

# GARDEN GLADIOLI

Most Common Varieties Are Complex Hybrids Representing a Number of Distinct Species—Success Suggests That More Species Should Be Used in the Production of New Horticultural Forms of Other Flowers<sup>1</sup>

ALFRED C. HOTTES

Department of Floriculture, Cornell University, Ithaca, N. Y.

GLADIOLUS offers an excellent example of a genus of plants which has been improved for garden purposes by the incorporation of a number of species into more complex multiple hybrids than most of the flowers of the garden. The China aster (*Callistephus chinensis*), sweet pea (*Lathyrus odoratus*) peony (*Paeonia albiflora*) and Boston fern (*Nephrolepis exaltata* var. *bostoniensis*) have been improved solely by the selection of variations and mutations within a single species. Phlox, German iris, larkspur (*Delphinium*), dahlia, columbine (*Aquilegia*), begonia and chrysanthemum varieties have arisen from the hybridization of several species. The rose, orchid, pelargonium and gladiolus, however, often have in the make-up of their best varieties three to seven species, each contributing characteristics to the modern degree of perfection.

The genus *Gladiolus* consists of approximately 130 species, most of which are natives of South Africa, though several are of European origin. Previous to 1840, only a few forms commanded any attention horticulturally. One was the hybrid species *G. colvillei*, a rather dwarf plant with flowers characterized by a white area or lozenge in the throat, bordered by a deep color; a feature inherited directly from its parent, *G. cardinalis*. *G. tristis* var. *concolor* was used as the other parent of *G. colvillei*.

Another form was known as *G. ramosus*, a branchy plant which resulted from crossing *G. oppositiflorus* with various hybrids (now unknown) of *G. cardinalis*. *G. oppositiflorus* is a

native of Madagascar and Natal, and bears a stem 3 to 6 feet tall which produces large white flowers with characteristic amethyst stripes in the throat. Twenty-four or even forty blooms are borne upon the stem, twelve of which are often open at one time. This tall, white, many-flowered species was crossed with *G. cardinalis*, a bright scarlet and rather dwarf species. The result of this crossing was *G. ramosus*, at that time thought to be quite admirable.

In 1837 Beddinghaus, gardener to the Duke of Aremberg, had growing on the estate in Engheim the *G. ramosus* hybrids, and besides these the Parrot Gladiolus, *G. psittacinus*. In this the upper segment is scarlet, with deep yellow medial line, and is also spotted with yellow at the base; the lower is rich yellow and scarlet. The plant grows to a height of three feet and is clothed for the most part by the sheathing bases of the leaves.

## MYSTERY OF GHENT VARIETY

The species *G. ramosus*, *G. oppositiflorus*, *G. cardinalis* and *G. psittacinus* were crossed rather promiscuously. In 1841 a form appeared which was thought to be superb. In "Flore des Serres" was published an account of this new type, and it was said to be a hybrid between *G. cardinalis* and *G. psittacinus*. However, Dean Herbert and others, after attempts to cross these latter species, failed and declared that the new hybrid was *G. psittacinus* and *G. oppositiflorus* instead. A controversy over the parentage has raged since then, but to the writer the explanation is simple in saying that the new hybrid

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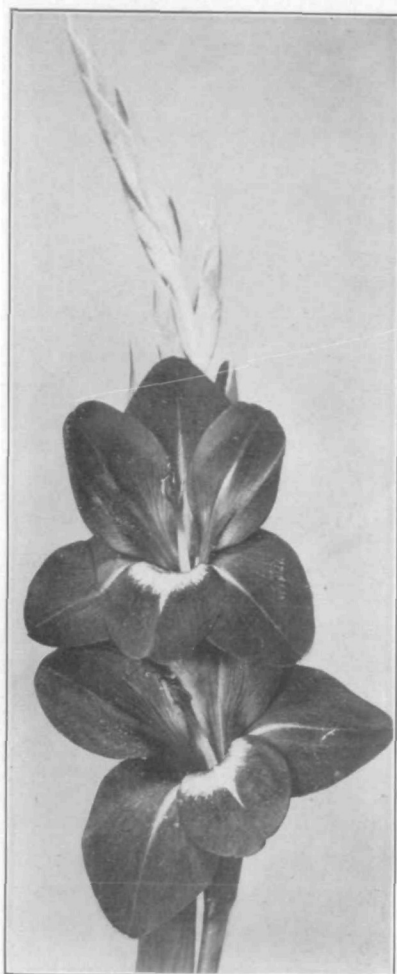
#### SAUNDERS' GLADIOLUS

This brilliant scarlet species (*G. saundersi*) has an amber white throat finely dotted. The openness of its throat is marked, and it has been particularly prized by hybridizers for that reason. It has been used in the creation of many modern garden varieties of gladiolus, to produce well open blooms and clear white throats. Adapted by Hottes from the Botanical Magazine. (Fig. 6.)

was *G. ramosus* (*G. oppositiflorus* by *G. cardinalis*) crossed with *G. psittacinus*. This is substantiated by the fact that the new form contained features from each. Louis Van Houtte obtained the stock and advertised it as *G. gandavensis*, naming it from Ghent, Belgium, and describing it in glowing terms as bearing majestic flowers, numbering eighteen to twenty, of the most charming vermilion, the inferior petals adorned with chrome, amaranth and brown. He writes: "All Ghent comes to admire it. In stateliness and color it exceeds all others we have among Gladioli."

Napoleon III was much interested in the amelioration and introduction of new plants, and so it was that *G. gandavensis* came into the possession of Souchet, gardener of the Emperor. Souchet worked with it, developed by hybridization and selection its form, color, size and arrangement of flowers until it became a valuable addition to our garden plants. *G. gandavensis* can be characterized as having many flowers open at the same time, being of great size and of good substance, having rich colors, handsome and somewhat angular form, often having light areas or penciling in the throat. The flowers are arranged in two rows on a tall spike in such a way that each flower appears attractive. The spikes are very erect and quite stiff.

Some few years previous to 1878 the species *G. purpureo-auratus* came to the attention of that master French horticulturist, Victor Lemoine, who began to use it with improved forms of *G. gandavensis*. By this time, the group had been materially improved by Souchet, Brunelet and Souillard. Lemoine immediately realized the possibilities of this species, which was introduced into France in 1872. *G. purpureo-auratus* is pale yellowish-green and bears upon the lower segments of the flower admirable diamond-shaped blotches of maroon. The flowers are bell-shaped, rather hooded, pendant, far apart and face one direction. The foliage is somewhat glaucous, narrow and stiff. The stems are slender, wiry and inclined to be curved. The corms bear many short underground stems



#### PRINCEPS

This amaryllis-like gladiolus is one of 2,000 produced by Dr. W. Van Fleet; its interesting pedigree can be seen at the end of the text. In color it is rich crimson with a magnificent, large, white throat. From the "Modern Gladiolus Grower." (Fig. 7.)

tipped by clusters of cormels. The flower was not beautiful, but Lemoine realized that combinations of the *G. gandavensis* varieties with this new species would result in something unique.

#### LEMOINE'S HYBRIDS

In 1878 Lemoine exhibited at the International Exhibition at Paris a number of these hybrids and called them *G. lemoinei*. The stems are wiry,

slender, graceful, inclined to be curved, but the spikes have the ability to open only a few blooms at one time. Many of the varieties have too strong a tendency toward being bell-shaped, to the extent that the interior of the flower is not readily seen. The flowers are rather smaller than *G. gandavensis*. The colors are exceedingly rich and the lower petals of the blooms are usually blotched, a feature gained from *G. purpureo-auratus*. The blotches are deep, velvety and very striking. Enthusiasts have ventured to say that some of the richest colorings in the plant kingdom are found in the lemoinei. *G. purpureo-auratus* is about the hardest of the African species and has contributed this quality to the hybrids. Many of them are hardy, even in the region of New York City. A moment's consideration will show that the rich petal coloring has been derived from the species *G. psittacinus*; the blotch, hardness and graceful stem from *G. purpureo-auratus*; and the vigor, erectness, and perhaps the great number of flowers, from *G. oppositiflorus*.

Lemoine's next work was to influence the form and colorations of the *G. lemoinei* by using the species *G. saundersi* which is truly a beautifully colored species, even in its unimproved form. The flowers are brilliant scarlet with a pure white center, finely dotted scarlet. They are very open, being faulty in this respect. The plants are dwarf and weak-stemmed; six to eight large hooded flowers are borne upon a stem usually less than 2 feet tall. The leaves are short and glaucous.

Using *G. saundersi* with the best varieties of *G. lemoinei*, a new group was introduced in 1886 named *G. nanceianus* from Lemoine's home, Nancy, France. *G. lemoinei* was used as the pollen parent. Reciprocal crosses did not appear to be identical. The *G. nanceianus* varieties are characterized by being very large (larger than *G. gandavensis* or *G. lemoinei*), very well open as contrasted with lemoinei. The open flower looks one in the face, as the side segments are spreading. The throat is marked with peculiar mottlings of fine, short strokes of contrasting color. The

varieties vary much in vigor, some being exceptionally strong, others very weak. They are quite hardy. The colors are excellent, brilliant or subdued according to the variety.

Max Leichtlin, of Baden Baden, Germany, admiring the species *G. saundersi*, but realizing its faults, made a series of crosses with the *G. gandavensis* varieties and obtained a few rather pretty seedlings which he sold in 1882 to V. H. Hallock who, after ten years of hybridization and improvement, sold his stock to John Lewis Childs. In 1892, Childs placed these seedlings upon the market under the name of *G. childsi*. The *G. childsi* constitute a group of large, showy-flowered varieties which possess gigantic growth, rich colors, and pretty mottled throats. At first these were somewhat lacking in substance. Many of the varieties resemble *G. gandavensis* except that they are more open; others are quite like *G. nanceianus* except for the fact that the throats of the latter are richer and more often thickly marked.

*G. turicensis* has the same parentage as childsi, and was originated by M. Froebel of Zürich, Switzerland; but because it has not been widely developed nor advertized, it is not of great importance.

Dr. W. Van Fleet produced a form which is much like an amaryllis in its clear, deep red. It is a cross between a childsi variety, Mrs. H. Beecher, and *G. cruentus*, and is called variety *Princeps*.

#### THE MAID OF THE MIST

Recently there has come to the attention of the gladiolus breeder a species from the Rain Forest near Victoria Falls on the Zambesi River, which is pale golden-yellow, primula-scented, and known as the Maid of the Mist or *G. primulinus*. This species is rather straggling in form, often three to four feet tall, and bears four to five narrow, hooded, rather small flowers. With this species many of the finest varieties of the other groups are being hybridized. Several seedlings of unusual merit have resulted from a cross between this species and the ruffled gladiolus, the



#### MRS. FRANK PENDELTON

In the large flowers of this variety, salmon-pink with deep blood-red blotches in the throat, can be traced the influence of a number of distinct species of gladiolus. The form of bloom is that of *G. lemoinei*, the markings are from *G. purpureo-auratus*, while the stem comes from *G. gandavensis*. From the "Modern Gladiolus Grower." (Fig. 8.)

latter a development by A. E. Kunderd, of Goshen, Ind., who produced these charming varieties by selecting blooms showing a ruffled tendency. The ruffled-primulinus hybrids are exceedingly vigorous and of excellent colors. *G. primulinus*, according to Dr. Van Fleet, who has produced over 2,000 hybrids, is dominant over the deepest reds, subduing them to pure, soft, pleasing shades of orange, salmon and terracotta, with deep and light yellow throats.

Hybridized with the whites and light colors, the resulting progeny is cream, buff, ecru, lemon and canary, often without markings. Deep yellows, in which the blotches are eliminated, result from crosses with yellows of the other groups. Most of the hybrids inherit the hooded character.

It is interesting to note that it is mainly one species which has contributed the blue color to the hybrids. This species is *G. papilio*, a purple one.

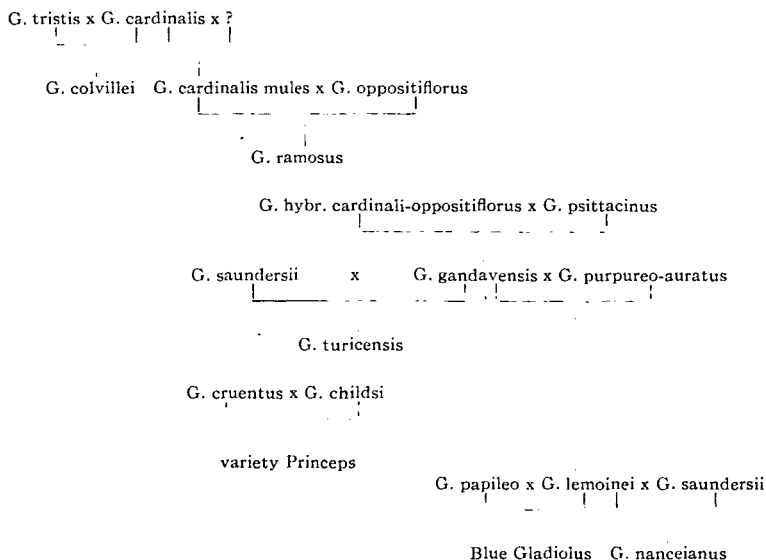
Lemoine used his *G. lemoinei* and the result was a series of more or less blue hybrids very much resembling *G. lemoinei*.

The foregoing discussion has concerned only a few of the species used, but it is hoped that the historical facts presented will show that the garden gladiolus is a multiple hybrid, resulting from a series of species each valuable for one or more dominant characteristics. Does not this bring out strongly the advisability of using a larger range of species in other plants? Each species in the practical hybridist's mind repre-

sents certain desirable characteristics to be incorporated into a hybrid. Too often there are many unfavorable features, the consideration of which is entirely neglected.

It must be admitted that greater progress can often be made with the interbreeding of established varieties, but when new features are to be added, the employment of new species is quite advisable or imperative. These should be the basis of hybridization. As years pass, the inferior seedlings may be discarded, and the ideal form may be far removed from the wild species; but the ancestor is necessary.

#### PEDIGREE OF SOME IMPORTANT GARDEN GLADIOLI



#### New Publication Planned

In order to furnish greater opportunity for the publication of the results of research in genetics, the Princeton University Press is making plans to launch a new periodical to be called *Genetics*. It is hoped that the first number can appear in January, 1916. It will be under the control of a board of editors, chief of whom will be Dr. George Harrison Shull, of the Carnegie Institution, Cold Spring Harbor, Long Island, N. Y., who has recently resigned his position there to become associated with Princeton University. *Genetics*, it is announced, will accept only technical papers, the results of original research, and will therefore not conflict with the JOURNAL OF HEREDITY, whose function is rather to interpret the results of research to those who would profit by them, but are not in a position to follow the technical literature.