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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 and Floriculture; Vegetable Gardening; Fruit Growing and all activities allied with Horticulture.

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[See page 34]

The National Horticultural Magazine

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Contributing Editors

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The reader will discover various new features in the magazine this year. We had hoped to bring you a larger magazine, but an unavoidable occurrence at the last moment delayed our leading article so that it will not appear until the April issue. We do have for you a larger number of illustrations. Concerning them, it is our hope, we should like to say intention, to establish them in series, so that our members will have in time illustrations of all the important species or varieties in the families surveyed. The iris series, which was started in 1928, is continued and this issue sees the beginning of series in barberries, cotoneasters, lilies, narcissus and phlox. The pyracanthas are relatively few in number, too few to be considered a series, but it is our hope to have all of them. In addition there are several new departments which are to be counted as permanent features if the members approve. Not least of these are the propagation notes which close The Gardener's Pocketbook. We should like to open the pages of the magazine to correspondence, but that depends upon our members, for we decline to write imaginary questions and answers! Will you accept our often-repeated invitation and send in your comments or your queries?

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*Dorsett & Dorsett**A willow hedgerow**U. S. Department of Agriculture*

Harvest Forks From Willow Trees

NOTES FROM AN EXPLORER'S DIARY

By P. H. DORSETT

On the third or fourth day of our stop at the Yao Wang Miao Temple, while hunting for an orchard of a seedless jujube, we passed through the village of Wang Mong, some fifty miles southwest of Peking, and learned that this was the center of the "harvest fork industry" of that region.

For considerable distances outside of the village we had observed many long hedgerows of willows but gave them no thought, as willows are commonly grown as hedges and as sources of firewood.

These plants, however, were destined for other uses.

They are grown as bushes with one or more shoots from the crown. These commonly produce nearly opposite

branches about six to eight feet above the ground. When these lateral branches reach the desired size they are cut back to within two to three feet of the main trunk. The trunk by this time is from one and one-half to two inches in diameter. This is now cut off to equal the branches, leaving a rough three-tined fork. Sometimes the central branch is shortened before the lateral branches to force them into growth equal to the leader.

This tendency to uniform branching at a uniform distance above the ground is remarkably constant throughout the hedgerows, a striking instance of vegetative form preserved through human methods of propagation.

The making of these branched sticks

*Dorsett & Dorsett**Newly cut willow stocks**U. S. Department of Agriculture*

into harvest forks is a more or less simple operation. The bark is stripped from the stem and branches of the freshly cut young trees, a notch is cut just below the branches on what is to be the under side of the handle, and a dozen or more at a time they

are placed in an open-top brick-lined oven or kiln to be heated. The green wood, which is sprinkled with water from time to time, is soon steaming in the heat from the fire below.

After the forks have been steamed in this way for an hour or two, the

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Native compound with finished forks and forks in curing frames

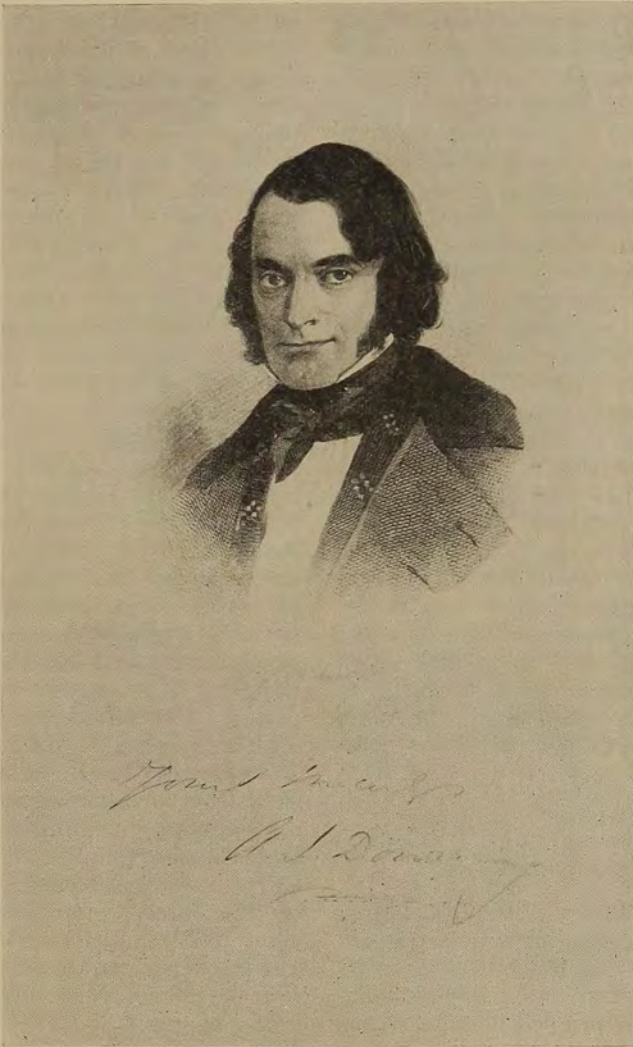
branches can be bent readily without any danger of breaking. When taken from the oven or kiln the forks are placed in a forming frame, where the branches are spaced to form the tines and given the proper curve.

The forming frames are simple in construction, inexpensive and apparently very efficient. Logs six to eight inches in diameter and of any convenient length are anchored to other logs buried immediately under them, by means of willow thongs wrapped around both of them, at intervals of about six feet. The log on the ground is sufficiently raised above the other to admit the willow branches between it and the soil. As they are taken from the kiln the forks are thrust between the logs, the tines spaced as desired and held in place by pegs

driven in the earth. The handle is then raised to a height sufficient to insure the correct curvature of the tines and by means of a short stick driven in the ground and wedged into the notch in the handle mentioned above the whole is securely held in this position.

They remain in this frame for about six weeks. By this time they are thoroughly dried and set in the desired form.

When dried they are removed from the forming frames and stored in piles about the compound, covered with matting or any other available material. Later, as they are wanted for the market, the tines are pointed and they and the handles smoothed down ready for use. The finished article sells for about seven cents in American money.



Development of American Horticultural Literature, Chiefly Between 1800 and 1850

BY HAMILTON TRAUB

PART TWO

APPEARANCE OF SPECIALIZED TREATISES ON HORTICULTURE, 1817-1850

As the importance of the horticultural industries increased with the gen-

eral economic development of the country, the activity is reflected in the nature of the horticultural literature. The growing of fruits, especially the apple, the peach and the strawberry,

early assumed leading positions among the commercial horticultural industries. It is natural, therefore, that the first specialized work published was devoted to the science of pomology. The flower and vegetable industries, near the centers of population, responded to the greater demand created by the increase of population and the general prosperity and well being of the people in the great cities. This gave rise to a vigorous literature devoted to the science and practice of floriculture. But the literature given over to vegetable growing lagged and is to be found chiefly in the general horticultural manuals. The specialized literature of this branch of horticulture had a rather late beginning. Since a pioneering people lean toward the pretentious rather than the tasteful, the literature of that branch devoted to the expression of the art sense in horticulture, the theory and art of landscape design, is the last branch to become differentiated from the main trunk of general horticultural literature.

POMOLOGICAL LITERATURE, 1817-1850 GENERAL TREATISES

During the entire limited marketing stage in the development of the horticultural industries, the culture of fruits was one of the important departments of horticulture, and pomological works were undoubtedly in demand before any American manuals of this nature had appeared. An American edition of William Forsyth's "Treatise on the Culture and Management of Fruit Trees"¹ had been brought out by William Cobbett as early as 1802, and this "was one of the most influential books on fruit growing in the period before orcharding over large area gave rise to essentially American horticultural writings."² Apparently no native book on pomology appeared until 1817,

when William Coxe's "A View of the Cultivation of Fruit Trees" was published in Philadelphia. Although his work is characterized by more originality than is shown in works that follow for two decades, and in a measure foreshadows Downing's later work, in its conciseness and judicious selection of the material included, Coxe modestly remarks, "Notwithstanding the acknowledged fitness of our climate for the production of Apples and Cider of the most exquisite flavor, we are yet without any detailed system of practical management by a writer of our own country;—the want of such a guide among a people characterized by their attachment to the agricultural life * * * has been frequently lamented * * *. On a topic which has so often been discussed by men of science and information of other nations, originality cannot be expected; pretensions to it on the part of the writer of these sheets, would probably destroy that confidence which it is his wish to inspire."³ Coxe's book covers 253 pages; 48 pages are devoted to the exposition of the scientific principles of pomology, including 11 experiments by the author on orchard management; 41 pages are given over to a discussion of the nature and manufacture of cider, perry, spirits and vinegar; and 154 pages are required for the description of 133 varieties of apples, 65 varieties of pears, 38 varieties of peaches, 18 varieties of plums, 6 varieties of apricots, 5 varieties of nectarines, 15 varieties of cherries and 1 variety of the quince. The section devoted to fruit descriptions is illustrated with cuts showing the size, outline and spotted, splashed or streaked nature of the fruits. While these illustrations are crude as judged by our standards, they were excellent for his day and generation.

Coxe was a keen observer, and in addition he had the advantage of

¹William Coxe, *Cultivation of Fruit Trees*, 1817.

²Wilhelm Miller, in *Standard Cyclopedia of Horticulture*, vol. III, 1915, pp. 1568-1569.

³Coxe, *Cultivation of Fruit Trees*, 1817, pp. 6-8.

practical experience in orcharding—“Having been for many years actively engaged in rearing, planting and cultivating fruit trees, on a scale more extensive than has been attempted by any other individual of this country.”⁴ The fact that his attempt did not prove a successful venture financially does not minimize the correctness of his scientific knowledge,⁵ for Coxe was a pioneer in striving for a standard nomenclature and systematic varietal descriptions, the essentials of a true systematic pomology. One of his objects was “to establish with some degree of certainty, the name, character, and origin of each variety,” and in many cases the synonymy is also given of the varieties described. The influence of the work of Coxe upon later pomological writings was important, and his book remained one of the standard manuals on pomology until the appearance of Downing’s “Fruits and Fruit Trees.”

Coxe’s work was followed by James Thatcher’s “The American Orchardist,” Boston, 1822. This was “compiled from the latest and most approved authorities, and adapted to the use of American farmers.” Subsequently it was bound with William Cobbett’s “Cottage Economy” and appeared under the title “American Orchardist and Cottage Economy,” New York, 1824.

In 1831 appeared “The Pomological Manual”⁶ of the Princes. The members of this family were well qualified to undertake the work, since at least three generations had been actively engaged in the nursery business, and the horticultural establishment of the Princes contained for a long period the most notable collection of useful plant material in the country. The Manual of the Princes, on the whole, was a valuable addition to the few works on the subject then in existence. The book comprises two parts. The first includes 199 pages and is devoted to

the description of apricots, pears and peaches. The material is arranged alphabetically under common names with the synonymy listed beneath, and followed by a description of the variety. Part II, along similar lines, comprises 215 pages devoted to the description of peaches, nectarines, plums, cherries, almonds, raspberries, strawberries and pears. The Princes had originally planned to add a third part covering the apples, but this plan was never carried out. The work contains the descriptions of 25 varieties of apricots, 283 varieties of pears, 103 varieties of peaches, 23 varieties of nectarines, 123 varieties of plums, 103 varieties of cherries and 15 varieties of almonds.

The Princes had excellent opportunities of basing the fruit descriptions upon first-hand material, but one is disappointed to learn that “This work when completed, will comprise all that is useful or important in the more ancient publications, and also all descriptions of choicer fruits contained in the New Duhamel, the Transactions of The London Horticultural Society, the Transactions of the Horticultural Society of Paris, the Pomological Magazine, the *Pyrus Malus Brentfordensis*, Lindley’s Guide to the Orchard and Kitchen Garden, the different publications of Van Mons and other Flemish and German authorities, and will further combine, as an object of the highest importance, the descriptions of all the choicest varieties of fruits which have originated in our own country.”⁷ The Princes, however, made the first exhaustive effort in America toward a standard pomological nomenclature by reducing all duplicates to the rank of synonyms, and this must be recorded as their chief contribution to the science of American pomology. The American nurseryman had been left in great confusion by the importation of quantities of European stocks from many sources and by many

⁴Ibid., pp. 6-7.

⁵Horticulture, 1856, pp. 304-307.

⁶William Robert Prince, aided by William

Prince. The Pomological Manual, Parts I and II, 2d ed., 1832.

⁷Pomological Manual, 1832, p. vii.

individuals. In the course of this process many mistakes in nomenclature were bound to occur, and as a result American pomological nomenclature was characterized by many errors. The Princes did much to weed out the duplicates, and even if their work is not brilliant as we would expect, it served a very useful function.⁸

The appearance of William Kendrick's "New American Orchardist" in 1833 does not mark any advance in the science of pomology, and the chief point of interest about the work is the attempt toward a classification of varieties, probably based upon European conceptions in the main. Kendrick's acquaintance with contemporary pomological literature appears to have been quite extensive. He frankly acknowledges that his work is almost wholly a compilation from European and American sources. The introduction treats of the general horticultural practices, and cultural directions are given after each kind of fruit described. The appendix is devoted to the fruits that may be cultivated in the South. With the publication of such works as that of Kendrick's, the science of pomology was marking time, but his book served the function of popularizing the accumulated knowledge, since apparently his work had a greater circulation than any that went before.⁹

The appearance of Robert Manning's "Book of Fruits" in 1838, however, marks a distinct advance in pomology. The work of Manning is of first importance. In his day scientific orchard management was crude, and the chief reliance was placed upon varieties; orcharding was attracting more and more attention and the confusing nomenclature that existed as a consequence of many years of individual importation from foreign sources was a constant grief.

The chief function of the early pomological writers was therefore to straighten out this great Chinese

puzzle of foreign names. Coxe, the Princes and Kendrick had relied chiefly upon European descriptions in making their works. It was probably essential that these preliminary check-lists should first appear to serve as a ready means of reference. While other contemporary pomologists had attempted to simplify the nomenclature of fruit varieties by a comparison of descriptions, Manning engaged in the testing of varieties and then based his variety descriptions upon the fruits themselves, thus setting a precedent and fulfilling the ideal that Coxe had very faintly voiced as far back as 1817. Manning had ample opportunity to carry on his work, for his collection of fruits,¹⁰ which was commenced in 1823, included all the desirable varieties listed in European and American catalogs, but unlike the Princes, he used his great collection as a means to an end. Whereas the Princes attempted to publish all the varietal descriptions that could be gathered from the four corners of the earth, Manning actually verified the foreign descriptions and published only those that were of value to the American cultivator. In his work, Manning had before him an ideal concept of what constitutes a desirable variety. He remarks that there are few first-rate fruits, for "the essential characteristics of a first-rate tree are health, vigor, and fertility; those of a first-rate fruit are, magnitude of size, beauty of shape and color, and richness of flavor."¹¹ His method of testing was thorough and scientific;¹² "after a strict examination of the produce of * * * [the] trees, carefully comparing the wood, the leaf and fruit, with the figures and descriptions in the most popular works on pomology, it was intended to select for permanent cultivation, those varieties which were at once fitted to the climate of New England and of high merit in themselves * * * we have never limited ourselves to one specimen, but have

⁸Pomological Manual, 1832, p. vii.

⁹P. Barry, Fruit Garden, 1860, pp. vi-vii.

¹⁰At Salem, Mass.

¹¹Magazine of Horticulture, 1838, p. 187.

¹²Ibid., pp. 186-187.

* * * in every instance procured trees of each name from many different sources, in order to more surely arrive at correct conclusions concerning their identity, as well as to multiply our means of estimating their commercial value."

In only one particular Manning seems to have erred. Probably surfeited with the endless variety descriptions, and the numberless synonyms quoted, he went to the other extreme and dispensed entirely with synonymy. The reasons for this omission are not altogether convincing, and a well developed and complete treatment on pomology certainly should include the synonymy of the varieties described.

Manning's work on the whole was not characterized by any great bulk, but rather by its quality. He had intended to issue a new series supplementary to his book, every autumn, but on account of declining health he never carried out the original plan. The accumulated material was published in the "Magazine of Horticulture." The demand, however, for his work had increased the spread of the "reputation of Mr. Manning for correctness of nomenclature," and at the time of his death his work was completely sold out. A new edition, under the title "The New England Fruit Book," was brought out by John M. Ives in 1844, and an abridged edition, entitled "The New England Book of Fruits," appeared in 1847.

It is indeed difficult to overestimate the influence of Manning. In his day the importance of varieties was paramount, for the scientific management of orchards was in its infancy. The main reliance had therefore to be placed on suitable varieties. Manning and his contemporaries, in the field of pomology, attempted to straighten out the confused nomenclature. While his coworkers relied primarily upon secondary sources, Manning included no descriptions which he had "not actually identified, beyond a reasonable doubt of its genuineness."¹³ In

¹³Ibid., 1838, p. 187.

consequence of his painstaking accuracy, Manning's decisions on pomological nomenclature were accepted as final.

The horticultural industries, especially pomology, were becoming increasingly important as the middle of the century was drawing nearer, and the great accumulation of facts forming a basis for a distinctively American pomological literature made possible the brilliant career of A. J. Downing.

The genuine mark of genius in the prosaic walk of horticulture is only too rarely met with, but America has been specially fortunate at least in one instance,—"** * ** the reserved man (on the banks of the Hudson) whom publishers and others found 'stiff,' and 'cold' and 'a little haughty,' and whose fine points of character stood out like sunny mountain peaks against a mist" probably did more for the advancement of American horticulture during a few short years of activity than many another accomplished during an entire lifetime spread over the allotted three score and ten years. Having survived an unhappy and repressed childhood, Downing found himself face to face with the problems of life. Endowed with a keen intellect and handicapped with a very sensitive and artistic nature, the youthful Downing seemed destined for a literary or an artistic career, but the circumstance that he must make his own living at an early age decided the choice of vocation in favor of horticulture, for all who come in contact with his work after the lapse of half a century, instinctively feel the touch of his genius.

Downing's "Fruits and Fruit Trees of America" was published in 1845 and it became at once the most popular treatise on the subject. The work was modeled upon Lindley's "Guide to the Garden and Orchard." The arrangement is alphabetical and a general treatise precedes each kind of fruit described. The work includes the description of 190 varieties of apples, 16 varieties of apricots, 76 varieties of

cherries, 35 foreign and 12 native varieties of the grape, 27 varieties of peaches, 13 varieties of nectarines, 10 varieties of raspberries, 35 varieties of strawberries and a number of varieties of various other kinds of fruits. It should be noted in this connection that a "great portion of the fruits are described from specimens produced in his own nursery, while others have been supplied by friends. The descriptions and engravings of some have been copied from foreign sources."¹⁴ Downing, however, made the best use of his opportunities and instinctively practiced a judicious selection of his material. His work possesses another quality not before met with in American horticultural literature. Not only does it possess the conciseness of Coxe's treatise, but in addition it is characterized by an easy and pleasing literary style.

Downing was berated by certain of his contemporaries for his lack of honesty in not acknowledging his very great debt to his predecessors, especially Coxe, Manning, Kendrick and the Princes, whose pioneer work made possible the career of Downing.¹⁵ There is probably some justification in this criticism since Downing nowhere in his book gives sufficient recognition to the labor of those who preceded him.

The culture of fruit had reached a stage in its development where there was great activity in the planting of commercial orchards. It is clear that a work possessed of so many qualities that make for popularity should outstrip all others. Prior to the publication of Downing's "Fruits and Fruit Trees," the circulation of pomological books was confined almost wholly to "Nurserymen or persons already engaged and interested in fruit culture in the older parts of the country."

Downing's book was the first of its kind to really command a widespread circulation.¹⁶

Downing's chief claim to immortality as a pomological writer rests not on any original discoveries or pioneer innovations, but rather upon his potent influence in broadcasting the salient facts demanded by an aspiring fruit grower over a wide area.

The pomological literature produced during the five years following the appearance of Downing's work is on the whole below the high standard set by the "Fruits and Fruit Trees." In 1856 appeared John J. Thomas's "The American Fruit Culturist." In the preface to the later editions it is stated that "The first edition of the 'Fruit Culturist,' the basis of the present work, was written * * * a year before the appearance of Downing's first edition of 'Fruits and Fruit Trees of America.'" It should be noted, however, that Downing's work appeared full-fledged, whereas the book of Thomas was the result of laborious evolution. In its expended and mature form it undoubtedly represented much research. It lacks, however, the conciseness and literary flavor of Downing's work. "The Fruit Culturist" of Thomas was built in the main on the same plan as that of Downing's book, but the author confesses that his contribution "is not intended as exhaustive,—the work was an attempt to provide a plain, practical treatise for beginners; * * * to furnish useful directions to those who may be little acquainted with the management of fruit trees." Those who need more extended information he refers to Downing's manual.¹⁷

Three separate books of general pomology appeared in 1849, the last year of the period under consideration. George Jacques's "A Practical Treatise on the Management of Fruit Trees, adapted to the Interior of New England," was brought out to provide a useful manual for the New England fruit growers. The appearance of works adapted to especial localities is

¹⁴Ibid., 1845, p. 298.

¹⁵T. S. Humrickhouse, Magazine of Horticulture, 1846, pp. 47-58.

¹⁶P. Barry, Fruit Garden, 1860, pp. vi-vii.

¹⁷Magazine of Horticulture, 1846, p. 224.

evidence of extensive planting and culture of fruits, for neither authors nor publishers would waste the time, energy and funds to provide articles that were not demanded.¹⁸

S. W. Cole's "The American Fruit Book" appeared in Boston in 1849. It is a small volume printed in small type, and contains a "vast accumulation of facts and information" making it highly popular and useful. In the same year appeared Chauncey Goodrich's "The Northern Fruit Culturist."

The chief aim of the early pomologists was to establish a standard nomenclature by reducing superfluous varietal names to the rank of synonyms. Great dependence was placed upon varieties since scientific cultural management was in its infancy. Robert Manning first emphasized the fact that all fruit descriptions should be based upon first-hand material as the essential prerequisite for a sound science of systematic pomology. Popularization of pomological knowledge followed as a natural result of this great accumulation of facts. Before 1845 the work of Coxe and the Princes was primarily confined to nurserymen and fruit growers in the more developed regions of the country. The principal pomological manuals that had any considerable circulation were Kendrick's "American Orchardist" and Manning's "Book of Fruits." But with the appearance of Downing's "Fruits and Fruit Trees of America," in 1845, a pomological work for the first time commanded a widespread circulation. The work possessed to a high degree the qualities that make for popularity, and was published at a time when fruit growing was booming as never before in America, and this explains its immediate success.

LITERATURE OF THE GRAPE

The vigorous pomological branch of horticultural literature had been differ-

entiated from the main trunk in 1817. With the increasing activity in the various fields of pomology another phenomenon remains to be noted, which gave to America an early literature on grape culture as a branch from the more general pomological literature. Various isolated attempts had been made during early Colonial times to establish grape culture in eastern North America with the European *Vitis vinifera* as a basis.¹⁹ With the opening of the Nineteenth Century and the increasing importance of the horticultural industries, systematic attempts were inaugurated to establish the foreign grape in America. During the first quarter of the century the chief experimental work in an attempt to establish grape culture was carried on under the leadership of the Dufours, an heroic pioneer stock from Switzerland. Possessed of an inflexible European outlook, which precluded an insight into the fact that the temporary success achieved had probably been the result of the chance cultivation of native species of the grape, or their hybrids, John James Dufour, even after two failures, could not discern that the grape industry in the Eastern United States could not be based upon the European grape vine, and he died, in 1827, a disappointed man.

A parallel development, however, was taking place. Even as early as 1806, the estimable Bernard M'Mahon, in his "American Gardener's Calendar," remarks, "There are several varieties produced by the intermixture of [the American species] with one another, or with the varieties of *Vitis vinifera*, which are called hybrids or mules; the most noted are, 1. Alexander's or Tasker's grape; 2. Bland's grape; 3. That called the Raccoon-grape. From either of these hybrids it is probable that good wine may be produced, but I shall leave that to the experience of those who have made, or wish to make the experiment."²⁰

¹⁸Horticulturist, vol. III, p. 572.

¹⁹L. H. Bailey, Sketch of the Evolution of our Native Fruits, N. Y., 1898, pp. 9-21.

²⁰Pp. 234-235.

To Major John Adlum, however, belongs the credit for the first clear perception of the fact that grape culture in the eastern portion of North America, at least, must be based upon the native species of the vine, but he, too, died a disappointed man, unrecognized by the nation he had served so well. The torch was carried on, however, by Nicholas Longworth of Cincinnati, who had received the Catawba, apparently an ameliorated form of the native species *Vitis labrusca* from John Adlum. With this as a beginning, Longworth demonstrated the practicability of growing the grape on a commercial scale for wine production in the Eastern United States.²¹

Part of this activity manifested itself also in the growth of an early native literature of the grape, and prior to 1850 at least nine or ten books on the subject had appeared in America, beginning with John Adlum's "A Memoir on the Cultivation of the Vine in America," Washington, 1823.²² Adlum's work was followed in 1826 by the "American Vine Dresser's Guide" of John James Dufour.

Alphonse Loubat's "The American Vine Dresser's Guide" was published in 1827. The pages of this work were alternately in English and in French. In 1828 appeared J. S. Kecht's "Der Verbesserte Praktische Weinbau in Gaerten, und vorzueglich auf Weinbergen." This work was published at Reading, Pa., and went through seven editions. In 1830 appeared "A Treatise on the Vine," by William Robert Prince aided by William Prince. In outlining the object of their work, the Princes remark, "We must collect from the four corners of the earth all that combined intelligence and experience can offer, and then mark out the course most profitable for us to adopt,—adding thereto such improvements as our own knowledge would

indicate. In accordance with this view of the subject, it is the anxious purpose of the author that this work should represent a *concentrated intelligence* of every clime derived from all the experience of the past." The work includes a history of the grape, directions for the vineyard, garden and hothouse culture of the vine, and the descriptions of 209 varieties of European and 81 varieties of American grapes with their synonymy. The Linnaean Botanic Garden of the Princes at that time included some 422 varieties of European and 91 varieties of American grapes, and in commenting on the varieties described the authors state that the descriptions of "as great a number of varieties of the grape, as can be consistently done at the present period" have been included, and where their own observations "did not suffice [descriptions] have been extracted from the most noted authors of the day." The Princes carried the importation and testing out of the European vines to the logical conclusion. Their grape manual gave to the public the vast accumulation of facts.

In 1830 also appeared C. S. Rafinesque's "American Manual of the Grape Vine and the Art of Making Wine." This was followed in 1837 by Edward Sayer's "A Manual on the Culture of the Grape." At Cincinnati, in 1846, Nicholas Longworth published a 19-page pamphlet, "The Cultivation of the Grape and the Manufacture of Wine," etc. In the East appeared Alden Spooner's "The Cultivation of Grape Vines and Making of Wines," also in 1846. Toward the close of the period J. Fisk Allen's "The Culture of the Grape" was brought out in 1847. This work was later published as "A Practical Treatise on the Culture and Treatment of the Grape Vine," in two succeeding editions, in 1848 and again in 1853.

²¹Bailey, Our Native Fruits. The exact genetic affinity of the Catawba, however, is not known. It may contain *Vitis vinifera* blood. See also Hedrick et al., Grapes of New York.

²²"A second edition of the book, made exotic by much foreign writing, appeared in 1828," Bailey, *ibid.*, p. 52.

LITERATURE OF THE STRAWBERRY

The caustic controversy regarding the sexual character of the strawberry, with C. M. Hovey and Nicholas Longworth as the chief protagonists, which enlivened the periodical horticultural literature toward the middle of the century, gave rise to the beginnings of a specialized literature of the strawberry.²³ The controversy began apparently in the "Magazine of Horticulture." Later the pages of the "Horticulturist" were pressed into service to expose Hovey's inconsistencies—a service which was ably performed by the Rev. Henry Ward Beecher. Mr. Longworth included a treatise on the strawberry in his pamphlet on the grape, which was published in 1846. To settle the question impartially, the Cincinnati Horticultural Society appointed a committee to report on the question, and the unanimous decision of the committee was published in 1848 as Strawberry Report, read before The Cincinnati Horticultural Society, August, 1847.

FLORICULTURAL LITERATURE, 1828—1850

The growing importance of floriculture near the centers of population, especially in Philadelphia, New York and Boston, during the decades following the opening of the Nineteenth Century, made possible the growth and development of another branch from the main trunk of general horticultural literature in the form of important treatises devoted to floriculture.

Prior to 1828 there had appeared several European adaptations and compilations devoted to floriculture. Apparently the first of these was J. P. Casey's "A Treatise on the Culture and Growth of Different Sorts of Flower Roots and of Green-house Plants Kept in Rooms," 1821. This was followed in 1823 by an anonymous

compilation entitled "The Practical Florist."

The first phase in the development of an American floricultural literature is marked by the appearance of general treatises devoted to flowers. Probably the first important native book wholly given over to this subject was Roland Green's "A Treatise on the Cultivation of Ornamental Flowers," Boston, 1828. This short work of 60 pages includes general directions and lists of plants.²⁴ In 1832 Hibbert and Buist of Philadelphia brought out the "American Flower Garden Directory," which went through at least six separate editions. In the second edition the name of Hibbert is omitted, and presumably most of the practical information in the work is that of Buist, who was trained at the Edinburgh Botanic Gardens and came to America in 1828. Joseph Breck of Boston published his "The Young Florist" in 1833, and this was the forerunner of Breck's important "Book of Flowers" which was published after 1850. In 1835 Robert Bridgeman published separately Part II, "The Florist's Guide," and in this form the work went through a number of editions. Toward the end of the period appeared Edward Sayer's "The American Flower Garden Companion," Boston, 1838; Lucy Hooper's "The Lady's Book of Flowers and Poetry," New York, 1843; James Norman Eley's "The American Florist," Hartford, 1845; and T. Winter's "A Guide to Floriculture," Cincinnati, 1847.

The growing importance of floriculture is also reflected in the appearance of books devoted to special flower subjects. The first work of this kind is probably Edward Sayer's "A Treatise on the Dahlia and the Cactus," Boston, 1839. This was followed by three treatises on the rose—Robert Buist's "Rose Manual," 1844; William Robert Prince's "Manual of Roses," 1846; and S. B. Parsons's "The Rose: Its history, poetry, culture and classification," 1847.

²³Magazine of Horticulture, 1848, pp. 225-231; 1844, pp. 4, 51; 1845, p. 4; Horticulturist, vol. II, pp. 517-520; pp. 273-277.

²⁴L. H. Bailey, Standard Cyclopedia of Horticulture, vol. III, p. 1511.

OLERICULTURAL LITERATURE

Most of the general works on horticulture had devoted considerable space to kitchen gardening, and separate works on olericulture before 1850 are rare. In 1828 appeared William Wilson's "Economy of the Kitchen Garden." Information regarding this publication is meager. Fessenden refers to it as "a little work,"²⁵ and other horticultural writers are silent regarding it. In 1836, Part I of Thomas Bridgeman's "Gardener's Assistant," devoted to vegetable growing, was published separately. This went through several editions, the last appearing as late as 1864. The growing importance of the potato and the pressing problem of potato diseases gave rise to the publication of Charles P. Bossom's "Observations on the Potato, and Remedy for the Potato Plague," Boston, 1846. "The Family Kitchen Garden," by Robert Buist, was brought out in 1847.

LITERATURE ON LANDSCAPE GARDENING

"With regard to the literature and practice of Landscape Gardening as an art, in North America," writes A. J. Downing in 1841, "almost everything is yet before us, comparatively little having been done."²⁶ In the light of the economic facts it is not at all surprising that the literature in this field should be the last to become separated from general horticultural literature. It is to be expected that landscape gardening during the formative years of a nation should receive scant attention, for a pioneering people, absorbed in the winning of an empire from the wilderness, only gradually arrive at a stage when the sufficient accumulation of capital makes possible the more general practice of fine gardening. An early development in landscape gardening naturally would be confined to the regions in and near the great centers of population.

Along with other valuable heritages

from the Old World, Americans inherited a noble conception of landscape design as developed in England. The early references on the subject are chiefly fragmentary restatements of some of the more obvious concepts of the English school of landscape gardening as professed by Repton and Loudon, whose works had circulated to some extent at least in America.

Apparently the first indigenous book in which any space is devoted to the subject is Bernard M'Mahon's "American Gardener's Calendar," 1806. Downing refers to this as the "only American work previously published which treats directly of Landscape Gardening," but he apparently overlooked Andre Parmentier's article written for Fessenden's "New American Gardener," 1828. This article covers several pages and is quite superficial. These early fragments, however, are of slight importance, since practical details are not included, rendering them ineffective.

Our literature on landscape gardening, in fact, dates from the publication of A. J. Downing's "A Treatise on the Theory and Practice of Landscape Gardening," in 1841. It is to be expected that Downing should appear at his best in the realm of the artistic, and one is not disappointed in making a critical survey of his work in this field. At last he had found an outlet for his repressed artistic instinct, and his enthusiasm takes the reader captive as he proceeds.

Downing's conceptions are in direct line of descent from those of the English school of landscape gardening, but unlike the early American writers, he is no slavish imitator. Having absorbed the essence of the theory and the art, he produced an original, sound, concise and popular treatise of such vitality that its fundamental conceptions are still cherished after a lapse of over eighty years. The tenth edition of the work—surely not the last and final—appeared in 1921, under the able editorship of Frank A. Waugh.

²⁵New American Gardener, 1828, p. 11.

²⁶Landscape Gardening, 6th ed., 1859, p. 42.

The outstanding features of the work are the chapters devoted to "Historical Notices," sketching the development of the art up to 1841; "Principles of the Art," "Deciduous Trees," "Evergreen Trees," "Vines and Climbing Plants," "Treatment of Ground—Formation of Walks," and the "Treatment of Water."

In 1844 Downing followed up his first contribution by the publication of "Cottage Residences," a "series of designs for rural cottages, villas, and their gardens and grounds." Until his untimely accidental death in 1852, Downing remained the dominant figure in the American landscape profession.²⁷

²⁷In 1852 appeared Downing's third work in this field, Rural Architecture. His contributions to the Horticulturist were collected and posthumously published, in 1853, with an

introduction by Frederica Bremer and a sketch of Downing's life by George William Curtis.

Planting and Design

The owner of a small home plot has a problem in the development of his place that is often more difficult than that which has to be solved in a larger property, for he is forced into many compromises and sacrifices that are not necessary in larger compositions. The papers and studies that follow in this series have been planned, therefore, to lay before such home owners, in as untechnical language as possible, some of the principles which govern the design of such properties in the belief that a keener appreciation of landscape design will result if they have this "back stage" insight into the workings of the designers' minds. This has been done before and doubtless will be done again, but it can not be done too often. In it, the editors have the assistance of Mr. D. Victor Lumsden, Mr. Robert S. Sturtevant and Mr. Stanley H. White, with others whose aid will be acknowledged from time to time.

The average layman who undertakes the improvement of his property usually approaches it from his desire to grow particular plants. This departure is almost the exact opposite of the designer's, a statement which seems rather distressing to the garden-minded beginner. The designer has a more removed viewpoint, for he considers the whole problem as a unit in which the growing of plants bears a

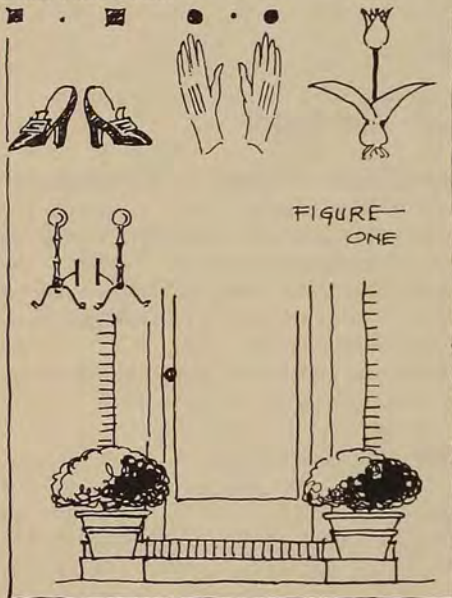
subordinate relation to the organization of the whole.

If one turns to the dictionary to see what is given under "design" he finds that the word is defined as "a plan or scheme formed in the mind of something to be done" * * * "an outline or pattern of the main features of something to be executed" * * * "the arrangement of elements or details which make up a work of art. * * * ." We find also that the word has come down to us through various French words (most of which are related to drawing) from the Latin *designare*, to mark out. In our work, therefore, we are to be concerned with marking out a pattern upon land, the elements of which are to be related to various uses. We are to deal with a series of areas. This may seem somewhat remote from plants and flowers but that connection will become apparent later in the discussion.

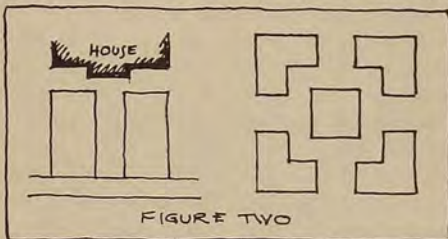
The study of areas, which are often relatively flat surfaces, has been pursued by all artists who work on flat surfaces, but most of the artists have studied flat surfaces that stood upright before the eyes, rather than under foot as does the earth. They have developed two general schemes of arrangement of decorative units which depend for their success upon two types of balance, symmetrical and asymmetrical. These schemes are the

result of countless trials and errors, and what may seem an arbitrary pronouncement to-day is really the result of long experience.

Because it is more tangible, more definite, and therefore apparently more simple, a discussion of symmetry may well serve as a starting point, remembering that this is being studied because it is one typical way of garden design, the expression of typical human reactions.



The most familiar expression of symmetry is met daily in the pair. We have pairs of scissors, shoes, gloves, andirons, earrings, spectacles, all of which are quite useless unless paired! Each member is just like its fellow, except that they are related in a right and left hand manner to a central



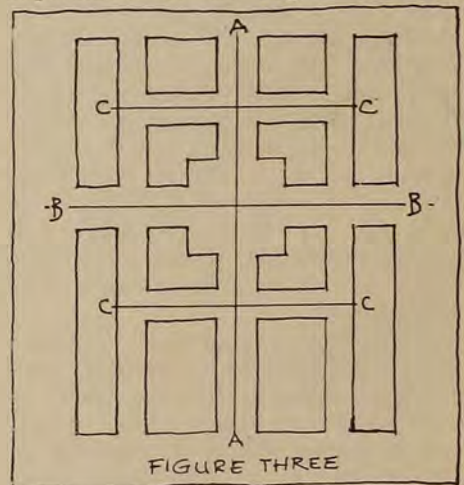
point or axis. Figure 1 gives examples of this type of symmetry in design, from an abstract pair of dots to the

almost inevitable pair of box bushes by the front stoop.

If our pair of objects happens to be a pair of plots of ground, garden beds, we have the plan relation that is shown in Figure 2. This is the type of development which is perhaps most natural to man, for he is not only both right and left conscious himself, but has the impulse to divided large areas for use in order that all points may be reached with equal effort from given places. If our plot were circular, one might stand on a spot in the exact center and reach the distances equally in all directions, but since we rarely have such garden areas we have to divide our plots by lines, or by paths along such lines.

The imaginary line to which all parts of the design is related, the backbone of the scheme, is called an axis. In plans this is often drawn in to emphasize the relation while the designer is working on the paper stages of his scheme, but on the ground this almost never appears.

To the main axis, there may be one or more subordinate axes, as in Figure 2 where there are two axes of equal importance or in Figure 3 where



A-A is the main axis, B-B the secondary axis and C-C the minor axes, symmetrical only in regard to the outline of the path.

The multiplication of such axes and

of their relationships to one another may be increased almost endlessly, but the smaller the area to be developed, the less chance there is for success if too many axial relationships are emphasized. The important things to remember are that this is an expression of design of areas and that in such designing success depends upon scrupulous observance of symmetry. There are exceptions to this as for every other arbitrary generality, some of which will be discussed later.

The study of the arrangement of areas is of primary importance to the owner of a small home plot, because his house lot is immediately divided into plots by the location of his house upon it, and the location of such walks and drives as are inevitable to make his house accessible to the public road.

lines. An absolutely diagrammatic plan might be set down as in Figure 4. In actual practice such a scheme is rarely possible and is usually undesirable. It serves to show, however, the initial pattern on our plot.

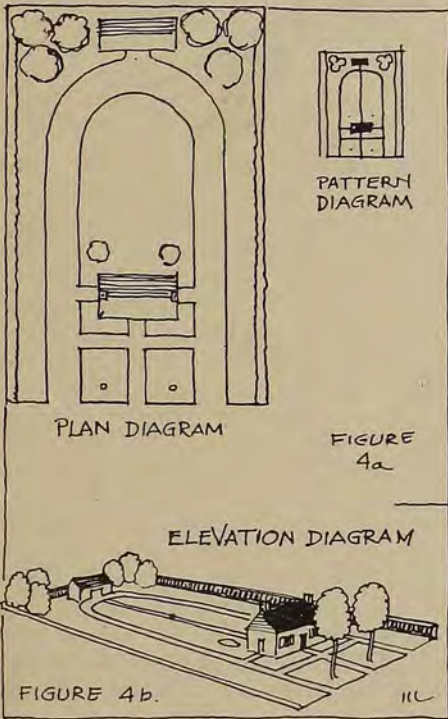
The location of buildings and paths in real life is often controlled by local ordinance and by necessity. In many places building lines determine the location of both house and garage, and the distances which must be maintained between building and side and rear property lines. Here is usually the first compromise that the designer has to face, for such general rules often cause serious waste in the use of land which is not level.

In the design of a small house absolute symmetry is often wasteful of space within the dwelling, if carried to its extreme.

The usual result, therefore, is a plot on which are located a house and garage often unsymmetrically related to one another and a parcel of land cut up into irregular, more or less rectangular plots which are often related to one another in very unsymmetrical fashions.

While the study of the plot layout in terms of design as related to a flat surface is useful in devising traffic relations between parts, that is not the only way in which the design must be studied. Our materials have vertical dimensions, and the problem must be approached as a study in solids and open spaces related to one another, much as an architect or sculptor might study his problem.

For the gardener and plantsman, it requires some resolution to consider his plants as solids, to look upon his lilac hedge dispassionately as a rectangular prism ten feet high, five feet wide and an indefinite number of feet long, to look upon his red cedar as a dark green cylinder five feet through and twenty feet high, but it is in some such way that one can best study the relations of the elements that go into the development of a garden design, for then one is not disturbed by the



In terms of abstract design, our house lot might be considered as a huge rectangle on which are located one or more smaller rectangles connected to one another and to at least one boundary of the plot by traffic

color and perfume that have so much to do with the pleasure in the garden once it is built.

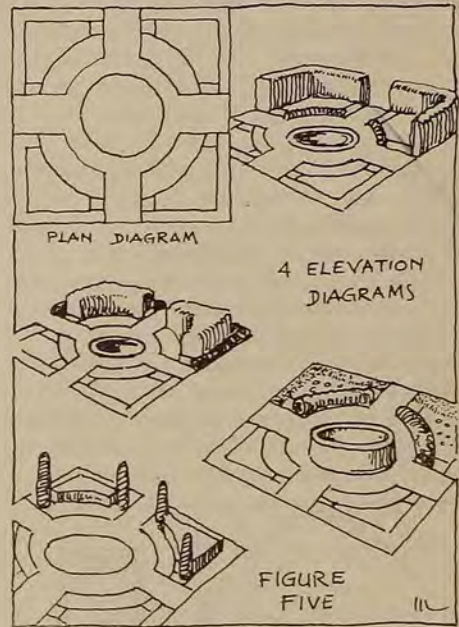
Accepting for the moment the diagrammatic plot plan of Figure 4a as the basis of our scheme, Figure 4b may be considered as this plot plan raised up into solid form, with only one-half of the scheme carried out so that the work may be seen. Barren as this may appear, it is of prime importance. If a model can be made these relations are still more apparent, provided the maker of the model is not diverted by the hundred and one ingenuities required to give his model verisimilitude.

At this stage of the study it becomes apparent that any element with height introduces a vertical division, just as the horizontal lines divided our original plot. These vertical elements have the power, therefore, to enclose areas from which we do not want the eye to wander and to exclude objects which we do not care to have as parts of our scheme. From these properties have come the common catchwords of "enframing" and "screening." The latter usually is useful to the small owner in shutting out his neighbors and the former for focusing attention on particular objects or parts of the whole. In no case is the small home owner able to develop these factors to so great an extent as can the owner of a huge estate.

In our symmetrical design we turn to walls, fences and hedges for our elements of screening, erecting them as they are needed but keeping always in mind that they as solids will cast shadows over the plots enclosed and that shadows interfere with the growth of plants inside those areas. Here is another of the principle points of compromise that the small owner must face, and the result is usually for a simplification of the entire design which operates to his ultimate advantage in that it saves him from bad proportions.

But to show that there need be no lack of variety in vertical develop-

ments, Figure 5 is included to show different schemes for the vertical development of the same plan.



The discussion so far has been definitely limited to an almost diagrammatic study of a diagrammatic scheme, developed in a way that has been arbitrarily limited. It in no way covers the entire field, but is given to suggest the beginnings which underlie the building up of a design. The plans that accompany are given in a sketch condition, in various ways to suggest the methods of attack. In later issues we shall present an identical plan developed according to the personal tastes of several designers and with plant lists suited for different parts of the country. Comment and analysis will be offered with each one in order that the reader may get hold of the principles of the design which underlie the solution offered. This is done in the belief that if our readers understand the whys and wherefores of several specific cases they will not be befuddled by their interests in plants themselves, when they come to laying out their own gardens.

A Shopper's Guide

There is a delight, nearly equal to that of actual adventuring, to be had from reading through any collection of catalogs. There are, to be sure, many kinds of catalogs from the encyclopedia-like volumes with their almost identical offering year after year, conservative and secure as the proverbial bank, to the most slender lists offering only a few special plants, lists colored by imagination and haunted sometimes, even with a taint of worldly impracticability!

After the amateur has planned and carried out the original planting of his home plot, he is no longer concerned with the catalogs of firms which offer only the staples of the garden. He turns rather to the lists of specialists whether they be lists of varieties of one plant or of many plants suited to one type of gardening. Normally he seeks out lists from dealers living nearby or to the north of his own location, but eventually even this security becomes tiresome and he turns to the pursuit of plants of which he knows little or which he feels rather unlikely of success. But whatever the route, the lively gardener comes finally to experimenting.

The notes that follow are of plants listed in American catalogs of 1928. The 1929 lists are not printed in time for use in our January issue and April is too late a date for ordering, so that a survey in our second issue would have little value. It is not likely, however, that the plants listed in 1928 will be dropped in 1929. If in reading you see plants you would like to secure, write the editor but do not expect an answer unless you also send a stamped, self-addressed envelope!

Thanks to the interests of the rock gardeners, crocus species are coming into greater prominence each year, and the continued efforts of Mr. Bowles, whose book "Handbook of Crocus and Colchicum" makes one

yearn for a crocus collection, and leads one on to searches both here and abroad. There was a time when Cloth of Gold (*susianus*) was the only species to be found in our lists; *sativus* and *speciosus* came next with *tommasinianus* and *imperati* close upon their heels. In the lists for 1928, I find one firm offering nineteen species and another twenty-five, fairly well divided among spring- and fall-blooming sorts. The particular charm of the crocus is its habit of flowering when other bloom is scarce, many of the spring flowering sorts pushing into bloom whenever there is a mild day or two in late winter and the fall-blooming species making a display after the frosts have checked the garden pageant, and continuing through November and December.

For the gardener with a moderate winter climate and a warm terrace or wall (or cold frame), *Iris unguicularis* is worth trying. There are five sorts named in one California list. The same catalog offers *Iris hoogiana* and *stolonifera* for those who want to attempt rather exacting iris species.

Daphne mezereum, of modest charm and ravishing perfume, is offered from Vermont. This does not have the sort of beauty that characterizes the better known *Daphne cneorum* but should be tried in every garden, especially where an early nosegay is cherished in cold spring days when a sprig of jasmine, a violet or two, a branchlet of the first honeysuckle and a bit of daphne will make a bouquet of pungent fragrance, if not of colorful and glowing beauty.

Do you know *Bruckenthalia spiculifolia*? This charming tiny shrub for a gritty acid soil appears in a New Jersey list which is filled with other good things, including a choice list of armerias ranging from the difficult but exquisite *caespitosa* to the modern sorts like the brilliant crimson "Vindictive." As an aside it might be re-

marked that the thrifts look well only in masses, forming dark green sods from which their flower heads rise charmingly. Eight forms of arabis, five iberis and six alyssums are worthy the attention of the less adventurous.

For small-scale ground covers in the rockery one can find *Linaria aequitoloba*, *Mazus pumilio* (not *Mazus rugosa* by any means), any number of saxifrages and sedums, thymes without end, the delectable *Veronica repens*, arenarias, *Epilobium nummularifolium*, *Herniaria glabra* and many others.

If you are interested in *Dianthus* species, and who is not, at least twenty-five are named, including the yellow-flowered, but rather disappointing *Knappi*, which makes a large and rather sprawling plant to carry its moderate-sized light sulphur yellow flowers.

Campanulas, too, are well represented with some forty-odd names of species and garden forms excluding of course the forms of *Campanula medium* and *persicifolia*. The most exacting of the list are: *Bellardii* "Miranda," misprinted as *bellandi-mirandi*, over which Farrer enthuses for a page; *fenestrella*, related to *garganica*; *Leutwinii*, which should be *incurva* according to Farrer; and *macrorrhiza* related to *rotundifolia*.

If summer-flowering bulbs are to your liking, in addition to the *Amaryllis belladonna* you can find *Lycoris purpurea* and *squamigera* and *Nerine fothergilla major*, at very high prices to be sure, but available nevertheless. These with a warm site and a little protection the first winter will succeed farther north than is commonly realized.

For a somewhat shaded, but not dark place, with moisture to boot, try the astilbes, between fifteen and twenty kinds of which are available in every tint from the faintest pinky white to deep amaranth magentas. Flowering in midsummer, they make a welcome change in the shady border.

Tucked in the back of an iris list one finds *Silene wherryi*, a rare native

species somewhat resembling *S. pennsylvanica*.

To gather together native phlox species one has to shop about in many States. A nursery in Pennsylvania lists *Phlox stellaria*; *bifida* comes from Illinois; *reptans* from New Jersey; *ovata* and *pilosa* are easier to locate and *divaricata* is almost everywhere; *argillacea* is listed in New York; Oregon offers *adsurgens*; Idaho *longifolius* and *Kelseyi* (as seed); and Colorado contributes *multiflorus*. Doubtless there are many others but this is as far as this shopper has gone. If one consults Rydberg's Flora of the Rocky Mountains many other species will be found to pique his interest both in the phloxes and in their near neighbors the polemoniums, a few pages away.

The notes on *Sempervivum* in the July, 1928, Journal of the Royal Horticultural Society prompt one to look about for them in this country. Here the field is not so crowded for only six or seven species are offered by name and more than one catalog confesses to a mixture past all identification.

One must turn to the Pacific Coast for a few shrubs that should be here in the East. All the pyracanthas should be investigated and several of the evergreen barberries, *verruculosa* offered in Pennsylvania and elsewhere, and the splendid *Sargentiana* from New Jersey, Georgia and several places in California. Two evergreen brooms must close the list. The Moonlight Broom (*Cytisus praecox*) with its lovely sulphur-tinted white flowers and *Cytisus kevensis*, a dwarf hybrid which showers its flower-covered branches gracefully between the stones of the rock garden.

As a postscript one might suggest *Genista pilosa* which has just appeared in a list from Massachusetts. This makes a spreading mat of greenery somewhat like the masses of the creeping junipers from a little distance but covered in spring with a wealth of golden bloom.

Words

In the delectable introduction to "The English Rock Garden" the late Reginald Farrer has many things to say concerning common and Latin names and gives as an example of botanical English—"an acaulescent herb of circinate vernation with the leaves imparipinnatifidate or uncinately-lyrate with mucronate-crenulate lobules, setulose-papillose, decurrent, pedunculate and persistent"—which he translates as—"stemless with undecaying leaves uncurling from the center, set with bristly little warts and cut into an uneven row of featherings, with the lobes pointed and scalloped around the edge, some having a barbed, spear-headed effect, standing on foot stalks down along which they continue in wing-like flaps on either side." Scholars without a saving grace of humor were, and presumably still are, quite horrified at so buoyant a reading but for the layman there is a zest in this vocabulary which is a perennial joy, so much so that a page or two of Farrer on a dull day will make the Spring again.

No one else can hope to do what Farrer has done, but hereafter in each issue of the magazine we hope to offer a page or two given over to the discussion of words which the gardener should know for his better understanding of his own field. The editors believe that the real gardener will be no more disinclined to learn and use such words as *mucronate*, *papillose*, *inflorescence*, *raceme*, *peduncle*, than the new owner of an automobile to boast of *carburetors*, *distributors*, *differentials* and such, or the radio-fan, of *static*, *superheterodyne*, *kilocycles* and *trickle chargers*! That many of the words have a Latin origin which makes them somewhat remote from the life of to-day is only an argument in their favor, since their acceptance and use in our daily conversation will keep in our tongue a flavor and distinction it can ill afford to abandon.

Instead of presenting the words in alphabetical order, they will be given in groups according to their related meanings with comments quite unorthodox from the viewpoint of a well-ordered glossary and with illustrations whenever possible.

Fruticose is a word that does not so often come to the gardener as does its compound *suffruticose*; the first means shrubby or shrub-like and the second is really a diminutive. In boxwood its name signifies that type of box which has many close twigs as compared to the freer growing type and the loose-growing tree box; its use also implies a suggestion of dwarfness of habit. *Buxus sempervirens* is merely evergreen boxwood, but its variety, *suffruticosa*, is a dwarf, twiggy boxwood and its variety, *arborescens*, is a tree-like boxwood. Another word that appears more commonly in compound form is *caulescent*, having an evident stem above the ground. The familiar words are *acaulescent* in English and *acaulis* in Latin. These signify stemless and the familiar thrift is a good example.

If stems lie upon the ground, ascending only at the tips, as in some of the junipers, they are called *decumbent*, but if they begin to rise near the crown they are *ascending*. If they lie perfectly flat but do not root as they go, they are *procumbent*.

Cespitose is another word which is used in describing stemless plants. Both this and *acaulescent* are to be found particularly in the realm of the rock gardener, as witness *Arenaria caespitosa* and *Gentiana acaulis*. Of course, both of these plants have stems and the term is used only in a relative way.

Stem here is used in the sense of the part of the plant which bears the leaves and flowers and does not refer to the stem of a flower, as we use the word in the phrase "Cut them with long stems."

A Book or Two

The Hardy Heaths, by A. T. Johnson. The Gardener's Chronicle, Ltd., London, 1928. 116 pages, 16 illustrations.

In the preface of his book the author confesses that he has written for the amateur in the hope that others may be led to grow the heaths that have been conspicuous and beloved inhabitants of his garden for twenty-five years. The reviewer, at least, immediately succumbed to the enthusiasm of the text and cast about among the catalogs of his acquaintance to see what could be had in this country, a meager list as compared to one compiled from the text or from British lists.

The text is planned to meet the needs of the inquiring amateur. The chapters are brief, clear and calculated to inspire confidence and interest. The natural distribution and the discussion of the necessary soil and situations are of great importance, as upon an understanding of these the American gardener must base any modifications required by our differing climate.

Propagation, garden uses, special heath gardens, planting and care, an encyclopedic discussion of varieties and final chapters on other shrubs to be used with heaths, complete the book.

Rock Gardens, by F. F. Rockwell. The Macmillan Company, New York, 1928. 86 pages, illustrated.

This, like the other volumes of the "Home Garden Handbooks," is written for the beginner to use with his seed and nursery catalogs. The author gives clear directions for the building of rock gardens of various types; details the requirements of climate, soil, location, maintenance; discusses the use of water as a decorative feature and treats at some length of the plants used in rock gardens,

herbs, bulbs, shrubs and evergreens with short lists of plants recommended for the beginner.

The text is much more successful than the illustrations, many of which show very unfortunate placing of the rocks. This is particularly true of the figure on page ten, where all the stones stand up like tomb stones, an error which the beginner is likely enough to make without having a diagram. The construction diagrams, on the other hand, show excellent placement of stones.

Lilies and Their Culture in North America, by William N. Craig. Florists' Publishing Company, Chicago, Ill. 146 pages, 36 illustrations.

This small volume should lead many amateurs to the cultivation of lilies. The book is divided into two parts, the first related to historical, botanical and cultural matters and the second to descriptions of the species, arranged in alphabetical order. The discussion is concise, clear and stimulating, reflecting keenly the varied personal experience of the author.

On turning the pages one is impressed by the illustrations, from the exquisite *testaceum* which serves as frontispiece to the familiar *tigrinum splendens* which closes the list. A second examination of the remainder shows many which are distinctly unfortunate and at least one in which the subject is unpardonably arranged. The photograph of *Lilium speciosum album* (facing page 122) shows the amazing phenomenon of two flowers in the axils of several leaves! A little closer examination shows that the blooms were cut from some other stalk and laid in place on the glass plate with so scant attention that one stem does not touch the stalk that is supposed to bear it and another actually crosses it and shows beyond!

The correct habit of the plant is shown on the next plate (facing page 123), where growing plants were not improved on by the camera man. The plates of *Hansoni* (opposite page 54) and of *superbum* (facing page 132) suffer also at the hands of the photographer, who apparently cut off all the flowers on the side of the stalk away from the camera and stuck them into the nearer side. Here we have the truly amusing sight of a flower of *superbum* facing upwards. The composition of the plate of *Lilium elegans* (facing page 73) is poor, as *elegans* is a lily giving horizontal masses similar to those shown in *dauricum* (opposite page 4) and not the built-up heap which is typical of other lilies. Such criticisms may seem beside the point, but that is not so, for illustrations are a potent factor and are often more valued by readers than the text, however good that may be. So if Mr. Craig's book goes into other editions, as we hope it may, we should like to see many new illustrations, photographically as good as these, but with *Henryi* showing its flowers hanging down, no such medley as that facing page 27; *Hansoni*, *carolinianum* and *superbum* without doctoring; *philadelphicum* viewed from above as one does and not from below as here; *philippinense* and *sulphureum* in more life-like positions and *tenuifolium* standing free and with fresher flowers than these.

*Iris*es, by F. F. Rockwell. The Macmillan Company. New York, 1928. 82 pages, illustrated.

To the valuable series of Garden Handbooks, Mr. Rockwell now adds a very useful text on iris. As the reviewer is badly biased in favor of this particular plant he is more than willing to subscribe to all the praise that Mr. Rockwell gives. The book gives a general survey of the large family and then treats rather more fully the sections that are of most value to the gardener. Chapters on Propagation,

Culture, Insects and Diseases, and an interesting Summary complete the book. There are one or two errors in the illustrations which are of minor importance except in the case of the illustrations of bulbs, where the Juno bulb is labelled Xiphium and the bulb labelled Juno is a Xiphium bulb with a Reticulata coat! To the gardener this is a relatively minor matter as there is very small chance that he will have either Juno or Reticulata bulbs to worry with for many years.

Lilacs, by Susan Delano McKelvey. The Macmillan Company, New York, 1928. 579 pages, 172 illustrations.

Unlike the other books mentioned in this issue, this volume is not a handbook. It represents the results of years of painstaking and devoted effort, results which have been eagerly awaited by many who have known of the work as it progressed at the Arnold Arboretum and elsewhere.

The main body of the work is essentially botanical, but the garden-minded person will read it with interest and pleasure, for in addition to all the data necessary to any monograph he will find notes and comments, historical mention and modern remarks which many monographers would not permit themselves, much to the detriment of their works. To the gardener, the fact that the pages devoted to species outnumber the pages devoted to the lilacs that he knows may seem a trifle startling, but after he has read them and studied the species illustrations, I fancy he will be as keen as I to add at least *Syringa reflexa* to his list of shrubs. *Syringa tomentella* and *Syringa pubescens* clamor for attention as well. The chapters on Culture, Propagation and Pruning, Forcing and Diseases and Insects are less interesting to the reviewer than the rest of the book, for they inevitably contain much that is routine. The illustrations are magnificent.

The Gardener's Pocketbook

SMALL DOSES

An ounce, liquid measure, is equivalent to two tablespoonfuls. A tablespoonful is equivalent to four teaspoonfuls. Should you wish to measure a quarter of an ounce of Black Leaf 40 for a small batch of insecticide, it is half a tablespoon or two teaspoonfuls. As a mixer of sprays, one needs to become a good cook when it comes to mixing proportions, and a useful garden tool in this connection is the measuring cup used in cooking.

Ten-cent stores sell a glass cup marked in the equivalents of cups, ounces, fractional pounds, fractional pints, tablespoonfuls and teaspoons. These cups facilitate the mixing of small quantities of sprays, the directions for which usually come in more gallons than the average gardener cares to or can conveniently mix at once.

The dry weights work out pretty close to the liquid equivalents. A full cup is one quarter of a pound, or four ounces, of flour. A full cup is one-half or eight ounces of sugar. A tablespoon of sugar is half an ounce, two tablespoons an ounce, but they should be "rounded" spoonfuls. For powdery substances nearer the consistency of flour than of sugar, use two heaping tablespoons. It is not precisely accurate but close enough for practical purposes.

For example, the latest formula to combat delphinium blacks is as follows: one-half ounce Black Leaf 40; one ounce dry lime sulphur; two gallons of water. Translated into kitchen terms, this is one tablespoon of Black Leaf 40; two heaping tablespoons of the dry lime sulphur and two gallons of water.

To measure gallons, a Mason fruit jar, which is nearly always available, is most convenient. A pint jar four times filled is a half gallon. A pint jar eight times filled is a gallon.

Fertilizers are often given in terms of tons to the acre, which is not helpful

for a garden on a fifty-foot lot. A ton to the acre is a scant half pound to a square yard.

S. R. D.

WINTER COLORS

We frequently make a point of remarking the autumn colors of deciduous foliage, but we do not often mention the play of color that cold and frost bring to our evergreens, particularly the broad-leaved evergreens. Perhaps because I have been hunting for as diverse a group of the latter as I could assemble for my locality, I have noticed the play of colors that come to these plants. The cotoneasters, which for the greater part are not evergreen here, turn to purples and crimsons before falling and such leaves as remain are essentially purple bronzes. The pyracanthas show only a little dulling of the green. Evergreen berberis show the same type of bronzing that the native mahonias exhibit, particularly on the sunny side of the bushes. The Japanese mahonia and some of the evergreen berberis with thin leaves show little change of color unless one can suspect a little yellower hue in the green from sunburn. The nearly deciduous privets turn toward dull purple, but such species as *lucidum*, *ionandrum* and *delavayanum* keep as bright a green as do the evergreen eleagnus and laurocerasus. *Lonicera nitida* shows purple colors over the green, but eventually sheds all its leaves here; its mate, *pileata*, has not been out of doors long enough to give a certain report, but apparently it will show a privet-like coloring. B. Y. M.

SOIL

Soil left to itself ordinarily is self-supporting. It not only maintains its fertility but fattens. The jungles and untouched prairies with their tremendous wealth of vegetation demonstrate the automatic self-fertilizing of



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Gordonia alata

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nature. Soils do not starve or wear out of themselves. It is only through the influence of man that they are starved or worn out. And conversely, in the words of Prince Kropotkin in "The Conquest of Bread," "In the hands of man there are no unfertile soils."

The vegetation takes from the soil and returns to the soil all that it takes with an increment from the air, rain and sun. If we could plant our gardens and leave them they would automatically maintain or increase their fertility. But weeds and undesired and indiscriminate increase would soon make a prairie or jungle.

The reason that the garden is not self-fertilizing and self-maintaining is because we remove from it each fall and spring the dead or dying tops of the plants which contain all that they have taken from the soil. There is that much loss of fertility. By returning this vegetation or a compensating amount from some other source, the fertility is maintained. The use of compost, therefore, is the nearest approach to natural fertilizing.

With the advent of Adco, the English reagent, and some of the compounds devised by American experiment stations, making possible the reduction of waste vegetable matter to decayed manure in the course of a season, the task of returning to the soil all that is taken from it with good measure is greatly speeded up and facilitated. Every scrap of waste vegetable material that is not too woody should be saved for the compost heap.

The writer in his first experiment with Adco started a pile of oak leaves, lawn rakings and dried grass and weeds moved from the garden in April. In August it was sufficiently disintegrated to dig in as manure. Our own experiment stations have similar compounds, but so far they are slower acting than the Rothampstead compound.

The soil in the garden is to a great extent what we choose to make it. It all depends upon how much labor we choose to put into it and in this

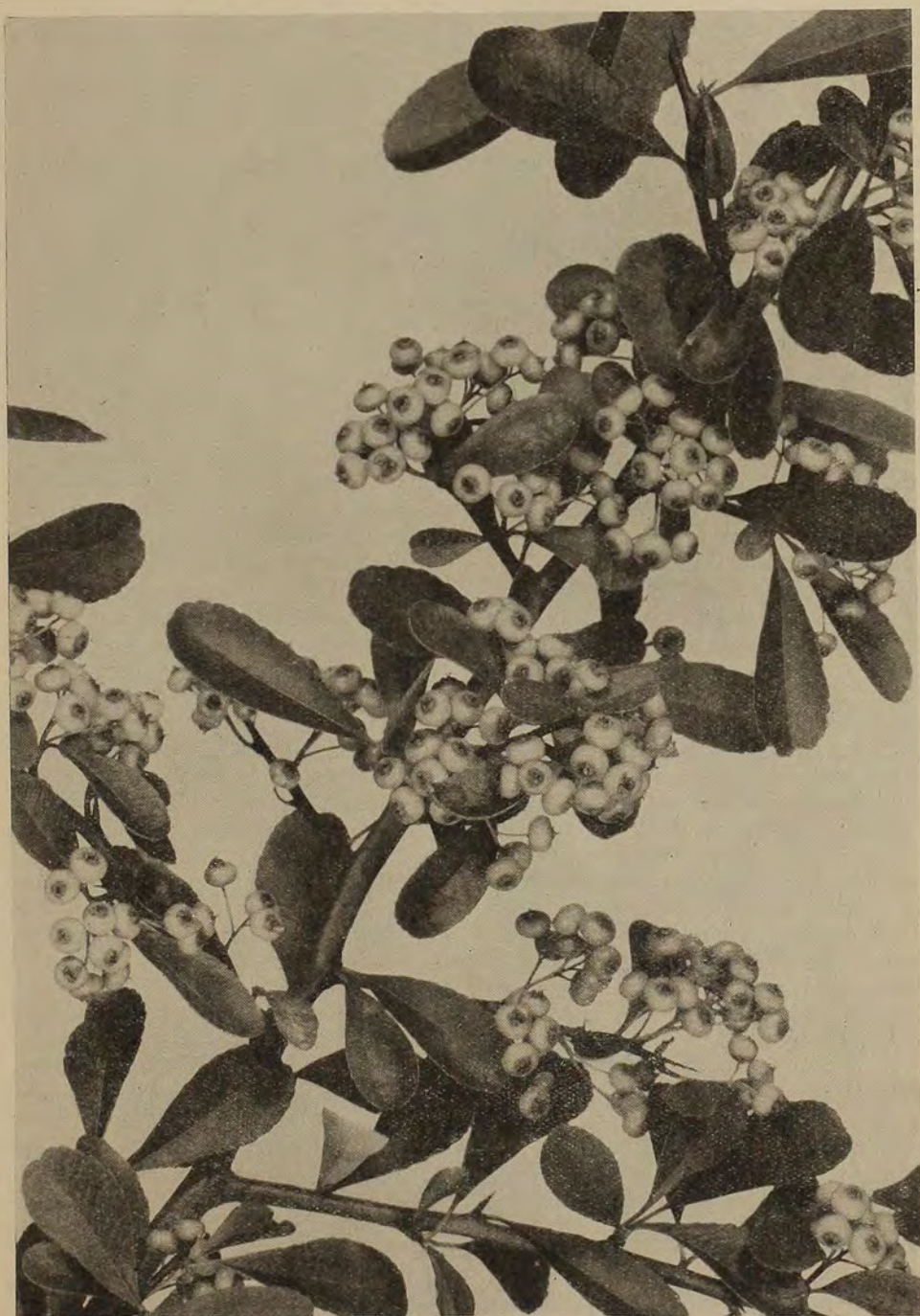
connection it is necessary to debunk some of the entailed misinformation from which horticulture suffers. Some English gardener with a martyr complex ages ago started out to punish himself and originated the trenching idea. The sons did as their fathers did before them. It is current advice. We are told to trench. This trenching operation is in the nature of a sewer or ditch digger's job, working the soil anywhere from two feet to three feet in depth, an entirely unnecessary martyrdom for those who do their own garden work. The place for the martyr is in the arena. Let the lions have him. He doesn't belong in the garden.

There are so few plants whose root systems go down to sufficient depth to require trenching, it is purely lost labor. Plants with such deep-going root systems are usually natives of dry localities and the roots will go down in search of the moisture they want in perfectly vigorous manner without the trenching.

The most foolish advice in garden literature is to make as hard work as possible of gardening. Preparation of the soil a spade depth is quite sufficient. A farmer's plough doesn't turn the soil to the depth of the trenching advocates' formula. Yet he grows his crops year in and year out. No more need be done in the garden. It has always been my idea to make gardening as much of a sport and as little a hard labor as possible.

The start is to get acquainted with the soil and find out what it is made of and what it needs. If it is light and sandy, it needs to be made more retentive of moisture. If it is clayey and heavy, it needs to be lightened. If it is decidedly light or unusually heavy, the best plan is to select plants suited to soil conditions for main effect rather than to struggle with those unsuited to the going.

Texture, it seems to me, is the first soil quality to be considered. There is nothing more soul-satisfying to a gardener than the feel of mellow soil



Lilian A. Guernsey

Pyracantha gibbsi yunnanensis
(F. P. I. 54991)

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that crumbles readily, but not too readily, through his fingers.

After battling with various kinds of soil, I am convinced that the most difficult to change over is a very light sandy soil, especially where it has a subsoil of sand for many feet. The moisture-retaining quality of this soil is practically nil at the start and it seems to eat up humus. The quickest means of getting a little stiffness into it is to haul in a coating of clay and dig it in. Then follow this with manure or compost and it will take all the compost the place yields and still cry for more for many years before it begins to show the spongy moisture-holding qualities desired. For a very light soil, the selection of plants for main effects largely limits itself to those which will stand drought.

After years of struggle with a soil of this nature I know that it will be some time, if ever, before I can induce phlox and Japanese anemones to flourish in it.

The lightening of clay soils and bringing them into good tilth is a far easier process. Digging in torpedo sand breaks up the soil more quickly than any other method I have discovered. Crushed limestone has an ameliorating effect but does not work as quickly as does the torpedo sand. After digging in sand or crushed limestone, the digging in of compost or well-rotted stable manure in a few seasons make the clay soil friable and a delight to work.

It is the most discouraging of all soils at the start, as in the spring it is like trying to work in thick glue and in the summer during periods of drought it is as easy to work as a brick walk. The sand and limestone, however, remedy this condition.

Sandy soils are at their best in the spring when they can be worked easily, when other soils are so wet that they can not be handled. That is the time to spade in the compost or manure. Manure put in during the summer often dries in the soil and is not assimilated before the following season.

Constant working of heavy soil is the secret of bringing it under control. Constantly adding vegetable matter to sandy soil is the one method of giving it consistency.

Before gardening became scientific weeds used to be regarded as an excellent index of the condition of the soil as to fertility. They remain a good indicator. A luxuriant growth of weeds shows that the soil is fertile. This is a valuable tip when starting a new garden, as the weeds will tell whether or not the soil is in immediate need of a heavy dressing of fertilizer. Fertilizing very often is overdone and much more fertilizer is applied to the soil than the plants can possibly use. Light and frequent fertilizing, particularly in the use of balanced commercial fertilizers, is most effective.

Lime of recent years seems to have come into vogue as a panacea for all soil ills and tons of it have been spread with no advantage to anything or anybody except the dealer who sold it. Lime in itself is not a fertilizer. It won't make grass grow except as it liberates other elements in the soil. The heavy liming of lawns commonly seen in many sections rarely does much good.

It is now a simple matter to test the soil to see whether it is acid or alkaline and in need of lime. A little device in common use on farms known as Soiltest is equally valuable for the garden. A gardener can tell in about three minutes as to the condition of his soil so far as acidity or alkalinity is concerned by the color of a pinch of soil moistened with a few drops of distilled water to which has been added a drop or two of the Soiltest solution, the whole operation being conducted on a piece of waxed paper about the size of an ordinary cigarette paper.

With the color goes a scale showing the degree of acidity, if any, and the amount of lime necessary to neutralize or correct the conditions. These little outfits are now sold by nearly all seed houses. In the country where distilled water isn't available cistern or rain



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Cotoneaster horizontalis

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water is used with satisfactory results. The main concern is to use water that is not "hard" or lime impregnated.

And, in this connection, it might be noted that sprinkling with the city water supply very often will satisfy all lime requirements. Over a large portion of the country the water supply from springs or wells is hard, in some cases very hard. The tea kettle is the homely test.

If it is heavily encrusted the water supply is lime impregnated. The lime impregnation of water supplies for gardens very often has been the cause of the death of plants which insist on an acid soil for their well being. They are killed with kindness when soaked with a city water supply by a gardener thoughtless as to the lime content of the water. I have seen Japanese iris plantings languish and die when kept thoroughly moist in dry weather because they were being soaked with limewater.

I killed a nice bed of azaleas by the same "dummheit" before I woke up to the fact I was poisoning them. It is practically a useless task to try to grow acid-loving plants that need moisture in gardens where the only water supply available is heavily lime impregnated.

Mulching is an important factor in conserving moisture in the soil and one not as well understood and practiced as it might be. Some mulching is practically waterproof and keeps off more moisture when it rains than it keeps in the soil. Well-rotted stable manure is the ideal mulch, but it is objectionable both from the odor that often goes with it and its untidy appearance. Well-rotted compost or synthetic manure serves as well and is odorless, doesn't draw flies, and is less unsightly. Dried lawn clippings are excellent mulching material and always at hand. It is merely a matter of collecting them from the first cutting and storing them dry until needed.

Applying a dry mulch to a dry soil doesn't do any good, it seems to me. Neither does applying wet mulch to

dry soil. The mulch and soil should both be wet or moist and the soil should be stirred before the mulch is applied. Just before a rainstorm, if one can be forecast successfully, in early July or late June, is about the most effective time to start mulching. Otherwise, the soil can be soaked down with the hose and stirred and the mulch moistened and applied.

In this connection, it must be said that the comparatively new garden material, peat moss, much used as a mulch, put on dry operates almost as a waterproofing for the soil. This waterproofing quality has undoubtedly given rise to a belief in some communities that peat moss brings ants. Some gardeners have even advanced a theory that the ants come in the bales of the moss. This, however, is untrue. The ant, a proverbially wise insect which we are advised to consider, knows a good thing when she sees it. Finding that peat moss gives her a rainproof roof over her head, she hastens to use it. That seems to be the real and only reason for the prevalence of ants in peat moss when used on rockeries and in flower gardens.

The peat moss needs to be thoroughly saturated before being put on as a mulch, according to some gardeners who have experimented with it. It seems to me that the best use for it is as a manure to be dug into the soil. It adds humus quickly and it is more quickly assimilated if dug in moist.

There has been considerable experimenting with paper mulch and favorable reports of its effectiveness in vegetable gardens have been made. It consists of stretching heavy paper strips between the rows of vegetables, leaving a strip of soil along the stems uncovered. It has one great advantage, as have all mulches, of obviating a great deal of hoeing and weeding. The paper mulch, I have an idea, will develop into a sound and valuable garden practice.

Experienced gardeners are likely to take their soil rather casually and attend to it as they go along without



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Berberis polyantha

[See page 38]

much fuss and have successful gardens. The heavy and toilsome work so frequently advised is not necessary. I have had many an appreciative smile out of Dr. Horace McFarland's remarks about the futility of mining to plant roses. Long before Dr. McFarland wrote about roses many of us grew our old La Frances, our Perle du Jardins, our Niphetos, our Catherine Mermets, Crimson Bedders and other old timers and got very satisfactory roses merely by digging a hole with a trowel and chucking them in. It can be done with most garden plants with the ordinary fertile soil found in a great majority of gardens. S. R. D.

Gordonia alatomaha Sarg. (See p. 27.)

At the present time a native plant does not suffer under the disadvantage of being "only a wild plant," but even now there are many native plants which are not as well known or as widely used as they should be.

This particular species was discovered by Bartram and brought by him to his garden near Philadelphia. Trees propagated from his plants were distributed at the time and their progeny is still available, a most fortunate circumstance, as the species has never been found growing wild since 1790 in spite of endless search. Various nurserymen are working on the propagation so that in time we should have it commonly for our gardens.

The plant makes a shrubby tree somewhat like that which is often formed by *Magnolia glauca*. It is entirely deciduous and shows most gorgeous autumn colorings before the leaves fall, and while it is still flowering. Its flowers, however, are its special beauty. These are of dazzling whiteness with a brimming cup of golden stamens. They first appear in summer, but it is not until the cool days of fall that the plant is well covered with them. Through September and October until killing frosts the display continues, making one think of the camellias that will soon be

flowering further south, although these blooms have not quite the waxen substance nor so rich a scent as have the former.

Pyracantha coccinea lalandi Dipp.

(See p. 2.)

The firethorns are closely related to the cotoneasters and the crataegus, and at times have been included with each of these genera. The species of which the variety *lalandi* is illustrated has been longest in cultivation, particularly in Europe. Like its relatives it resents moving, so the gardener should give it a permanent place when he first receives it, setting it out as a young and preferably pot-grown plant.

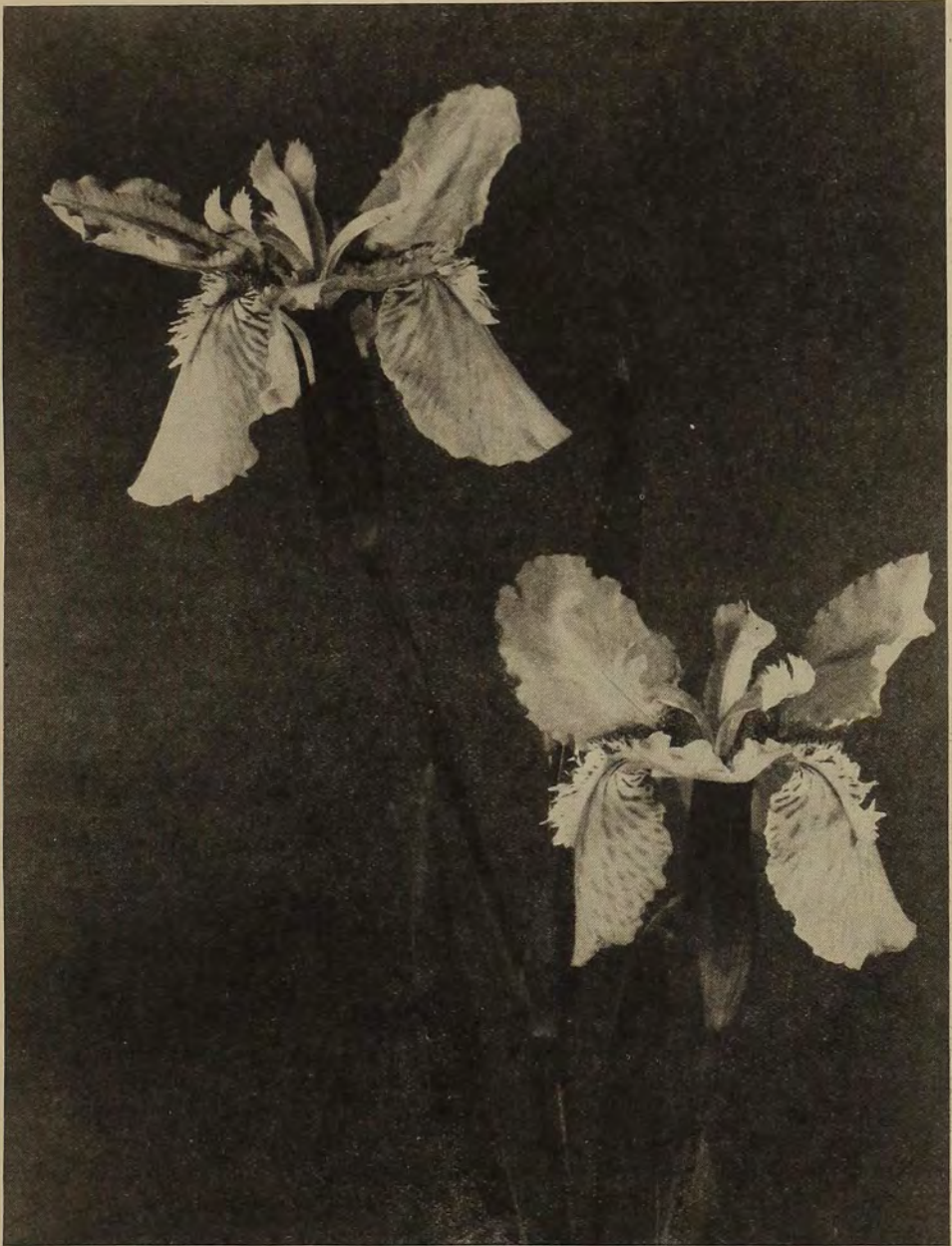
Under favorable conditions the plant makes a vigorous shrub up to 12 to 15 feet. When established it is characterized by strong shoots which make a prodigious growth in a season. The following year the lateral branches are developed, which are strong enough for fruiting thereafter. Like many other shrubs in Europe, this is a favorite for growing against walls, and such situations might extend its usefulness northward in this country.

The leaves are evergreen, the flowers small, dull white in hawthorne-like cymes but with leaves and flowers quite overshadowed by the gorgeous orange red fruits which ripen in October and keep their brilliant color until severe freezing darkens them.

Pyracantha gibbsi yunnanensis Osborn.

(See p. 29.) F. P. I. 54991.

As young plants, this species seems very different from the older *coccinea*. The growth is equally vigorous, but seems somewhat more robust with stronger, more tree-like trunks. The leaves are much larger, perhaps a little thinner and more subject to winter injury, especially on shoots that develop late in the summer. The plant is entirely hardy at Washington, D. C., and has fruited moderately well the



Lilian A. Guernsey

Iris tectorum

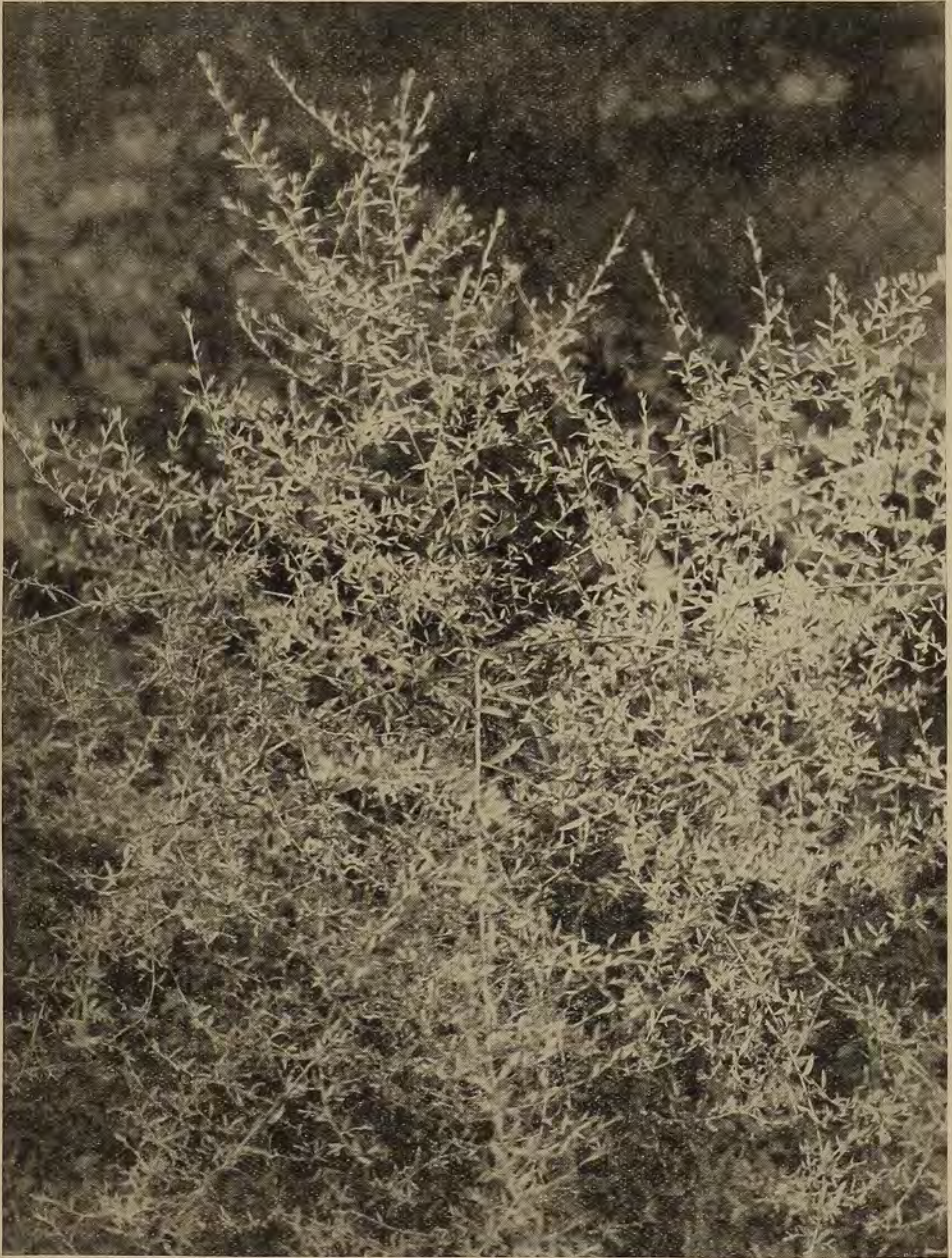
[See page 38]



Michael Carron

Phlox divaricata

[See page 39]



Sherman R. Duffy

Artemisia, Silver King

[See page 39]

fourth season from seed. As the illustration shows, the fruiting clusters are much more dense than those of *coccinea* and the berries are of a different shape. The most striking difference, however, is in the color, as this species shows more rose than orange in the red of the ripe berries. Indeed, the difference is so marked that the plant should never be too close a neighbor to the scarlet firethorn.

Cotoneaster horizontalis Decne.
(See p. 31.)

The cotoneasters have been appearing in American catalogs for many years, but as a family they have not yet taken their merited place among our ornamental shrubs. The subject of this note is named to suggest the habit of the plant which produces vigorous shoots almost parallel to the ground. It is commonly recommended for rock gardens, but certainly a word of caution should be said as to the vigor of the plant and the huge area it will eventually cover. Undoubtedly its handsome growth, its green and shining foliage with the brilliant colors of the fruits and the old leaves in the fall, make wonderful contrasts with stone colors, but one wonders if the English custom of training it against a wall is not a happier method. It must be fastened to the wall in some way as it is not a climber and has no natural means of support.

The flowers are very small and are more conspicuous for the rosy calyces than for the tiny pinkish white petals. The fruits are brilliant scarlet red and last well into the winter. The plant is almost deciduous in the North and increasingly evergreen as it is grown farther and farther South.

It is easily propagated from seeds, which usually require two winter seasons before germination; and less readily from soft cuttings in early summer. These give a greater percentage of rooting than half-ripe cuttings in late summer and autumn.

Berberis polyantha Hemsl. (See p. 33.)

The barberry family is a large one and more species have come into cultivation from China in relatively recent years than from South America, the other great barberry center of the world. The oriental species are rather more hardy than the southern species, but even they are not of equal hardiness over our whole continent.

The present one grows feebly at the Arnold Arboretum but robustly at the U. S. Plant Introduction Garden at Glendale, Md. Here it makes a shrub about 8 feet high with strong erect shoots like those of *subcaulialata*. The leaves, which are gray green, somewhat lighter beneath, show clearly in the illustration. They are evergreen here but show some bronze to red color in the fall, especially on the oldest leaves which are almost ready to drop. The flowers are produced in large panicles in midsummer and are more conspicuous than those of the allied species because of the size of the inflorescence which gives the name to the species, many-flowered. The berries ripen very late in the fall and change from a greenish pearl color to rosy pink. They are translucent and filled with acid juice, soon shrivelling and darkening after frost.

This species is somewhat susceptible to stem rust of wheat and is of course contraband in wheat-growing regions.

Iris tectorum Maxim. (See p. 35.)

The roof iris of the orient has been the subject of various stories which are everywhere repeated until one wearies of them as of Bacon's inevitable essay on Gardens! The species is by no means only Japanese as one might think, but grows on the continent, China particularly. Like many other plants which come from regions where winter cold is tempered by fog and rain, with little sunlight, this iris suffers in American winters with their freezing temperature, sharp winds and brilliant sunlight. It seems to be

hardy enough as far as its roots are concerned, but the broad green leaves suffer and in time the plants may be weakened enough to succumb. It is easily raised from seed which is produced rather freely and the little seedlings soon come to flowering. The exquisite white form will also breed true from self-fertilized seed. The type varies somewhat in color but is usually a rather rosy lavender with blotches and marblings of a slightly deeper hue. Both types increase naturally by means of the spreading rhizome, which travels in somewhat the same way as our native *cristata*.

Phlox divaricata L. (See p. 36.)

No series of phlox portraits could begin more auspiciously than with this lovely lavender native, found through all the rich river valleys and moist woods of the East and reaching far into the Middle West and the States west of the Mississippi Valley. Its tender color never comes under the suspicions that attend so many phlox with their intense and not always pure, purplish pink hues. When once established in rich soil it will self-sow in every direction, so that hundreds of tiny seedlings may be harvested every fall. With some care these will come to flowering the following season, but usually flower better the second spring. They vary greatly, not only in color which may be lighter to pure white or deeper to rosy lavenders, but in shape with corolla lobes that are broad or reduced to mere strips. The poor seedlings should be weeded out, as they of course propagate their kind. Division after flowering is easily accomplished and the divided plants with a little attention are soon strongly rooted and send up fine crowns of shoots in the late fall. During midsummer the plant is not active above ground, and as Miss McIlvaine points out in her "Spring in the Little Garden," this is a time when the unwary gardener is likely to

lose the plant by not recognizing it and weeding it away. It flowers about the time of the earlier tall bearded iris and is lovely in the garden with them, pale primroses and late cottage tulips, but if one has a bit of open woods that is not too dry in summer, a sheet of its blue lavender makes an even lovelier color there. B. Y. M.

Artemisia "Silver King." (See p. 37.)

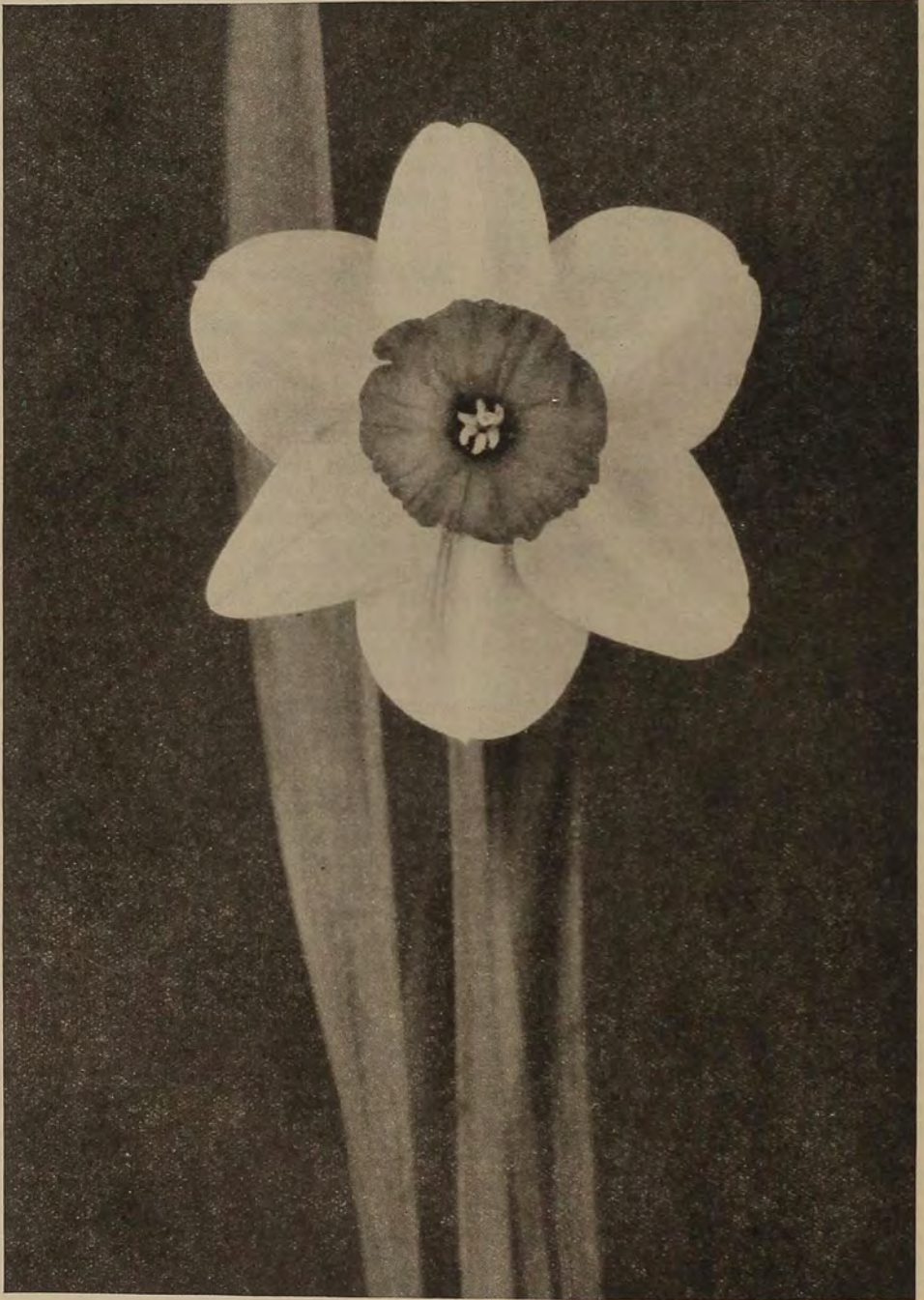
A new plant has come into our gardens in recent seasons under the name of Artemisia Silver King. What it may be botanically I haven't been able to learn. However, it seems to me one of the finest of the white- or gray-leaved plants, a class for which I have never greatly cared. This artemisia is singularly clean compared with some of the woolly dust catchers.

It makes a regular and thickly branched pyramidal bush about three feet high, the foliage small and lavish and particularly fine to cut to lighten heavier subjects in bouquets, much as gypsophila, *Euphorbia corollata* or galium are used.

I used it at six-foot intervals along a border of delphiniums underplanted with *Nepeta Mussini*, an idea cribbed from an English photograph. The effect attracted much attention. The use of the nepeta for underplanting is a very practical one for this greatly overpraised plant. Tuck in a nepeta wherever bare ground shows and no other weed has a chance. It is valuable for producing a uniformity of weeds which is an artistic gain. It also makes an excellent background for the delphiniums, and it isn't necessary to hoe or weed them with the thick pile of nepeta as a ground cover and mulch.

In the fall Artemisia Silver King is covered with little bead-like white globular flowers that seem about to open and do something but, like the bloom of *Artemisia lactiflora*, they remain simply little beads, white but ornamental.

S. R. D.



Lilian A. Guernsey

Narcissus, Croesus

[See page 42]



F. L. Crandall

Lilium umbellatum

[See page 42]

Narcissus "Croesus." (See p. 40.)

This lovely incomparabilis narcissus is by no means a novelty as it received a First Class Certificate as an exhibition flower, from The Royal Horticultural Society in 1912 and an Award of Merit as a garden flower in 1914. It was raised by J. C. Williams, who has been responsible for many beautiful hybrids. This variety has been offered in this country in retail trade in 1928 and should eventually become a staple sort. In the garden it increases with rapidity and flowers profusely. The illustration is natural size and shows a flower of the right type for exhibiting. This sort, like many others, if grown on very rich and moist soil will become much larger at the expense of symmetry, with a resulting irregularity in the perianth segments. The color is an even clear light yellow, with an almost flat orange crown, flushed with orange red from the margin. Like other colored flowers, its most perfect coloration is secured if the buds are cut just as they are unfolding and the flower brought into a mild, but not warm, room to complete its opening.

B. Y. M

Lilium umbellatum Hort. (See p. 41.)

This is one of our good garden lilies, one a beginner should always include in his selection, which will still be found present when many later acquisitions are gone. It is one of a group with a badly mixed nomenclature, all grouped as *Lilium davuricum* by Wilson, but this particular variety is usually found listed as *Lilium umbellatum*, or the "umbellate" lily. It is a Siberian lily of uncertain origin, but is believed to be a hybrid of *davuricum*, possibly with *bulbiferum*, *croceum* or *elegans*.

The umbellate lily makes a bright spot in the garden in late June and early July in this vicinity. It is one of the upright type, usually one to ten or more flowers to a stalk. While many of its relations excel in color, it

is an attractive bronze-red to scarlet, yellowing in the center of the petals. Mature plants are usually three to four feet in height. It may be grown under a wide range of conditions, but prefers sun with some sort of a low ground cover, and a loamy soil with good drainage.

H. E. A.

NOTES ON GRAFTING FOR BEGINNERS

Grafting, which is one of the oldest arts used in horticulture, is the process of inserting a portion of one plant into another in such a way that it may grow.

The plant or portion of a plant intended to form the roots is called the stock. The twig or other portion intended to form the new top of the desired variety is called the scion. To unite these two parts, it is necessary to bring the cambium layer of the stock into close contact with that of the scion and to hold it in place under conditions suitable for growth. The cambium layer is the thin zone of cells between the wood and the bark. The many ways of grafting all depend for their success on this matching of the two parts at the place where wood and bark meet.

The limits of botanical relationship within which grafting may be done are not clearly defined. Varieties within the same species may be expected to unite: for example, all varieties of pear will grow on French pear. Often different species within the same genus will make satisfactory unions. As an example, most species of apple (*Malus*) as well as the familiar named varieties will grow on each other. On the other hand, cherry will not unite with peach although both belong to the genus *Prunus*. In many cases, plants more distantly related will grow, as hawthorn upon apple and firethorn on mountain ash.

The stocks used by nurserymen for the principal deciduous orchard fruits are usually one-year-old seedlings. In this list the one most commonly used is named first:

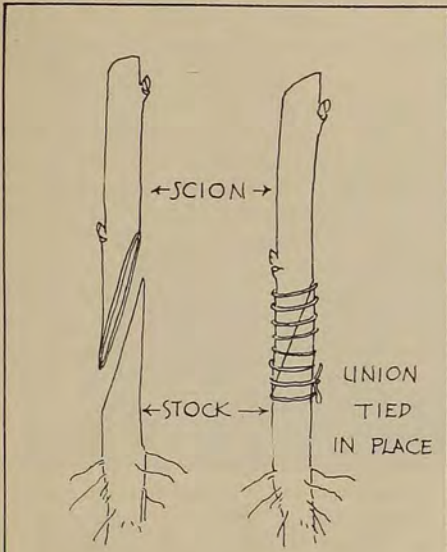


FIGURE 1. SPLICE GRAFT.

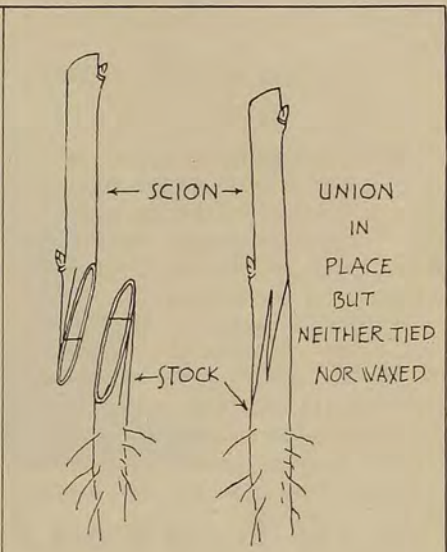


FIGURE 2. WHIP GRAFT.

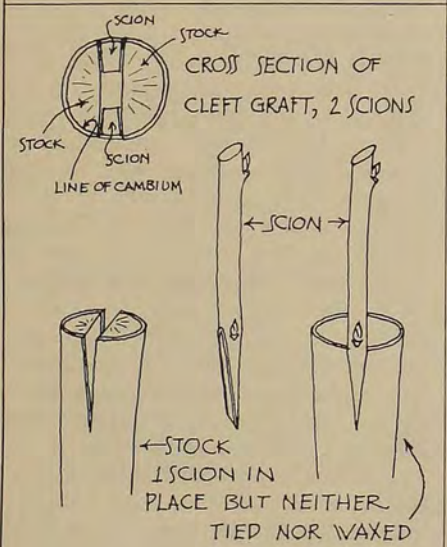


FIGURE 3. CLEFT GRAFT.

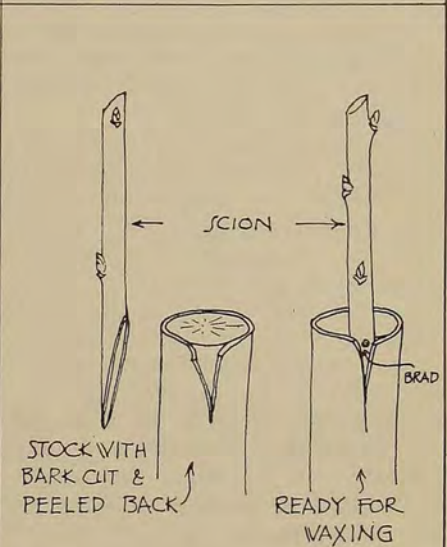


FIGURE 4. BARK GRAFT.

Apple—French crab, seedlings of orchard varieties, Vermont crab.
 Apricot—Apricot and peach seedlings.
 Cherry—Mahaleb and Mazzard (cherry) seedlings.
 Peach—Seedlings from seedling trees

found in North Carolina, Kentucky and Tennessee. Also seedlings of orchard varieties.
 Pear—French pear, Japan pear, *Pyrus ussuriensis*.
 Plum—Myrobalan, *Prunus americana*,

Marianna plum cuttings, also peach seedlings.

Quince—Seedlings, or layers of Angers quince.

Varieties of ornamental plants which are increased by grafting are generally worked on seedlings of their own species. Many exceptions might be named, however, such as Norway spruce, the usual stock for Koster spruce. Sometimes a stock is used as a "nurse root" to carry the plant until it develops roots on the scion above the union. Conifer grafts develop more slowly than most deciduous grafts, hence are ordinarily started under glass where temperature and moisture can be controlled.

Unions may be made at different positions on the stock: On the root, called *root-grafting*, on the stems, called *stem grafting*, or on the branches, called *top-grafting*.

A very sharp knife, preferably with a moderately thin but stiff blade, is necessary to make the smooth straight cuts required for good work.

Unions may be made in many different ways but in actual practice few of these are simple and easy enough for general use. Four styles of unions frequently employed in practical work are illustrated.

The splice graft, one of the most simple (Fig. 1), is often used for roses and some other plants having a relatively thick pith. A diagonal cut about $1\frac{1}{4}$ inches long is made on the lower end of the scion and a similar cut is made on the upper end of the stock. The two parts are placed together, matching the cambium layers on at least one side, and tied firmly with thread or light twine.

The whip graft (Fig. 2) is used more than any other for root grafting apple and other fruits. The work is done at a bench or table, hence this graft is often termed a "bench graft." The time is late winter or early spring. In addition to the diagonal cut a "tongue" is made so that when the two parts are joined they fit snugly.

Care is taken to match the cambium layers and the union is tied firmly in place. Such grafts are packed in slightly moistened sand or moss and stored cool, preferably about 45° F. They are planted in the early spring with the unions below ground where they will be in contact with moist soil.

The cleft graft (Fig. 3) is well suited for the union where the stock is larger than the scion. It is especially useful for "top working" bearing trees to change them from one variety to another. The work is done in spring, usually before growth has started, but may be done later, provided the scions are kept dormant. A branch is sawed off at a smooth place where it is $\frac{1}{2}$ to 2 inches in diameter, care being taken to avoid loosening the bark. The stub is split with a heavy knife or chisel and held open with a wedge to admit the scion. The scion is cut wedge-shape with the outer edge a little thicker than the inner, so that when fitted into place and the wedge removed, the pressure will hold it tight. All the cut surface is then covered with grafting wax to exclude air and to prevent drying.

The bark graft (Fig. 4) is another useful form of union when the stock is larger than the scion where wood and bark meet. The time to make this graft is in spring after the sap has started enough so that the bark will lift. The stock is sawed off as for a cleft graft. A cut is made through the bark extending downward about $1\frac{1}{2}$ inches. The bark is lifted and the scion, which is prepared by cutting diagonally, is inserted. It is held in place by a half-inch brad or by tying with twine and the wound covered with grafting wax.

Wherever the union is in a position exposed to the air, the use of wax is necessary. One standard formula for grafting wax is: Four parts rosin, two parts tallow and one part beeswax, by weight. Melt altogether and apply with a brush while warm.

GUY E. YERKES.



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