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THE WISTERIAS*

THE Arnold Arboretum wisteria collection now contains some 35 species and varieties, not all that are being grown in this country today, but certainly a goodly representation. These lovely twining vines are widely used as ornamentals in the gardens of this country, and those who have travelled in Japan will long remember the striking specimens as they are grown there. They are without doubt among the best of our ornamental vines. Many gardeners have found them easy to grow, still others most difficult, but all will agree they are outstanding when in bloom during late spring. In this issue of ARNOLDIA, some of the interesting points about the varieties will be noted, as they have been observed growing in the Arboretum collection during the past ten years.

However, it must be admitted at the beginning, that except for standard recommendations, there are no magical ways of making certain vines bloom. Many articles have been written dealing with the culture of these vines, and it is not the object here to enter into a minute discussion of this topic. Suffice it to say, that all vines should bloom, some just won't—at least it may take them ten to fifteen years to produce their first flowers. It is inadvisable to grow plants from seed. They had best be propagated asexually from plants known to flower early. Grafted plants of one variety, *Wisteria* "Issai," are known to flower when very young, often at three years. This has happened with a vine here, but all too frequently valued specimens of other varieties do not bloom for a long time. Then the standard recommendations are to root prune, to prune the vigorous growing young shoots, and sometimes to give a feeding of superphosphate. These things have been known to help plants bloom, but sometimes even these do not seem to help. Experiments have been started at the Arboretum which may throw some light on the best procedure, but until these have had sufficient time to produce

* Spelling follows that of Alfred Rehder in his "Manual of Cultivated Trees and Shrubs" and Liberty Hyde Bailey in his "Hortus Second."

results, the old standard recommendations of top and root pruning, and feeding with superphosphate are best to follow.

There is even a controversy on which soils seem best—that is in aiding flower production. Planted in a light sandy soil, the plants may grow less vigorously, but tend to produce flowers sooner than when grown in a rich soil where vegetative growth is pronounced. However, E. H. Wilson, who studied this group thoroughly in Japan, made the observation that the larger, better flowering vines were those frequently planted by ponds where they had an unlimited water supply.

Introduction

There are about nine species of wisterias in North America and eastern Asia, six of which are growing in the Arnold Arboretum. Of these, three are natives of eastern Asia, two of the eastern United States, and one—the hybrid species *W. formosa*—is a cross between *W. sinensis* and *W. floribunda*. The Chinese (*W. sinensis*) and Japanese (*W. floribunda*) wisterias, have far outstripped the others in popular acclaim, at least in northern gardens, because of their profuse bloom, their large flower clusters and their varieties of varying colors and fragrance. Varieties are available with flower clusters from 6'' to 48'' in length, pink, white or varying shades of lilac, single or double flowers, some of which are very fragrant. The double-flowered varieties make poor ornamentals because their bloom is erratic and the double flowers quickly decay in wet weather. *Wisteria frutescens*, native on the east coast from Virginia to Florida and Texas, is not a strong vine and has not bloomed with us in recent years. *Wisteria macrostachya* is perfectly hardy, but blooms late, after the leaves are developed so that blooms are considerably hidden by the foliage. *Wisteria venusta* has poor flowers when compared with its two Asiatic relatives. *Wisteria formosa* might be considered even a better ornamental than *W. sinensis* because it is deliciously fragrant.

The longest flower cluster I have measured in the collection at the Arboretum was one 36'' long, but E. H. Wilson has measured them up to 64'' long on well-grown specimens in Japan. Soil, moisture, and general culture all enter into the picture as far as length of bloom is concerned. The point is that there are some varieties which, if given optimum growing conditions, will produce flower clusters 3 to 4 feet long in this country.

The genus was named in honor of Dr. Caspar Wistar (1761–1818) Professor of Anatomy at the University of Pennsylvania. The first species named was *W. frutescens*, a native of the southeastern United States from Virginia to Florida and Texas. About the same time seeds of *W. sinensis* were first sent to England where they were grown and it was not long before some reached this country. The Japanese wisteria (*Wisteria floribunda*) was first sent to the old Parson's Nursery at Flushing, Long Island, by Dr. George R. Hall, whom we have to thank for several of our very best ornamentals. This was done in 1862. *Wisteria formosa* was named from a plant growing on the Sargent estate in Brookline, Massachu-

setts, about 1905. *Wisteria floribunda violacea plena* first flowered in the garden of Francis Parkman of Jamaica Plain, Massachusetts, before 1875. The original *W. floribunda rosea*, in this country at least, was probably that found in a garden owned by a Japanese years ago in California. The entire place was bought by the late Mr. Henry S. Huntington of San Marino, California, primarily to preserve this beautiful vine. The Arnold Arboretum received scions from this plant in 1917. Later, further exploration and the growing of many seeds in this country have resulted in other varieties. If seeds are sown of *W. sinensis*, the resulting plants will not vary much, but seedlings of *W. floribunda* (formerly *W. multijuga*) vary considerably, both as to flower color and flower size.

Some plants like the huge "Rosecraft" wisteria at Point Loma, California, or the excellent plant so carefully tended for many years by Miss Mary P. Barnes of Hingham, Massachusetts, or the huge *W. sinensis* growing in the little town of Sierra Madre, California have created wide interest because of tremendous size and profuse bloom. These have grown to such proportions that they cover hundreds of square feet, and undoubtedly have been propagated. Some may have been given varietal names. So, today, there are many wisterias in this country, but there is much that they have in common. Only the better varieties should be grown.

"Tree" or "Standard" wisterias are merely vines which have been staked rigidly upright and then the tops heavily pruned for years, thus forcing the stem to grow in trunk-like proportions. In the South, wisteria vines are allowed to ramble into the tops of the tallest trees, but it should always be kept in mind that they are twining vines and can kill trees and shrubs on which they climb by strangulation.

In certain parts of China, the natives consider the flowers of *W. sinensis* quite a delicacy. The flowers are collected when in full bloom and shipped to areas of wealth where they bring premium prices. They are steamed and eaten. Flowers of the more fragrant Japanese species are not so valued, for in these the flower odor is very strong and is a continual reminder that they are flowers after all! Flowers of *Robinia* species are also cooked and eaten this way.

The Chinese wisteria is not quite as hardy as the Japanese (*W. floribunda*). During very cold winters, the flower buds of both may be killed. Some gardeners in the northern states and southern Canada like wisterias so much that they are willing to take the pains of laying the vines on the ground each fall and covering them with soil to protect the flower buds from too low temperatures. This is a considerable effort, since the main stem of the wisteria becomes very woody and more or less rigid as it grows older, making the vine much more difficult to handle in this way than rambler roses.

Twining

It is of considerable interest to note that the wisterias can be sharply divided into two groups by the way they twine. Some vines climb by twining from left

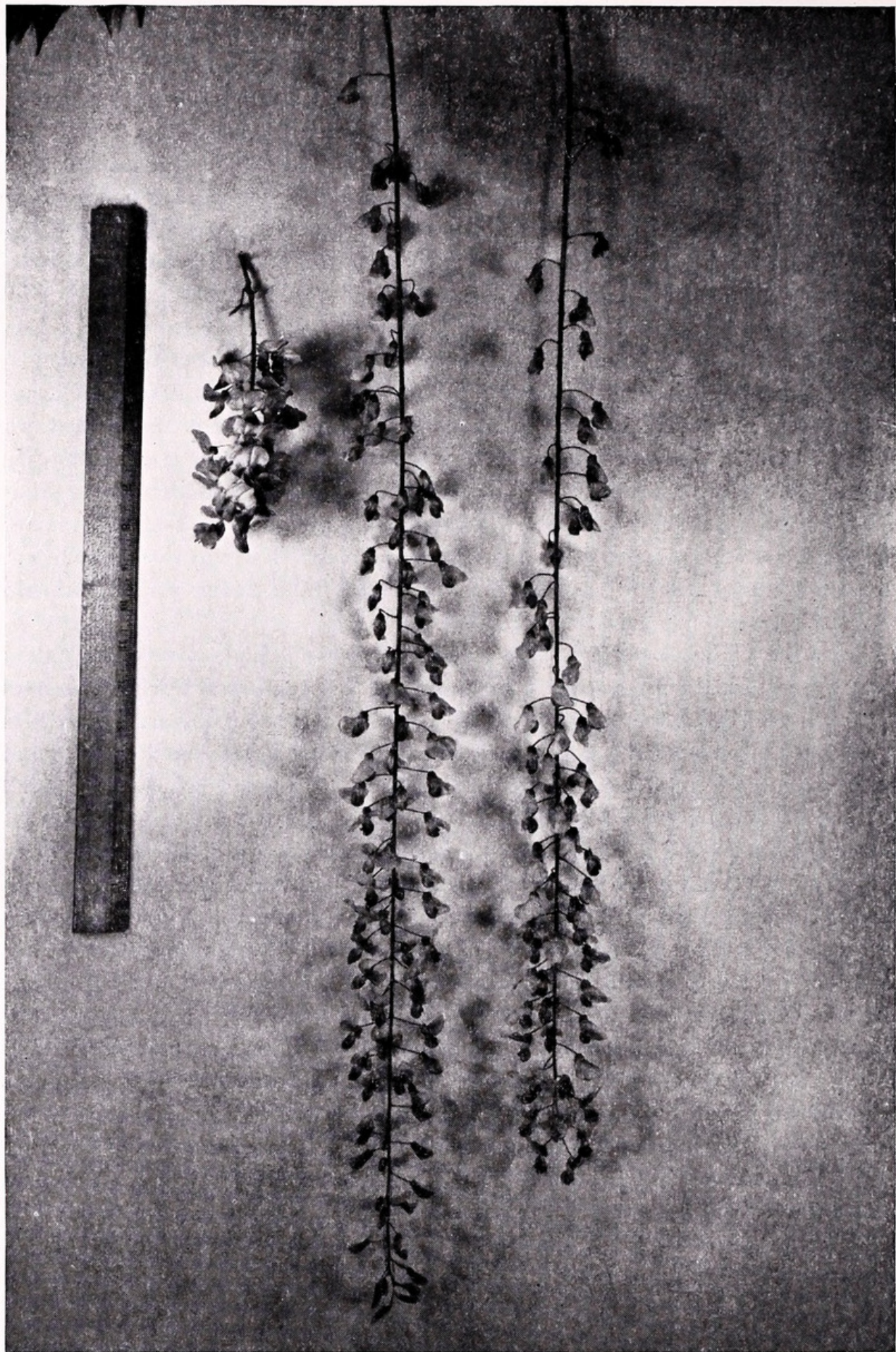


PLATE IV

Left: *Wisteria sinensis*. Right: *Wisteria floribunda macrobotrys* which bloomed at the Arnold Arboretum in 1948 with flower clusters 36'' long. The blooms on this same plant in 1949 were profuse, practically all of them being only 24'' long.

to right, others twine by climbing from right to left (ARNOLDIA, Series 4, Vol. VII, No. 7, June 23, 1939). The two native species, *frutescens* and *macrostachya* and the Chinese wisteria, *sinensis*, twine by climbing from left to right. The other three species in the Arboretum (*floribunda*, *formosa*, *venusta*) all twine by climbing from right to left. As one looks at a plant which is naturally growing around some upright object, if it starts on the lower left side of the rigid object, and grows or twines upward towards the right side, it belongs to one group, if the reverse is true, then the other.

This is most helpful, not only in training the vine properly, but also in identifying it. Of all the Japanese varieties checked in this respect, several plants of each, none showed any variation from twining by climbing from right to left. The varieties "Issai" and "Mrs. McCullagh," it has been noted by others, are not true *W. floribunda* types (they twine by climbing from left to right) but are probably hybrids of *W. sinensis*.

Identification

Since most wisterias in northern gardens at least are either varieties of *W. sinensis* or *W. floribunda*, distinguishing characteristics between them are needed. The following points might be helpful.

	<i>Wisteria sinensis</i>	<i>Wisteria floribunda</i>
Length of flower cluster	6 to 12"	8 to 48"
Fragrance of flowers	not fragrant	fragrant
Leaflets	7 to 13, large	13 to 19, small
Autumn color	none	yellow
Time flowers appear	before leaves appear	with the leaves
Twines by climbing from	left to right	right to left

The following key is offered merely as a help in identification. It is always best to consult a standard botanical reference with complete keys when positive identification is necessary. It should be pointed out that the native wisterias (*frutescens* and *macrostachya*) and *W. venusta* do not appear often in northern gardens as they are not among the better ornamental types. *Wisteria formosa* may appear, for it is a hybrid and a very beautiful one, too. The flowers appear similar to its Chinese parent, the fragrance and twining are similar to its Japanese parent. The plant in the Arboretum came from the old Sargent Estate in Brookline. It might well be the other clones of this cross might show other characteristics.

Wisteria species

Vine twines by climbing from left to right		
Flower clusters 2 to 5" long		<i>W. frutescens</i>
Flower clusters 6 to 14" long		
Leaflets usually about 9		<i>W. macrostachya</i>
Leaflets 7 to 13		<i>W. sinensis</i>

Vine twines by climbing from right to left

Flower clusters 4 to 6'' long *W. venusta*

Flower clusters 8 to 48'' long

Leaflets 13 to 19, flowers open progressively downwards *W. floribunda*

Leaflets 7 to 15, flowers open all together *W. formosa*

Order of Bloom

The wisterias in the Arnold Arboretum bloom throughout a four-to-five-week period, starting with *W. venusta*, the earliest, and ending with *W. macrostachya*, which blooms after the others have all faded. In fact it blooms after the leaves are out so that they frequently hide the pale bluish blossoms. *W. frutescens* has not been recorded as blooming recently in the Arnold Arboretum, but it probably blooms after *W. macrostachya*. The order in which they bloomed in 1949 (the season was 10 to 14 days advanced) was as follows:

Order of Bloom

Full bloom 5/6/49 Past bloom 5/13/49

W. venusta and varieties

Full bloom 5/13/49 Full - Past bloom 5/20/49

W. floribunda macrobotrys

W. formosa

W. sinensis and varieties

Full bloom 5/20/49 Past bloom 5/25/49

W. floribunda and varieties

Starting to full bloom 6/1/49

W. macrostachya (blooms when others are past)

Best for Fragrance

The varieties noted for their delicious fragrance belong mostly to the species *W. floribunda* or its hybrid, *W. formosa*. The true Chinese wisteria has no fragrance, but it may well be that there are many vines passing in gardens as *W. sinensis* that are actually hybrids (i.e., *W. formosa*). *Wisteria venusta* is only slightly fragrant. The best of all the varieties in the Arboretum for fragrance might be:

W. floribunda "Kuchi Beni"

" " "Longissima alba"

" " *macrobotrys*

" " "Naga Noda"

" " *rosea*

" *formosa*

" *sinensis* "Jako" (possibly a hybrid)

Length of Clusters

The length of the clusters varies with the species, variety and growing conditions. *Wisteria frutescens* has the shortest clusters, about 2 to 5'' long, thus eliminating it as a desirable ornamental. *Wisteria floribunda* has the longest, some of its varieties having clusters 36'' long in the Arboretum, and most of them 12 to 24''. E. H. Wilson measured clusters of *W. floribunda macrostachya* in Japan as much as 64'' long, grown under ideal conditions. This was on a huge vine growing on a bamboo trellis covering one sixth of an acre. However, this length of cluster can vary on the individual plant. For instance, one plant at the Case Estates in Weston last year had only a dozen or so clusters, but some measured 36'' long. This year this same plant produced a large number of clusters, most of which were about 24'' in length. The variety "Kyushaku" has clusters 4 to 5' long when grown properly in this country, according to the former A. E. Wohler of Narbeth, Pennsylvania, who used to specialize in these plants. It must be admitted that the one flower cluster on our plant of this variety measured only 26'' this year, the first time it has bloomed. Consequently, length of cluster will vary with weather and growing conditions. The following modest measurements were taken in the Arboretum collections during the past five years:

Length of Cluster

3 to 5'' long

W. venusta and vars.

6 to 12'' long

W. floribunda

" *alba*
 " *carnea*
 " "Geisha"
 " "Murasaki Noda"
 " "Russelliana"
 " "Sekine's Blue"
 " "Shiro Noda"

W. floribunda "Ushi Jima"

" *violacea plena*

W. macrostachya

" "Mrs. McCullagh"

" *sinensis*

" " "Jako"

" " "Sierra Madre"

13 to 18'' long

W. floribunda "Beni Fugi"

" " "Kuchi Beni"

" " "Longissima alba"

W. floribunda rosea

" " "Royal Purple"

" *formosa*

20'' long and more

W. floribunda "Kyushaku" 26''

" " *macrobotrys* 36''

W. floribunda "Naga Noda" 24''

It should be emphasized again, however, that these measurements are only for these plants growing on one type of soil. Mr. W. B. Clarke of San Jose, Cali-

fornia, who grows many wisterias says that *W. floribunda* "Longissima" will grow 3 to 4' with him. Possibly others will do similarly better if given more suitable growing conditions. The variety "Shiro Noda" has been recorded as having clusters 30" long in this country, but has not yet performed this way in our collection.

Flower Colors

The wisterias can be classified or selected because of four general traits, namely, color, fragrance, time of bloom and length of bloom. Consequently one can not eliminate varieties merely by color alone. It might be far more satisfactory to buy a variety known to produce flowers early, regardless of color or size of bloom, rather than to wait years for the plant to produce its first flowers. However, there are certainly not thirty or forty different varieties of wisterias worthy of being grown and widely planted in this country. The following varieties are grouped in their respective color groups, together with notes about them, merely as an aid for those who wish to make their own selections. Colors are those of the English "Horticultural Colour Chart." The number of leaflets on the leaves of the plants vary of course and should not be used as a means of distinguishing one variety from another, but the number given is the number normally on well-grown leaves on the plants in our collections in 1949.

Also the length of flower cluster varies on the same plant and from year to year. For instance, clusters of "Ushijima" were only 6" long in 1944, but 13" long by 1946 on the same plant. Consequently all these figures are given merely as a matter of record. Apparently the flower clusters of a certain variety will become better and longer as the plant becomes better and better established.

Selections of the better varieties as they have performed up to this time in the Arnold Arboretum are listed with an asterisk (*) but undoubtedly there is ample opportunity for further testing in this interesting group.

Flowers White

**Wisteria floribunda alba*: Clusters 10 to 11" long; moderate fragrance; cluster dense; leaflets thirteen.

Wisteria floribunda "Kuchi Beni": Cluster 12" long; good fragrance; color not a pure white, but slightly pinkish, giving a slight faded appearance; leaflets fifteen.

Wisteria floribunda "Longissima alba": Clusters 14" long; good fragrance, supposedly a sport of the violet-colored "Longissima"; leaflets thirteen.

Wisteria floribunda "Shiro Noda": Clusters 8" long; moderate fragrance; leaflets fifteen; has been listed in catalogues with flowers 24 to 30" long.

Wisteria sinensis alba: The true vine has not bloomed recently in the Arboretum, but should be similar to *W. sinensis* except in color.

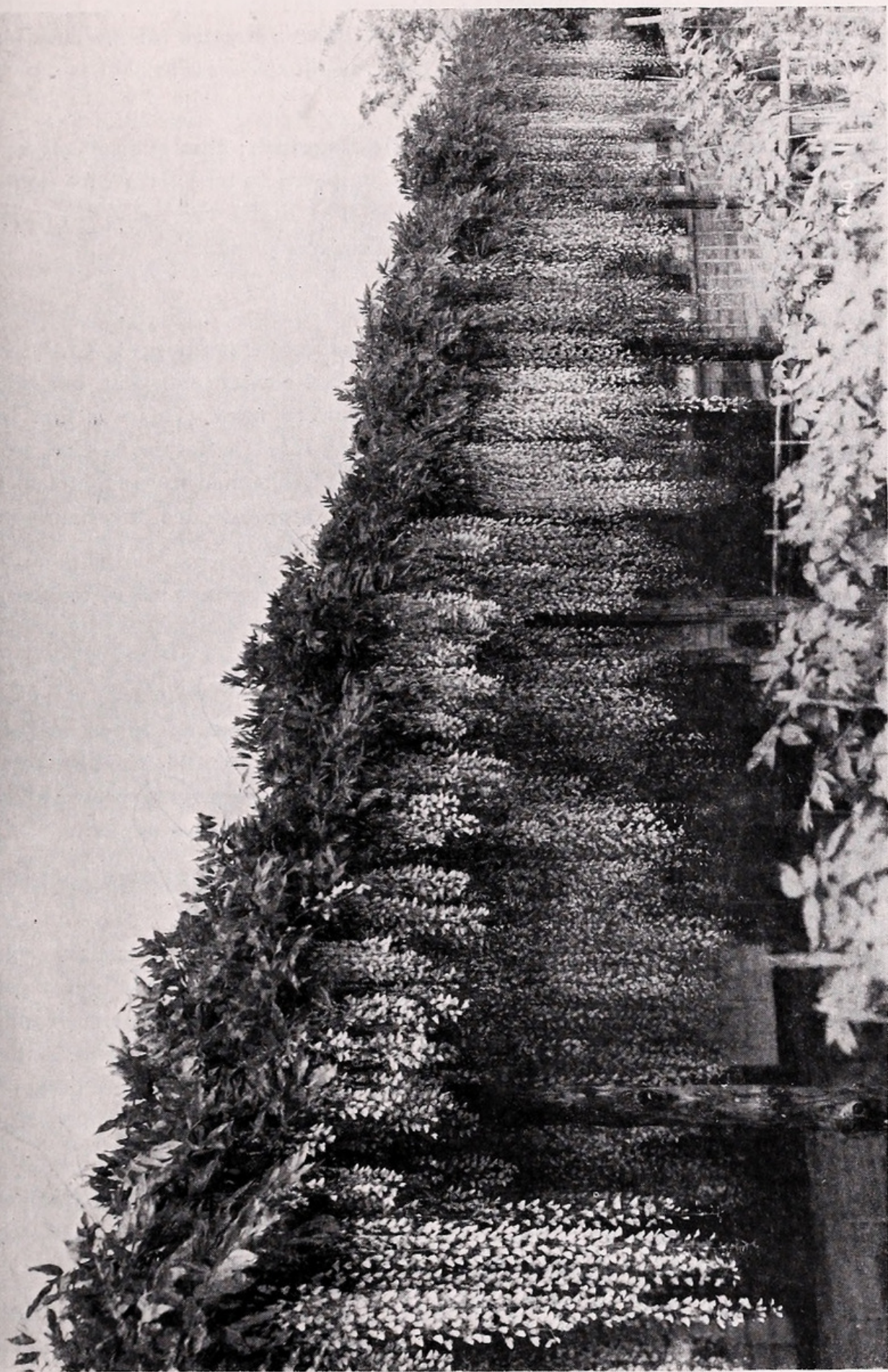


PLATE V

Wisteria floribunda macrobotrys photographed by E. H. Wilson in 1914 in a garden near Tokyo, Japan, with largest flower clusters 50 to 60" long.

* *Wisteria sinensis* "Jako": Clusters 11" long; dense; leaflets eleven; excellent fragrance—very probably a hybrid of *W. sinensis* because of its excellent fragrance. This is probably in the trade as *W. sinensis alba*, but is a much more desirable plant.

Wisteria venusta: Clusters 3" long; very little fragrance; thin open clusters; 9 to 13 leaflets; poor ornamental, There is supposed to be a form with double white flowers, but all plants we have received under the name *W. venusta plena* have turned out to be *W. floribunda violacea plena*.

Flowers Pink

Wisteria floribunda carnea: Clusters 9 to 10"; moderate fragrance; 13 to 15 leaflets; a flesh pink. Our plant has only had a few clusters this year, but these did not vary too much from those of the variety *rosea*. This was first imported to this country by W. B. Clarke of San Jose, California, in 1931 from Japan under name of *W. sinensis rubra*. When it bloomed it was found to be a *W. floribunda* type and not red but flesh pink—hence the name was changed. It is said to have a very strong fragrance.

* *Wisteria floribunda rosea*: Clusters 15" long; excellent fragrance; leaflets fifteen; color—Amaranth rose 530.

Flowers Light Reddish Violet to Violet

Wisteria floribunda: Clusters 18 to 20"; moderate fragrance; fifteen leaflets; standard of flower whitish; keel and wings cobalt violet 634/2. These colors vary widely when plants are grown from seed. Flowers open progressively from base of cluster to the end at the same time the leaves appear.

Wisteria floribunda "Beni Fugi": Clusters 12 to 14" long; fragrance fair; leaflets nineteen; only one blossom on vine in 1949.

Wisteria floribunda "Kyushaku": Clusters 26"; fragrance fair; identical in color with *macrobotrys*. This plant first bloomed this year with only one flower cluster. It may well be that this variety and *W. floribunda macrobotrys* are identical. "Kyushaku" was first offered by A. E. Wohler of "The Garden Nurseries" in Narbeth, Pa., shortly before 1935 as the "ultimate" in length of wisteria flowers, but the botanical variety *macrobotrys* of Rehder and Wilson probably covers such clones.

Wisteria floribunda "Longissima": This has not yet bloomed in our collections, but was planted in 1938. Some nurserymen have given this name to selected seedlings so plants with this name are probably not identical.

* *Wisteria floribunda macrobotrys*: Clusters 18 to 36" long and longer; fragrance excellent; standard of flower cobalt violet 634/3, keel and wings cobalt violet 634; supposedly the variety with the longest flower clusters.

- * *Wisteria floribunda* "Murasaki Noda": Clusters 10" long; fragrance fair; leaflets fifteen; identical with *macrobotrys* except that the standard of the flower is larger and slightly lighter.
- * *Wisteria floribunda* "Naga Noda": Clusters 18"; fragrance excellent; leaflets 17; standard of flower bishop's violet 34/1; keel and wings bishop's violet 34/3.
- Wisteria floribunda* "Royal Purple": Clusters 12 to 14"; fragrance fair; leaflets fifteen; standard mineral violet 635/1; keel and wings mineral violet 635/2; first offered in 1937 by W. B. Clarke of San Jose, California.
- Wisteria floribunda* "Russelliana": Clusters 8"; little fragrance; leaflets fifteen; standard of flower almost white; wings and keel mineral violet 635.
- Wisteria floribunda violacea plena*: Clusters 10 to 12"; fragrance fair; leaflets thirteen; flowers double of varying shades of reddish violet. Not an ornamental variety since the plants produce few flowers and they rot quickly in wet weather.
- Wisteria floribunda* "Ushi Jima": Clusters 13"; fragrance poor; leaflets fifteen; flower standard white and violet 36/2; wings and keel violet 635.
- Wisteria frutescens*: Flowers 2 to 4½"; leaflets eleven; listed as having "lilac purple" flowers but has not bloomed in the Arboretum during recent years.
- Wisteria macrostachya*: Clusters 12"; leaflets eleven; blooms after all other types (except *W. frutescens*) have passed.

Flowers Violet to Bluish Violet

- Wisteria floribunda* "Geisha": Clusters 12" long; moderate fragrance; leaflets thirteen; flower standard whitish; wings and keels sea lavender violet 637/1.
- Wisteria floribunda* "Sekine's Blue": Clusters 7" long; little fragrance; leaflets seventeen; standard whitish; wings and keel sea lavender violet 637/2.
- * *Wisteria* "Issai": Clusters 12"; moderate fragrance; leaflets seventeen; flowers "Blue-purple" according to W. B. Clarke, but it has not bloomed for several years in the Arboretum. Probably a hybrid form because it twines by climbing from left to right and also from right to left.
- * *Wisteria formosa*: Clusters 12"; fragrance excellent; leaflets thirteen; a hybrid (*floribunda* × *sinensis*) twining by climbing from right to left but all the flowers opening at once; flower standard campanula violet 37/3; wings and keel campanula violet 37/1. It is probable that many so-called Chinese wisterias being grown in gardens today are actually *W. formosa*.
- Wisteria* "Mrs. McCullagh": Clusters 6"; moderate fragrance; color only noted as "bluish violet." It is less vigorous than the others, not a good type.

**Wisteria sinensis*: Clusters 8'' long; not fragrant; leaflets eleven; flower standard methyl violet 39/3; wings and keel violet 36/1; twines by climbing from left to right; the standards of individual flowers are larger than those of *W. floribunda* types (*floribunda* 11/16'' $\times$ 5/8''; *sinensis* 1'' $\times$ 3/4'') and all the flowers open together before the leaves appear.

Wisteria sinensis "Sierra Madre"; Clusters 8''; excellent fragrance, leaflets thirteen; flower standard whitish; wings and keel sea lavender violet 637/1 merely propagated from a large vine at Sierra Madre, California, that has been given wide publicity. This may be a hybrid.

**Wisteria venusta violacea*: Clusters 6''; fragrance good; leaflets thirteen; flower standard whitish; wings and keel methyl violet 39/2. A good variety. Mr. W. B. Clarke says that older plants, especially grown in standard form, have an overwhelming profusion of bloom that is better than any form of *W. sinensis*.

DONALD WYMAN



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