most widely cultivated daylily in the world today (probably all the plants are the cultivar 'Europa'). It is a highly sterile, self incompatible triploid. Despite this, through extensive and persistent breeding work it did give rise to a few important seedlings. Its tenacity on life is legendary. Portions of plants have been buried 40 inches deep in soil and have survived, producing long rhizomes that emerged from the top of the heap and developed into healthy plants. An edition of Gray's Flora published in 1848 lists it as a common escapee. The double flowered cultivar of this species, known as 'Kwanso', and a green and white-leaved double flowered cultivar known as 'Kwanso Variegata' still fascinate many gardeners. 

H. minor, the Dwarf Yellow Daylily, is an early flowering species with fragrant yellow flowers. Charles Sargent, the first Director of the Arnold Arboretum, reported it growing in his Brookline garden in 1895 and recommended it highly. H. multiflora, first described in 1929, has numerous small orange flowers later in the season. A well-known cultivar developed from it is called 'Tinkerbell'.

In the late 1800s the first daylily breeding work began in England. The first cultivar, named by George Yeld in 1892, was 'Apricot' — probably a cross between H. lilioasphodelus and H. middendorfii. Sporadic work continued in England, but nothing we would now consider remarkable appeared. The new cultivars were moderately popular garden subjects, but similar in color, being mostly yellow and shades of orange.

Breeding work in daylilies started in America mainly as a result of cooperation between Dr. Albert Steward, who was a teacher of botany at the University of Nanking from 1921 to 1950, and his close friend, Dr. Arlow Stout of the New York Botanical Garden. Dr. Steward was highly regarded by the Chinese and was readily admitted to many gardens and farmyards where he found interesting "forms" of daylilies. These were sent to Dr. Stout for his consideration and to be used in his breeding work. Perhaps, from the gardening standpoint, the most important plant of all was H. fulva var. rosea, which had rose-colored flowers. The first specimens of this variety were sent from China in 1924. When the chromosomes of this variety were counted it was found to be a diploid, making it much easier to use in breeding than the triploid cultivar 'Europa'. A seedling named 'Rosalind' resulting from Dr. Stout's work with this variety had rose-red flowers and helped unlock a vast array of new colors in daylily breeding.

During the forty-one years between 1893 and 1934, only twenty-three hybridizers were known to be working with daylilies, producing a total of one hundred seventy-four cultivars or an average of only four a year with no great change in flower color evident. With the availability of the new species and their variants that Steward sent
to Stout, many colors not seen before began to emerge. During a period of only fourteen years, from 1934 to 1948, the American Hemerocallis Society registered 2,278 new cultivars, an average of one hundred fifty a year; but from 1948 to 1966, a period of eighteen years, 10,145 new cultivars were registered, averaging around five hundred fifty a year. During the last ten years the average number per year of newly registered kinds has been seven hundred thirty-four. In 1975, more than one hundred fifty active daylily breeders were listed in the American Hemerocallis Society's registry. Since this society started in 1946, known then as the Midwest Hemerocallis Society, it has registered over twenty thousand cultivars.

With daylilies’ skyrocketing popularity already underway, a remarkable new development in their breeding occurred in the middle 1940s when the first man-made tetraploids appeared. Up to that time most cultivars had been diploids with a normal set of twenty-two chromosomes in each somatic or body cell of the plant; each gamete or sex cell contained eleven of these structures.
The tetraploids were developed as a result of the use of the chemical, colchicine, which is obtained from the *Colchicum* or Fall Crocus. (Colchicine is a well-known agent for developing polyploidy in plant tissues.) The tetraploids have forty-four chromosomes in each body cell — four times the number in a sex cell of a diploid variety, which accounts for the prefix “tetra.”

There seems to be confusion about who should be considered first in bringing about this radical change in what was already a popular garden plant. According to the best information available, the first tetraploid daylily flowered in 1947, and was the result of the work of Robert Schreiner, a student at the University of Minnesota. Mr. Schreiner flowered several tetraploid clones that year, and a treated plant of the cultivar ‘Cressida’ was named ‘Brilliant Glow’. In 1948, more tetraploid daylilies were flowered at the University of California in Los Angeles; these were the results of work by Quinn Buck. Over the years much daylily breeding has been done at the United States Department of Agriculture in Beltsville, Maryland. In 1951, Dr. Hamilton Traub gave detailed descriptions of his experiments there. In 1949, he flowered what he described as a “complete tet” and named it ‘Tetra Starzynski’. The term “complete” indicates that the plant is completely tetraploid. When colchicine is administered to a grown plant or seedling, there is a very high possibility that the result will be a “chimaera” with some tissue diploid and some tetraploid. Much more desirable for breeding work is the “complete” tetraploid. By 1959, sixteen named tetraploids bred by Dr. Traub were introduced to the gardening public at prices ranging from $65.00 to $500.00 a plant. The race was on!
People were confounded by this extraordinary development and the prices being asked for the plants. All the Traub introductions were "evergreens," which do better in the southern states than in the north because they have a tendency to continue to grow and not die down to rest during the winter, even after frosts have killed them back. (This usually results in enough damage to the plant tissues to cause the plants to do poorly the next season.)

In the 1950s, Dr. Robert Griesbach and Orville Fay teamed their efforts and treated many diploid seedlings with colchicine. By 1959 they had flowered around one hundred tetraploids. In 1961, four tetraploids were introduced: 'Crestwood Ann', 'Crestwood Bicolor', 'Crestwood Evening', and 'Crestwood Lucy'. In 1963, the Griesbach-Fay team added 'Crestwood Gold' to the roster; and in 1967, 'Mary Todd' and 'Golden Surrey'. The latter was the first known daylily with a pronounced lacy fringing on the petals. All these cultivars were "dormant;" when the cold came they died down and rested until spring when new growth started. They were, therefore, more suitable for northern gardens.

More and more researchers became involved. It is only possible to name a few of them here, which means slighting a great many others. In 1964, Dr. Toru Arisumi at Beltsville reported converting seventeen diploid cultivars to the tetraploid condition. In Illinois, Brother Charles Reckamp's work was notable for the production of many new tetraploids in shades of yellow and so-called melon colors. Drs. Virginia and Richard Peck, two college professors who taught English in Tennessee, started intensive work in the 1960s. The results are still bearing fruit. Soon there were hundreds of dedicated amateurs and professionals who were deeply involved with work on this new type of plant. In New England alone, several growers started work with colchicine more than fifteen years ago with excellent results. A whole series of tetraploid daylilies has been developed especially suited to this climate. And yet, by 1967 from all of the United States only sixty-six tetraploids that had been grown from seed, and seventeen that had been induced by the use of colchicine, had been registered by the American Hemerocallis Society.

The differences in the tetraploids and diploids were striking even to the non-scientist. In most cases the petals of the flowers were larger and heavier textured. Flower buds and flower stalks were thicker in diameter and the colors of the flowers were deeper and richer than before. Pollen grains examined under a microscope were seen to be noticeably larger. The leaf pores or stomates were fewer, but larger by about 1/3. The illustration accompanying this article of the diploid and tetraploid cultivars of 'Frances Fay' will give some idea of the obvious differences. The conversion work in this case was done by William Lachman of Amherst, Massachusetts who has been especially active in this field.
Left. Hemerocallis 'Love Is', an unintroduced tetraploid developed by Donald Stevens.
Photo. L. Mitchell.

Right. H. 'Dawn Ballet', a light polychrome tetraploid.
Photo. G. Pride.

Left. H. 'El Tigre', an eyed tetraploid.
Photo. G. Pride.
Originally there was much discussion among gardeners as to whether or not the new tetraploids were as superior as was being claimed. Now most Hemerocallis growers seem to be convinced that they are a decided advancement both as a garden subject and as a show flower. Some gardeners have abandoned the diploid cultivars and are now growing almost exclusively the newer tetraploids. Jokingly referred to as the “Tet Set,” they are strong in their praises of the new tetraploid daylily cultivars.

Perhaps the greatest advance in making these plants even more available to the average gardener is tissue culture, which is going on at the present time. Hemerocallis are especially adapted to this process, which is bringing radical changes in the speed of plant propagation. In the last few years, several researchers, including Dr. Martin Meyer of Urbana, Illinois and Dr. Abraham Krikorian of Stony Brook, New York, have shown that by using very small pieces of the undeveloped buds and inflorescence stems one can increase the number of plants from a single specimen astronomically. The proper techniques are well understood, but are not easy for the amateur as they involve a laboratory similar to one used for growing bacteria, and completely sterile conditions. Claims of a potential of several hundred thousand plants produced in less than a year from the tissues of one plant are being made. A new film that the Arnold Arboretum has just completed dealing with plant propagation features this process in some scenes. It may be only a short time before a new, very choice daylily which would have been introduced in the past for from $50.00 to $100.00 will be available to the gardener in quantity for only a few dollars a plant.

There are several gardens not far from Boston where many of these exciting new tetraploids may be seen. A collection has been established at that part of the Arnold Arboretum known as the Case Estates in the town of Weston. Two commercial growers in Massachusetts have quantities of these cultivars. They are Robert Seawright, 134 Indian Hill, Carlisle, and Charles Trommer, 45 River Street, Rehoboth.

A dozen or so non-commercial gardeners have excellent collections that may be seen by visitors. One might check the membership roster published in the Journal of the American Hemerocallis Society to locate members nearby and request permission to see their new daylilies. This list is on file at the library of the Arnold Arboretum in Jamaica Plain.

Another way to see many of the newest daylilies is to visit a horticultural show featuring them. For many years, the Worcester County Horticultural Society, Elm Street, Worcester, Massachusetts has held one of the finest daylily shows in the world. One day only, it is usually on the last Saturday of July. It would be wise to call the Society and check before visiting.
With all that has been accomplished so far in such a short time, it is hard to believe that daylily breeders are still unsatisfied. They are now concentrating on clearer colors, and the production of a pure white and a true blue daylily. Improvement in early flowering types is being sought. There is hope for many more cultivars with flowers that stay open at night for indoor decoration, and even that a daylily with flowers lasting two days may yet appear. Startling picotee edges are showing up on some of the new cultivars. Reblooming or remontant varieties are being used extensively in hope of producing an everblooming daylily that would start to flower in the spring and continue until stopped by frost.
Fragrance has been neglected. Many gardeners are hoping for more varieties with pleasant scents. Some of the night-flowering yellow daylilies are noticeably fragrant; other cultivars have no fragrance at all. This is apt to be true of the red and purple varieties. The scent occurs only when the flower is open and comes from special “scent cells” widely distributed over the inside of the petals.

The daylilies of the future may have all these desirable characteristics, and new methods of propagation will make the plants available in great quantity at very reasonable prices. The components needed for such marvels are available now. All that is necessary is the wizardry of the plant breeder to assemble them in the proper manner.

Hemerocallis ‘Chicago Picotee Promise’, a recent development in tetraploids featuring a striking eye zone. Photo: Courtesy, George Lennington.
Author's Favorite Fifty Regardless of Price
(all are tetraploids except where noted)

**SHADES OF RED**
- Barbarossa (Peck) bright red
- Bruce (Pride) orange-red
- Chicago Rosey (Marsh) rose-red
- Cherry Cheeks (Peck) rose-red
- Dragon Lore (Peck) rich medium red
- Ed Murray (tet. form) (Grovatt) black-red
- Firedrake (Peck) rich red
- Howard Goodson (Griesbach) medium red
- Joey Langdon (Griesbach) bright red
- Lusty Leland (Peck) bright red
- Rubric (Griesbach) red with green throat
- Scarlock (Peck) bright red
- Slowly Won (Peck) bright red
- Turned On (Pride) firey-red
- Wine Bold (Peck) wine-red

**POLYCHROMES**
- Dawn Ballet (Reckamp) light blend
- Heavenly Harp (Reckamp) light blend
- Prides Crossing (Pride) light blend

**VARIOUS**
- Highland Lass (Peck) bicolor
- Heather Green (Peck) pink with green throat
- King Alfred (Reckamp) double yellow
- Little Hustler (Pride) dwarf yellow diploid
- Mary Moldovan (Moldovan) melon
- Ruffled Apricot (Baker) name describes it
- Rose Revue (Griesbach) medium rose
- Sable Night (tet. form) (Wild-Hardy) deep chocolate
- Segramoor (Peck) wine
- Thai Ballet (Moldovan) cerise

**SHADES OF YELLOW**
- Erin Prairie (Fay) greenish-yellow
- Evening Bell (Peck) light yellow
- Golden Prize (Peck) deep yellow
- Hudson Valley (Peck) large light yellow
- Ice Follies (Pride) very pale yellow
- Mary Todd (Fay) gold
- Royal Kin (Peck) light yellow
- Orange Prelude (McEwen) very early orange
- Yellow Crystal (Griesbach) medium yellow

**EYED**
- Brindlee Beauty (Webster) pale eye zone
- Chicago Maid (Marsh) striking eye zone
- El Tigre (Durio) medium eye zone
- Kempion (Peck) light eye zone
- Thumbprint (Peck) odd patterns

**LAVENDER AND PURPLE SHADES**
- Aberdeen (Peck) very pale lavender
- Chicago Bride (Marsh) pale bluish-lavender
- Chicago Queen (Marsh) lavender-purple
- Helen Boehm (Peck) pale lavender
- Rum Plum (Pride) purple

**FRINGED PETALS**
- Chicago Knobby (Marsh) purple with "knobbed" petals
- Creepy Crawler (Hite) yellow with pronounced fringing
- Golden Surrey (Griesbach-Fay) yellow with fine fringing