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The American Horticultural Society

A Union of The National Horticultural Society and The American Horticultural Society, at Washington, D. C. Devoted to the popularizing of all phases of Horticulture: Ornamental Gardening, including Landscape Gardening and Amateur Flower Gardening; Professional Flower Gardening or Floriculture; Vegetable Gardening; Fruit Growing and all activities allied with Horticulture.

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Daffodils of the Future

BY GUY L. WILSON

The casual observer at one of our English Daffodil Shows would have some difficulty in guessing which of the almost bewildering number of beautiful new varieties shown will eventually prove good market flowers or popular garden plants; yet it is on either or both of these qualifications that the future of any flower to a great extent depends. A flower of supreme beauty from the Show standpoint will doubtless remain in favor with exhibitors and collectors for a time, but unless it also possesses the qualifications of a garden or market plant, the extent of its popularity must remain limited.

A good market daffodil must be free of bloom and increase, of vigorous constitution, with stem of adequate length and flower of good form and balance, sufficiently stout texture and clear, clean color. If it comes early and easily when forced, its value is much enhanced, though of course late varieties are wanted for successional bloom. Practically the same qualities are required to make up a good garden plant, though the matter of stem length is not quite so vital in this case. Varieties that produce a telling effect combined with vigor of habit and reli-

ability of constitution are always of value in the garden. It is only by growing them that one can discover the best garden and market sorts. Not only have I been breeding daffodils for many years, but I visit the gardens of other raisers and secure as many as I can of the finest of their productions for trial, so a few notes on some of the best new introductions may be of interest to growers in the United States who can not come to our Shows.

Beginning with Yellow Trumpets, beyond question the one that astonishes visitors to my grounds most, is Bulwark, raised by the Brodie of Brodie. This is on account of its enormous size and bold, slightly upward pose which makes it exceptionally striking as a growing plant. Though its stem is about 18 inches long, it is scarcely long enough in proportion to the size of the flower to make it a good market variety. It is very free of bloom. Florist's Delight and Golden Flag, two of my own raising, are very handsome garden plants of great vigor and rich color. Golden Flag is a tall plant but not free enough in bloom for market. Hebron, another of the Brodie of Brodie's introductions, is the best

Yellow Trumpet for Show purposes that has yet been seen, a most perfect and beautiful flower of rich self gold throughout, with smooth regular clean-cut perianth, and perfectly proportioned trumpet which is beautifully

the stock is yet very limited. Valiant, a flower of my own raising, is after King Alfred type, but rather more massive, and more vigorous and reliable in habit; it may prove useful where King Alfred does not succeed.



Beersheba

finished with a well-flanged and evenly serrated brim. It is free blooming but its stem is not sufficiently long for market purposes. In *The Perfect Gentleman* I think we shall have a beautiful market flower: it is not large, but is of attractive decorative form with a well-fringed trumpet, and its dark, intensely brilliant gold coloring is gorgeous and makes a beautiful effect in the garden. It has a very long stem and blooms with great freedom, but

In Bicolor Trumpets several very beautiful flowers have been raised by the Brodie of Brodie. *Carmel* is quite perfect from the exhibitor's standpoint, a flower of geometrical symmetry with regular flat pure white perianth of great breadth and shortish soft yellow trumpet. It is free blooming. The bulbs, however, in my brief experience with them, are somewhat inclined to split up too quickly and throw a number of small blooms in

consequence, but I think it probable that this tendency will disappear when it is more fully acclimatized. Halfa is a flower of very soft color, fine substance and ideally beautiful form, so is valuable for show. It also has the advantage of vigor, rapid increase, a good length of stem, and early flowering. It has broad, flat, even and smooth overlapping perianth, clean cut and pointed, and smooth symmetrical trumpet which has an evenly flanged brim. Moira O'Neill (Engleheart) is a really magnificent plant for garden or market. Its stem is 20 to 24 inches tall, and in vigor of habit it reminds one of Emperor, only more so; not only this but it is a flower of high quality and beautiful form, the clear, cool lemon tone of its trumpet being particularly pleasing. It blooms with great freedom and increases rapidly. In Rosary (Engleheart) and Suda (Brodie of Brodie) we have something quite novel, as the trumpets of both these flowers show a most fascinating tint of pinkness when fully developed on the plant. This color, however, is not lasting, and sometimes does not develop under unfavorable weather conditions.

I should imagine that the average spring in U. S. A. is rather later than ours, and blessed with a good deal more sunshine and warmth when it does come; I think therefore that the modern white daffodils, both the White Trumpet and Leedsii sections, should be particularly well suited to many parts of America, as I have often observed that they are especially fine in late seasons here, and seem to revel in warm sunny weather which increases their substance and purity to a marked extent. Personally I think the white daffodils are the most beautiful of all. They are ideal garden plants, as instead of being damaged and faded by sunlight as is usually the case with varieties which have red coloring in their crowns, the sunshine increases their purity and beauty. When seen in the twilight of a balmy spring evening their loveliness is well nigh un-

earthly, as they seem to create around themselves a mystic luminosity of their own as the light of day fades. I may mention in passing that far the best time to see daffodils is in the evening when the sunlight has gone off the flowers. The living purity of their colors with all their delicate and entrancing variation of tint which is partly camouflaged by the glare of sunlight is fully revealed in the twilight, while their matchless youthful grace of outline is far best seen against a background of mother earth in the quiet light of evening.

It is amongst the white daffodils that the most remarkable developments have taken place of recent years. Our great master artist in hybridizing, the Rev. G. H. Engleheart, M. A., V. M. H., who has worked for more than forty years on the daffodil, has recently given us white daffodils that bid fair to rival the stateliest lilies, and he promises still more wonderful things in this class in the near future; and the Brodie of Brodie is following closely in his footsteps. In White Trumpets I would unhesitatingly put Beersheba (Engleheart) first, as the most remarkable achievement of recent years. The two leading British daffodil societies, viz: The Narcissus Committee of the R. H. S., and the Midland Daffodil Society, have both unanimously awarded it the First Class Certificate, the highest honor in their gift. It is a plant of the utmost vigor, increasing with quite exceptional rapidity, remarkably free blooming, and early, opening here about a week before King Alfred, while it has wonderful durability of texture enabling it to last a very long time in good condition, and the stem is of ample length. The flower itself is of supreme beauty and great size, often attaining 5 inches in diameter; it has a superb perianth standing perfectly flat and at right angles to the slender and graceful trumpet, with the segments, long and broad, and beautifully pointed. It is pure white throughout, with a touch of cool green at the base of the perianth

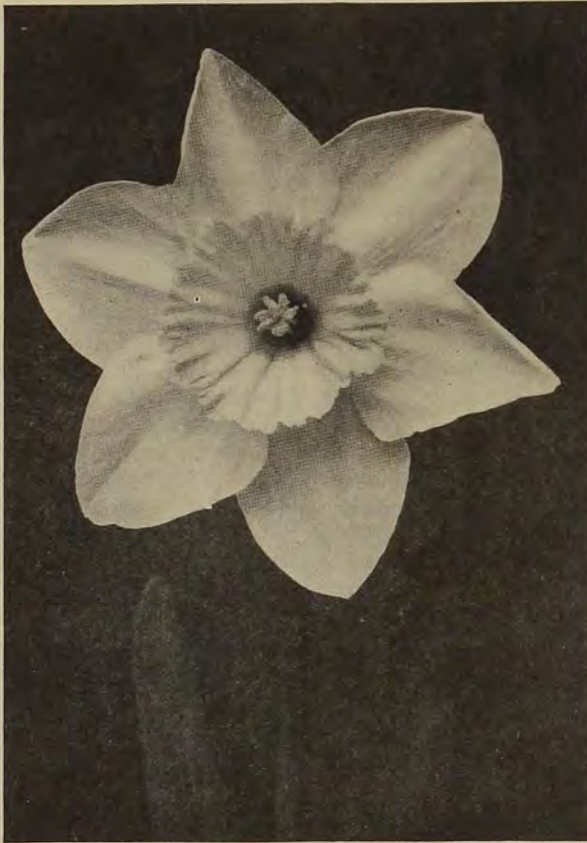
tube. It makes a glorious garden plant, and when seen growing in company with other daffodils, the outstanding purity of its whiteness is most striking, while its beautiful lines and stately carriage give it a serene loveliness and refinement that compels universal homage. Undoubtedly this daffodil has a great future, for not only is it an ideal Show flower and a garden plant of superlative merit, but its remarkable vigor, freedom of bloom and rapid rate of increase combined with sufficient stem and exceptional power of lasting will commend it to market growers who want something specially choice for the purposes for which white flowers are in demand. When plentiful I have no doubt it will be in great demand for growing under glass; I have not yet tried forcing it, but a few bulbs grown in an unheated greenhouse came so very easily and quickly as to indicate that it is going to be specially well adapted for this class of work. Kantara, another of Mr. Engleheart's productions, is a flower of giant proportions and massive build and substance. It created quite a sensation when shown here, being the largest White Trumpet yet seen. It will be sought after by hybridists and exhibitors, for though it sometimes comes rather rough, it has great vigor and increases very fast; so fast in fact, that it is best lifted annually. It will make a striking garden plant, but is not quite tall enough for market. In Eskimo, a flower raised by the Brodie of Brodie, we have an ideal garden plant, possessing great vigor and exceptional freedom of bloom with fast increase. It is not large, but very well formed with broad perianth and shortish trumpet which open pale lemon, but the whole flower soon bleaches to brilliantly pure white. It comes very fine under glass. Quartz, another of the Brodie's seedlings, is quite ideal for exhibition; the exquisite smoothness of its texture and perfection of its form would delight the heart of any florist. It is a vigorous plant but too short for market. Valetta (Brodie of

Brodie), is another Show flower of exquisite beauty and purest whiteness. White Conqueror, raised by the late Mrs. R. O. Backhouse, is one of the most splendid garden plants I have seen. It is a flower of the largest size and very bold outline, with a snowy white perianth of great substance and a great bold trumpet very faintly tinted lemon. The flowers are carried on very strong stems well above the stout foliage, which is a peculiarly blue shade of green, adding much to its strikingly beautiful effect as a growing plant in the mass. It is immensely vigorous and increases rapidly.

Some sensational plants have appeared in the Leeds section of recent years, notably Mr. Engleheart's Tenedos with its large water lily-like flowers, often $5\frac{1}{2}$ inches in diameter, carried on 2-foot stems. It is a lordly plant in the garden, growing with great vigor and broad foliage and blooming freely. The crown is primrose on first opening but soon passes to white. Between Tenedos and Nevis, one of his own seedlings, the Brodie of Brodie has raised Moray, a still more remarkable flower, even larger than Tenedos, whiter and possessing more substance; but only some 6 or 8 bulbs of it are yet in existence. Hymettus, another of the Brodie's seedlings, is a peculiarly attractive garden plant, having a large widespread white perianth of good substance and a somewhat shallow crown that is reflexed and frilled and daintily margined with clear lemon. Marmora and White Nile, two other Brodie introductions, are the best of their particular type seen up to date: both are flowers of most beautiful balance and symmetry and very high quality, perfect for Show purposes, and they have the advantage of fine long stems; and Lido, yet another from the same source, is a large flower of good substance that stands out on account of the intense purity of its whiteness. In Mitylene Mr. Engleheart has given us a magnificent plant of quite distinct character; it is a large and perfectly symmetrical flower of most beautiful

smooth quality and stout texture, with overlapping pure white perianth and shallow, spreading saucer-shaped primrose crown. It increases fast, is exceptionally free flowering with long strong stems, makes a most telling

of superlative splendor, being of largest size, perfect form and great substance, having broad, flat over-lapping clear golden perianth, with large and long deep crown of gorgeous glowing coppery red orange; stems of exceptional



Mithlene

garden plant and should prove a very fine market flower.

In the *Incomparabilis* section striking advances have been achieved, the most outstanding of which is *Fortune*, an epoch-making flower, which probably has before it a greater future for market purposes than any daffodil in existence to-day. There is little doubt that those favored persons who have been fortunate enough to secure bulbs of it will find them an astonishingly profitable investment. It is a flower

length, and a very vigorous and free-blooming habit; but its most remarkable feature is its extreme earliness, opening as it does only a very few days after *Golden Spur*. Very little imagination is required to realize that its value in the future as an early market flower is well nigh incalculable. Although it is probably the highest-priced daffodil in existence, all available bulbs on the market are always bought up very early in the season. Some very fine rich self-yellow giant

"Incomps." have appeared recently. Flava, Hopeful, and Osiris, all of my own raising, are good examples of these; while Pilgrimage, raised by the Brodie of Brodie, is a distinct self yellow of very high quality. Mr. P. D. Williams of Cornwall is also at work on this type, and has raised some very promising plants. This class being very vigorous and free, and having tall stems, will provide a series of admirable rich yellow garden and market flowers. Some of them, intermediate between Yellow Trumpets and the older type of Incomparabilis, are very handsome, symmetrical and richly colored.

The late Mrs. R. O. Backhouse of Hereford raised a series of very highly colored red cupped Incomparabilis varieties, and her husband is carrying on the good work. Their seedlings are very striking, and attract much attention at Shows, but are somewhat lacking in refinement. Torrid, which is one of the most remarkable, is a very large flower with medium yellow perianth and large expanding crown of solid red lead color. It is a tall plant of great vigor with broad foliage. Galopin is perhaps the most outstanding of this series, being a real giant with broad white perianth and large deep long crown of red lead color throughout. The finest quality high colored flowers are coming from Mr. P. D. Williams. Killigrew is one of his best; a medium sized flower of superb quality and beautiful symmetry, with smooth perfect yellow perianth, and well frilled cup of richest tangerine orange red, which is retained much better than in the average high colored flower. It is a perfect Show flower and also has a good stem, but as I have only had it one season I can not yet testify as to its adaptability for market. Folly is another very fine thing of Mr. Williams' raising, a late flower with large white slightly reflexing perianth of excellent quality, and large bowl-shaped orange-red crown. It has a good stem, and Mr. Williams tells me retains its color exceptionally well.

I think we shall hear more of this flower.

Of Barri varieties, Firetail is already well established with the most up-to-date market growers in Britain. Its freedom of bloom and rate of increase are quite extraordinary. It is a good sized well proportioned flower with spreading primrose or ivory perianth, which passes almost to white, and very deep and rich solid red eye. The stem is very long and wiry: it is universally admired at Shows, and undoubtedly has a great future for market. Kilter, raised by Mr. P. D. Williams, is a superb Show flower, best described as an improved and larger Firetail, with whiter perianth and even more intensely red eye. I have not grown this flower yet, but I am told it is not so tall as Firetail, nor so free of increase. It is certainly outstanding as an exhibition variety. The Admiral, raised by the late Mrs. R. O. Backhouse, I consider a very promising market flower, tall and vigorous, of large size, with a brilliant crown, yellow edged with a broad band of crimson, splendidly set off by a big perianth of purest snow white, almost blue-white. Market men are on the lookout for white perianths like this with colored crowns.

Mr. Engleheart has raised so many beautiful Poeticus varieties that it is difficult to discriminate. Personally, I think the finest I have seen is Dactyl, a very late flower of fine size, wonderful substance and quality and quite geometrical perfection of form; its stem is very tall and strong; while Ace of Diamonds, from the same raiser, is a smallish flower, snow-white, with a blazing solid orange-scarlet eye, a wonderful jewel of brilliance and supremely refined quality.

Before concluding these notes I should like to call attention to the Jonquil hybrid Buttercup, now no longer new, as a particularly good garden plant. It grows here with the utmost vigor, and opens its richly scented brilliant flowers late in the season when most yellows are over.

Golden Goblet is a new Jonquil hybrid of very rich golden color, and almost trumpet dimensions, whose vigor and lasting properties are said to be quite wonderful but I have not yet fully tested it. It is very probable that we may get some splendid plants with Jonquil blood. With reference to *Incomparabilis* and *Barri* varieties with red coloring in their crowns, I consider that these are at a great disadvantage as garden plants, as almost without exception the red coloring fades or burns more or less in the sun directly the flower is open, leaving it looking shabby and past its best. I think their value lies chiefly in their brilliance and effectiveness for exhibition and as cut flowers. Certain of them of course will have immense value for market purposes, but for any of these purposes they must be cut when just opening, before the sun can damage their crowns. These remarks apply, in perhaps a less degree, to the *Poeticus* varieties, the perfection of whose flowers is also to some extent marred by exposure to sunlight.

In the foregoing notes, with very few exceptions, I have spoken only of flowers that I have tried out in my own grounds. I am not acquainted with climatic and other conditions in U. S. A., but think it likely that on the

whole the varieties that have proved good here will be the more likely to prove good there. Though there may probably be exceptions and disappointments, on the other hand quite possibly it might be found that certain varieties that are not particularly good doers here would find themselves more at home in the States. Experienced growers will not need to be told that imported bulbs require some considerable time to acclimatize and get accustomed to their new surroundings. My own experience has always indicated this, and I often find that bulbs imported to my ground, even from other districts in Great Britain, sometimes take as much as four or five seasons before they really do their best. They grow quite fairly from the outset, but after they have been here for a length of time I often observe a very marked increase of vigor, and improvement in size and quality of bloom, which I consider an indication that they have become thoroughly acclimatized.

I am sure as time goes on, we shall see still more wonderful developments, and have daffodils such as we have scarcely yet dreamed of.

*Broughshane,
County Antrim, Ireland.*

Among the many bulbous plants that flower with the narcissus and make delightful contrasts with them both in the border and in bouquets, are the grape hyacinths. Some of the darker sorts contrast particularly well with the paler or sulfur colored daffodils while the bluer varieties make a brilliant contrast with the strong yellow sorts. The familiar *botryoides* and its white form, and the variety Heavenly Blue are fairly well known, but the variety which glories in the terrific name of *Muscari szovitzianum* has been the gayest of them all with flowers of very brilliant blue. *Muscari elegans* and *polyanthum* are useful when dark violet colors are wanted.

Among the purple and lavender flowers of autumn should be remembered, in addition to the familiar buddleias, several species of vitex of which *V. macrophyllus* has the most showy and deeply colored flowers and the familiar *Caryopteris incana*. Both of these are nice for cutting and combined with pale pink roses and white flowering spurge (*Euphorbia corollata*) make jolly bouquets—bouquets, please notice—and not “arrangements.”

When planting bulbs, remember that the best food should be under the bulbs. Their roots normally grow down and should find their richest meals there.

The European Background of American Horticulture

BY HAMILTON TRAUB

(Continued from the July issue)

Following in the rear of the advance in the science of plant physiology and agricultural chemistry there was a slight advance in the management of horticultural crops. The situation during the first three decades of the Nineteenth Century was encouraging, but there was still much to be desired in the way of scientific horticultural management, and contemporary writers realized this keenly. The English horticultural historian, George W. Johnson, sums up the situation in 1829—A knowledge of the "constitution of soils; of the mode of operation of different manures and their economical management; the operation of the air upon the roots as well as the other parts of plants; * * * the importance of pulverizing the soil; rotation of crops; rendering the natural heat afforded by the sun of greatest possible benefit by darkening the colours of enclosures, etc., the very great variety of tools * * * the gardener has offered to him, are all evidence of improvement. The art of training and pruning so as to check over vigorous trees and promote the strength of the more weak are equally improved. Though grafting and budding have been improved;¹¹ it is yet regretted that the question whether grafts may be inserted successfully upon stocks of a contrary species has not been set at rest by a course of extensive experiments. It justifies those who maintain an affirmative opinion upon this point, that such men as Pliny and Lord Bacon, declare they have seen nuts, grapes, figs, apples, etc., growing on one stem, and an apple on a colewort stock."¹²

In still another department of the management of horticultural crops the forcing of vegetables, fruits and flowers, there had been a progressive development in Europe with the advance in scientific knowledge. The introduction of foreign plants into England, beginning in the Seventeenth Century, led to the gradual growth of conservatories and hot houses. In the later Seventeenth Century "attention was * * * turned to growing oranges, and the houses built for their shelter are the earliest kind of conservatory * * * they were like large rooms with big windows, and a stove or open fire to warm it in the coldest time * * * The oranges were planted in cases, and were lifted out to adorn the garden during the summer months."¹³ Pineapple culture was first introduced in the Seventeenth Century, and by 1800 they were grown "in all large gardens where hot-houses were kept."¹⁴ In the early part of the Eighteenth Century,

¹¹In reporting his experiments with root grafting, Thomas Andrew Knight, in 1811 observes,—Six-inch lengths of pear roots were "accurately fitted and bound, as in the splice, or whip grafting, to scions of Pear Trees, which were selected as nearly as possible of the same size; and the roots with their attached branches were deposited in the ground as cuttings, so deep, that the whole of the root and about an inch of the graft or scion were covered. The soil was then drawn up with the hoe on each side of the plants, which were placed in rows, so that one bud only of each graft was above the soil, and another just within it. These grafts succeeded perfectly well." *Trans. Lond. Hort. Soc.*, 1818, pp. 239-240.

¹²Johnson, *English Gardening*, 1829, pp. 360-361.

¹³Cecil, *Gardening in England*, 3d Ed., p. 175.

¹⁴*Ibid.*, p. 269.

forcing houses, regular structures roofed with glass, and artificially heated were introduced, but they "continued, however, chance-directed edifices until the commencement of the present (Nineteenth) century. In 1809, Dr. Anderson, and the President of the London Horticultural Society, in 1806, roused the attention of gardeners to the subject; the first, by his philosophical reasoning; the latter, by the same united to the voice of experience. Mr. Knight directed his remarks chiefly to demonstrate the proper angle for glass roofs of hot houses; they gave rise to the patent structures of Stewart, Jordan and others; and these were still farther improved on the firm basis of mathematical demonstration in 1815 by Sir G. Mackenzie, who showed what is now confirmed (1829) by practice, that an hemispherical glass roof admits the most rays of light * * * Another improvement, also the birth of the present (Nineteenth) century, is forming the frames of houses of cast iron instead of wood. The plan of heating hot-houses by flues is owing to the Duke of Rutland about 1717. Steam was first employed for the same purpose by Mr. Wakefield of Liverpool in 1788; and more effectively for the same purpose by Mr. Butler, gardener to the Earl of Derby at Knowle near Liverpool, in 1792. It did not begin to be generally adopted until about 1816; and this appears likely to be superceded by employing hot water, which was first strenuously advocated in 1828, though first proposed and adopted by A. Bacon, Esq., of Elcot in Berkshire in 1821."¹⁵ In the Eighteenth and early Nineteenth Centuries, various improvements in hot-bed construction had been made by Knight and others.¹⁶ This advance in the construction of hot-beds, greenhouses and conservatories had a direct effect upon the infant vegetable and flower forcing industry in the United States, but the further discussion of this subject must be reserved for a later chapter.

POPULARIZATION OF HORTICULTURAL KNOWLEDGE

Although the British horticultural practices were a part of the general stream of European civilization, it is significant that by the opening of the Nineteenth Century the British possessed an extensive and distinctive horticultural literature, which is in a measure an index of the health and vigor of the horticultural pursuits in the British Isles. On analysis, it is found that over 500 works pertaining to horticulture had been published in England prior to 1800.¹⁷ During the Nineteenth Century the number of works on horticulture published in Britain rapidly increased, and beginning in 1815 horticultural periodicals played an increasingly important role in popularizing gardening in the land. The *Botanical Magazine* had come into existence as early as 1787 (and has been continued to this day). The *Botanical Register* appeared in 1815 and was issued until 1847. The latter was followed by a number of periodicals: *Botanical Cabinet*, 1817; *Maund's Botanical Garden*, 1825-50; the *Gardener's Magazine*, 1826-43; the *Pomological Magazine*, 1827; *Harrison's Floricultural Cabinet*, 1833-51; *Paxton's Magazine of Botany*, 1834; *Gardener's Chronicle*, 1841. The chief function of these publications during the early part of the century seems to have been the spreading of information concerning new horticultural varieties of plants, since the trade catalogues for general distribution were the exception rather than the general rule.¹⁸

The tie of a common language made this vast storehouse of information readily available to the American horticulturalist who was interested enough to procure the British works and periodicals. The fact that British treatises were so readily available probably

¹⁵Johnson, *English Gardening*, 1829, pp. 257-269; 362-363.

¹⁶*Ibid.*, p. 361.

¹⁷Cecil, *Gardening in England*, 3d Ed., pp. 332-377.

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M D C C LXXXVII.



Title Page and Three Plates of American Plants from the First Volume of Curtis Botanical Magazine, 1787.

delayed the early development of a distinctly American horticultural literature. "Our easy access to all the best works published in England," writes A. J. Downing in 1837, "while it has greatly aided our practical advancement, has of course precluded the necessity of many original books on the same subjects here. * * * Loudon's Encyclopedia of Gardening, the most valuable compilation on the subject in any language, is the standard work here as well as in England."¹⁸ In spite of the fact that the circulation of English horticultural works in America apparently retarded the growth of an indigenous literature in this field, the role of British gardening literature in the development of a native horticultural tradition is of primary importance. Before 1800 Americans were almost wholly dependent upon European works on gardening. After the opening of the Nineteenth Century, Europeans, especially British immigrants to America, as well as native-born Americans, brought out gardening manuals based largely upon foreign models. Only gradually did American experience enter largely into the composition of such works.

Another important factor in the popularizing of horticultural knowledge was the Horticultural Society of London. The organization of the society marks a turning point in the advancement of scientific horticulture in England, and its influence was also potent in other lands. The London Society, remarks A. J. Downing in 1837, "has exerted an astonishing influence for the promotion of horticulture, not only at home but in every country connected with England, in either hemisphere, collectors have been sent out on exploring expeditions, experiments have been made, grafts, seeds, and cuttings of valuable or new plants distributed, and scientific discoveries and improvements in culture

published—all of which has been attended by the most beneficial results."¹⁹ Although associations for the advancement of general science and agriculture had been organized in England, the field of horticulture had been neglected in this regard. It was to the distinguished scientist, Thomas Andrew Knight, that "the Horticultural Society owed its origin. * * * He felt the want of some stimulus to horticulture, and thought the foundation of a society 'Whose object should be the improvement of horticulture in all its branches' would have that effect. Accordingly, with Sir Joseph Banks, he organized the Horticultural Society and a meeting to inaugurate it was held on March 7th, 1804."²⁰ The papers read before the Society covered a wide range of horticultural investigations, and in the published form the information was made available on both sides of the Atlantic. Other activities of the Society included the stimulation of plant breeding by the offering of prizes for meritorious productions, and the importation of new plant materials from the four corners of the earth.²¹ Prominent American horticulturists were soon elected to membership in the Society, and it served as the prototype for the first horticultural associations organized in the United States.

IMPORTATION OF PLANT MATERIALS

It has been noticed in connection with the popularizing of horticulture, that the growing interest in horticultural pursuits led to the systematic

¹⁸Magazine of Horticulture, 1837, p. 3.

¹⁹Cecil, Gardening in England, 3d Ed., pp. 270-271. Trans. Lond. Hort. Soc., Vol. 1, 2d Ed., 1815.

²⁰Linnaeus published his *Species Plantarum* in 1753 based upon the binomial system, which laid the foundation of scientific plant nomenclature. This system soon superceded the cumbersome "phrase name" method in use prior to this time. The advent of the Linnaean simplified system was a fortunate event for it would have been difficult to digest the great quantities of new plant materials that were poured in Europe and America after the middle of the 18th Century without it.

¹⁸Cecil, *ibid.*, pp. 288-290; Johnson, *ibid.*, pp. 329-331.

¹⁹Magazine of Horticulture, 1837, p. 9.

introduction of new plants from various parts of the world.²³ According to Johnson, previous to 1700 the number of exotic plants cultivated in England probably did not exceed 1,000 species; during the Eighteenth Century, above 5,000 new ones were introduced, and during the first sixteen years of the Nineteenth Century an average of 156 new plants were added to those cultivated each year.²⁴

In 1818 the London Horticultural Society began its great work of receiving plants from abroad from its correspondents and through its own collectors. During the Nineteenth Century the whole world was searched for desirable material, and the story of the collectors, the dangers, even death, which they courted, reads like a romance. As a result of this activity the new plant materials available for the garden and the embellishment of the home was increased at a rapid rate.

According to Johnson, in 1829, about 1800 species and varieties of "stove plants," "nearly 3,000 greenhouse plants, nearly 4,000 hardy trees and shrubs, nearly 3,000 hardy perennials, about 800 biennial and annual flowers, were cultivated in England. The varieties of Florist's flowers * * * are more than proportionately numerous. Of hyacinths we have about 300, whereas in 1629, Parkinson mentions but 50 * * * of tulips we have nearly 700 varieties * * * of ran-

unculus we have nearly 500 varieties * * * of anemone about 200, of dahlias * * * between 200 and 300. Narcissi, 200, auriculas more than 400, pinks 300, carnations about 350, of roses included in the list of hardy shrubs, there are more than 1,450 * * * the number of plants cultivated by gardeners at present amounts to 13,140, of these 1400 are natives of Great Britain."²⁵ There was a fairly close connection between the prominent horticulturists of America and certain European countries, especially England, and the new plant materials imported by the London Society and other agencies, sooner or later found their way across the Atlantic to our shores.

PROGRESS IN PLANT BREEDING

New species and varieties of plants were pouring into Europe from various sources, and, before long, ameliorated forms, or garden varieties were secured by the preservation of chance seedlings which possessed desirable new characters. With the awakening interest in gardening in England, the subject of systematic plant breeding received serious attention beginning in the first quarter of the Nineteenth Century. During the Eighteenth Century and even before, isolated workers²⁶

²³Johnson, English Gardening, 1829, pp. 356-360.

Also Loudon's Encyclopedia of Gardening, 1822.

Evelyn Cecil remarks, that "This floral wealth" greatly influenced the manner of gardening. The pinetum was the result of the bewildering number of pines. Greenhouses became popular to house the tender exotics, and when greenhouses became overstocked, the system of bedding out came into vogue about 1820. Gardening in England, pp. 291-292.

²⁶Camerarius, in 1694, demonstrated sex in plants; his work was verified by Thomas Fairchild in 1719, Miller in 1731, Logan in 1739, Gleiditsch in 1750. Koelreuter in 1761 enunciated the principle of the union of male and female elements in fertilization, and demonstrated the role of insects as pollen carriers. (Later developments: Amici, in 1830, traced pollen tubes to the micropyle of the ovule; Geartner, in 1835, attempted to explain inheritance.)

²³Johnson, English Gardening, 1829, p. 151; pp. 356-360.

²⁴An incomplete list of the ornamental plants and trees introduced into England before 1850 includes:

Wistaria sinensis and other Chinese plants; peonies; roses; chrysanthemums; orchids in great variety; dahlias; Douglas pine; *Abies nobilis*; *Taxodium sempervirens*; calochorti; clarkias; godetias; gaillardias; collinsias; lupines; eschscholtzia; mimuli; barberries; fuschias; achimenes; anemones; *Dicentra spectabilis*; *Kerria japonica*; *Victoria regia*; viburnum; ixias; spirea; many azaleas; *Gardenia fortunei*; *Daphne fortunei*; *Forsythia viridissima*; *Weigelia rosea*; *Jasminum nudiflorum*; sparaxis; agapanthus; crinums; Arum lily; *Abutilon striata*; poinsettia; etc. Cecil, Gardening in England, pp. 271-285.

had laid the scientific foundation in part for the improvement of plants by means of controlled crosses. Before 1850, there was a considerable activity in the organization of horticultural varieties of plants by cross fertilization.

The most noteworthy practical plant breeders during the first quarter of the Nineteenth Century were Dr. Thomas Andrew Knight (1759-1838) of London and Dr. Van Mons (1756-1842) of Belgium. The latter worked mostly with pears. During twenty years of experimentation, he raised somewhere near 80,000 seedling pears, and by 1823 he had catalogued over 400 of his own creations. Dr. Van Mons was an honorary member of the Massachusetts Horticultural Society²⁷, and he sent many of his seedlings to that society for trial. Robert Manning, of Salem, Mass., procured the best varieties brought out by Van Mons, and gave them a systematic trial. Certain of Van Mons varieties of pears are still in demand—Diel, Bosc, Manning's Elizabeth—and this is an undeniable argument in favor of the practical results of the process of mass selection in the breeding of plants.

Thomas Andrew Knight first made use of the principle of cross-fertilization on a systematic and extensive scale in the improvement of horticultural varieties of plants. Knight held that this method was a more certain method in the road to success in plant improvement. He produced valuable varieties of apples, pears, plums, peaches, nectarines, cherries, and strawberries that remained in vogue for a long period.

The reader can best form an estimate of the concrete manner in which the subject of plant breeding was brought before the public by an examination of some of the contents of a paper entitled, "Some of the Objects for which the Horticultural Society (London) intends to present Premiums

and Medals," read before the society in 1811. The following are proposed as objects deserving, "amongst others, the attention of experimental horticulturists," "New Varieties of the Potatoes," "A rich and sweet variety of the common Red Currant," "New varieties of the Gooseberry," "New varieties of the Pear similar to those introduced from France; but sufficiently hardy to grow and ripen on standard trees." "A good and early new Grape, better adapted to the climate of Great Britain, in open air, than any known," "better and more productive varieties of the apple," "A good early Nectarine," "A variety of the Strawberry earlier than the common Scarlet, and of the Cherry, which would ripen before the early May," "More and earlier varieties of the Peach." "Several native varieties of the plum afford blossoms so hardy that they are rarely injured by the frost. Might not rich varieties be obtained by introducing the farina of the fine but tender kind into the prepared blossoms of these? * * * It is stated, in the Pomona Herefordiensis, that very rich and very hardy varieties of the apple have been thus obtained immediately from the seeds of the Siberian Crab."²⁸

The methods of both Van Mons and Knight were soon adopted by practical plant breeders in North America, and the results achieved by these workers will be related in detailing the story of American horticultural development.

PROGRESS IN LANDSCAPE GARDENING

Parallel with the gradual development of a scientific tradition in horticulture, the English ideal of landscape gardening was slowly taking shape. During centuries of gradual evolution, the ideals of the English regarding a national conception of landscape design underwent progressive change due to a variety of local and foreign influences. The monastic garden gave

²⁷See the History of The Massachusetts Horticultural Society, 1880.

²⁸Trans. Lond. Hort. Soc., vol. 1, 2d Ed., 1815 app., p. 1.

way to the feudal garden, which in turn was superceded by the Elizabethan formal garden²⁹; this latter type was progressively modified in the Seventeenth Century, under the influence of the French ideal as exemplified in Le Notre's Versailles, and the Dutch formal garden, finally culminating in the decadent "Old English Garden." A sharp reaction against "The stiff, regular garden" culminated during the latter half of the Eighteenth Century in the introduction of the so-called "Landscape gardening"³⁰, an attempt to imitate nature in all garden design.

The chief principles underlying the theory of "landscape gardening" as set down by Batty Langley have been summarized by Evelyn Cecil, "The grand front of the building lies open upon an elegant lawn, adorned with statues, terminated on its sides with open groves. 'Such walks whose views can not be extended terminate in woods, forests, misshapen rocks, strange precipices, mountains, old ruins, grand buildings, etc.' 'No borders or scroll work cut in any lawn or parterre.' 'That all gardens to be grand, beautiful and natural.' 'That all trees in your shady walks and groves

²⁹The Elizabethan formal garden is adequately described in the following passage: "In front of the house there was usually a terrace from which the plan of the garden could be surveyed. Flights of steps and broad straight walks, called 'forthrights,' connected the parts of the garden as well as the garden with the house. Smaller walks ran parallel to the terrace, and the spaces between were filled with grass plots, mazes or knotted beds. * * * This square garden was usually enclosed by a high brick or stone wall." Cecil, Gardening in England, 3d Ed., pp. 95-96.

³⁰The Elizabethan garden was the outcome of the older fashions in gardens combined with the new ideas imported from France, Italy and Holland. The result was a purely national style, better suited to this country (England) than a slavish imitation of the terraced gardens of Italy or those of Holland, with their canals and fish ponds. There was no breaking away from old forms and customs, no sudden change. The primitive mediaeval garden grew into the pleasure garden of the early Tudors, which by a process of slow and gradual development eventually

be planted with Sweet Brier, White Jessamine, and Honeysuckle, environed at the bottom with a small circle of Dwarf Stock, Candytuft and Pinks.' 'Hills and dales be made by art where nature has not performed the act before.' 'That the intersections of walks be adorned with statues,' and many rules for the correct way of making 'rivulets, aviaries, grottoes, cascades, rocks, runs, niches, canals and fishponds. * * *'" Such were the high flown ideas which inspired these designers, but in their efforts to reproduce the beauties of nature they fell into the most artificial system that can possibly be imagined.³¹ So complete was the change in fashion that the exponents of "landscape gardening" were not "content to lay out new gardens to suit the prevailing style, but they freely destroyed and abused, where they could not obliterate the work of former generations."³² The work of destruction reached its height under the influence of Lancelot Brown, commonly known as "Capability Brown": "Old gardens in every part of England disappeared before the transforming influence of Brown, but luckily, before many years had passed, a reaction set in, or it is doubtful whether a single garden would have survived."³³

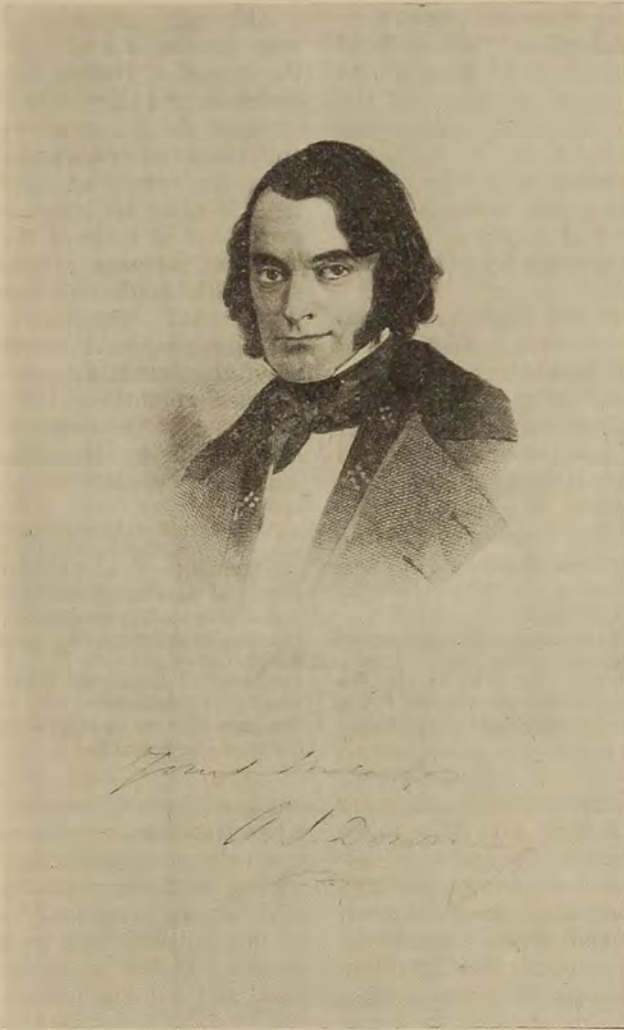
became the more elaborate garden of the Elizabethan era. * * * What is now meant by a 'formal' or 'old fashioned' garden is one of this type, but as genuine and unadulterated Elizabethan gardens are rare, it is generally the further development of this same style a hundred years later which is known as a 'formal old English garden.' Cecil, Gardening in England, 3d Ed., pp. 94-95.

"We must look for the beginnings of the landscape style in the gradual change or decadence of the old formal school. The Dutch style introduced by William III was an exaggeration of the old manner of clipping trees. Topiary work in yew, box, and 'other greens' was carried to such an excess, the gardens were so overcrowded with cut trees as to become the laughing stock of the succeeding generation, and so bring about their own destruction." Ibid., p. 204.

³¹Cecil, Gardening in England, 3d Ed., pp. 246-248.

³²Ibid., p. 243.

³³Ibid., p. 252.



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A. J. DOWNING
 From "Rural Essay" 1855

Under the criticism of his contemporaries and due to the loss of popularity suffered by the extremists, Humphrey Repton modified his conception of landscape design,—“He did not always alter all he found at a place, before commencing additions, and he did not entirely confine himself to the ‘landscape’ style. He maintained that a ‘flower garden should be an object detached and distinct from the general scenery of the place; and whether large

or small, whether varied or formal, it ought to be protected from hares and smaller animals by an inner fence; within this enclosure rare plants of every description should be encouraged, and the provision made of soil and aspect for every different class.”³⁴ Under the constructive criticism of Sir

³⁴Cecil, Gardening in England, 3d Ed., p., 257.
 See also Repton, Observations of Landscape Gardening, 1803.

Walter Scott, Sir Uvedale Price, Loudon, Knight, and others, "who pointed out that some beauties were to be found in the formal garden, and the great folly of ruthlessly destroying everything in that style, * * * the progress of destruction (was gradually arrested). The taste became modified, and further attempts to improve were not accompanied by such disastrous results."³⁵

As the end of the Eighteenth Century was reached the modified ideal of landscape design had become the recognized national style of the British, and it was copied on the continent of Europe. When, in 1841, A. J. Downing published the first separate treatise on landscape design in America, it was based primarily on the firm foundation of the British constructive ideal.

³⁵Ibid., pp. 263-264.

³⁶A portion of a thesis on The History of American Horticulture, 1800-1850.

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It is a purple coneflower whatever the botanists call it, and they have named it *Echinacea purpurea*, *Rudbeckia purpurea* and *Brauneria purpurea*. The last name does not seem to have achieved wide commercial distribution, but under the first two names is a prairie plant that has achieved tardy distinction at home while enjoying full appreciation abroad for more than two centuries. It is interesting to note in an English paragraph that this native was introduced abroad in 1699 according to some early accounts, and in others in 1799. The English writer regrets that there is no hardy form of the plant which comes from Carolina and Virginia. Its tenderness is doubtless due to wet.

There is no question of its hardiness here, as it ranges up to Minnesota and stands 25 below zero without difficulty, and makes enormous colonies in the few patches of undisturbed prairie remaining. It is a fine plant for mid-

Although American horticulturists were serving a long apprenticeship in the school of British horticultural experience, and they were drawing heavily upon the European supply of available plant materials and profited much from the researches of foreign scientists, it must be borne in mind, however, that in spite of the fact that in the first instance attempts were undoubtedly made to adopt British and continental European horticultural practices without modification, the inevitable result was an adaptation to the new conditions, the physical limitations, and the economic demand as conditioned by the character of the American people.³⁶

Also submitted to the faculty of the Graduate School of the University of Minnesota in partial fulfillment of the requirements for the degree of Master of Science, June, 1924.

For stimulating constructive criticism during the progress of the work, the writer is deeply indebted to Dr. N. S. B. Gras, formerly Professor of Economic History at the University of Minnesota, and now Professor of Business History at Harvard University, who directed the research.

summer bloom, coming in mid-July when times of drought generally settle upon the midwestern states and giving its big picturesque bristling cones and ray flowers ranging from light pink with a purplish cast to deep, rich red purple. It has at times been advertised as "red sunflower," a misnomer.

The garden forms, often advertised as hybrids although probably merely varieties as the native plants show quite a wide range in color, have the advantage over the wild forms in having horizontal ray flowers, while those of the prairie usually droop. There is also much variation as to the number of ray flowers and as to their width. It is best to sow and raise a liberal supply and select the best forms when they bloom. It is one of the most reliable plants for a dry garden.

The better forms may be propagated by division of the clump when it has had three seasons' growth, as they resent too frequent division.

THE NATIONAL HORTICULTURAL MAGAZINE

Issued quarterly by The American Horticultural Society, a Union of The National Horticultural Society and The American Horticultural Society, at Washington, D. C. Editorial Committee, B. Y. Morrison, Chairman; Sherman R. Duffy, V. E. Grotlisch, P. L. Ricker, J. Marion Shull, John P. Schumacher, Hamilton Traub.

All members are cordially urged to send in papers and notes for publication to the chairman, at 116 Chestnut St., Takoma Park, D. C.

With this issue, we come to the end of Volume 6. It is difficult to realize that our year is so soon over, particularly so when there is as yet no sign of frost without. To be sure the whole summer season has been cold enough to call out the annual comments on the unusual weather, but even so there is much left to be done before winter really brings our gardening to a close.

As this magazine is a cooperative affair, written largely by members for other members of the Society, we, the editors who have served in the mechanical work of putting the whole together, hope that you have been pleased with the work of this first year and will have faith in the development that is to follow. It is too soon, perhaps, to say with absolute finality how many and how great changes will be made. Some rearrangements will come in the make-up of the paper and in the use of the illustrations which we hope will be more numerous as the issues follow one another. In each number, hereafter, will be a table of contents which will make unnecessary the index which fills part of this issue. As to the changes in what the table of contents will record, no prediction can be made. Suggestions have already been made that the ornamental side of horticulture has been overstressed. If so, this has resulted merely from the fact that the material sent by members has dealt with these subjects. If members who are devoted to the pursuit of more and better vegetables or fruits, will contribute papers on those subjects, the editors will very gladly consider them.

Indeed, it is impossible to overemphasize the willingness of all our committee to consider and publish the best

material on any subject that interests the members. There is a certain pressure in making up any magazine for publication, which hurries one into the use of the best available material, without making a great effort to coerce members into writing papers on subjects which would "be good for" the paper. It is really no part of the committee's duty to conduct such a campaign. If the contents, therefore, do not meet all the needs of the members, those neglected folk are the very ones to bestir themselves either to furnish the desired copy or to write in their very specific needs which will be a great help to the editorial staff, who carry on this part of the society work in addition to their many private interests and their several official businesses which are totally different.

For the cordial cooperation of those who have helped this year, we gladly record our appreciation. And although perhaps it is not customary in orthodox publications of this type to set down one's gratitude for the assistance of printers, photographers and engravers, the chairman is pleased to record the help that has been given by Mr. McQueen, in the printing and publishing, and Miss Guernsey in the preparation of many of the illustrations. Without their kind assistance and ready suggestion much of what merit we have achieved might be missing. To our committee members much credit is due for their help in the somewhat tiresome duties of seeing copy through and of sharing the work of writing in emergency. With these expressions of our appreciation and our pleasure in the approval of our members we bring to an end our last editorial page.



Entrance to Hemlock Grove.

From the Arnold Arboretum, Jamaica Plain, Mass.



Wild Roses and a Bit of Meadow Road.

From the Arnold Arboretum, Jamaica Plain, Mass.

The Future of the Arnold Arboretum

BY B. Y. MORRISON

As you are reading these pages, there are thousands of plants of Japan barberry adding their crimson leafage and berries to the pageant of autumn color. It is so common a shrub in all our nurseries, in all our gardens that it is taken very much for granted. Nevertheless it is a foreigner and the first came into use through the Arnold Arboretum. The same story might be told for many other plants, though none, with the possible exception of the Japan clematis (*Clematis paniculata*) have played as yet so large a part in our horticultural industry or in our garden developments.

To those who know and appreciate the Arboretum and its amazing contributions to and influence on American horticulture, it is difficult to realize that there are many who are quite familiar with this barberry and yet quite ignorant of the institution. Located in Jamaica Plain, Massachusetts, it forms part of the great park system of the city of Boston, but is attached to Harvard University. It was established in 1872 and given into the care of the late Professor Charles Sprague Sargent about a year and a half later, remaining in his care until his recent passing. So completely had he identified himself with the institution and so entirely did he make it his life, that it is almost impossible to think of the one without the other, and yet that is precisely what must now be done. The new director is Professor Oakes Ames of the Bussey Institute, and the Keeper is Dr. Ernest H. Wilson, the widely known and distinguished plant explorer who has long been attached to the staff and through whose efforts many new plants have been brought into the Arboretum and

thus into the American trade. In these hands the future of the Arboretum is assured in so far as its valuable work is concerned. The problem that confronts the institution is the ever present one of maintenance.

The income for the work comes from an endowment fund and amounts to "not more than \$60,000; whereas its average expenditure during the last five years has been \$80,000 with a pretty steady tendency to increase." This is now met "by gifts which, from the standpoint of sound finance, should be added to the principal."

"To place the Arboretum on a firm financial foundation, to enable it to meet the demands which growing America will make on it, the friends of the institution have organized to raise a Million Dollar Fund for the Endowment of the Arnold Arboretum. In the amassing of this Memorial Fund the participation of the friends and admirers of Professor Sargent is invited, of those who are interested in the preservation and continued growth of a great institution, of believers in the value of research and of the quest of scientific knowledge, and of all lovers of trees and shrubs, of parks and gardens, and of natural beauty as an important cultural element in life. For many years the Arboretum rested upon the shoulders of one man, then upon an increasing group who came to share the belief and enthusiasm of the leader. Just as it has expanded its usefulness it should also expand the circle of its friends. The appeal which it now makes for funds can justly be national, for there is no American who is not, consciously or unconsciously, to some degree indebted to the Arnold Arboretum."



Rhododendron obtusum araliaceum



Halesia caroliniana



Rhododendron obtusum japonicum



Rhododendron Fraseri

Dipelta floribunda



Arnica montana
30 May 1927

In presenting this information to the members of The American Horticultural Society, the committee feels sure that it is reaching a part of the public which is particularly interested in the Arboretum and all for which it stands. The writer has long known the institution and has spent much time there to his great benefit and delight and shares with others the hope that the work of the institution may never know any

diminution and may further be emulated by similar institutions over our entire country.

The executive offices for The Charles Sprague Sargent Memorial Fund are at 1014 National City Building, 42d Street at Madison Avenue, New York City. The first half of the fund has been accomplished. More is needed and as rapidly as possible. Will you not help?

Hot-House Flowers as Roadside Weeds

BY MRS. CHARLES H. STOUT

There is probably no more spectacular trip from a horticultural standpoint than one by motor over the mountains of Martinique. Starting from Fort de France early one morning, we were soon zig-zagging through gorges, across flimsy bridges, onward and upward four thousand feet or more. Resting among the drifting clouds on a shoulder of Mt. Pelée, we ate our lunch and took the opportunity to wander through the forest of tree ferns and along the banks of a tumbling stream.

It was maddening to see growing, lush of green and brilliant with bloom, some of the treasures of our hot houses. The slopes were matted with Wandering Jew (*Tradescantia zebrina pendula*), the purplish variegated plant which I had always imagined to be a hybridizer's child. Occasionally we met with the pale green form of *Tradescantia*. Shady nooks were carpeted with scarlet mimulus, all of these running and rooting as they go. Gutters by the roadside were choked with the golden "Black-eyed Clock-vine," *Thunbergia alata*, clambering over everything within its reach. Fallen trees and old stumps harbored the Stag-horn fern, which drew its suste-

nance from the rotting wood and grew to amazing size in this damp, cool climate. *Byrophyllum pinnatum*, Life Plant, or Tree of Life, as they sometimes call it, threw up its stately flower stalks everywhere. Lantanas in pink, yellow, red or orange become shrubs of good size, covered by a wealth of bloom. Wild cannas; *Pentstemon barbatus* in both coral pink and red; *Strelitzia regina*, or Bird of Paradise and its coarser cousins; caladiums of many forms; all are hopelessly tangled among the hedges of dracaenas which the natives plant around their huts. The Heavenly Blue Morning Glory, so tenderly cultivated in our gardens, fairly smothers everything over which it may twist. Shady cliffs were draped with ferns of the "Boston" types, their fronds, some two yards long or more, dripping with the cloud-dampness of that altitude. The meadows, shaded by overhanging crags, were carpeted by a mass of fluffy, pale green ferns, dotted here and there by tree-ferns thirty feet high or more.

Stately age-old mahogany trees renewed their youth with a dress of orchids, or sometimes with bright *Arengias* or *Billbergias*, relatives of the humble pineapple.

Down the mountain side toward St. Pierre, the hotter, dryer part of the island permits the growth of many types of cactus, aloes and a beautiful form of haworthia which throws up long sprays of tender apricot bells.

There are few gardens of merit in any of the West Indian islands. The poorer classes have a happy faculty of combining the vivid colors of their native shrubs and vines as nature loves them best. A common sight is a thatched hut, draped with blood-red bougainvillea, hedged by a tangled mass of poinsettia. Often that gorgeous tree, Flame of the Forest, stands sentinel beside it. Was ever a name better suited to a tree, which for six months of each year is a blaze of orange and red?

These people of mixed savage races prefer their plants of vivid hue. English and Americans, however, hedge their gardens with dainty *Plumbago capensis*, which, in spite of constant clipping, keeps throwing out its sprays of china blue bells. Crepe myrtle, pale hibiscus, roses and pink or white bougainvilleas add to the coolness of the picture.

The name "Shasta Daisy" applied originally to about the only production of the late Luther Burbank that has gained wide use in our gardens has been adopted even in England to apply to the various forms of *Chrysanthemum maximum*. While Mr. Burbank's daisy is supposed to have been a hybrid of *C. maximum*, *leucanthemum* and other daisies, the Shasta Daisies in the general lists in England are *C. maximum*, with the exception of the Burbank Alaska which is now listed abroad.

There have been a number of new and improved forms of this plant in recent years and one of the finest, honored by a R. H. S. award of merit, is Mayfield Giant, now offered in some American lists, truly a giant among daisies, of a glistening whiteness and not showing the coarseness

Bougainvilleas were a revelation to me there. In the Hope Gardens at Kingston, Jamaica, they have a collection of many kinds. Most of them were gathered from other islands and established there, while some are evidently hybrids. A trellis, quite 500 feet long, bordering this garden is a mass of henna-colored bougainvillea. A long arbor is smothered with what at first I thought was a Dorothy Perkins Rose, but proved also to be a hybrid.

In the mountains of St. Thomas' Islands ("one of the Virgins!"), bougainvilleas drape the crags and clamber over forest trees. They are pale yellow, orange, blood red and clear salmon pink. One pure white I saw, though they told me it was rare. The tresses are looser than the old magenta kind which we know so well in our South, and except for the crimson and henna colored, the growth is not quite so vigorous. Let us hope that soon we may see these beautiful wildings established in our greenhouses and southern gardens.

with its greater dimensions that some of the tribe display. This is a daisy well worth adding to the garden. It is a very robust type reaching 4 feet in rich soil and under good cultivation.

The *Chrysanthemum maximum* varieties and even to a greater extent the Shasta daisies sometimes show a tendency to die out. This is obviated by division every third year. This division is necessary owing to the thick matting of the clumps so that the center of the clump has a hard struggle to keep up with the outer divisions.

Mayfield Giant, like most of these daisies, shows some variation from seed, but all the types are unusually good and the true huge Mayfield Giant types with their small centers are readily selected from the lot. The percentage of inferior plants is small.

List of Plants Requiring Circumneutral Soils

By EDGAR T. WHERRY

In The American Horticultural Society Bulletin No. 4, lists of plants preferring soils of different degrees of acidity were published. In response to numerous requests a supplementary list is as follows, including 100 plants preferring circumneutral soils. Tests by the one-indicator method should give a strong purple color with soils adapted to these plants. This list may be inserted between pages 14 and 15 of Bulletin 4.

Abelia	Abelia.
Acer (many species)	Maple.
Actaea	Baneberry.
Adiantum	Maidenhair Fern.
Aesculus	Buckeye
Alyssum	Alyssum.
Ampelopsis	Ampelopsis, Creeper.
Amygdalus	Almond, Peach.
Anemone	Anemone.
Apium graveolens	Celery.
Asparagus	Asparagus.
Aster (many species)	Aster.
Astilbe	Astilbe.
Begonia	Begonia.
Berberis	Barberry.
Beta vulgaris	Beet.
Brassica oleracea	Cabbage, Cauliflower.
Bromus	Bromegrass.
Buddleia	Butterflybush.
Buxus sempervirens	Common Box.
Calendula officinalis	Calendula.
Callicarpa	Beautyberry.
Callistephus chinensis	China-aster.
Campanula (many species)	Bellflower.
Canna indica	Canna.
Celastrus	Bittersweet.
Chrysanthemum	Chrysanthemum.
Clematis	Clematis.
Coleus blumei	Common coleus.
Convolvulus	Convolvulus.
Coreopsis (many species)	Coreopsis.
Cosmos bipinnatus	Common Cosmos.
Cotoneaster	Cotoneaster.
Crataegus	Hawthorn.
Crocus	Crocus.
Cucumis	Cucumber, Melon, Squash.
Cucurbita	Pumpkin.
Dahlia	Dahlia.
Daucus carota	Carrot.
Delphinium (many species)	Larkspur.
Deutzia	Deutzia.
Dianthus	Carnation, Pink.
Euonymus	Euonymus, Wintercreeper.
Fagus	Beech.
Forsythia	Forsythia.
Fraxinus	Ash.
Gladiolus	Gladiolus.
Hedera	Ivy
Helianthus	Sunflower.
Hibiscus	Hibiscus, Rosemallow.
Hyacinthus orientalis	Common Hyacinth.
Hydrangea (many species)	Hydrangea.

Iris (many species)	Iris.
Juniperus	Juniper
Lactuca sativa	Garden Lettuce.
Lespedeza	Bushclover.
Ligustrum	Privet.
Lonicera	Honeysuckle.
Lychnis	Campion.
Lycopersicum esculentum	Tomato.
Malus	Apple, Crab.
Medicago sativa	Alfalfa.
Melilotus	Sweetclover.
Mertensia virginica	Virginia Bluebells.
Narcissus	Narcissus.
Oenothera	Evening-primrose.
Paeonia	Peony.
Papaver	Poppy.
Pastinaca sativa	Parsnip.
Pelargonium	Geranium.
Phaseolus (many species)	Bean.
Philadelphus	Mockorange.
Phlox paniculata	Garden Phlox.
Pisum sativum	Common Pea.
Poa	Bluegrass.
Polygonum	Fleeceflower.
Primula	Primrose.
Prunus	Cherry, Plum.
Pyrus	Pear.
Ranunculus	Buttercup.
Rhamnus	Buckthorn.
Ribes	Currant, Gooseberry.
Rosa	Rose.
Secale cereale.	Rye.
Spinacia oleracea	Common Spinach.
Spiraea (many species)	Spirea.
Syringa	Lilac.
Taxodium distichum	Common Baldcypress.
Taxus	Yew.
Thuja	Arborvitae.
Trifolium (many species)	Clover.
Triticum aestivum	Wheat.
Tulipa	Tulip.
Ulmis	Elm.
Viola (many species)	Violet, Pansy.
Vitis (many species)	Grape.
Wisteria	Wisteria.
Yucca	Yucca.
Zea mays	Maize, Indian Corn.
Zinnia	Zinnia.

Plants for shady borders and particularly useful for lighting up shrubbery in deep shade in midsummer and into the fall are *Eupatorium urticaefolium*, usually listed as *E. ageratoides*, and *Rudbeckia triloba*. Both are natives and will naturalize if given a chance.

The eupatorium or white snakeroot resembles a white ageratum both in bloom and leafage. It is under the ban of the Department of Agriculture in Illinois and its destruction is or-

dered because of serious losses in stock. It is a violent poison for stock and also for human beings, but there is no ban on its use in the garden.

The three-lobed coneflower is found in the woods but it also flourishes in full sun and its brilliant "Black Eyed Susans" covering the three-foot plants give a brilliant touch to dark corners that no other plant affords. It is a biennial or shortlived perennial that self-sows so numerously it may become a pest if not rigorously limited.

Herbaceous Lobelias

BY E. LADHAMS

With the advent of the modern hybrid varieties, the race of herbaceous lobelias now in commerce is surely coming into a well-deserved prominence, but being as yet comparatively little known, a brief description of the origin, culture and varieties available may be of interest. Some of the original types, as well as some of the named varieties may be known to many readers but I frequently meet people who are totally unfamiliar with either and their surprise when told that they are admiring lobelias is very real.

To begin with, I should like to say that many years ago, over thirty, Mr. B. Ladhams, after growing some fine specimens of *L. fulgens* obtained from North America, conceived the idea of breeding a race of this admirable plant with a better, hardier constitution and also greater variety. For this purpose, he took the two forms of *L. siphylitica* white and blue, *fulgens* and *cardinalis*, all from North America, and set to work to see what an admixture of the lot would bring him in variety and hardiness. He noticed that they would not readily intercross or hybridize of themselves, so carefully sterilized selected flowers and hand pollinated them, a tedious and lengthy business. This was done, however, with all three kinds, the two *siphylitica* forms being one species, and a limited quantity of seed was harvested. The net result of this first experiment produced nothing of outstanding merit, but it did give a much improved *siphylitica*, a strong growing green leaved hybrid with inferior colored purple flowers, one or two dirty reds, a 500 or 600 for the rubbish heap.

The next step was to hand pollinate the whole of this series in various

combinations. No particular records were kept of this stage. Seedlings from this queer lot were grown and much more hopeful progeny resulted, none, however, good enough to remain permanently. By following out this method, selecting the best of each generation for crossing, the first commercially good kinds eventually came, having as their characteristics hardiness, desirable colorings, and robust free flowering habits.

Three of these distributed about 1910 and still good and largely grown: B. Ladhams, brilliant scarlet; Mrs. Humbert, clear pink, distinct in habit from any other variety before or since that date; Purple Emperor, rich purple spikes, very branching. Later came: Carmineus, with slightly darker foliage and clear carmine flowers; Purple King, then nearest to deep blue and a rich color which has not yet been replaced.

We had then, by 1912, a fairly good range of color in hardy types sufficient to work for greater variety. A systematic course was then adopted with definite objects in view, a greater range of coloring, larger flowers, richer foliage, and an even increased robustness. This had hardly been commenced when the Great War intervened, upsetting these plans for other more essential work.

On resuming, the stocks of some kinds that had promised well were found to be lost, but some remained, and after getting them in order again, the work went on along the lines of the plan with very gratifying results until to-day there are at least twenty distinct good serviceable kinds, all having the characteristics of the original hybrids but with both flowers and foliage "glorified."

When you picture plants from single crowns, which grow each year to the height of five feet, some very branching with as many as twenty branchlets each, with dark crimson and beet-colored leaves, or in other cases vivid green, the branchlets covered with flowers, some an inch across, others smaller but more numerous, you begin to realize there is something in this race to justify the amount of work entailed over many years.

Culture is the simplest if a few requirements are met, and the plants are much too good to neglect these measures. There should be: Rich, well-drained, moist soil with provisions, for watering in case of drought, as the plants must not be allowed to flag when in growth; division of the roots immediately growth commences in the spring, to prevent fungous rots in the crowded crowns; covering of the roots during winter with ashes or sand to protect against slugs and to insure even moisture, the covering being removed in spring when the plants are divided; even moisture, with no abatement in moisture when once it has been increased; ordinary soil well enriched with rotted manure.

The following are some of the best and most distinct varieties in commerce to-day. Blue Bird, finest blue

to date, green leaves; B. Ladhams, glorious scarlet crimson, green foliage, very hardy; Carmineus, lovely carmine; Crimson Velvet, almost black crimson, foliage dark beet color; Delight, a novel gray-blue color, 4 ft.; Southern Beauty, 5 ft., very large brick red flowers, carmine flush, dark leaves; Kimbridge, robust rich foliage of bronze, large spikes of rich purple maroon flowers, 5 ft.; Lady Gregory, soft terra cotta, 3 ft.; Mrs. Humbert, bushy, branching plants, lovely in mass, rosy pink; Purple King, rich purple blue spikes, intense color, 4 ft.; Purple Emperor, immense spikes, rich purple; Shirley Beauty, produces huge quantities of rich mulberry crimson flowers, very fine, 4-5 ft.; Mulberry, richest deep purple, dark leaves, 4 ft.

This work of improvement is still going on. This season several improved kinds will probably be put on the market if stock permits, while the large quantity of pedigreed seedlings due to flower later, now that the work is so well in hand, should bring still other good distinct things, perhaps enabling us to discard older sorts, to keep the number of varieties well in hand, retaining only the best.

Southampton, England.

Among the shrubs that should be more commonly grown especially in the South are the several species of *pyracantha*. These plants, evergreen relatives of the hawthorn and the cotoneasters, are hardy as far north as Long Island and survive in sheltered locations even in Massachusetts. The old *coccinea* and its variety *Lalandi* have been in the trade for some time, but are now augmented by several forms of *crenulata* which have been introduced from China. Except for some on the Pacific Coast, these last have been little tested for hardiness. If possible, when planting *pyracantha*, secure small plants pot grown.

One of the brooms that rivals a juniper as a ground cover is *Genista pilosa*. At the Arnold Arboretum it forms great mats of dense, ascending twigs about ten inches in height and bears myriads of its brilliant yellow flowers in May. It does not appear to self sow as does its more rampant relative, *Genista tinctoria*.

When a small tree of rather large foliage is needed in a planting a paw-paw is not bad for variety. Its leaves have something of the decorative quality of the loquat but of course lack the richness of texture that comes from the furry loquat leaf.

A BOOK OR TWO

In his little book entitled "Balancing the Farm Output," Dr. W. J. Spillman, of the Department of Agriculture, clearly sets forth the fundamental difficulties in adjusting farm production to the requirements of the consuming public; for balancing the farm output means so adjusting the production of the land that there shall be a sufficient food supply without over-production to unduly depress prices.

In his first chapter entitled "The Minor Crops," Dr. Spillman states very clearly the important difference between intensive crops which return a large yield and consequently a large output per acre, in comparison with the more extensive and less remunerative crops when considered on a per acre basis. "For instance, a 10 per cent reduction in the acreage of potatoes means in round numbers a decrease of 350,000 acres. Such a change in acreage might double or treble the price of potatoes. But if corn, for instance, were substituted for this area of potatoes it would mean an increase of only one-third of 1 per cent in the corn area, and the resulting effect on the price of corn would be so slight as to be scarcely noticeable." This clearly brings out the difference between an intensive agricultural crop and an extensive agricultural crop in the farm organization. What is stated regarding potatoes is equally true of many other intensive crops spoken of in this volume as "minor crops." They are minor only from the standpoint of the area of the cultivated land which they occupy.

Another important distinction which must be taken into consideration in any effort which is made towards "Balancing the Farm Output" is brought out in connection with the production of apples. The apple crop is dependent upon a long period of preparation during which time there is no direct income from the apple trees themselves. If, during this period of development

following a long period of reduced planting of apples, prices tend to advance, the chances are that, because of the long cycle required in apple production, over-planting will result because of the stimulation of an upward trend in apple prices. Such a result is almost certain to be followed by a corresponding period of depressed prices resulting from large production as a result of the stimulation to planting from the previous period of falling production.

These illustrations of the behavior of various farm crops and the relation which they bear to one another and to the total output of agriculture lead up to the importance of the consideration of statistical information by agriculturists engaged in annual production or contemplated expansion of any particular agricultural industry. Until exploitation can be removed from agricultural development and a definite agricultural program worked out which is based on experience over a long period, there is little hope that agriculture will not be face to face with depressions extending over greater or less periods of time. To the extent that producers understand the food requirements, both from the standpoint of kind as well as total supply, to that extent will it be possible to balance the farm output.

Dr. Spillman has in "Balancing the Farm Output" developed in a very clear and concise manner many of the important and fundamental features of the problem involved in balancing the farm output. He is optimistic enough to believe that what he calls the "Limited Debenture Plan" will solve the problem. This plan is admittedly applicable only to those crops which he designates as "major crops." In other words, those which occupy a large acreage of the land involved in agricultural production and those which are capable of being warehoused and especially those which enter into international trade. The idea is to establish a domestic price for these products which shall be the world

price plus a tariff which is levied against the importation of such products by the Congress; and to arrange it so that each producer of an exportable commodity will receive for a product which he sells in the domestic market the world price of that commodity plus the import tariff duty, the buyer who engages in the merchandising of such commodities to pay the grower the world price plus the tariff and to have rebated to him the tariff upon all of that portion of the commodity which he exports. The "red tape" suggested for the handling of this proposition appears rather formidable but it is probably not impossible of execution. The plan, however, is so entirely different from any economic system which has heretofore been extensively practiced by the agricultural public that it appears to the writer to lack the appeal necessary to "put such a proposition over" with the general public. Among the various legislative remedies which have been proposed this one appears to be more economically sound than any other which has been proposed. Its chief handicap, it is believed, will be found in the machinery necessary for its operation; but once inaugurated, it may prove to be capable of much simpler methods of handling than are proposed by its author.¹

L. C. C.

¹Spillman, W. J. *Balancing the Farm Output*. Orange Judd Co., New York. 1927.

To those of us who rightly or wrongly have always associated the work of Professor Waugh with the informal style of landscape gardening, his recent book, "Formal Design in Landscape Architecture," is of particular interest. In the preface the author states that there is to be no attempt to recapitulate the history of the development of formal gardening, but rather an examination of formal gardening from the basis of pure design and an endeavor to examine its suitability to American conditions, since it has had so foreign an origin and growth.

After various chapters in which are found clear and interesting definitions of the various terms employed, the author passes on to the discussion of the basis of the development of a formal plan. There are several points on which one might quibble perhaps, but, for the main part, the text is both clear and stimulating and is full of meat, especially for the non-professional reader. Written with the same vital quality that marks most of Professor Waugh's work, this book makes a very able advocate for the formal style and should engage the interest and attention of many gardeners who are not now interested in the more artificial styles of gardening.

The illustrations are numerous and excellent.

The discussion of plant materials is too brief and might well have been omitted if so limited a treatment was obligatory.

B. Y. M.

Waugh, F. A. *Formal Design in Landscape Architecture*. Orange Judd Publishing Co., New York. 1927.

Many gardeners have regretfully given up trying to succeed with Judas trees or redbuds in the garden because of their destruction by borers. The same directions given by Mr. Wister in the January issue of this magazine for attacking lilac borers will conquer them. A sharp pointed wire, a knife, and a can of carbon bisulphide are the weapons. Stab them with the wire, dig them out with the knife and create a hostile atmosphere for them with the bisulphide. They wreck the redbud in no time if allowed to work at will. The redbuds want partial shade to be at their best. They flourish on the north side of woods in particular.

Landscape architects have produced gorgeous effects planting together redbuds and Early Richmond cherries, kept low branched.

The Gardener's Miscellany

LENGTH OF BLOOM OF CLIMBING ROSES

Some 500 varieties of climbing roses are now listed; at least 300 are in the trade. As these are divided into at least a dozen types there is more diversity of habit than in the bush roses, and there is less approximation or publication of flower effects. Each variety is quite distinct and has its definite uses in garden decoration. These notes are wholly on date and length of bloom, from observation for two seasons in the testing garden here.

a. *One bloom only.*

Empress of China (Climbing Bengal) is always first to bloom, with Paul's Carmine Pillar (Cl. H. T.) a close second. Both these have finished before the end of June. The first week of the season (early June) brings also many of the Multiflora types, such as Purple East, Apple Blossom and Bonnie Prince, followed by the three forms of Tausendschon. The large-flowered Multiflora types come mostly before the paniced type, as Crimson Rambler. The Wichuraiana forms follow these, again the large-flowered sorts mostly before the paniced types, as Dorothy Perkins. Climbing American Beauty and Mary Lovett are the earliest of the large Hybrid Wichuraiana.

With the opening of American Pillar (Setigera hybrid) the procession is about at middle. Few of the Multiflora forms appear after this, but here follow all the small Wichuraiana sorts, not opening until early July, when the many kinds appear together, the small double white Mrs. M. H. Walsh being the last of the small Wichuraiana hybrids. Freedom and Seagull are the latest of the large Wichuraiana hybrids, not opening until mid-July. The type forms of *setigera* and *wichuraiana* are last, coming about July 20, and

with them a hybrid (*setigera* x *wichuraiana*) closes the season.

Crosses of Tea, Hybrid Tea and Bengal with Multiflora give the early hybrids, and with Wichuraiana they are mid-season to late. The Setigera forms are inclined to be late, and by proper crossings it may be possible to prolong the season into August. The present range is eight weeks, from Empress of China on June first to the end of July with the fading of Freedom and Seagull. Each sort is effective about three weeks, but the Multiflora type is more brief than Wichuraiana, though the large-flowered hybrids are of about equal staying power. Of special long bloom are Paul's Scarlet Climber (Mult.) and Mary Lovett (H. W.).

Other climbing types, as *macrophylla*, *arvensis*, *alpina*, and *semper-virens*, have few varieties and need more study, but their bloom period seems to be much as for *multiflora*.

b. *"Everbloomers."*

Greater interest is found in the types which bloom all summer. The Climbing Hybrid Tea and Hybrid Musk begin very early in June, give heavy bloom while the bush roses are at their best, rest and grow in July and August, and give fair bloom from August to October, their latest blooms being best, and many buds are killed by autumn frost. It can not be said that their mid-summer bloom is heavy. The "Bloomfield" sorts are of these types, the flowers smaller and clustered. Climbing Gruss an Teplitz (Bengal) is the most free bloomer and most hardy. There should be other colors of this, and the hardy ever-bloomer would be accomplished.

There are no everbloomers in the Hybrid Wichuraiana, though Silver Moon, Lady Godiva, Dorothy Perkins, etc., do give a few flowers in October.

The present ever bloomers are Multiflora forms, the Trier group (Lambertiana) being fairly successful with some panicles of flowers all July and August, but always the small-flowered types. Then there are at least four Climbing Baby Ramblers, larger plants but not so free blooming as the bush forms. The climbing sport of the small Bengal, Cecile Brunner, is a more consistent bloomer than Hybrid Tea or Hybrid Musk. The future ever bloomers may come from a parentage of Dwarf Polyantha or Hybrid Polyantha or Bengal on some of our present climbers, where great hardiness must be joined to continuous bloom.

Two indications of what northern gardens may expect in large-flowered ever bloomers, hardy and vigorous, are worthy of observation. The light yellow Ghislaine de Feligonde (Mult.) gives more bloom than any yellow Hybrid Wichuraiana, and for a longer period than Trier, and in better mass effect, from Mid-June to late July, with some flowers the months following. Perfection is reached in Birdie Blye (Mult.), a Van Fleet hybrid, a kind of giant climbing Hermosa, with large rose blossoms from mid-June to the frosts of November. If this can be duplicated in other colors the group of hardy ever bloomers will have come to northern gardens, and the Climbing Hybrid Tea and Hybrid Musk can be left for warmer sections.

STEPHEN F. HAMBLIN, *Director*.
Botanic Garden,
Harvard University.

Forsythia intermedia var. *spectabilis* is the most golden of the golden bells, a gorgeous spring bloomer and much finer than the old time Forsythias. It is very free blooming and as easily grown as *intermedia* or *suspensa*. A bush of *spectabilis* planted with the older varieties intensifies the bank of gold. It seems a little more bud hardy than the older varieties but not notably so.

A few lilac notes from northern Illinois.—Of the dark colored lilacs, Ludwig Spaeth, whether considered as a souvenir or an andenken, is the most vigorous grower and profuse bloomer. Danton is the worst grower. Monge and Congo are good growers, the latter a toned purple.

Siebold, while lacking the fine quality of bloom of some of the other light varieties, is desirable because of the unusual coloring of the buds and expanding bloom. The buds have a distinct amber tone and the bloom opens a delicate flesh.

Of the "lilac" colored varieties, Mme. Francisque Morel or, as Mr. Wister has it officially listed, Mme. F. Morel, is the finest. It is remarkable for the size of the individual flowers. Pasteur shares the distinction of unusually large individual bloom.

The lilacs are distinctly lime lovers and a dose of lime will sometimes prove a surprising stimulant to lilacs that are not flourishing.

In this section of the country lilacs are grafted on ash seedlings with much success. It is a simple matter to gather ash keys and raise seedlings for experiment. Amateurs should learn to bud plants. It is a simple process and soon learned. The longevity of this union as compared with privet stock is sometimes questioned but the writer can find no data. Deep planting and establishing the lilac on its own roots ultimately is advised. Bud on the north side of the stem for protection from the sun.

There are many quite extraneous whites both in double and single. Mme. Florent Stepman appealed to the writer as a very fine white. The old Mme. Lemoine is a very satisfactory double white, flourishing abundantly and blooming freely year after year.

Of the pinks, the old Louvainensis, usually spelled Lovaniensis, as a large bush gives the pinkest effect in a large planting. *Macrostachya* is another excellent pink. The pinks of the lilacs are much the same as the pinks of the irises, all with a purple tone.

Ascertain the habit of growth as to height in planning a lilac planting. Some grow much taller than others and the appearance of a group may be affected by placing tall growers in front of those of dwarfer stature.

Keep down suckers but do not destroy those of fine varieties. Plant them in some reserved space and there will be a ready market or exchange for them.

S. R. D.

Three seasons' experience with the beautiful *Mariposa* tulips of California shows that they are admirable bulbs for a coldframe but are too unreliable for open planting in the Northern States, even in the rock garden where they are protected. They make a beautiful display in late May in a frame.

The frame may be set over the planting in the fall and removed in the spring, giving the planting a chance to show its full beauty.

With a heavy mulching of leaves they will come through one winter with comparative safety but do not reappear in quantity or with vigor after that in the open ground. However, the bulbs are so cheap that they can be replaced each year if desired.

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The American Horticultural Society

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The Society publishes The National Horticultural Magazine, a quarterly journal issued in January, April, July and October to all its members. It publishes special bulletins from time to time as material warrants special issues.

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