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Some New Roses in 1933

By J. Horace McFarland
Editor, American Rose Annual

There is no thought of telling all about all the new roses of the world in this reference to a few of them. The 1933 American Rose Annual described, usually in the language of the originator or from other original sources, 166 roses thus added to an inclusive total of 2,244 roses so described in fifteen years, making a yearly average of 149 new varieties. All of these were new once, but heaven is to be thanked that we do not have to study all of them in America!

Of the 1932 aggregation of 166, just 20 were of American origin, and that is about the usual proportion. Great Britain more than doubled us with 43, while France was more moderate with 26; Germany added 16, Holland 13, Luxembourg 6, Czechoslovakia 9. Spain gave us 6, Belgium 5, and Denmark 2. It may therefore be understood that a survey of the newer new roses would be quite complicated, and even more undesirable.

In reviewing a few of those actually in commerce in 1933, and generally new in the sense of yet inadequate distribution, I plan to write only of those of which I have some direct knowledge. Some of them will be illustrated in these pages from photographs made either at Breeze Hill, or at the Mount Pleasant Press from material sent there by the originators or introducers.

I must follow the beaten path, I presume, by mentioning first the hybrid tea roses, of which we grow too many to the exclusion of other classes. Among these were two interesting American varieties in Mary Hart and in Souvenir, one being the red and the other a yellow sport from that very variable and yet excellent variety, Talisman. It is interesting to note how the red and yellow of Talisman thus split up. Both carry many of the merits of their parent. Mrs. Franklin D. Roosevelt is another Talisman sport, this time with a little more of the yellow in it. Not quite as new in the yellow side is the Australian Golden Dawn, to me one of the loveliest roses of its class in its light yellow or deep primrose, full, fragrant, abundant and delightful flowers. Perhaps I ought to mention in this connection the clear yellow Amelia Earhart, reflecting the sudden popularity of that aviatrix. Deeper in color, with shadings toward amber and brown, comes another political rose in Alfred E. Smith. I have not seen enough of it to speak with any assurance.

Pink is the normal rose color, and the best new roses may always be looked for among those that can be generally classed as pink. The American Hill rose, Better Times, is a deep, rich pink. It is as yet confined to the greenhouse, but probably will be breaking into the open during 1934 to the advantage of gardens. With it ought to be named Mrs. J. D. Eisele, of American origin, and of rare, rich, deep pink beauty, of high fragrance, with a disposition to bloom all through a hot summer, and always to give pleasure. It is one of the best of the newer roses.

J. Horace McFarland Co.

Amelia Earheart

J. Horace McFarland Co.

Gov. Alfred E. Smith

Other good roses that were distinct in gardens in 1933, which were either pink or primrose or yellow, as you happened to strike them in the morning and as you chose the predominating shade you then saw, were Edith Nellie Perkins, Souvenir de Mme. C. Chambard and Countess Vandal. Deeper pink than the average, and much less pleasing to me who ought to think otherwise, was Editor McFarland. It seems to be happy in New York, and very happy in Texas as well as in some parts of Pennsylvania, but it doesn't love Breeze Hill. The sterling Leonard Barron, with its beautiful open, closely set flowers, introduces the "new" blood of *Rosa nutkana* into the hybrid tea family.

The roses which depend more or less on that aggravating and yet very desirable strain brought into the hybrid tea group about thirty years ago by the late Mons. Pernet-Ducher, were popular in 1933. Mrs. Sam McGredy, an Irish rose, fell into this group and was sometimes very lovely. Not quite so new, but rich in this particular type of beauty, was President Herbert Hoover, which as I found it in East Texas in mid-October last year, was easily the dominant rose there. Condesa de Sastago told much the same story in color and average desirability. Of the same French vintage is Mme. Nicolas Aussel, a year older, but producing some superb flowers. From my standpoint the hybridizers overworking this orange-amber-flame Austrian Copper type. I visited one nursery in which it was necessary to read the labels to see any difference between three or four of these Talisman imitations.

A variety which did not make as great a success as was hoped started in France in Mme. Raymond Gaujard, though by consent it was renamed Olympiad in America in order to help Los Angeles when the athletes were there. It is a good rose, but not a world beater.

Everybody loves a red rose. All summer through I went to a particular place in a long half-shaded border at Breeze Hill, at which I could be sure of seeing magnificent blooms of the old and yet unsurpassed Etoile de Hollande. I grew some of these plants right in the shade, and one of my permanently pleasant memories is the way in which one strong shoot worked through the branches of a great plant of *Taxus cuspidata* so that about level with my nose there bloomed in early October a superb flower of this deep, rich, fragrant and fine red rose.

But there are other very good red roses. E. G. Hill is fine and National Flower Guild is always in bloom. The General came out in 1920, but few yet know its dependable beauty as a budding rose. One with an indescribable unique red color is Margaret McGredy. Much newer is Duchess of Montrose, which has a very excellent habit of free blooming. Much darker is Ami Quinard, which if it really would grow and would hold its flowers long enough for one to love them, would be admirable. (I hear rumors of a new, still darker rose named Nigrette, crossing the Atlantic as "The Black Rose of Sangerhausen." I have, indeed, seen several flowers of this variety, and they are nearer black than I personally like.)

Let me get away from the hybrid tea roses and refer to some, of whatever origin they be, that are ambitious enough to get up a few feet in the air. There are climbing forms of some of the hybrid teas, and of the Climbing Talisman and Climbing Herbert Hoover are particularly admirable, just as is Climbing Los Angeles. All of these

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Edith Nellie Perkins

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Leonard Barron

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Kitty Kinninmonth

climbers are likely to bloom surely enough, but rather scantily, because much of their vigor has gone into the wood that takes them up from the ground.

Deeply interested as I am in all the hardy climbers, I reach back at least ten years to the exquisite Ile de France, in adequately described as "a double American Pillar," for it is better than that. I look with yearly admiration at the Australian roses which came to Breeze Hill in 1927 and have slowly worked their way into commerce. Kitty Kininmonth is red, large, loose, lovely. Miss Marion Manifold is all of the same adjectives a little bit farther along. Countess of Stradbroke again intensifies all these qualities, and adds rich perfume to its very deep rich hue. Reddest of all of them is the one appropriately named Scorcher, introducing a totally new type of flower in its broad, fluffy brilliance.

Everyone wants a yellow climber, and we have had to put up with some pretty poor imitations. Now we have the excellent Primrose, the much more excellent Mrs. Arthur Curtiss James, which has vigor, color, size and abundant once-blooming. Le Reve is distinct in its fragrance and admirable in its general yellowness. The quite new Reveil Dijonnais is both red and yellow, and, so far as I know, is entirely unique.

A dozen years old, but yet quite new here in America is the exquisite Bracteata hybrid Mermaid. An all-summer succession of five-inch single primrose flowers amid foliage that would justify growing the rose if it never bloomed is the different frillar or scrambling rose.

I have not yet seen flowers of a new English yellow climber which will be sent out in 1934 as Easlea's Golden Rambler. Its pictures are quite attractive. I have seen the blooms of a new and yet unnamed Horvath seedling resulting from a combination of *Rosa setigera* and *R. foetida bicolor* parentage. This is one of a group of once-blooming hardy climbers planned to be hardy to the tips at 20 degrees below zero, and I am going to keep my two eyes very closely upon it.

Mme. Gregoire Staechelin is not entirely new, but it isn't yet known as well as it ought to be for its unique pink loveliness. It is the best eastern approach to that literally marvelous California rose, Belle of Portugal—or Bela Portuguesa, as it is properly named. I remember when I was going into raptures over this latter rose three years ago in Southern California, being told somewhat disparagingly that it bloomed but once. Further inquiry developed the fact that it began to bloom in December, and I saw for myself that it was mighty fine in April, wherefore I could not subscribe to the disparagement! The Spanish rose with the dreadful name above mentioned has many of the qualities of this rose, but not its long blooming habit.

In 1933 much disturbance was made for, by and on acount of Blaze, reputed to be a constant-blooming Paul's Scarlet Climber, and New Dawn, which similarly was to keep on with the glorious beauty of Dr. W. Van Fleet, the best of all American-raised hardy climbers. The disappointment came because those who bought these roses expected them to keep right on. They couldn't, they didn't, they oughtn't! Both of them do bloom again, so that instead of being called everblooming they should be called recurrent-blooming. Both of them, I surmise, are like the rose which was named for Breeze Hill some years ago, and which is no good at all until

J. Horace McFarland Co.

Golden Moss

it has its feet well settled in the ground. So I believe that Blaze and New Dawn need establishment before they can be called completely satisfactory. They certainly do mark an important departure.

I could mention some other of these little known recurrent hardy climbers, particularly including several originated by the late Captain George C. Thomas, Jr., but it would only be confusing because they are not yet in commerce.

I am a somewhat persistent crank on the value of the rose in the shrubbery. I believe most heartily in *Rosa Hugonis, R. ecae, R. spinosissima* and the other once-bloomers that are far finer in their places than any spirea or deutzia I plead for fair treatment for these roses, to the vast advantage of shrubbery borders everywhere, and I urge that vigorous hardy climbers be given a scrambling place in shrubbery borders for the good of their owners and the glory of God. In the same breath I urge the planting of slopes with the yet little known Max Graf, a persistent rose which seldom gets over eighteen inches in height, covers large space, provides insect-proof, rich green, wrinkled foliage, and has just one grand and glorious climax of large light pink flowers in late June.

Among other new things I mention Golden Moss, which is really and honestly a yellow moss rose—and the mosses are coming back, along with some other of the old roses. I mention also Vanguard, which is a rugosa hybrid of great vigor, with flowers of warm amber, fading to a very fine pink, abundantly produced over a considerable time, and with full vigor.

Now let me drop to the rock garden and mention that dainty little old-new rose, *Rosa Rouletti.* It is in commerce rightly as a plant which really never does get much over eight inches high, and in commerce wrongly as an escaped Lawrenceana type which can grow to a foot or more in height. The genuine *Rouletti* blooms the whole summer through, and holds its foliage well into winter. It is so diminutive that at any time the kind of coffee cup I like to use—because I am fond of coffee—will fully cover it.

Training the Kwanzan Cherry Tree

By W. E. Whitehouse

Every spring thousands journey to see the Japanese cherry blossoms as they herald the approach of spring. It is quite natural that having enjoyed the beauty afar one desires them near at home in the garden and now that our nurserymen have an excellent list of varieties from which to select, these beautiful trees are planted in increasing numbers every year. Casual observations of the trees planted in the past makes it apparent that as far as form is concerned some training during the early years of their growth is necessary. This is the beginning of a series of articles on training the flowering cherry which we hope will create an interest in this subject and answer some of the questions as to the best training methods to employ.

Trees of species or varieties of plants show more or less distinctive growth and blossoming characteristics a few years after planting. The ultimate shape of the tree is easily influenced by the grower if in training it he understands a few of the principles involved. Horticulturists have spent considerable time in the past studying the best methods to use in training and pruning trees planted for their fruits, both from the standpoint of producing a desirable framework as well as maintaining the type of tree which will produce the best quality of fruit. In the case of ornamental fruit trees where blossoming and not fruit production is involved and because many of these develop strong well-formed trees when left to themselves, little attention has apparently been given to the question of training. Although it is recognized that in some instances, as when planted in groups for mass effect, an odd-shaped tree, not typical of the best form of the variety might not be undesirable, as a rule when planted in rows or as specimens in the open, well formed trees are essential for the best effect. It might be argued that when the trees are in bloom they are beautiful regardless of irregularity of form but we must not forget that blossoming seasons are comparatively short and there are many months during the late fall and winter when the trees have neither blossoms nor leaves to help soften them as they are silhouetted against the sky or snow. Although many of the problems which we will discuss in this article will probably apply to all varieties of flowering cherries, our attention for the present will be confined to the upright growing Kwanzan variety.

If some training during their early life is beneficial to the development of well-shaped trees, how is the average gardener going about it to produce good trees like that in *Fig. 3,* rather than letting them grow at will and taking a chance on getting unattractively shaped ones as shown in *Fig. 1.*

About 10 years ago Fagan[1] outlined a method for training apples by debudding, which has worked out fairly well; later Schrader and Auchter[2] tried a modification of this on

[1] Fagan, F. N. Selecting buds for the development of framework branches of apple trees. Proc. Amer. Soc. Hort. Sci. 20. 42-44 1923.

[2] Schrader and Auchter, Peach Pruning in Maryland. Md. Exp. Sta. Bul. 299, 1928.

peaches quite successfully and the work reported here indicates that somewhat the same type of training can be adapted to the flowering cherry. In this article and others which will follow from time to time we shall try to answer such questions as (1) whether the flowering cherry is best trained to a leader or a modified vase form (2) how to develop the head of the tree to the desired height (3) the number of lateral branches that should be left to form the scaffold framework (4) the distribution of the latter along the main trunk and (5) the subsequent attention which should be paid to the growth development of the scaffold branches selected so that they are at all times well balanced with each other.

Selecting the Trees from the Nursery

Opening up the nursery catalog we find, that depending upon the age, we can buy Kwanzan trees all the way from 18 inches up to 10 feet in height. What size shall we order? The answer to that question depends upon whether you want to shape your trees or let the nurseryman do it for you, and in the latter case the shape will probably depend upon the ideas of the nurseryman in question. I am not sure but I have a feeling that there must be differences of opinion among our nurserymtn as to the best methods to employ, if any, in shaping the tree as it grows from year to year in the nursery until finally sold as a specimen tree.

At the time of making up an order of sixty trees for a street planting the question arose as to what type was best and after deciding to do the training myself, two-year-old trees ranging 3-4 feet in height were selected. When received from the nursery these trees were fairly well branched. During the first year in the nursery the trees had grown to a height of about 18 inches without branching. In the second year growth from the terminal bud or one near it extended the trunk upward to a height of between 3-4 feet while some of the buds below developed in the lateral branches. This lot of trees had been allowed to grow at will and quite naturally, the lateral branches had grown out almost anywhere along the trunk, most of them arising in a bunch somewhere within 18 inches of the ground. It was impossible to begin a selection of properly balanced and well-spaced scaffold branches from these so as soon as they were planted, the leader was picked out and all lateral branches were cut back either to one bud if in a suitable location or close to the trunk if not. This left the trees as single whips between 3-4 feet in height, the upper two thirds of which were covered with good buds, potential scaffold branches.

I am wondering how many of my readers would have had the nerve to prune the top as severely as this just at the time when their thoughts were centered on producing more growth as quickly as possible. It has been my observation that garden lovers hesitate to prune the tops of trees at planting time fearing that they will hurt them, apparently forgetting that in the process of being dug from the nursery they are subjected to a fairly severe root pruning and lose most of the fibrous root system which is so necessary for the efficient intake of mineral nutrients and water. At this time a corresponding severe top pruning can be performed without destroying the physiological balance between top and

FIG. 1.—*Showing a leader type of tree where poorly spaced scaffold branches competing with each other have girdled and stopped the development of the leader (upper left).*

FIG. 2.—*Showing a leader type of tree where well spaced lower scaffold branches have allowed the leader to develop but poorly spaced upper ones are competing with each other. Largest lower branches allowed to develop unchecked at the expense of the upper ones (upper right).*

FIG. 3.—*Showing fair spacing and development of both leader and scaffold branches resulting in a well balanced tree (lower left).*

FIG. 4.—*Showing well balanced modified vase type of tree produced from three scaffold branches. Inner branch arising from the left scaffold developed into a modified leader (lower right).*

roots, which is so essential to the proper growth of the tree. In growing specimen trees the nurserymen make a practice of transplanting after the second year or so thus encouraging the root system to develop closer to trunk of the tree, allowing it to be dug later on and planted in its permanent site without checking the growth of the tree any more than necessary at that time.

Building the Framework

Soon after growth starts, small shoots arise from most of the buds on the upper two thirds of the tree, *Figs. 5, 9, 13, 17, and 22,* and the stage is set for selecting potential scaffold branches from the shoots most desirably located and discarding the rest. This should be done as soon as possible after growth starts but we must be sure that those wt leave will continue to develop as vegetative shoots and not suddenly stop and form short spur-like growths. When all the shoots are allowed to develop this may stimulate the production of short spur-like growths covered with blossom buds. *Figs. 5 and 6.* The long branch near the ground did not develop until later in the season after the numerous short spur-like shoots above it had completed most of their development. On the other hand the removal of all growth except those we have selected will not force those remaining to develop into strong branches if they have not already started to do so at the time of *de-shooting.* The shoots left should be at least three inches long at this time for if shorter than this they may develop into very short blossom spurs or cease further growth entirely. This is illustrated in a close-up view showing the selection of five growing points at the time of de-shooting and the subsequent development of only three of these. *Figs. 8 and 9.*

Height of Head

In selecting the shoots at the time of *de-shooting,* the lowest one is selected first and it is at this point in our training that we must decide how low to the ground we wish the head of our tree to be. When low-headed fruit trees were desired it has been the usual practice in the past to cut the whip back as low as 30″ at planting time, with the object of forcing shoots out lower down on the trunk. If we adopt this practice with these trees we will remove the upper ten inches of growth which contains some of the best buds and will probably get very few shoots to start out correspondingly lower down on the tree. With other fruit trees what usually happens is that the strongest growth develops from the five or six buds just below the place where the whip has been headed and there is no opportunity to properly space the scaffold branches which must be selected from these shoots. The shoots on these Kwanzan trees developed on the upper two thirds of the whip and in all probability we would have been confronted with a similar problem had they been headed back to thirty inches at planting time and as the trees grew older the scaffold branches would probably have crowded each other and possibly choked out the leader just as they have done on the trees in *Fig. 1.*

Where a relatively small number of scaffold branches are selected, this competition may not be as serious and in some instances such as the one illustrated in *Fig. 4* where only three scaffolds grew and all developed at about the same rate, a well-balanced semi-vase shaped tree may result. It

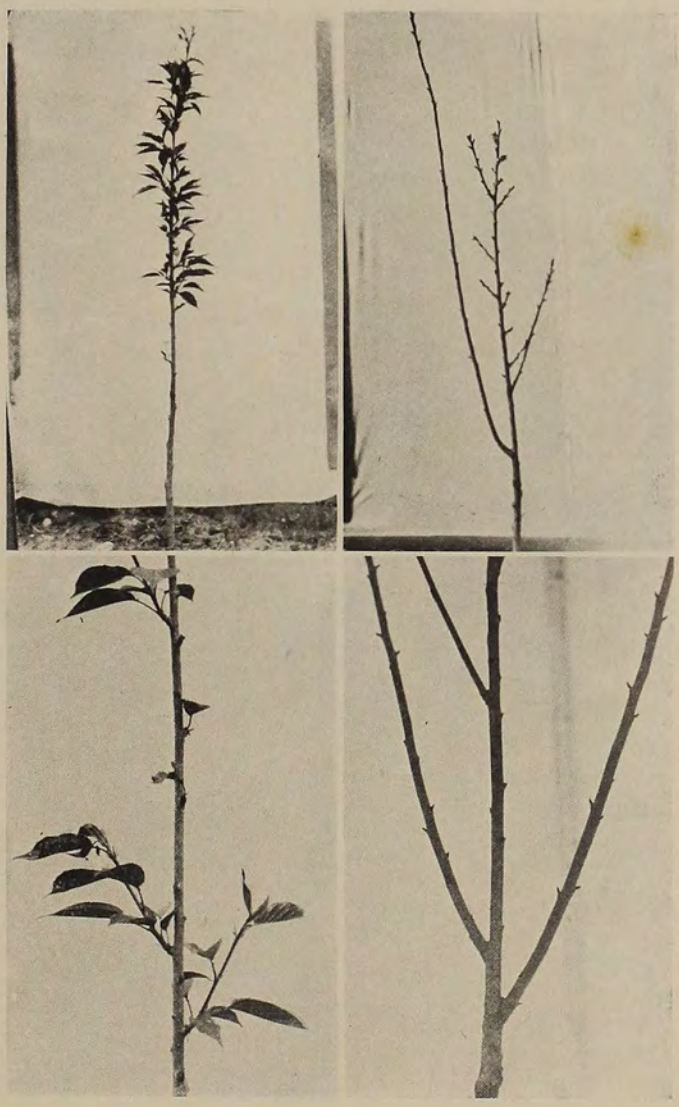

FIG. 5.—*All the shoots were allowed to grow on this tree (upper left).*

FIG. 6.—*Where all the shoots are left trees have a tendency to develop numerous short spur-like growths covered with flower buds (upper right).*

FIG. 7.—*Close-up view showing growths left to develop into scaffold branches (lower left).*

FIG. 8.—*Close-up view showing that only the growths over three inches in length developed into strong branches (lower right).*

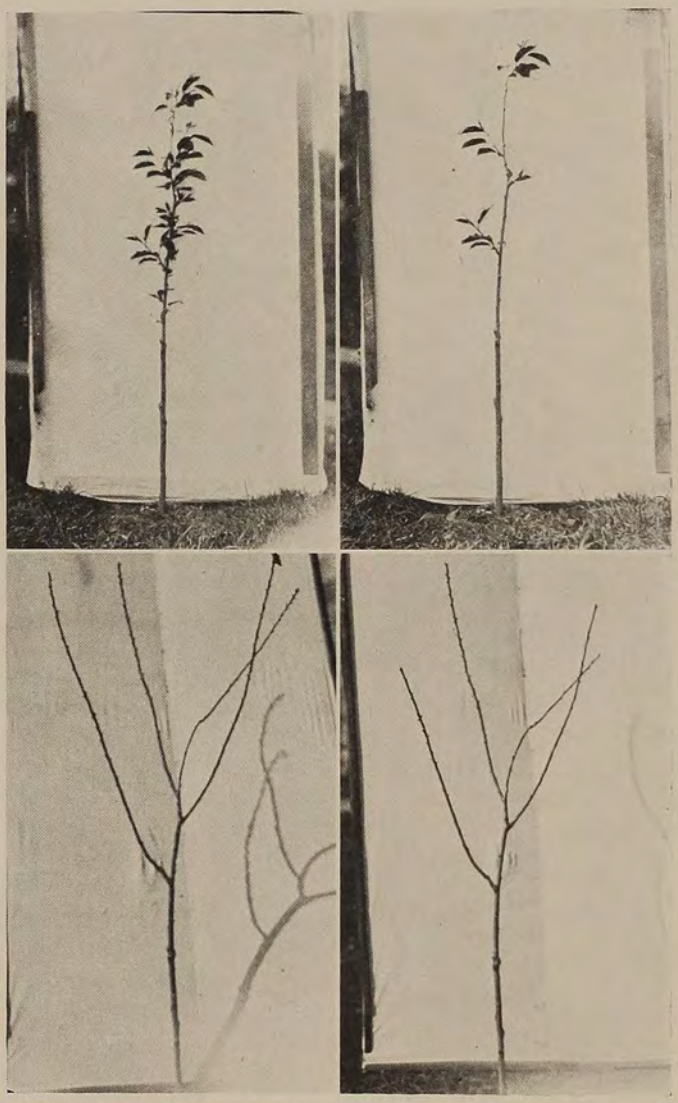

FIG. 9.—*Ready for de-shooting. Photographed spring, 1933 (upper left).*

FIG. 10.—*All growths removed except three lateral branches and leader—growth of tree above the upper lateral shoot is weak (upper right).*

FIG. 11.—*Growth made by shoots left to form scaffold framework —weak growth was made by shoot left for leader. Photographed spring, 1934 (lower left).*

FIG. 12.—*Upper lateral branch selected to replace leader and two lower laterals headed back lightly. Former leader headed back lightly and left as a possible scaffold branch (lower right).*

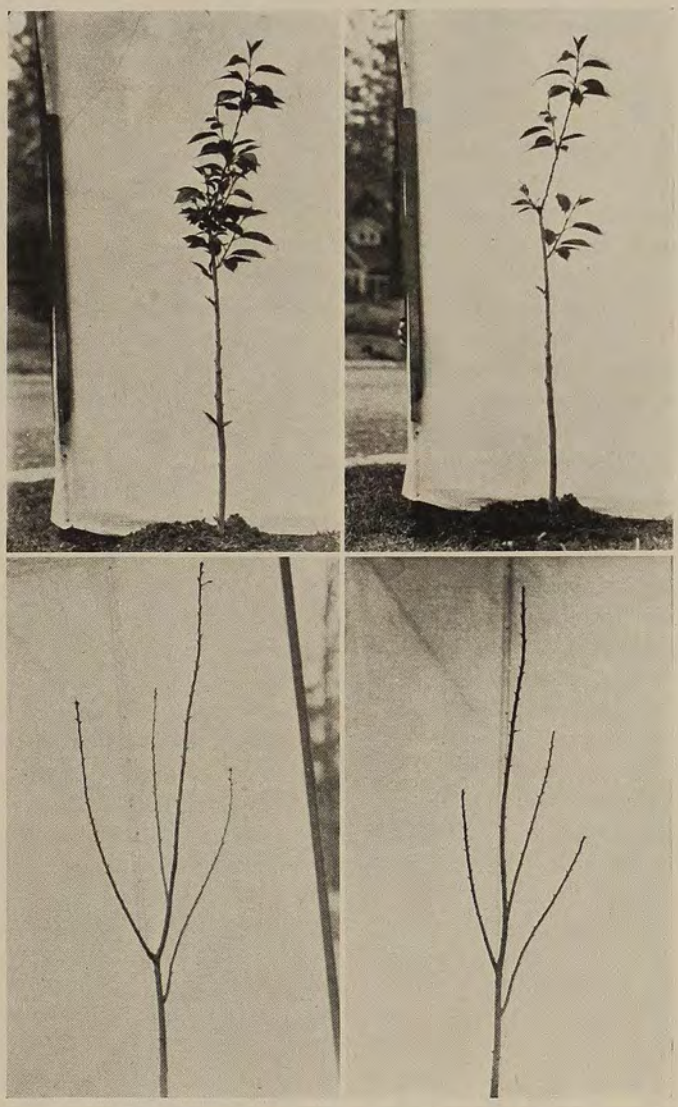

FIG. 13.—*Ready for de-shooting. Photographed spring, 1933 (upper left).*

FIG. 14.—*All growths removed except four lateral shoots and a leader (upper right).*

FIG. 15.—*Strong growth made by all but one of the shoots left to form the scaffold framework. Photographed spring, 1934 (lower left).*

FIG. 16.—*All branches pruned back moderately to force growth lower down. Strong growths allow heading back into healthy buds and are particularly desirable when the buds on upper part of the branches suffer winter injury (lower right).*

is interesting to note that even though no leader was left upon which to develop the top of the tree, an inner branch from one of these scaffolds grew toward the open center and formed a sort of modified leader upon which the upper framework of the tree has developed. Although this is the exception rather than the rule it does demonstrate that at times well-formed trees can be produced even though the tree has been headed back too low at planting time.

With the fruit bearing trees such as apple and peach, horticulturists have pointed out that scaffold branches arising on low headed whips, not only are too close together, but arise at more acute angles with the main trunk and the crotches thus formed are much weaker than those of branches arising at less acute angles. This is a very important factor to consider in training fruit trees which bear heavy loads of fruit and while relatively not so important in the case of the flowering cherry, it is still worthy of consideration, for during those periods when the branches are called upon to support heavy loads of snow or ice, or when violent winds whip them about, large scaffold branches with weak crotches may break and spoil the trees. Compare the strong wide-angled crotches of the well-spaced, first formed scaffold branches on the tree in *Fig. 2* with the closely crowded ones arising at an acute angle on the tree in *Fig. 1* and picture to yourself which of these you would pick were you to suddenly need one to support your weight.

Selecting and Spacing the Scaffold Branches

This is the most important phase of the training work. It has been my observation that in most cases, poorly shaped Kwanzan cherry trees are the result of lack of attention to the selection and distribution of scaffold branches. This is well illustrated in *Figs. 1-3 incl.* In *Fig. 1* the six scaffold branches were allowed to grow closely bunched together about midway on the trunk of the tree. As these scaffolds grew and competed with each other for space they gradually choked out that part of the tree above them which would normally have been the main trunk. In *Fig. 2* the first scaffold branches were fairly well spaced and they have had an opportunity to develop without restricting the growth of the leader. Unfortunately little attention was given to the secondary whorl of branches which grew from the leader later on and about midway to the top of this tree the story of the tree in *Fig. 1* has been repeated. In addition, some of the more vigorous lower scaffold branches have been allowed to grow unchecked and as a consequence have helped dwarf the growth of the limbs in the top center of the tree, the result being an unattractive unbalanced tree.

The tree in *Fig. 3* approaches nearest to the ideal well balanced leader type. Fortunately the first four scaffold branches, although arising in a cluster have not restricted the growth of the tree above and have made a relatively well balanced growth. The secondary whorl of scaffold branches arising on the leader about six feet from the ground are well enough spaced so each have developed without exerting a restricting effect on those nearest them and the development of the leader has continued uninterrupted until it terminates into a whorl of three smaller scaffold branches near the top of the tree. The growth of all of scaffold branches

has been fairly well balanced and a tree has been produced which is attractive in form. In the group of fifty or sixty trees of which this is one, there were only one or two trees like it, most of them resembling those in *Fig. 1* instead.

The upright habit of growth characteristic of the Kwanzan variety lends itself to the development of scaffold branches closer to the ground than would be possible with a variety of more horizontal growth habit. The branch nearest the ground can be started at any height to suit the fancy. In *Fig. 20* it is 18 inches, in *Figs. 19 and 23* it is 22 inches and in *Fig. 25* it is 27 inches from the ground, thus we have low and medium height heads represented, both developed on whips about 40 inches in height, which were not headed back after the lateral branches were removed.

There are two questions which we hope these articles will help clear up. How many scaffold branches must be selected to form a good bushy tree? How much space is needed between each scaffold? It has been pointed out that the scaffolds on the tree in *Fig. 3* were too close together and an examination of the tree on *Fig. 2* shows that the distance of 12 inches between the largest scaffold branches is too much. In training apples and peaches the shoots are spaced about eight inches apart. Will this be too much for the flowering cherry? In an effort to answer these questions, trees have been *de-shooted* leaving three, four, and six shoots respectively all well distributed around the tree. The tree in *Fig. 20* had the lowest shoot selected 18 inches from the ground, leaving 22 inches of trunk above it upon which to space the rest of the scaffold shoots. The distance between this lower shoot and the two above it being 6 and 10 inches respectively.

In *Figs. 13-15* inc. another tree with three scaffolds is shown. Here the lowest shoot is 27 inches instead of 18 inches from the ground but the tree happened to be 46 inches in height and this left 19 inches of trunk above it upon which to space the other two scaffolds which are 6 and 6½ inches apart respectively. With so few scaffold branches left the question arises as to whether they will be sufficient to form a well shaped, bushy tree which will produce the maximum amount of bloom.

In *Figs. 17-19* inc. the selection of four scaffold branches on a whip 41 inches in height is shown and the space between each scaffold is approximately 4 inches. This gives us a scaffold branch on all sides of the tree and as this tree develops it will be interesting to note whether four inches will be enough space to insure the proper development of all four scaffolds and the leader. The distance between the four scaffold branches making up the secondary whorl about midway up the leader of the 20 year old tree in *Fig. 3* is about the samt as that in *Fig. 19* thus giving us a suggestion as to how those we have just selected will look later on.

Going a step further, six scaffold branches have been selected on a tree 43 inches high, the lowest shoot arising about 22 inches from the ground. The distance between the branches is reduced to between 2½ inches and 3 inches or about one-third that considered ideal for the apple and peach trees. This makes a well balanced looking tree at this time but as new growth is added each year will it be necessary to prune out some of it to prevent crowding, or will there be

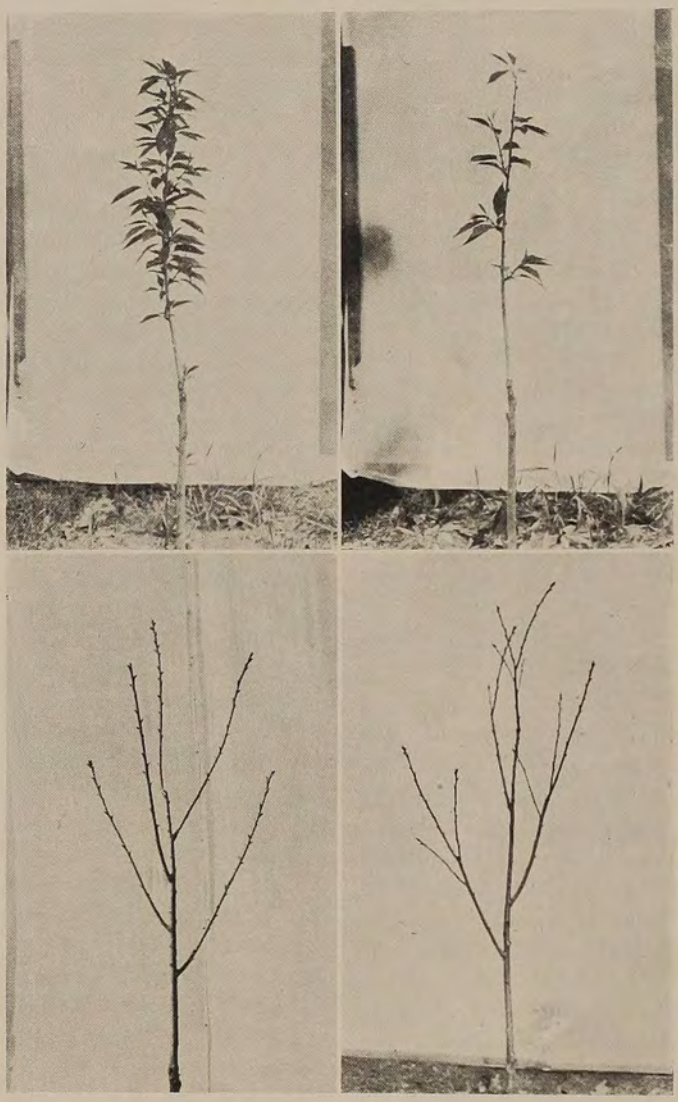

FIG. 17.—*Ready for de-shooting. Photographed spring, 1933 (upper left).*

FIG. 18.—*All growths removed except four lateral shoots and a leader (upper right).*

FIG. 19.—*Growth made by shoots left to form scaffold framework. No pruning necessary except for light tipping of middle branch. Photographed spring, 1934 (lower left).*

FIG. 20.—*Growth made on tree from which all growths were removed except three laterals and leader. Branching caused by Oriental peach moth injury. Photographed spring, 1934 (lower right).*

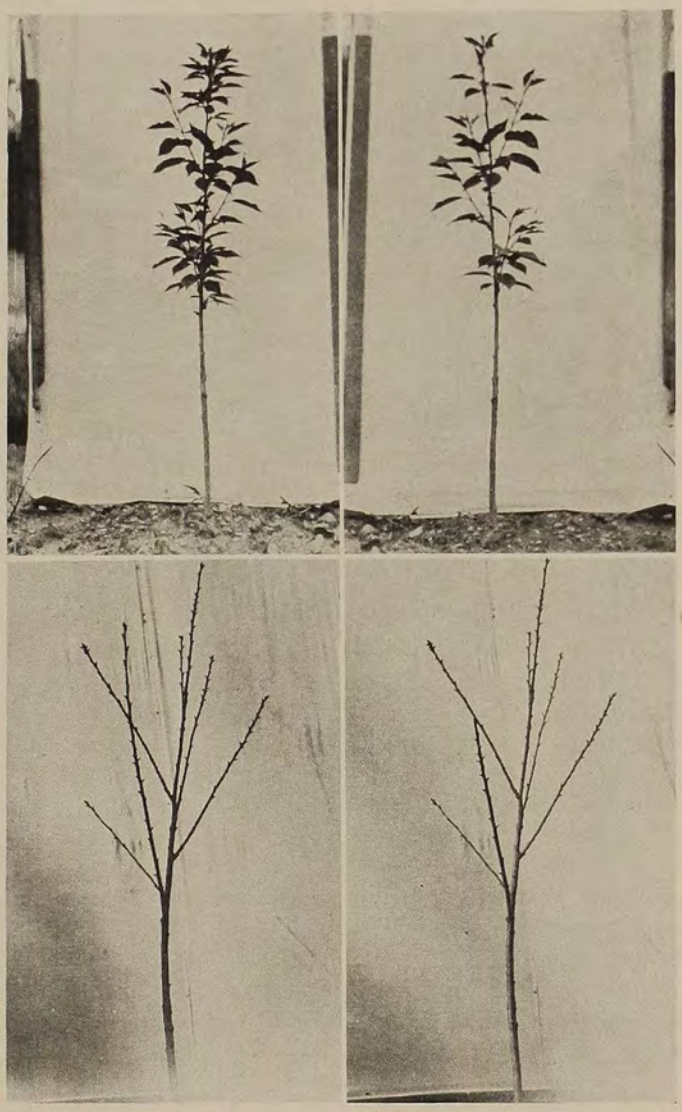

FIG. 21.—*Ready for de-shooting. Photographed spring, 1933 (upper left).*

FIG. 22.—*All growths removed except six lateral shoots and a leader (upper right).*

FIG. 23.—*Growth made by shoots left to form scaffold framework. Photographed spring, 1934 (lower left).*

FIG. 24.—*No pruning necessary except to head back the lowest branch (lower right).*

room for all to develop fully? I am sure it will be interesting to watch the development of these trees during the next five or six years and our questions should be fairly well answered during that time.

Failure of Leader

In some instances the shoot left to form the leader fails to grow as rapidly as the scaffolds do and after the first season's growth the strong branch just below it is the logical selection for a leader. *Fig. 9-12* incl. At *de-shooting* time it was noted that the growth on the upper foot of the tree in *Fig. 10* was weak and it is not surprising that the shoot arising from it did not develop properly. When this condition is present the leader can be subdued at the time the lower laterals are cut back and the strongly developed upper scaffold branch selected to replace it as shown in *Fig. 12,* or the weakly developed leader can be cut and the tree trained to a semi-vase shaped tree like that in *Fig. 4.* If, while in the nursery the flowering cherry tree grew as rapidly as the peach tree it would have been better to have selected trees 5 or 6 feet high and cut them back to around 40 inches at planting time, thus reducing the chance of leaving weak growth at the top of the whip.

Pruning Necessary after One Season's Growth

It will be recalled that at the time trees were planted they received a heavy pruning but no pruning was given these trees after de-shooting at which time potential scaffold branches were selected and all others removed. The growth made by each shoot is shown in Figs. 11, *15, 19, 20, and 23* Where Oriental peach moth is present, the larva may bore into the tips of the growing shoots forcing the buds just below the injury into growth as illustrated in *Fig. 20.* This may reduce in length the growth we would normally get but it does not seriously interfere with the shape of the tree, because the first bud just below the injury usually grows out at an acute angle and at the end of the season except for small lateral branches forced out at this point the growth of the scaffold branches has continued on in the right direction.

In contrast to the heavy pruning at planting very little pruning is required at the end of the first season's growth. In *Fig. 13* where each shoot made a growth just under two feet in length no pruning was necessary. In *Fig. 24,* where most of the shoots made a growth between 15 and 18 inches it was only necessary to cut the lowest branch back from 27 inches to 19 inches in order to balance up the tree. It might be well at this point to stress the fact that cutting a branch reduces its leaf surface and thus in addition to shortening the growth already made also reduces its ability to synthesize food and grow as rapidly as before. If the lower left scaffold in *Fig. 2* had been cut back at the proper time, it would not have grown large enough to give the tree an unbalanced shape.

In *Fig. 16* the lateral shoots made a growth of about 32 inches and the leader grew 36 inches. Each were cut back about 6 inches in order to stimulate shoot growth lower down. The growth of the shoots of this tree has been better than any of the others and illustrates the fact that unltss we see to it that the tree receives proper care and makes a good growth, all our efforts to produce good scaffold branches will probably be in vain. I stress this point for I have seen

numerous examples of flowering cherry trees making a valiant attempt to grow under adverse conditions. Any system of training would have been a failure on such trees. Strong growths are particularly desirable following a severe winter such as we have just experienced for many of the last formed buds on the upper one third of the scaffold branches may be weakened or killed and in giving these branches a moderate pruning we cut back to stronger buds as potential branches for the next season.

The next problem which will confront us is the development of the second whorl of framework branches which will arise during 1934. The selection of these and the care necessary to see that all branches make a balanced growth with one anoher will be described in future issues of THE NATIONAL HORTICULTURAL MAGAZINE.

Forms of Pine—III

By Arthur D. Slavin

COLUMNAR FORMS

As most conifers are more or less upright and narrow in their habits of growth, it is only when these characters become unduely accentuated that they are worthy of notice. Several of the species are notable in this respect and some of the forms of our most hardy species have a much narrowed growth.

Pinus cembra, the Swiss Stone Pine, is notable for its upright habit and short, horizontal branches. It belongs to the White Pine group, has five needles to the sheath, and is recognized by the tomentum or wooly covering of the young branchlets. In the wild this tree reaches a height of sixty to one hundred and thirty feet and in old age is said to develop a broad round top. In cultivation it remains narrow and seldom is more than forty feet tall. The branching is dense and covered with dark green leaves. Specimens twenty years old average twenty to twenty-five feet in height. Although not a fast grower, it is one of our most hardy cultivated pines. Its use, as a specimen tree where space is at a minimum, or in plantings with other larger evergreens as a background is to be especially recommended.

Pinus cembra columnaris, a particularly columnar form of the species, is mentioned by some authors. It is not common, however, and I know of no specimens in this country.

Pinus peuce, the Macedonian Pine, is a native of the Balkan Mountains from whence it was introduced in 1863. It is a slow-growing tree and probably the most tender of the columnar forms enumerated here. It is, nevertheless, quite hardy in most locations. Like the Swiss Stone Pine, it is narrow pyramidal in habit with short branches which are inclined to be more ascending than those of *Pinus cembra.* The leaves are slightly smaller and bluish green, a sufficient tonal attribute to be of value when this tree is planted in groupings with materials of brighter color. It is a slow grower of dense habit and reaches about eighteen feet in twenty years. Large specimens in England attain a height of fifty to sixty feet. It finds its greatest use in specimen planting where a small tree is desired. A light loam is an excellent medium in which to plant this tree and if some protection from cold winds and the late winter sun can be afforded it, one need have little concern for its success.

Pinus monticola, the Western White Pine, is closely allied to the Weymouth or Common White Pine but is more narrow in habit. A native of British Columbia, Northern California, and Idaho, it adapts itself admirably to conditions in the east and appears to do as well as the native eastern species. While not exactly columnar in habit, it is sufficiently narrow as a large tree to comment upon where height rather than a maximum covering of ground area is to be considered. Its fast growth makes it desirable as a windbreak. Although not as densely branched as the materials already mentioned, my own observations show it to be more densely branched than *Pinus strobus,* the Common White Pine. To one who

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Pinus cembra

has not seen many specimens it is easily confused with the species just mentioned. The leaves, however, are more densely disposed and generally shorter while the cones are quite distinct from the species *strobus* being longer, more narrow, and with a greater number of scales. To say they resemble a long, thin cigar is perhaps as good a comparison as may be made.

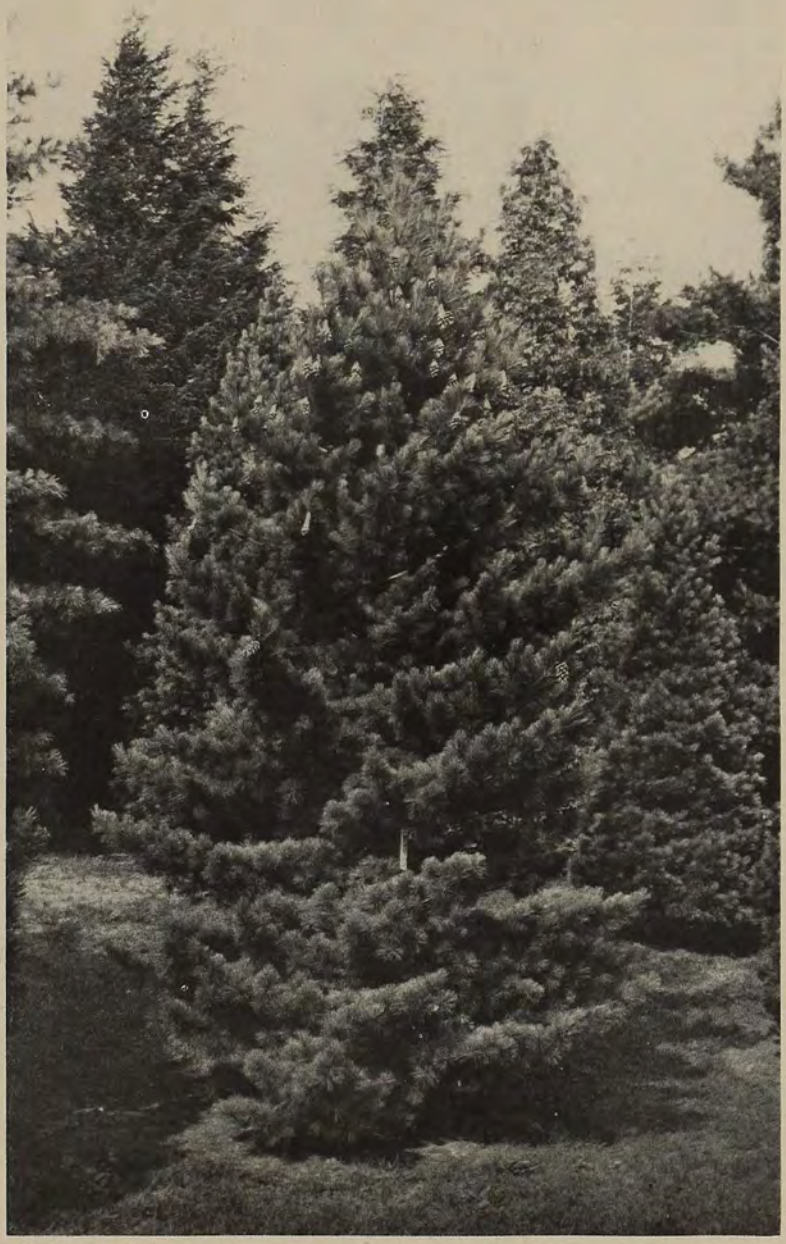
Trees of one hundred to one hundred and fifty feet are not uncommon in the wild and its fast growth in the east should make it a possibility as a reforestation material. Specimens in the Pineta of the Rochester Parks have attained a height of forty feet in twenty years. Several have produced fertile seed for some years. I can imagine no better pine as a specimen tree where height and grace-

fulness are desired or as a screen where speedy growth and size are essential elements.

The columnar form of the White Pine, *Pinus strobus fastigiata,* is fast becoming known as an ornamental plant material. It is excellent as a small specimen tree where the species *cembra* or *peuce* might suffer from undue exposure. It is most adaptive for use as a protective hedge and when planted four to five feet apart should, with judicious clipping, make a dense screen in a short time. Such a hedge may be expected to reach ten feet in a few years and after that continue to advance in size at a rate of six to eight inches per year. I am informed that at least one tree in this country is now close to forty feet tall. Specimens at Rochester were planted out in 1924 and now measure thirteen feet in height with a cross section of about six feet. From these dimensions it may be seen that it does not have the strict columnar tendencies of the upright Scotch Pine. The branching is markedly ascending and would appear to be more dense than in the later variety although this appearance may be due to its more compact habit. The foliage appears to be more closely arranged and lies in planes parallel rather than perpendicular to the branchlets.

The only species of Hard Pine to display columnar habit is *Pinus Jeffreyi,* Jeffrey's Pine. Introduced from Oregon and California in 1853 it was long considered a variety of the Western Bull Pine, and was called *Pinus ponderosa Jeffreyi,* which designation is still held by some authorities. Unfortunately, it does not appear common in cultivation and it is seldom seen in our plantings. Erect growing with rigid, horizontal or slightly ascending branches, it presents a bold effect and is to be recommended only where its surroundings are of sufficient size to remain in conformity with it. It appears entirely hardy here, a tree planted twenty-two years ago at Highland Park in Rochester now measures forty feet tall. Standing in the open, it reminds one of a huge monument with perpendicular sides and rounded top. The foliage identifies it immediately being very long, coarse, and a striking grayish green in color. The leaves are arranged in sheaths of two to five, usually three, and average six to ten inches long. Even as a small plant only several feet tall it presents a handsome appearance, its heavy grayish green leaves drooping gracefully at the ends of the branches. It attains a height of close to two hundred feet in the wild and is likely to reach seventy feet in cultivation. Specimens eighty feet tall are now growing in England. All of which tends to show that this beautiful conifer is not for the small garden but rather for large areas where its bulk may be in keeping with its surroundings.

A new entry into the field of columnar and narrow pyramidal forms is *Pinus nigra pyramidalis.* Found as a seedling in the Pinetum at Durand Eastman Park at Rochester, the first announcement of this variety was published in my paper given at the Conifer Conference of the Royal Horticultural Society in London, 1931. It resembles the columnar form of the White Pine but is more fastigiate than that variety. Although not well known, it should become an excellent substitute for the Columnar White Pine as it does not have the disease and insect troubles of that species. Due principally to its heavier branches and coarser leaves, it presents a somewhat bolder and stiffer appearance than the White Pine form. It is most adaptive to specimen plant-



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Pinus peuce

ing where space it at a premium or in groupings for shelter against wind and sun. The type is about twenty years old and twenty-four feet tall. It is not more than twelve feet in breadth. Due to the close proximity of other trees, the type cannot be photographed and the specimen illustrated here is a graft ten years old and nine feet tall. The branching habit is gracefully ascending or curving upwards with the tip of each branch perpendicular or nearly so. The foliage is like that of the species, heavy, lustrous, and dark or slightly bluish green.

For composition work where a distinctly columnar conifer has been required to give an ultra effect of height we have had until recently nothing but the juniper and arborvitae. The demand for such material has been so great and choice so small that in many cases these plantings have been eliminated where ever possible. This condition has been largely eradicated by the recent introduction, horticulturally speaking, of *Pinus sylvestris fastigiata,* the columnar Scotch Pine. Since it is a member of the Scotch Pine species, it may be depended upon to be perfectly hardy and not particular about soil. No one appears to know just how or where it was found except that it was first described by Carriere in 1867. English writers indicate that it is not widely distributed and speak of it generally as an uncommon plant of fastigiate character similar in habit to the Lombardy Poplar. There is some possibility that they may not have had the right thing and are referring only to specimens of more upright tendency than the type. I had the pleasure of sending several small plants to the Royal Horticultural Society of England a year ago and latest reports mention that they are doing nicely at Wisley, the experimental gardens of the Society.

The introduction of this plant to our local collection is interesting. In 1920 scions were received from a certain nurseryman and were propagated. Nobody appeared to know just what the result would be like. As the material developed, investigations were made to discover more data but little information could be obtained. The nurseryman said that he originally had two specimen but these had been sold and no record was kept of the transactions. Due to some reorganization of the firm, it was even impossible to determine where the plants had originally been obtained. The result was a somewhat disgusted nurseryman and several plants which proved to be a real find in the Pinetum of the Rochester Parks. I have been unable to find documentary evidence, but inquiry and speculation suggests that it was found in some continental nursery and I cannot dismiss the thought that it might quite likely be the establishment of Ludwig Späth in Germany. The largest specimen I have ever seen or heard of is our own. It stands eleven feet high after twelve years and is truly, "as straight and slender as a flagstaff." At the present time its maximum breadth is twenty-five inches. The color of its foliage differs from the type, being a glaucous or bluish green, which admits a pleasing contrast with other evergreens or flowering plants. The branches are ascending and in some cases erect, pressing themselves closely to the main stem. What height it will eventually attain is problematical. It is now steadily on its way to twenty feet and may, in time, top surrounding objects thirty feet tall. It may be said to be safe anywhere in the landscape except in front of windows.

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Pinus Jeffreyi

A. D. Slavin

Pinus nigra pyramidalis

A. D. Slavin

Pinus sylvestris fastigiata

For relieving the sharpness of corners it is unsurpassed. It is my fond hope that some day I may see this fine tree planted somewhere in rows lining the sides of a garden path.

PENDULOUS FORMS

Pendulous forms of trees, considered in the proper sense, include only those whose branches are completely without the ability to support themselves in any manner approaching a horizontal plane. For this reason, and because, in most cases, the woody character of the tree is the same throughout, we find that most of our true pendulous forms never attain the proportions of a tree, the leader, like the branches, having insufficient strength to support itself in anything like an upright manner. Where specimens of some height are to be seen it is generally because the leader has been supported by artificial means. When this does not happen, the plant is quite apt to be considered as a dwarf as it really is in such instances. However, the effort spent in providing artificial support for such materials is usually well worth while as the resulting specimen will add greatly to the gracefulness of the garden. Hence, even though many of the materials included in this group are really dwarfs if left to grow unaided by artificial means, we include them here because in most instances they are best suited to ornamental work if, so to speak, they are kept off the ground. In practical work, still other forms of trees are considered as belonging to this group. Such forms as those having pendulous foliage, branchlets, etc., are the most noteworthy examples.

Although there is a fair representation of material in this genus with pendulous characteristics, only a few attain notable size and the greater number must be considered as dwarfs. In my mind the most outstanding of our pendulous pines is *Pinus ponderosa pendula.* A very slender, erect tree with pendulous branches and drooping leaves. In all the published accounts of this form the later characteristic appears to go unmentioned although it forms a most important adjunct to the beauty of the tree and appears to be more pronounced than the drooping habit of the branches. In this variety but few lateral buds are developed, the result being a similar lack of branches. The growth is principally terminal and occurs at the ends of the main and lateral leaders. The foliage is much like the species, previously described, but longer, and measures eight to eleven inches.

As a small tree, it presents a rather grotesque, open appearance, a factor not generally desired where young plantings must give an immediate permanent effect. It is really a black sheep and will find its home among those gardeners who wish something odd or fantastic. For my own part, I like it because of its fast increasing size and exotic appearance. I do not think I would care to have it placed in too prominent a position in the garden. At the home of Mr. Fred Barry of Rochester there is a specimen set well back which I believe was planted by his father. It is now sixty-five feet tall and tops all the surrounding tree material. Viewed from the street it is rather an awe inspiring spectacle.

A form we know as *Pinus sylvestris pendula* is mentioned by Dallimore and Jackson who state that it was found in a woods in Eastern Prussia. Little appears to be known about it and no data regarding cultivated plants is available. Such a form if existent at the present time, should

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Pinus ponderosa pendula

prove a valuable addition to our list of ornamental conifers.

Another form, *Pinus nigra pendula,* has been described by Beissner. Dallimore and Jackson claim it to be of little merit and as I have never heard of its being in this country, I can act only as narrator of its existence.

With a brief comment on the pendulous form of the Japanese Red Pine, *Pinus densiflora pendula,* we leave this group. How long this par-

ticular form has been in America I do not know except that it is a plant introduced from Japan and common in the gardens of that country. Hence, it is quite probable that it has been known to horticulturists of the western world as long as any of the other forms of the species. Wilson mentions it as one of the three most important forms of the Japanese Red Pine and, hence, there must be value attached to it. In my own experience, I am inclined to place it at the lower end of the class because I have but on one or two occasions seen a really worth while specimen, although plants here at Rochester appear to make average growth. The branches are entirely pendulous and scant in number. The main stem is erect although in most cases the newer growth must be supported by artificial means for a few years. Notes which I made concerning this variety some three years ago states that it would most likely assume a prostrate habit if not tied up. Consequently observations strengthen this theory. Despite all this, however, there are some good specimens to support what has been said about it. Mayhap it requires some years to acquire that element of beauty. The material which I have at hand is now but twelve years old. If the time comes when I may freely allude to its good quality and value for ornamental work, I judge, from present conditions, that I shall quote it as a narrow tree with entirely pendulous branches and foliage but in all other respects similar to the type.

COLOR FORMS

This horticultural group as represented by the Pine is not large. Its members are, however, important, and no plan for a selection of coniferous trees should be passed on without their being considered. The golden forms, although not in great number in this genus, may be used almost anywhere in so far as their color value is concerned. It may well be mentioned here, however, that the selection and arrangement of yellow foliaged plants in the dwarf group should receive some thought. Arrangements calling for low plantings, especially for the purpose of foundation work and backgrounds, often have their appearance marred by an over exaggeration of yellow color in what should be a dark mass to accentuate more colorful plantings in the foreground.

To those of us who are in close contact with conifers, probably the first thing that comes to our minds when color is mentioned in relation to species is the Lace Bark Pine, *Pinus Bungeana*. Color in plants is most often expressed through the flowers, and after that, by the foliage. The conifers, exclusive of their cones, have no ornamental flower value and in this species the bark of the tree rather than its foliage is the dominating feature of its color characteristics.

The Lace Bark Pine is recognized immediately by the bluish white color of its rather smooth bark which approximates that of the Plane Tree. The branches too are smooth and grayish green. This tree is a native of the North Western China and is nominally a slow grower in this country. A specimen at Rochester planted out in 1900 is now eighteen feet tall. It is, however, located on poor ground and would probably have reached thirty feet if given the benefit of better soil conditions. In the wild it attains a height of about eighty feet. This species belongs to the White Pine group and has stiff, rigid leaves two to four inches long.

It is supposed that this tree will find use only among the oddities,

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Pinus densiflora pendula

though for my own part, I would not place it in that category. Its characteristic bark, peeling off in large irregular areas, and leaving behind large whitish spaces, would induce me to place it where I might have it under constant observance. It is always a relief to the eye and mind to see something which succeeds in a complacent mood although different from its near relatives.

A more popular form, and one which has many features of beauty and use, is the glaucous form of the Japanese White Pine, *Pinus parviflora glauca*. Its habit of growth, vigor, and other essentials are the same as the type described previously in the special tree group. It has, however, as its one distinguishing feature a silvery cast to its ordinarily blue-green leaves. A complete description of its characters would be only a repetition of what has been said of the species. Used as a specimen tree of small size, it fulfills its requirements to the utmost. Where space is available, I can think of no better combination than a somewhat scattered group planting of both the variety and species to create a pleasing color contrast, each specimen acting mutually with the others to accentuate the color of the foliage. It is difficult to conceive how a garden layout designed in an oriental tempo can possibly be without some form of the Japanese White Pine.

The most commonly known pine with aureated or golden foliage is *Pinus densiflora oculus-draconis* and, for ornamental purposes, it is perhaps difficult to say whether it should be treated as a tree or dwarf form. It is a tree, however, although few specimens have been planted a sufficient length of time in this country to receive that qualification. It is identified by its leaves which are green with two bands of yellow equally distributed from each of the ends. In other respects it corresponds to the species. The habit of growth is irregular with horizontal branches, forming a broad head in specimens of tree size and in smaller plants a roundish, shrubby appearance. The largest specimens I have seen in this country are not more than five feet tall but they have not been long planted and there would appear to be little doubt that in a few years some of these will be the square of their present dimensions.

A second form of the same species is *Pinus densiflora aurea,* a variety of long standing in the gardens of Japan. The foliage of this tree is almost entirely yellow. In other respects it resembles the preceding variety. I have little data concerning this form and have seen it but a few times. It would appear, however, to follow the same cultural requirements as the variety *oculus-draconis*. I quote the following from Dr. Wilson's "Conifers and Taxads of Japan:"

"It was introduced to this country by Dr. George R. Hall in 1862. In the garden of Mr. C. H. Tenny at Metheun, Massachusetts, there is growing a fine specimen of this curious pine which is 5 meters high and 2.3 meters through the crown." All the forms of this species are hardy in cultivation and little concern need be given to their protection. A good soil, well drained, is the main consideration and I find that a composition of light sandy loam is most successful.

(To be continued)

Lilium Leucanthum Baker

By David Griffiths

The English-speaking world had its first introduction to *Lilium leucanthum* from a collection made by Dr. Augustine Henry, employed in the Chinese Imperial Customs Service of Great Braitain (1) at Ichang, China, in 1888. The collection was made according to Baker (2) in the "Ichang Gorge of the Yang-tze-Kiang;" Wilson 3) refers to the Henry collection as from "glens off the Ichang Gorge." It is important to note the locality, also that the package which Doctor Henry sent to Kew Gardens by way of Hongkong, reaching there in 1889, contained what was settled upon by Baker as *L. leucanthum* (2) and *L. browni chloraster.*

Doctor Baker appears to have had a great deal of difficulty in classifying this lily. He first described *Lilium longiflorum chloraster* (4) where it seemed to me his description fits the lax and white-flowered form of the lily rather than what is now commonly called *L. leucanthum chloraster* Wilson (*L. centifolium* Stapf) (3). Later in the same year (5), however, he presents a revised description of the same lily which fits the *L. centifolium* form better. Baker's final decision (2) has been accepted as making the lily with lax white flowers *L. leucanthum,* and the other the variety *chloraster.*

It was in 1894 that Doctor Baker wrote *Lilium browni leucanthum* (6) and said the lily resembled *L. formosum* of Franchet (7). Wilson (3) shows that the two are the same lily. Grove (8) discusses and figures the white and lax-flowered form of the lily which was sent out from the Petrograd Botanical Garden as *L. browni kansuense.* This is further discussed by Schenkel (9). Wilson gives the history of this at the bottom of page 40 (3). It is fortunate that Wilson (3) knew the history of the *L. jamesii* offered by Farquhar (10), for *L. leucanthum* was put out in this firm's catalogue as a "new Bermuda lily closely related to *L. harrisi.*"

Reginald Farrer (11) tells how he found a lily in the village of Siku in the Province of Kansu, China. Grove (12) gives an excellent account of this lily, referring to it as Farrer's No. 316. This lily is again discussed and figured under Farrer's number about the same date in another publication (13). Clarence Elliott gives his experience with Farrer's No. 316 (14) and predicts for it a brilliant future.

Elwes (15) presents a preliminary revision by Stapf of the lilies of the *Lilium browni* group which is rather difficult to follow in its entirety; but Elwes thinks that the *L. leucanthum primadium* proposed and *L. browni chloraster* are identical. Elwes also ties up *L. centifolium* of Stapf with Farrer's No. 316. Wilson (3) refers the *L. leucanthum leiostylum* proposed in (15) to *L. leucanthum,* although Stapf says the style bases are glabrous. The main importance of this article lies in the addition of the new names, all of which must be rejected.

Stapf publishes his own description and figures of *Lilium centifolium* a little later (16). It is particularly interesting that he, Stapf, expresses a

The late Miss Mary Webb in her original planting of Lilium leucanthum in the Piedmont of North Carolina. The plants flowered for the first time from imported seed, in 1924.

doubt about including Henry's plant "from Fang in Hupeh." Henry's manuscript note says the flowers are perfectly white. This will be referred to later.

There are other references, but those noted are the important ones in the history of this species. Enough is given to show the diversity of names applied and the conflict of opinions which have existed regarding the relationships. Fortunately the record is rather clear all the way through. There are good illustrations accompanying many of the references, and Wilson (3) especially has cleared up and given specific statements regarding the results of the examination of types, thus clearing up points which would otherwise be doubtful. Besides, the identiy of Farrer's plants is easily verified, for the material of *Lilium centifolium* distributed from Britain the last few years is derived mainly by seed propagation from Farrer's No. 316.

Within the past five years three distinct lots of this Farrer lily, two bulbs of each, have been secured from as many sources by the Bellingham Bulb Station, Bellingham, Wash. One bulb of each of them has blossomed. One of the blossoms would be readily referable to Farrer's No. 316 as figured in No. 16, while the others are unmistakably referable to the white and lax-flowered plant figured in the excellent plate accompanying Wat-

Two plants of Lilium leucanthum chloraster (Lilium centifolium) in an unheated greenhouse at the Bellingham Station, from bulbs furnished by Miss Webb.

son's account (1), now accepted as *Lilium laucanthum*. Farrer reports that the original seed of his No. 316 came from two plants cultivated in a garden in the village of Siku, Kansu, China.

The Lily in the United States

On June 15, 1925, the Office of Foreign Plant Introduction of the U. S. Bureau of Plant Industry received among other items a small quantity of seed of a lily from the Rev. A. S. Cooper, long stationed at Ichang, China. A brief account of this seed was published under the inventory No. 64222 (17) as from Chingkangsan, Hupeh, China.

A letter of inquiry to Mr. Cooper elicited the very interesting information that this lily was collected "in a glen above Ichang," and further that the seed sent to the Department was not from China but that it was grown from bulbs produced from seed sent from China "several years before." Later Mr. Cooper is still more specific. He reports that "it was found growing two or three miles up the San Yu Tung glen in a dense thicket of small trees and bushes." A very important piece of information for our purposes is the fact that Mr. Cooper sent to the United States the contents of a single pod of seed.

The original seed from China was sent to the late Miss Mary Webb, located in the Piedmont of North Carolina. She grew it and produced from the first blossoming the seed that

was sent to the Department. Miss Webb wrote in November, 1927, that she grew the lily six years before it blossomed. When she was visited in October, 1929, however, she warned against taking that statement too literally, that it seemed to her six years but that "several years" might be more exact. It will be noted that Mr. Cooper said the seed was sent from China "several years" before it came to the Department. Although the lily blossoms readily the second year from seed under good cultural conditions at the Bellingham Station, it is not at all surprising that Miss Webb should have grown the seed she got from China "several years" before seeing a blossom. Her location is characteristic of the Piedmont. The soil is a refractory, gravelly red clay typical of so much of the poorer lands of this region.

It has already been stated that the seed which Mr. Cooper sent from China was out of a single pod. This is important, for we have in the progeny of this in both the first and subsequent generations both of the lilies which were described and figured as *Lilium leucanthum* and *L. centifolium*. Both forms were recognized by Miss Webb, and the differences have been very striking in the plantings at the Bellingham Station. So far as known this and the Farrer collection constitute the only material of the species in cultivation today in either Europe or America. This diversity has made it impossible to treat the species in the handling which the Department has made of it except under the specific name, *Lilium leucanthum*, for it has not been practicable to segregate the seedlings into the two forms. This, however, may be done eventually, for the difference is too great to be included in one horticultural variety. After this is done, seminal propagation for increase of stock of the segregated varietits must be abandoned. This is not desirable at present.

Lilium leucanthum is a wonderful lily when at its best, but it may well be that in the future it will not be a widely-grown lily for the reason that it is very subject to mottling which not only disfigures it greatly but interferes with its persistence in both garden and greenhouse. Although one of the grandest of the world's lilies most lily gardens may have to get along without it. As near as can be judged better success is had with it in Britain than in the United States. It has not persisted well at Bellingham. For this reason the effort at the Bulb Station has been to place with growers 2-year-old setdlings in the hope that a good percentage of them would escape the mottling and become firmly established in enough gardens to insure perpetuation.

A Lily for the Breeder

The writer is inclined to look upon *Lilium leucanthum* mainly as a lily for the breeder. Its hybrids with *L. regale* are of wonderful constitution, vigor, and beauty when the latter is used as the pollen parent. The reciprocal cross is too likely to be predominantly regal. It also crosses readily with *L. sulphurcum* and *L. sargentiae*, but its offspring with Mrs. Sargent's lily are as prone to mottling as either parent, but when a touch of the regal enters the complex, whether from *L. regale* itself or from any of its offspring such as George C. Creelman or Sulphurgale, there is a wonderful invigoration. Another peculiar thing is that the progeny of *L. regale* ×*L. leucanthum* although variable is much more uniform than *L. leucanthum* itself. This coupled with the

Scale propagation of Lilium leucanthum at the Bulb Station, Bellingham, Wash., between August and April.

fact that growers on Vashon Island recognize white, red, and yellow regals besides the ordinary form, from an almost clonal development of the regal in this country, makes one wonder what these lilies are in reality. It also makes one "itch" to get into the regions where the lilies are native for the purpose of securing the variations that must occur in nature. We already know that the regal is by no means the rare lily that Mr. Wilson considered it. The report is that it is abundant over very large areas.

Description

A technical description of *Lilium leuchanthum* is not considered necessary here. Those who have use for such a characterization can readily refer to the literature cited, especially to the comprehensive characterization by Wilson (3). In vegetative characteristics it may be looked upon as a very robust regal and its flowers are larger and lighter in color. One characteristic which sets it off from most other lilies is the densely pubescent filaments and style bases.

The species is quite hardy at the Bellingham Station when the bulbs are set down where they belong, 6 to 8 inches deep, but propagation from scales and young stock which is shallow require careful mulching. Mr. Frank Campbell wrote me some years ago that this was one of the few lilies which persisted in his Michigan garden neglected for two years while he was off in the war. It is even a more prolific seeder than the regal. Seeding under open field conditions at Bellingham will nearly

always give some blossoms the second year in the seed bed. Scale propagation which is prolific will do likewise; there are usually a few bulblets produced on the stem just below the surface of the ground; and the bulb cleavage is quite similar to that of *Lilium regale.*

Conclusions and Suggestions

To summarize, Doctor Henry's original collection was referred to two species, which have been variously interpreted and have been assigned several names, but are now generally accepted as *Lilium leucanthum* and *L. l. chloraster,* while in Europe the latter is usually referred to as *L. centifolium.* The seed collected by Farrer from two plants in a garden in the province of Kansu, China, contain the same two lilies. Mr. Cooper's collection, from what may be considered the type locality, contains both lilies in the same pod of seed. In the light of these facts it is not difficult to appreciate the reason for confusion regarding the lily sent by Henry to Kew from Fang in Hupeh, referred to in No. 15, and discussed further by Stapf (16).

The most important practical fact, however, is the possession by the American lily grower today of a foundation stock of this lily, thanks to the efforts of Mr. Cooper and his niece, Miss Webb. It is a lily that has excited the interest of all growers, and the cupidity of both growers and dealers. The prices asked for bulbs have been among the highest on the market in recent years. It is to be hoped that the lily growers of America are sagacious enough to succeed with the culture and that they will maintain stocks. In foreign countries stocks are continually dissipated. One-year-old seedlings are put on the market. Of course but few of them live. On account of the prevalent mosaic condition it is advisable to keep seedlings coming right along. The lily requires a long season. Seed did not mature with Miss Webb until late October. At Bellingham the field-grown crop must be cut on advent of cold weather and matured in vessels of water in artificial warmth.

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Bureau of Plant Industry,
U. S. Department of Agriculture.

Double Rue Anemone

The A B C's of Rock Gardening—V

By Alice Minfr

I am often asked whether wild flowers may be used in a rock garden. By all means use them if their habit of growth and type of bloom are suitable. Each gardener must select from native plants only those which are harmonious to his specific garden. In the wooded and prairie regions adjacent to my home, there is a wealth of material. My garden being limited to plants of small scale excludes many that are most charming, but I find those in the following list of real value:

Anemone.

Anemonella thalictroides is the commonly called Rue Anemone of very wide distribution. It is found in both pink and white forms. The rue-like leaves come up in the spring tightly curled and a lovely deep red color. It has an extremely long period of bloom. The roots are tuberous, having three tiny sweet potato-shaped bulblets joined together to form a tripod. Late in the summer the foliage dies down. It is best to plant a dozen or more plants in a group. I have recently acquired a very double form in delicate pink. It is even more charming than the picture.

A. pulsatilla used to be found abundantly throughout this section but has been practically exterminated. It is a precious thing from the first

moment its downy silvery leaves push through the ground to the final persistent fluff of seeds that are almost as decorative as its deep purple flowers with their golden stamens. It is one of the earliest plants to bloom.

A. patens is similar to the above except that the blooms are pale lavender.

A. quinquefolia is our dainty white wood anemone. It is small and of delicate form but nevertheless an active spreader.

Asarum.

A. canadensis or wild ginger will thrive where nothing else seems to grow. The strange red flowers appear just above the ground before the large rough dark green leaves. It seeds promiscuously but is easy to pull out.

Caltha.

C. palustris is the widely distributed gay marsh marigold of damp places. The buttercup yellow flowers come early and are so gay that one must have a bit of it and that preferably near a pool. The foliage gets very large later, dying down in mid-summer and becoming very unsightly. If it can be tucked between other things and some of the largest and tallest leaves cut away, most of the unsightliness can be avoided.

Cypripedium.

C. pubescens is the tall yellow lady-slipper fairly common, at least in the past, in the woods of this region. I have found them most frequently at the base of a tree and planted them in a similar spot in the garden where they have persisted for many years. They like a soil rich in leaf mold.

C. parviflorum we call the "baby slipper," for it is a small edition of *pubescens.*

C. candidum is like the preceding except that it is white and blooms a week later. All varieties of cypripedium that can be made happy are more than worth while. The big pink one and the mocassin flower of the North woods resent my lime soil and will not thrive, much to my regret.

Dodecatheon.

D. media (shooting star) is very common with us but prefers a slightly moist situation. The foliage dies down in the summer. I use it among other plants so that the slender stem, with its nodding flowers, is partially concealed.

Dicentra.

D. cucullaria in the vernacular, Dutchman's breeches, is a very familiar flower in our spring landscape. The delicate fern-like foliage and dainty sprays of "breeches" coming in pink or white are pleasing companions to the early bulbs. This plant has a small pink bulb-like root, and the foliage dies in early summer.

D. canadensis is often called squirrel corn, no doubt owing to the peculiar collection of small "corns" which are bunched together to make the bulb-like root. The whole plant is very similar to *cucullaria* except that the foliage is a greyer green and grows in flat sprays.

Hepatica.

H. acutiloba is one of our first signs of spring. The many down stems carrying small flowers come before the leaves have uncurled. The color

range is white, together with many shades of blue, lavender, and pink. The shiny three-lobed leaves have good foliage value all summer. I have never yet had too many of these lovely plants.

H. triloba is very similar but the leaves are not so deeply cut and are rounded rather than pointed. I have found both varieties in Northern Michigan but only the *acutiloba* in Illinois.

Iris.

I. cristata is said to be found even in these days in the mid-western states. I have personally never seen it growing wild but have talked with members of older generations who speak of it as growing in vast patches. It has been described in a previous section.

Mertensia.

M. virginica, too well known to require description, is still found in central Illinois, though I have never collected it in this region. It is lovely grown with *Trillium grandiflorum* and the yellow bellwort. I use this grouping at the edges of the background, and the resulting picture is very lovely against the dark evergreens.

Phlox divaricata has been previously described.

Polemonium.

P. reptans, the wild Jacobs Ladder of my childhood, is one of our most successful natives, for it thrives almost too well in cultivation. The finely cut foliage and showers of pale blue bells make many a lovely picture with the pinks and yellows of the Alpines.

Sanguinaria.

S. canadensis (blood root). As a child I used to be fascinated by the large roots which bled so freely when broken. I tuck them in an out of the way corner where their early white and yellow blooms are cheery and where the huge leaves which follow may die back unnoticed.

In a recent bulletin of the British Alpine Society, an article mentions a double blood root as having come from America. I have never found one but from now on I shall search. If there is a double rue anemone, surely there might be a double blood root. Have any readers collected it?

Tiarella.

T. cordifolia is commonly called foam flower due, I suspect, to the fluff of tiny white blooms. It has pointed, somewhat toothed leaves and makes a neat plant both in and out of flower.

Trillium.

T. grandiflorum is common in nearly every section of the country. The rhizomes are deep in the ground, necessitating a long strong trowel and great care in digging lest the slender brittle stem be broken. Three leaves surmount this slender stem and are from 10 to 15 inches from the ground. The lovely three-petaled flower springs from the center of the three leaves on an even more slender stem from 1 to 3 inches long. The flowers are large and a very clear white. They turn pink as they fade.

Last spring I found in Northern Michigan what appeared to be a very different variety. The flowers were sometimes entirely pale green, sometimes all white with a green

line down the center or again merely piped with green on the edges. They were strangely beautiful. I was much interested to learn from an able botanist that the plants have a disease which causes these odd combinations.

T. nivale is a tiny replica of *grandiflorum* but only a few inches high. It can still be collected in out of the way places in this region. It blooms very early.

T. erectum is the red flowered type commonly called Wake Robin. The three leaves are mottled, and the three stemless flower petals stand erect in the center of the leaves.

Viola.

Most of our violets are zealous seeders and should be used only in spaces devoted to naturalizing wild flowers. There are a few, however, that are desirable.

V. pedata is often called sand or bird's foot violet. The leaves are finely cut, and the flowers are large and delicate lavender. The yellow center is shaped like a tiny beak.

V. pedata bicolor is a gem. It is like the above only two of the petals are a deep winy purple.

V. peratafida has the foliage of *pedata,* but the flowers are like our common blue violet. It is quite a seeder but hasn't as yet become obnoxious.

To Avoid

A few varieties to avoid in the rock garden are the wild geranium with its charming large lavender pink blooms but most pestiferous stick-tights for seeds. Equally bad is its cousin Herb Robert.

The wild red columbine while very pretty should not be used if you are growing the better types. All columbines with only a very few exceptions are dominated by the wild variety when cross fertilization takes place. The seedlings are almost invariably classed as "dowdies," so keep the wild one out if you wish your columbine strains kept pure.

The dainty spring beauty, *Claytonia Caroliniana,* makes vast and beautiful carpets in the woods, but it is too great a spreader for the rock garden.

Ferns

The maiden hair and other small types of ferns are fine in rock crevices in shady places or are pleasing among lady slippers and other wild flowers.

We Consider Little Bulbs

There are a number of small bulbs that I have found useful for planting among hepaticas and plants of like habit of growth.

Chionodoxa.

C. Luciliae is to me much more charming than the scilla, the blue of which seems dull beside the clear blue and white of the chionodoxa. In addition the blooms face upward while those of the scilla turn down.

Crocus.

The Dutch crocuses are too well known to need description. Infinitely more charming are the wild specie crocuses, an admirable list of which is found in Mrs. Wilder's book. I regret that in my garden the chipmunks eat the crocus bulbs almost as soon as they go in, so I've abandoned all further experimentation.

Fritillaria.

F. meleagris, commonly called guinea flower, grows about 10 inches high and blossoms in May. The

bell-like blooms are checked purple-brown and white. It is most effective when planted in clumps.

F. meleagris alba is a clear creamy white form, and while not as interesting a bloom, is far more beautiful. Both varieties should be used more extensively than they seem to be at the present time.

Johnson's Gardener's Dictionary lists over a hundred varieties of fritillaria, the two above being the only ones with which I am familiar. I recently realized this much to my embarrassment and hope to enlarge my acquaintance soon. There are a number of native western varieties said to be hardy in this climate and well worth growing though I have not yet tried them.

Galanthus.

There are many varieties of snowdrop, most of which are not obtainable in this country at the present. *G. nivalis* is perhaps the best known. Its whole name is very descriptive for it comes from gala meaning milk and anthos, a flower. *Nivalis* means snowy, and so we have a snowy milky flower.

G. Elwesii is similar but much larger and more showy.

Muscari.

The grape hyacinths come largely from Asia Minor, Greece, Spain, Italy, and France. The flower stalks resembling miniature hyacinths stand about 6 to 8 inches high and last a long time. They are hardy and very desirable in the garden. I have used them with the pale pink rue anemones and with yellow primroses.

M. botryoides var. Heavenly Blue is one of the best. Its only drawback is the profusion of floppy long slender leaves. I find that I can cut them, leaving only 3 or 4 inches which seems to do no harm to the plant and certainly improves the appearance.

M. b. album, the white form of the preceding, is very lovely, though it doesn't persist in quite the same vigorous way as do the blue forms.

Nearly all of the varieties are blue though there are some few yellow as well as the white forms. I have never seen the yellow ones listed in this country.

Narcissus.

The tiny narcissi are the most beguiling of small bulbs. When and if you can obtain them, plant in a sunny but protected location not more than two inches deep with a light sandy mixture around the bulb.

N. bulbocodium, the Hoop Petticoat Daffodil, is a precious thing. The pale yellow cup flares stiffly for all the world like a tiny hoop skirt. It grows only three or four inches tall and prefers a moist sandy soil with an admixture of leaf mold.

One of the tragedies of my life was that a fine established clump was somehow lost in one of the reconstruction periods in the garden.

N. minor grows about six inches tall and is a small edition of the cheery bright yellow daffodils we all know so well. It is of the easiest culture.

N. triandus var. (hybrid) Queen of Spain is the tallest of the species narcissi suitable for a small rock garden. The flowers, about 10 inches tall, are slender and a clear golden yellow.

Puschkinia.

Puschkinia is allied to the hyacinth and named for a Russian botanist, Pouschkin.

P. scilloides, the name indicating its

similarity to the scilla, is sometimes referred to as "striped squill." It is not reliably hardy, though from a dozen bulbs I still have a few that come year after year. The tiny pale blue bells striped with a darker blue are genuinely charming, especially coming up through the rose *Phlox subulata.*

Scilla.

S. sibirica seeds relentlessly in my garden. The color of the pendant stars is not the sky blue of the chionodoxa but rather greenish in tone. I am replacing the scillas with chionodoxa as rapidly as possible and relegating the squills to a bit of woods where they can increase to their heart's content.

Tulipa.

The species tulips are among the most desirable small bulbs for the rock garden. They are easy to establish and have increased pleasingly with me.

T. Clusiana blooming in late April always makes me think of peppermint candy with its pointed rose and white striped flower. It grows from 8 to 10 inches tall and does not increase as rapidly as some varieties.

T. dasystemon has slender leaves lying flat on the ground from which rise on a 2 or 3 inch stem the most lovely light yellow and white wide open flowers. By all means seek it out and plant it on a warm, well-drained ledge.

T. Kaufmanniana in my garden is the earliest to bloom. It is planted well back in the garden among clumps of polemonium. When the sun shines, the pale yellow petals open wide revealing an unexpected deep red throat.

T. persica is one of the later ones to bloom. It is low, and coming in May, its bronzy yellow contrasts with the gay riot of color most delightfully. It requires a warm, well-drained corner.

T. sylvestris flowers in late April and is a native of England. It is perfectly hardy and well repays the little care necessary to make it happy. The bright yellow pointed blooms growing on slender 10-inch stems are quite fragrant.

One more word about the small bulbs. Owing to the quarantine, all that are obtainable must be grown here. There probably has not been a great demand for some of these little used specie types and all the bulbs in your order may not be blossoming size. In my experience, if enough people ask for a thing, the nurseries will eventually supply it, so encourage them by ordering those already offered and then perhaps they will feel justified in increasing the number of varieties in their lists.

Small Shrubs

In conjunction with dwarf evergreens, dwarf shrubs give us accent points in the garden. They must all be used with thought and not merely planted indiscriminately around the garden. I find the taller ones useful in the near background and the prostrate varieties to shower over large rocks. Carefully combined evergreens, shrubs, and rocks can do wonders in the matter of scale, the number used, of course, depending on the size of the rock garden.

Berberis.

B. verruculosa is called the holly-leaved barberry and justly so. The sharply pointed glossy green leaves look for all the world like English holly. It seems to be not quite

hardy in my garden, and if not well protected, kills back to the roots but always comes up again.

Cotoneaster.

C. horizontalis is an extremely prostrate shrub with small shiny dark green leaves and bright red berries. If planted behind a big rock over which it can trail, the branches will conform to the shape of the rock.

C. adpressa so closely resembles the preceding that I suspect they are varying forms of the same plant.

Cytisus.

The brooms are for me one of, if not the most valuable and delightful shrub groups in the rock garden. I am unable to find any real distinction between *cytisus* and *genista* unless possibly the varieties included under the latter are hardier. Mr. Bailey remarks at one point that "genista of florists is cytisus." However, they are both legumes and very closely related.

C. Ardoini grows possibly a foot in height and needs some protection in winter. The yellow blooms come in late April or early May.

C. kewensis has pale yellow flowers and is a garden hybrid between *Ardoini* and *albus.*

C. procumbens is very prostrate, and the blooming time of the bright yellow flower is June.

Daphne.

D. cneorum is a most lovely thing but does not do well for me. I have tried a variety of locations and soils and several types of winter protection. The fine, dark evergreen foliage and the spicy fragrance of the pink heads of bloom make it worth struggling for.

Erica.

E. carnea has proved hardy with me if given a winter covering. When the covering has blown off, it seems to be the blossoms that suffer, not the plant. The buds are formed in late summer, and the tiny pink flowers are among the earliest to appear in the garden.

Genista.

G. dalmatica reaches six or eight inches in height and has yellow flowers as do nearly all members of this genus and of cytisus.

G. pilosa has tiny wooly leaves and bright yellow blooms in late May and June.

G. sagittalis means arrow-jointed, and the plant has a curious wing-like appearance. It attains a larger growth than some of the genus and is semi-prostrate.

Pachystima.

P. Canbyi is a hardy tiny leaved evergreen shrub which hails from Virginia and North Carolina. The flowers are insignificant, but the shiny dark green leaves give a fine color note.

Potentilla.

P. fruticosa var. *dasiphora* is a smaller form than the type. The leaves are slightly wooly and the flowers yellow.

P. fruticosa Farreri collected by Mr. Farrer in China is also small and very choice. The blooms are yellow.

Prunus.

P. sibirica nana is a horticultural variety of *P. armeniaca.* It attains a height of about three feet. The blossoms are clear pink, single, and come before the leaves. It is very

floriferous. It appears to be absolutely hardy in this region and requires no protection.

Rosa.

R. Rouletti is an extremely tiny and perfect rose with double pink blooms. It is very choice and perfect for a small garden.

Viburnum.

V. Carlesii from Korea has heads of fragrant pink flowers. The three to four foot height is too large for most rock gardens, and I find it needs considerable protection in this locality.

V. opulus nana is very dwarf and slow growing. The shiny dark green leaves turn to a deep red in the fall. The dense mass of foliage makes a fine accent.

Dwarf Evergreens

I want to iterate and reiterate the vital importance of dwarf evergreens. There is nothing that so gives our make-believe mountains an authentic air. Also the combination of weather worn rocks, sturdy small evergreens with the gay alpines clustering about is hard to resist.

At the beginning of our search for dwarfs, we were fortunate in finding Hornibrook's "Dwarf and Slow Growing Conifers." This admirable volume saved us much time and money. The search for the trees themselves was long and arduous, and I think we have now tried all of the small and low growing forms that are available in this country. Some, though unquestionably dwarf types, are too large for a small garden, and if used at all, must be kept in the background. I feel that such varieties as *Picea Remonti, P. Gregoriana,* and *P. pygmaea* fall in this group as do also most of the small types of pine.

In the following list I have included those that I have found eminently satisfactory after a number of years.

Abies.

A. balsamea hudsonica is the only dwarf fir that I can find listed in catalogues, and this apparently is not always true to name. The several that we have purchased certainly have been far from resembling the authentic specimen I saw in the Country Life Gardens. The true variety is compact, very low growing, and spreads slowly. I yearn for a specimen answering this description. This is the only variety in this list that I have seen but have not been able to obtain.

Chamaecyparis.

Many people think that the cypress family is not hardy in this country. Many varieties are not, but the dwarf forms in the rock garden seem to have no such difficulty. They should be given protection in the winter against sun burn to which they seem quite susceptible.

C. obtusa var. *nana densa.* Syn. var. *nana gracilis.* The cypresses resemble arbor vitae in growth except that the fan shaped branchlets are much denser and are twisted. The clear green foliage, bluish underneath, is very compact and the tree extremely slow growing.

C. pisifera var. filifera nana is a low slightly rounded bushling never in my garden reaching any considerable size. The juvenile foliage is silvery grey and loosely branched.

Juniperus.

There are many desirable junipers

Juniperus chinensis procumbens (left), J. sabina tamariscifolia (right) at top of dry wall.

to chose from, not only for use in the rock garden but admirable for foundation planting. They are so easily clipped and can be kept in any desired size and shape. Most of them are too large for the average rock garden and all will have to be carefully controlled.

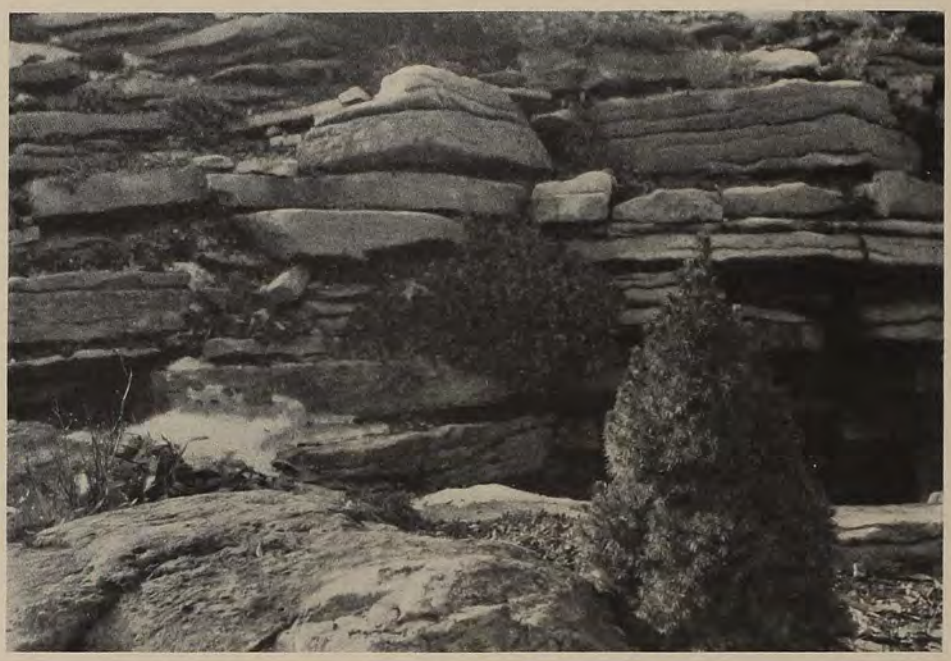
J. depressa plumosa is exactly what its name says, a low growing feathery juniper with *communis* blood. It is very lovely in winter and late spring, for parts of the needles turn a rich plum color which seems to glow through the green. Buy small specimens and keep them well pruned.

J. chinensis procumbens gives a very "Japanesey" look with its stiff twisted branches. It has dark bluish-green foliage and in time makes a large mat. I have had specimens for years which I keep pruned to fit specific locations. They will get much too large if they are not cut sharply back.

J. chinensis procumbens nana is a diminutive from the preceding and a real treasure. It has tiny needles which are greyish blue on the under side and it grows very slowly.

J. chinensis globosa syn. *J. virginiana globosa.* The specimen I have grows about 18 inches tall, and its tendency is certainly globe-shaped, though I have to help it along a bit. The foliage is yellow green, which contrasts well with varieties having different color values.

J. douglasii or Waukegan Juniper is native to the old lake level flats near Waukegan, Illinois, where there are said to be some thirty variations of the type. I have personally collected several with quite different habits of growth. It is a very rapid spreader and must be kept compact by drastic pruning. It has a gor-



Picea conica densa

geous undertone of purple in winter, making a fine contrast with the deep blue green of chinensis procumbens.

J. horizontalis var. Bar Harbor coming from the coast of Maine is similar to the preceding but is more compact and grows more slowly in my garden. The foliage remains green in winter.

J. squamata Meyeri is an upright form with grey blue foliage and branches that grow in a very irregular manner. It is slow growing and most decorative.

J. chinensis var. *Sargenti* is a semi-prostrate form with loose greyish yellow-green branches.

J. sabina tamariscifolia is a semi-prostrate tree having both juvenile and adult foliage of a bluish-grey green. It is a rapid grower and frequently large branches winter kill, but the color is so good that I hesitate to discard it.

Picea.

Of the many dwarf spruces that we have, some have only numbers. These were interesting types I selected from a nursery seedling row and as yet were unnamed. They have all remained compact and slow growing. Of those that are listed in catalogues, I suggest the two following as extremely satisfactory in any rock garden.

P. conica densa is so completely described by its name that further word is scarcely necessary. I have found that very small specimens transplant easily. They have a tendency to turn brown in our strong winter sun, so I give them a little protection to the west. They are most charming planted in a group with quantities of grape hyacinths among them.

P. Maxwelli grows slowly into a

low rounded dark green tree. Its foliage is very dense, and when the new growth comes out in the spring, it looks as if it were in blossom. I think it is one of the best in the garden.

Pinus.

P. montana var. *mugus* has a great variation in type. I have gone through large nursery fields of seedlings before the plants are sorted according to habit of growth and have seen plants of corresponding size with needles a half inch and others with needles two or three inches long. From this it can readily be seen that one should personally select the type desired for a given location. Short needles in a seedling mean a smaller growing plant. All pines in the rock garden should be kept pruned. I cut at least half of the "candle" off just before the sheath breaks.

Tsuga.

The hemlocks are among our loveliest trees and stand almost any amount of pruning. If you are able to wander through a large nursery, you will find a great variation in this genus. Several of the small growing types have been found among seedlings of large trees.

Tsuga diversifolia grows slowly and has in my garden made a small rounded yellow green tree. The branches are slightly twisted, giving the tree a very different character from the ordinary hemlock.

Tsuga Sargenti pendula. Mr. Hornibrook says that all of the present stock of this variety has come from grafts from the four original plants found near the summit of Fishkill Mountain on the Hudson River. The long slender arching branches are periodically covered with the tiniest cones imaginable. The specimen in my garden has been there 7 or 8 years and shows no appreciable increase in size. It is a wholly delightful tree.

Taxus.

The yews are valuable for the glossy dark bottle green foliage. They are absolutely hardy and will stand considerable shade as will the hemlocks also.

T. cuspidata var. *nana.* Syn. *brevifolia* var. *compacta* will eventually make a wide spreading mass 2 to 3 feet high if left undisturbed. I find, however, that it yields readily to pruning and have had no trouble keeping its activities curtailed.

T. cuspidata var. *densa* is the slowest growing tree we have in the garden. It is a fine dark green, very dense, and completely satisfactory, both as a tree and as a dark color note among the yellow blue and grey greens of other specimens.

Pruning and Culture of Evergreens

Conifers should be pruned before any growth starts which is in March in my locality.

Pines, spruces, and firs have a leader with several lateral buds surrounding it. If you wish the trees to be low and flat, keep all the leaders cut out; if it is to grow tall and slender, the leader and some of the outside buds should be retained. When part of the new growth is cut out, the strength of the tree goes to the buds that are left.

Junipers, hemlocks, and yews increase in size on the same principle, but the new growth is not so well defined. Always trim so as to give

Small pools surrounded by ferns, Phlox divaricata, polemonium and columbines.

the lower branches light and air, and start when the tree is small and watch it carefully. Perhaps you will want a tree to grow in a one-sided fashion over a pool. This is not difficult but must be done patiently and slowly.

In my experience conifers thrive best in a sandy, well-drained soil. Newly planted trees should go into the winter with the surrounding soil thoroughly soaked and well mulched with straw or leaves.

Winter Protection for Alpines

I find, in this climate, alpines need some winter covering. They will stand plenty of cold, but they are protected from the sun by heavy snows and so they resent our frequently snowless winters and, therefore, must be covered lest they sunburn.

The covering should be light and not exclude air and should be put on after the garden is frozen. We used oak leaves for years with success, but lately have found marsh hay much preferable, as it does not mat as do the oak leaves. It should not be removed all at once in the spring but taken off gradually. If it is left on too long, the plants will mildew.

After the covering is completely off, the garden should be carefully gone over, weeded, dead leaves removed, and plants that have been disturbed by frost put firmly back. I then top dress the whole garden with a mixture of leaf mold, sand, and gravel. The leaf mold washes through the gravel and the latter keeps the soil from caking in our hot summer sun.

Reference Books

Regarding reference books, I find that among the many I have collected, those I use constantly are:—

The English Rock Garden, 2 Vol.—Reginald Farrer
My Rock Garden—Reginald Farrer
Alpine Flora—H. Correvon
Adventures in My Garden and Rock Garden—Louise Beebe Wilder
Dwarf and Slow Growing Conifers—Hornibrook
Gardener's Dictionary—Johnson
Encyclopedia of Horticulture—Bailey

I refer to a number of others fairly frequently and to still others occasionally, but I should regret exceedingly if I had to be without any of the above list.

At the end as in the beginning we come back to one fundamental point. Helpful and necessary as articles and books are, the only way the aspiring rock gardener really becomes acquainted with these bewitching and sometimes temperamental alpines is to work, not direct work, in his own garden. Real knowledge and great pleasure comes from emulating the old colored gardener who said, "Mah aim, ma'me, is to wo'k and wo'k ha'd."—Glencoe, Ill.

Iris Wattii

By S. Stillman Berry

The delightfully picturesque plant, which, following the researches of the late Mr. William R. Dykes, we must call *Iris* (*Evansia*) *Wattii*, has now been grown long enough in this country so that we know somewhat more than formerly regarding its requirements and suitability to our conditions. In the north and east it is doubtless of value only as a pot-plant. Grown in this fashion it is a curious and interesting subject even when out of flower, and can be managed quite successfully. In just how much of the country it is available as a safe outdoor subject remains to be established, but since it is proving eminently suitable to gardens generally in southern California (unless at considerable elevations) it would probably be an equally dependable subject in favorable districts in the Gulf States. It seems easier to handle and certainly increases very much faster in light than in heavy soils, but the stems are not always then as tall. This is witnessed by the accompanying illustration, which gives a very good idea of the effect of this strange plant in mass. In exhibiting to those unfamiliar with it either specimens or photographs of this most individual of irises, it is a common experience and fairly exemplary of the thoughtless impressions prevailing with so many people concerning the things they grow in their gardens, to have the auditor gently reply, "Yes, for some years I have had a large bed of it." The time is not far when large beds of it will be the possession and joy of many, but at present such beds are of necessity far between. It is almost an unexceptionable rule that those who advance their claims so lightly have confused our species with its near ally, the much longer known but less elect *I. japonica*.

Now *Iris japonica* is itself emphatically not to be despised. It ranks very high in distinctiveness and beauty, besides being in its best forms considerably more colorful than any *Wattii* I have ever seen; but its creeping root-stalks never rise into the tall bamboo-like jointed stems which are the eminently strange, characteristic, and conspicuous feature of *Wattii*. In very young plants these stems may be but slender and at their least only a few inches tall, but in succeeding years, if the plants are in sturdy growth, they rise ever higher and higher until, as in my original clump, which still stands where it was first planted, some of them may attain a maximum height from ground-level to apical flower of well nigh a sheer six feet. We may concede that as pretty good for any iris, but remember that this is an *Evansia*, near relative of our own wee *cristata!* Throughout most of their length the stems are at maturity absolutely bare of foliage, although an isolated leaf or two or their sere and withered remains may for some time persist just below the large terminal fan. As the plant does not root very deeply such stems are often sufficiently topheavy to be blown or knocked over if unsupported by artificial means or by the surrounding growth, so I sometimes resort to staking or the use of peony frames. In light soil where the stems arise more thickly they tend to support one an-

Berry & Kline

Iris Wattii showing stem growth for following season's bloom

other. They have the curious propensity of growing one season, flowering the season following and then dying, but when the old spent stems are at last ready to be cut away, the new ones already have attained a considerable eminence and your plant is therefore at no single moment ever quite barren of its beauty, especially as the sword-shaped leaves are wide, graceful, smooth, and, for an iris, of a peculiarly brilliant, fresh, and shining green.

One is forever wondering as to the significance of so strange a manner of growth in the native ecology of the plant. Does this iris grow in lush masses, or is the stilt-like habit an adaptation to association similar to that of certain lilies, which are most at home thrusting their spired campaniles up through a thicket of open shrubbery or spreading herbaceous plants? The spear-like aspect of the rapidly pushing shoots of the iris before they rise to the height at which the fans are fully expanded certainly suggests the possibility of something of the sort. A search of the literature available affords small further

clue. Indeed, very little seems to be known regarding the natural history or even the major distribution of this plant.

Stocks in cultivation appear to be mostly, perhaps entirely, derived from a single sending of seeds to Mr. Dykes by an interested priest in Yunnan, the well-known Pere Ducloux, with whom he corresponded. On the other hand the real original *Wattii*, at present represented by herbarium specimens only, is attributed to the Khongui Hills, Manipur (Assam), which is far enough on the other side of the southern Himalayas to render not undesirable a confirmation of the identification through the acquisition of fresh and living material from the prime locality.

The crowning charm of *Wattii* of course resides in the flowers which shower forth from the center of each mature fan in a diffuse feathery arching panicle like the spray of a cascade, each dainty tripartite blossom poised with expanded wings like some rare and exotic insect, and as delicately laced as a bit of filigree. It is personable, dainty, a being impossible adequately to describe. The words which we find slipping into conscious utterance are ethereal, airy, diaphanous, sprite-like. The last term, though itself indefinite and indefinable, is perhaps the best. To these must likewise in all fairness be added the adjective ephemeral, but this is not so sad as might seem, for although each blossom lasts individually but a day or at most two, one after another they keep coming and keep coming, the bursting buds putting in a sudden and magical appearance almost out of nowhere, to one's never ceasing surprise and amazement. A single spray thus continues its beauty for weeks. The stems maintain something of the same valuable habit even when cut and placed in water, hence they are available for our indoor fancies and readily lend themselves to an enchanting variety of uses. The flowers are essentially similar in form and character to those of *I. japonica,* but smaller, more delicate, more distantly spaced, and so pallid in their barely tinted suggestion of lavender as very nearly to be describable as white. Deeper lavender forms may exist, indeed I strongly suspect that they do, but I have not seen them. On occasion I have thought that I could detect a pleasant and delicate but elusive fragrance.

Increase is by runners, which sometimes come up close to the parent stem, sometimes go dipping and diving through the surrounding mould like an errant porpoise, finally to arrive at a permanent settlement quite a distance away. The plant is a lover of coolness, retirement, and shade, succeeding in my garden where scarce any sun or sometimes none at all may reach it. Of baking it is never tolerant. By the same token it appreciates a soil "in good tilth and rich in humus," as the books like to tell us, to attain which consummation I am wont to use a plenty of any loose fibrous material to incorporate with it, such as crumbled peat or leafmould, or old compost, that I can get.

Seed formation occurs rarely with me, and about as rarely in the case of very carefully hand-pollinated flowers as those I do not touch. It must be remembered, however, that all of my flowers thus far available have been from the stock of a single clon. With parents of different seedling origin one might conceivably anticipate a greater degree of fertility.

In the state of New York Mr. James C. Stevens has had remarkable success growing this and the other large Evansias as indoor plants for

R. H. Terrell

Iris Wattii in the garden

late winter bloom. In this fashion he has managed to secure synchronous flowering of some species which with me in California hardly ever overlap, while furthermore he has been successful in hybridizing *Wattii* with several forms of *japonica,* a feat which has given me no end of trouble to accomplish and for which as yet I have nothing to show. Whether these hybrid plants will have a garden value beyond or different from their aristocratic parents is something we are now engaged in trying to learn. A similar hybrid raised in England has been commercially listed there under the informing but hardy euphonious name *Japo-watt.* An interesting circumstance is that in some cases these hybrids appear to be more readily fertile than the parents. I have been successful in making the back cross with *wattii* and Mr. Stevens writes me that he has not only done the same, but has accomplished various other crosses with them, including their own intercrossing.

Redlands, Calif.

Collecting Plants Beyond the Frontier in Northern British Columbia

PART II

By Mary G. Henry

July 18 will always remain one of the memorable days in my life, so I will just start with daybreak. Our tent the night before had been pitched on bare stones beside Keily Creek, with not even a bit of moss or a spear of grass beneath it. Not far away, however, were fine large almost circular mats of *Dryas Drummondii* many of which were 8-9 ft. in diameter, and pretty patches of *Aster Richardsonii,* a handsome and interesting 3 in. creeper that carried comparatively large lavender flowers. The girls, my tent mates, and I had given up our pneumatic mattressses long ago. We just laid our sleeping bags on a piece of canvas on the stones. It may not sound very comfortable, but we found it so. By this time we had learned to sleep almost anywhere. Of course when the ground was *very* rough we sometimes arose with our bodies slightly bruised, which really mattered not at all.

I awoke at 5 just in time to hear Cliff, our cook, call "breakfast." The day was very clear and very cold, and our boots and clothing, wet from many fords the day before were frozen hard beside us. This happened frequently and we never stopped to dry them, it did not seem worth while, because in a short time they were usually in just the same condition again.

The wranglers always started their day an hour or two ahead of the rest of us, so they had left long ago to round up the horses which were always turned loose at night, to feed. On a lucky day, and this happened to be a lucky day, at the end of 2 hours more or less (mostly more!) the whole 58 horses, driven at breakneck speed by the hardy riders, returned to camp. We never tired of seeing them, with their manes and tails flying in the breeze, come tearing back neighing, snorting, and bucking in all their early morning enthusiasm, their bells jingling noisily, their feet sounding like mild thunder, and lastly but most important of all we always enjoyed the wild, picturesque, quite polite, but very emphatic language which Fabe and Smoky threw in for good measure and which always accompanied the round-up in true cowboy fashion. All the loud hah! hah!, the laggard's names yelled loudly, good natured (?) reprimands that none might linger, all this and much more was the first event of every day, rain or shine. Strange to say, after the round-up, one thin strand of rope about waist high tied from tree to tree to form a corrall held the whole bunch until each of the 58 was tied to something more substantial.

We partook of a fair size breakfast with much solemnity as usual, and then set to work, all of us, at the rather arduous daily tasks of rolling up our sleeping bags and packing up our belongings. I looked over, most carefully, my precious cans of plants and stowed them in a wooden packing case, the tin cans all separated by chips of

B. H. Chandlee

Looking west from Caribou Ridge
Lupinus arcticus in foreground

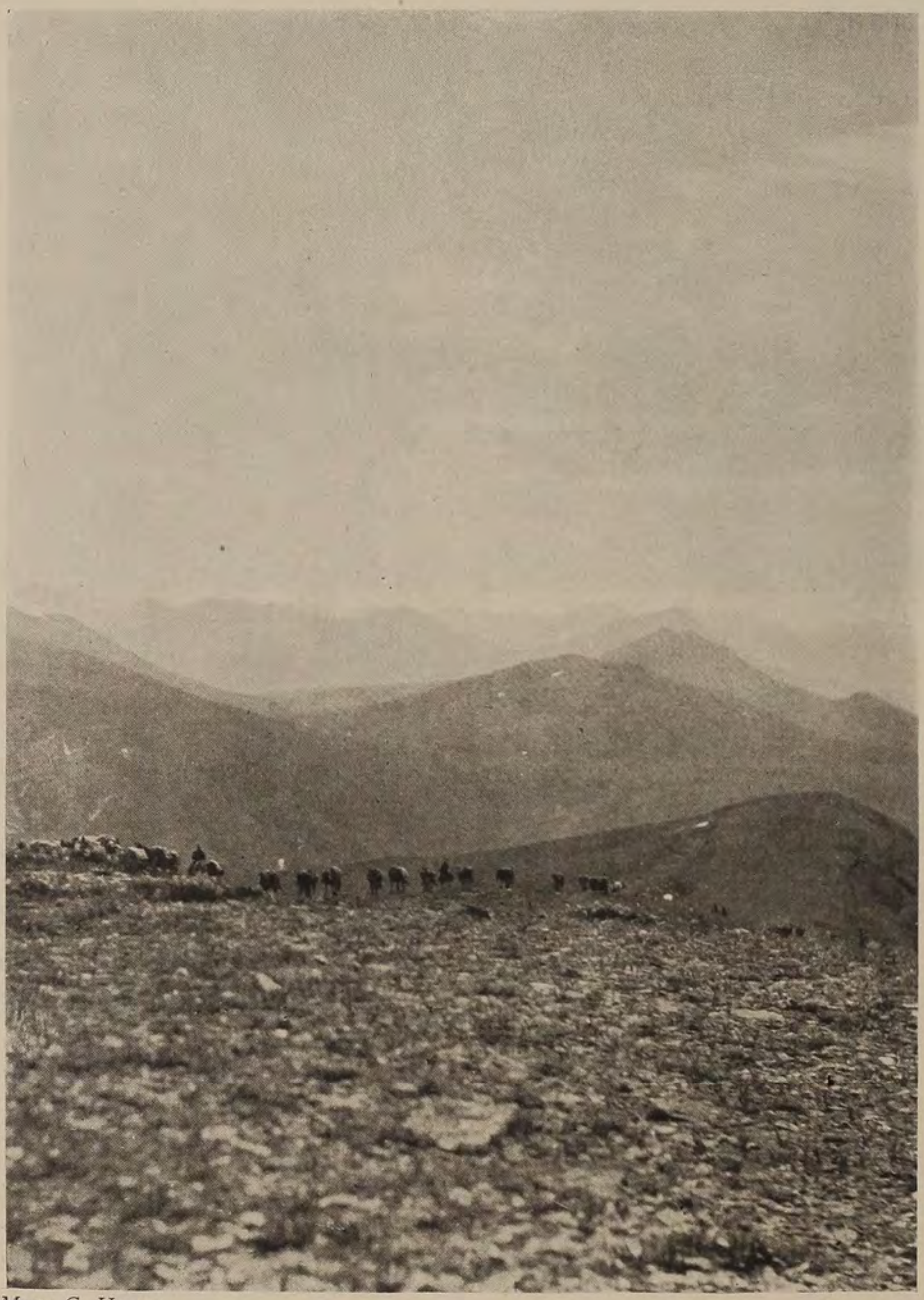
wood and balsam sprigs etc. in order that air circulation would be fairly good. The plant press too, of course, needed careful attention.

Norman, McCusker and Chandlee took down the tents. The two boys were still off fishing.

When we and the horses were at last in readiness, we tied our personal necessities on our saddles. By the time I fastened my saddle bags, which contained 4 or 5 tin cans, on poor big black Chum (I being so small had to stand on my tip toes for this) also my rifle, fishing rod, camera, field glasses, trowel, slicker, and coat, there was scarcely room for me! But he was so big and strong he did not mind at all, and always came in fresh as a daisy at the end of the day. We were in our saddles at 8:10 and we started ahead as was our custom, with McCusker who led the way. The guides and pack horses would follow in an hour or so. At first our way took us up a long steep grade above Keily Creek, through a young poplar forest. Then came some open high meadowland. It was just about timber line and the only woody vegetation was composed of scrubby willows and birches, and now and then a stunted balsam, *Abies lasiocarpa.* It was mostly all uphill work and we dismounted and walked a lot in order to lighten our horses' burdens.

Sometimes we followed a faint trail and sometimes we just went ahead anyhow. McCusker, the topographer, who of course carried his barometer, compass and small hand level, always seemed to know what to do and where to go.

We soon were travelling along a high, bleak, windswept plateau, and mountains were one every side. About



Mary G. Henry

Travelling above timberline; looking southeast toward the snowless mountains

11 we dropped into a tiny valley, only about 75 feet wide from rim to rim, some 35 feet deep and perhaps a quarter of a mile long. It was like suddenly stepping into a different world. The sloping sides were a veritable garden and I never saw one more charming, and distant snow peaked mountains lent enchantment.

Aconitum delphinifolium's truly wonderful dark hoods were everywhere. At this altitude (about 5000), they were tiny plants only 3-8 inches tall with such huge indigo colored flowers, it was hard to believe they were real. There were many polemoniums, perhaps an alpine form of *P. acutiflorum,* and as they were all just newly opened, every bloom was perfect. Here also were *Myosotis alpestris,* myriads of them of a color so pure they seemed to outblue the sky above. Sometimes there was but one stem with a rounded cluster of flowers, exquisite beyond words, and sometimes there were 8 or 10 stems growing in a little clump.

In amongst all these lovely blues and growing as though planted as a foil to set them off, were countless numbers of *Potentilla dissecta.* These were slim-stemmed plants growing about 10 inches tall with inch wide, flat, rose-like blooms of purest golden yellow.

It seemed to me the whole world could hold no fairer sight. There were a few rocks that fitted into the scheme of this little garden perfectly, and there were saxifrages and other small white blossoms that peeked out around the rocks. But it was the blues, those marvelous pale shades and the deep rich ones combined with the golden blossoms, that made it all so outstandingly lovely.

I slid off Chum that I might see more closely in this little fairyland, and I wished that I might linger, but impossible, I could only walk slowly and fall behind a bit as was my custom when I came to an extra choice spot, and then I mounted and after a short gallop I was with the others again.

As we emerged from this valley there was a deep gulley just ahead with its stream, and on the high hill opposite to us a huge bull moose was grazing amongst some stunted spruces. He was a noble looking beast and he held his magnificent head proudly erect as he faced us. King, literally of all he surveyed, he showed not the slightest fear, and his enormous horns and sleek dark body seemed as though moulded in bronze. He remained thus a long time and then unmolested he trotted slowly away. Away up, over and beyond the high level plateau, where he disappeared into the forest just below, his home.

Covering the mountain sides great solid areas of blue were now visible, although some miles away. It was such a joy to ride up to and then right through acres and acres of *Lupinus arcticus,* with all its delicious fresh fragrance.

But the best was yet to come, and as we climbed higher and higher towards the Caribou Ridge, many new flowers appeared.

We were far above timberline and snow lay in the hollows. Suddenly we found ourselves in the midst of a small band of caribou. They had a most awkward gait, and did not seem to know how to handle their legs, which always made us laugh whenever we saw them.

There was an outcropping of rock and much broken stone on the steep up grade. I had to dismount to view the flowers more closely and Chum and I could scarcely take a step with-

Josephine Henry

Lupinus arcticus often goes down into the timber

out treading on a loveliness of some sort.

With Josephine I fell behind the others here, for when my eyes first fell on a dwarf Polemonium sp.* nothing else mattered, and when I looked up at last the others, with their horses in the distance looked like ants!

I had thought *Polemonium acutiflorum,* as it grows in these western wilds, a beautiful flower and so it is and so it always will be, but this was a hundred times more lovely. With large flowers like its pretty cousin of the meadows, of the same pure, pale, almost skyblue they were enlivened by a gorgeous orange throat and were about 2-6 inches tall and carried in a sort of loose head of several blossoms. The petals seemed to be made of a delicate semi-diaphanous substance and were all crinkly at the margins. The leaves were fine, like those of a small fern, and the tiny leaflets were strung along the stems like little green beads.

Of all the flowering plants I have ever seen anywhere, this was the most perfect, the most dazzlingly beautiful, surely, yes surely the crowning glory of these mountains.

I gathered, ever so tenderly, these most appealing blossoms and placed them in my press, and then continued my way to the summit of the pass. The variety of flowers was positively bewildering. The glorious little Polemoniums were everywhere and many, many others.

Papaver radicatum whose large, evanescent blooms were a lemon yellow with a bold black center, were very delicately lovely plants. For the first time I saw *Campanula uniflora.* It bore narrow, nodding, very dark blue bells and grew 2-4 inches high and had scant foliage. A quiet, unobtrusive little thing, it seemed so shy it scarcely could raise its silent bells above the lichen through which it often grew.

Arnica alpina made splashes of violent orange. *Saxifraga cernua* was a beautiful tidy little plant with dainty flowers of purest white. *S. flagellaris* carried its clusters of butter yellow blooms about 3 inches high. They were large for such a tiny plant, and the small tight rosettes of foliage were thrown out on fine threadlike red stems in such a pretty fashion, like many of the sempervivums.

Pedicularis lanata made a magnificent display, with its impressive stiff, wide spikes of lavender-pink flowers rising 8-12 inches from a neat gray wooly rosette of nicely divided leaves that set them off to perfection. They had an indescribable prim air about them, and always reminded me of wooden soldiers.

The single dark hoods of *Aconitum dephinifolium* in its dwarfest type were poking up in every direction, and always held their own with the best. I was delighted to see another handsome yellow oxytropis, *O. Maydelliana.* It was quite similar to the one that grew on Pink Mountain, except that the foliage was green.

The flowers were just beginning to open and the jet-black fuzzy hairs that covered the buds gave this plant a most unusual appearance.

Many of the other species of Oxytropis that grew farther south bore dark hairs on the buds too, but as these were all fairly advanced or opened into flowers they were not so conspicuous.

Neat mats of *Oxytropis arctobia* were tucked in near many of the stones, and the little lavender or pink

* Species to be determined later by Dr. E. T. Wherry.

blossoms nestled prettily in against the foliage. Although it frequently spread to 12 inches and more in diameter, it rarely rose above 2 inches.

There were quantities of mertensia and they seemed so different from the mertensia of the meadows, I thought they must be another species. They had scarcely any foliage at all, just a few small, narrow, gray, hairy leaves that almost clasped the stem, and then at the top of the 4-6 inch little plant was the comparatively huge, heavy, flopping mass of depending blue bells. They all seemed to be open at one time and they looked ridiculously large and top heavy for the plant. And their color was of a blue so deep and rich and velvety, so pure and unalloyed, surely no earthly artist could ever wield a brush to portray it.

It was the highest Alpine form of *M. paniculata.*

Potentilla uniflora with bright yellow ½ inch wide flowers had extraordinarily silky, velvety divided little leaves, and grew into the most delicious little tuffets. I brought this home from southern British Columbia some years ago, where I found it on mountain tops about 10,000 feet.

Myosotis alpestris always every where around 5000-6000 feet, whose flowers of Heaven's own tint were always such a welcome sight, had many variations here. There were whites and blue-whites that looked like fine porcelain, and lavenders and pinks.

In addition to the above there were many lesser beauties, a dwarf lavender erigeron, an arenaria with small white blossoms, two silenes, one with pink and one with white flowers, several dwarf drabas, etc., etc.

It took me some time to climb that slope but I had an exciting time. This was one place I simply could not hurry. The others were already there. In due time I stood on the summit of the Pass, Altitude 6500, with all these glorious mountain flowers at my feet.

It was all beauty underfoot, almost past belief, and the panorama in every direction was simply marvelous. Magnificent beyond words, I hesitate to describe what I saw. In every direction were high mountains, many with snow on them, peak beyond peak far into the distant haze. Pink Mountain I climbed days ago was easily seem, and numberless others unnamed.

Some years ago I climbed the Mont Blanc, Altitude 15,781 feet. It was a thrilling experience and formed the first high spot, in more ways than one, in my life; but then I was so far above all the surrounding mountains that they seemed low in comparison to the one I was on. Of course the distances were great, and the haze and clouds made them seem still farther away. Here the mountains were close to us, intimate with us, and all around they pierced the sky with their jagged bare rocks and snow-peaked summits. If such a thing as living on air was possible, this would surely be the place to try it. But it was well past noon and our sandwiches tasted good.

In about ten minutes we saw Billy Hill with 51 horses coming slowly, in a perfect line, up the long slope. For those of us who loved the life on the trail it was an inspiring sight.

Billy stopped to tell us that two grizzlies crossed the trail right behind us and just ahead of him. Too bad that we missed seeing them. When Josephine and I had fallen behind they must have been very close to us. We remained here about an hour and never ceased to look and admire, and

Josephine Henry

Potentilla uniflora whose golden yellow flowers are among the prettiest of mountain flowers

B. H. Chandlee

The summit of Caribou Ridge, which was covered with myriads of beautiful flowers

then, reluctantly, started,down the north side of the pass. The flowers were still beautiful but there were far fewer. One new flower appeared, *Corydalis pauciflora* a tiny relation of the Bleeding Heart. Very small and exquisitely beautiful, it was colored a light plum. Here too were quantities of a *Cassiope sp.,* for a cold north slope is a favorite situation for this superlatively beautiful little shrub.

We came to a steep down grade through a thick forest where travelling was difficult. There was much muskeg and in spots the horses slipped on the solid ice benath the surface, while in other places they bogged down to their stomachs. We were all glad when this was over and we had descended the 3000 feet to Richard's Creek, which we forded and on whose shore we camped.

The days were still long, so the sun was high and the air was pleasant. We enjoyed a swim directly in front of our tents. We had caribou for supper, it was very good and very tender and had a nice gamey flavor. Norman and Norman, Jr., brought in some grayling, often called Arctic trout. The Victrola was playing and our evening camp-fire soon crackled beside our tents, for the day was over and another cold, clear northern night had come.

And tomorrow all that remained of July 18 would be stacked away in one of those dark recesses of my brain where I store the precious, oh so enormously precious, "never to be forgotten" events of my life.

Next day found us wending our way along Richards Creek. In the soft river sand I saw the footprints

Josephine Henry

Corydalis pauciflora—flowers light plum color (natural size)

of a large wolf, and we saw similar footprints off and on all day. About noon we came to the main branch of the Prophet River. It took all afternoon to get duffle and the horses over. The altitude where we crossed was 4000 feet.

About 6 we heard a weird noise. There could be no mistake about this sound. It was the howl of the timber

Mary G. Henry

Spruce trees (Picea glauca) on the Prophet River

wolf. We heard it again during supper and just before going to bed, and this time it was much nearer. It was truly the "Call of the Wild," and we were glad to hear it as this was all that was needed to make us feel that here at last, we were truly in the wilderness.

The next day we rode up the Prophet River for about 6 miles to a "Hot Springs." Much of our way was through a fine spruce forest. Many of the trees had a trunk diameter of over 30 inches.

Our way led us over the side of a mountain from whence we obtained a beautiful view of the river. There were very many colonies of *Oxytropis splendens* which covered and decorated stony, exposed places. These exceedingly pretty plants bore magenta colored flowers which varied through many shades of pink and lavender, and some were pure white. The foliage was gray and downy.

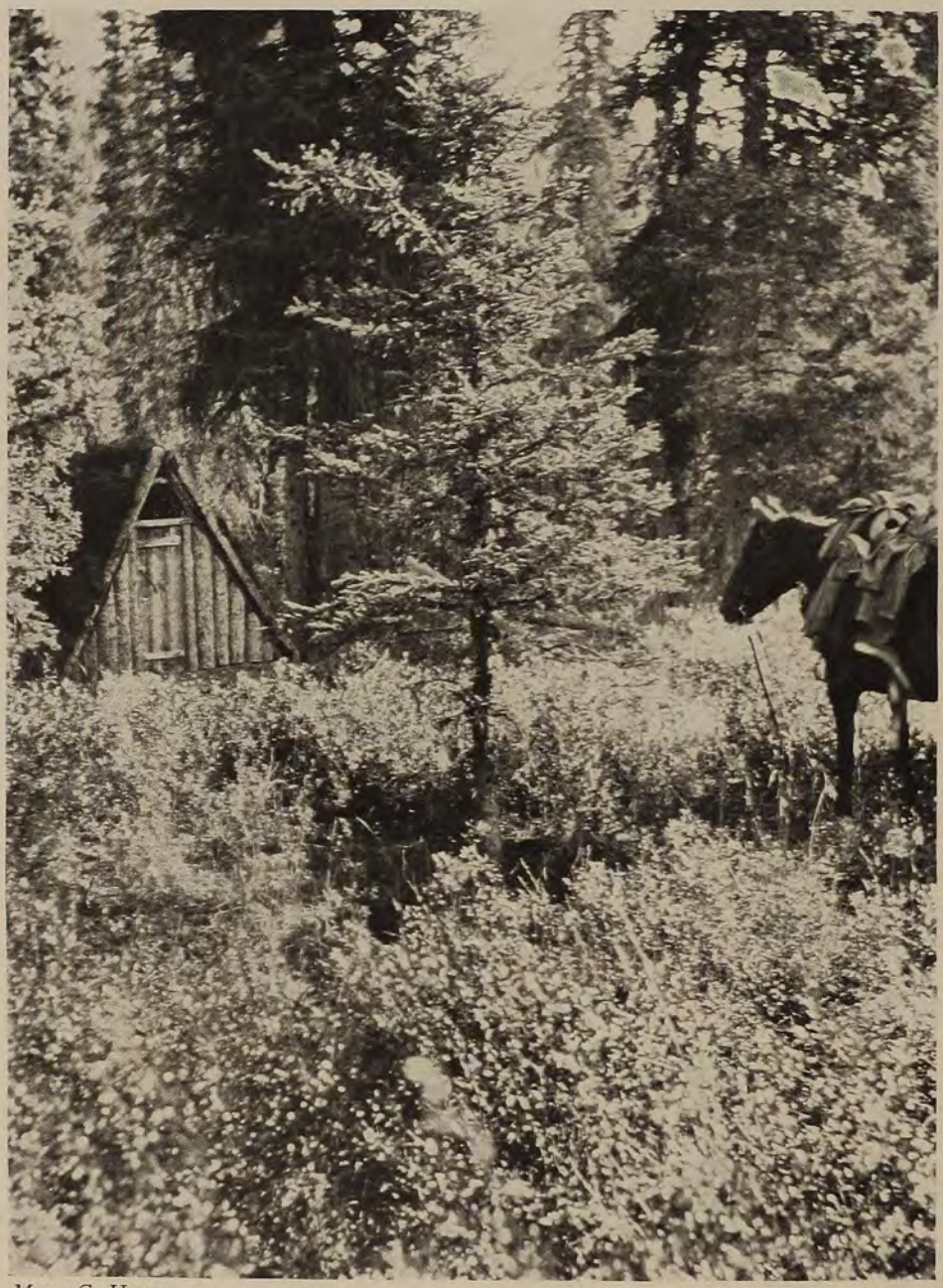
We soon descended to the river again, which we forded several times, and wended our way along the stony bars over which were growing great patches of *Dryas Drummondii.*

The "Hot Springs" were on the south side of the river. A trickle of lukewarm sulphur water flowed from under some stones in front of which was a sort of ledge about 30 feet in diameter, and on the surface of this

B. H. Chandlee

Pool at "Hot Springs" on the Prophet River

were countless numbers of spherical stones about 3 inches in diameter, but nearer the springs there were smaller ones, from about ½-1 inch in diameter. All were round and each size was in a separate area!



Mary G. Henry

A trapper's cabin. The roof is covered with sod in which Mertensia paniculata thrives and blooms. The shrubbery is Betula glandulosa

B. H. Chandlee

Rafting our "duffle" over the Musqua River

The place was evidently a "lick," judging by the tracks of animals leading to it.

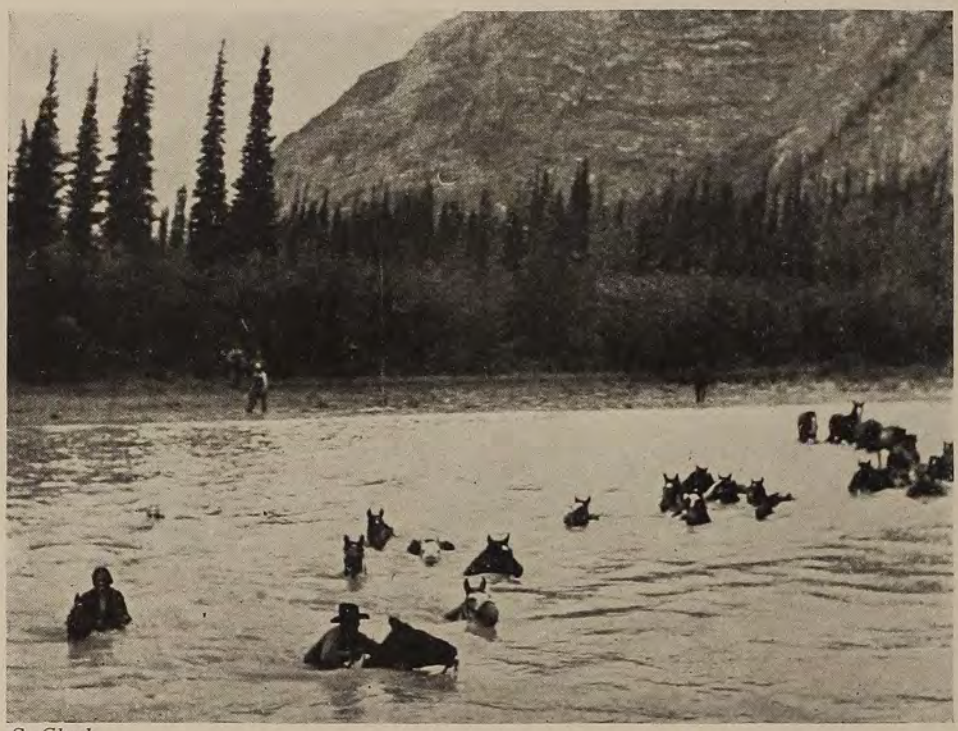
Near the edge of the ledge which was moistened by the sulphur springs, several small plants of *Botrychium sp.* were growing.

For some days past I had been observing that the bark on the spruce trees at a lower level, of course, was of a handsome vivid reddish copper color on the south side of the trees, while on the north side it was dark gray. Thus, looking north the trees have reddish trunks, but turning back it was hard to believe the forest was the same one, for all the trunks appeared dark gray! *Spiranthes Romanzoffiana* was abundant in moss, and *Ledum groenlandicum* was plentiful here as well as along almost our entire trail.

As this part of the country was only mapped as far north as the Prophet River, McCusker took a sheet of paper out of his "Survey kit" as he called it, and worked on the new map each evening after the day's ride.

We reached the banks of the Musqua River on July 21st. Its swift flowing waters were pearly and opaque from glacial silt. It was about ¼ mile across and too deep to ford. Musqua is the Indian name for bear. The shore was formed of soft, almost black sand. Heavy spruce timber reached nearly to the edge of the river and here, where light sifted through, grew *Viburnum pauciflorum. Cypripedium passerinum* was here too, in great numbers. There were also some other orchids that grew along the Musqua River. *Habenaria obtusata, Orchis rotundifolia, Epipactis repens, Listra borealis* and *Calypso bulbosa* were all growing in the soft, deep, green moss.

It took a day and a half for the guides to build two rafts, and they and all our duffle crossed the river in them. We preferred to swim our horses. After some urging they entered the water rather bravely, but when the deep, fast current swept



S. Clark

We preferred to swim our horses

them off their feet it took a bit of their nerve. Of course this method of crossing a river is always an exciting performance, and we enjoyed it thoroughly. Chum was a good swimmer and we passed a number of other horses. My eyes wandered around in search of the various members of my family, for 58 horses in the water swimming together created quite a confusion. It was with real satisfaction that I saw them here and there in the water, and making good progress. After landing we hastened to unbridle the horses and relieve them of their burdens. We were about as wet as they were, and it was late afternoon and bitter cold, but in about an hour our tents were up and we were able to make ourselves fairly comfortable.

While on our way towards Blue Sea Lake we passed several ice cold brooks and along the edges there grew the prettiest little shrub I ever saw, *Andromeda polifolia*. Holding itself up to its full height of 2 or 2½ inches, it managed to hang out several comparatively large bright pink bells on red thread like stems.

As we were skirting the lake late in the afternoon, we saw a big bald-headed eagle soaring above us. High over-head it flew in huge circles and then suddenly swooped down on a pile of sticks in a dead tree, and for the first time in our lives we saw an eagle mother sitting on her nest. She was a magnificent bird with much more white on her than I had ever seen on an eagle before. Evidently it was the Alaskan variety of the bald headed

B. H. Chandlee

Norman, Jr., and Howard with a few fish from a small stream near Blue Sea Lake

eagle, which is a larger, handsomer bird than the well known eastern form.

For several days ouh way took us through a desolation of burnt timber. Camping and riding through the dead trees with their blackened trunks, however, made us appreciate doubly nature's beautiful live, green, growing things when we came to them once more.

We crossed the Howard River on July 26th. McCusker as usual worked on his map that evening, and we were al quite thrilled when Howard came over and announced that this river was to be called the Howard River as he had seen it marked on the new map!

Mary and Josephine, who both had some slight knowledge of geology, frequently searched the stream beds for gold and minerals but found only an occasional trace of gold. Cliff, too, who was a former prospector, could be frequently seen after his long day's work was over, quietly leaving camp with a pan under his arm. We all knew he was aiming for a stream bed, and sometimes we could hear him rattling stones way into the night.

It was lucky for me that it remained light most of the night, for these long evenings gave me time to put my pressed specimens in order, to care for my live plants too, and to gather in new ones. Norman usually enjoyed his Shakespeare, but sometimes he went fishing with Chandlee and the boys.

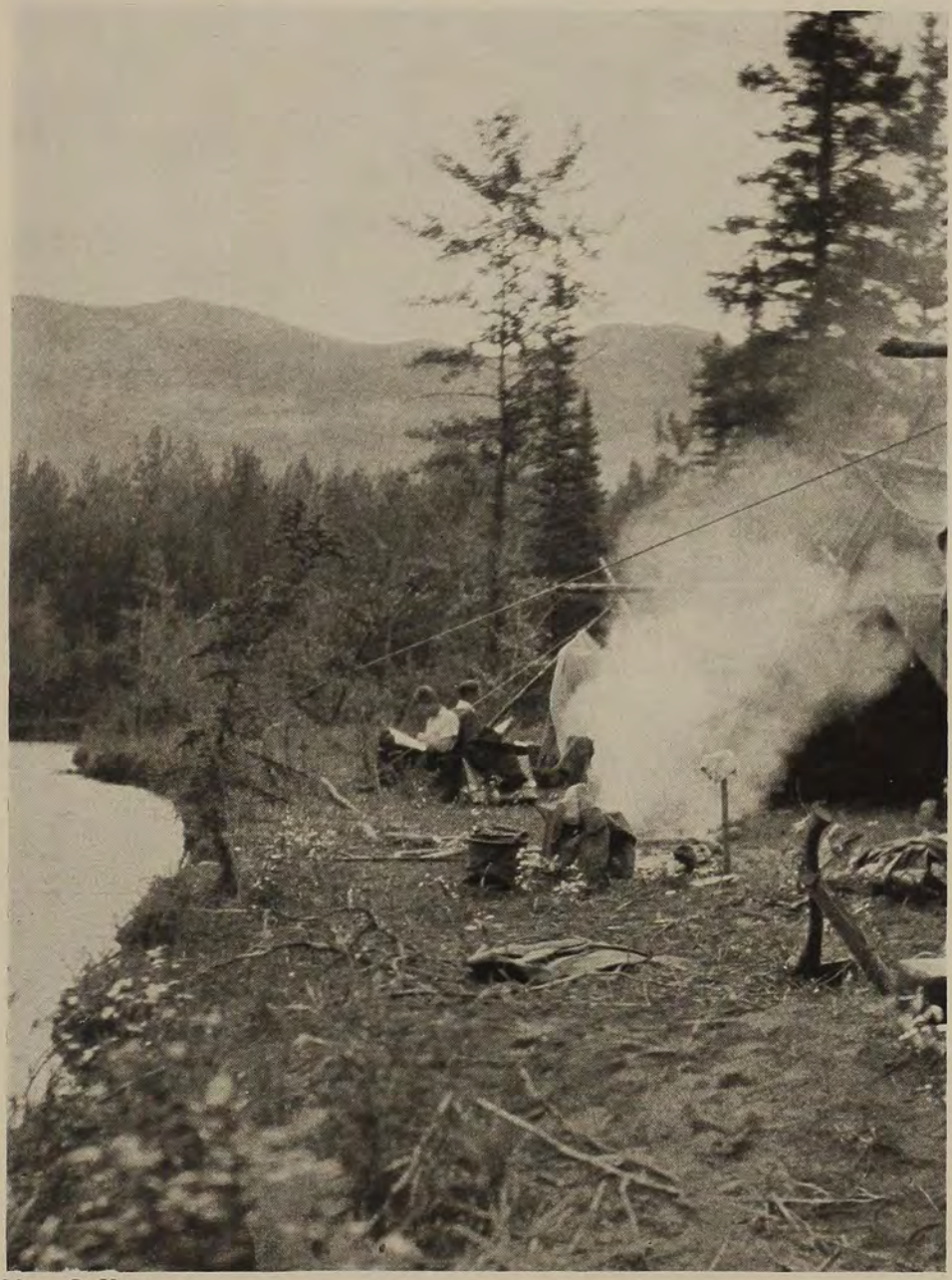
On July 29th we came to the Henry

River and rode along the south bank for miles. The water was crystal clear and of a fine deep blue green color. *Actea rubra* was growing in the shade of spruce trees near the edge. *Linnaea borealis americana,* as usual, was everywhere and so was *Cornus canadensis.* We forded the river and on the stony bar on the edge of the north shore *Aquilegia brevistyla, Dryas Drummodii* and a dwarf *Solidago sp.* were growing. The most delicious strawberries, *Fragaria glauca,* were ripe, and we surely did enjoy them.

On July 30th we camped near the upper part of the Falk River. For various reasons we stayed a whole day here, so I was delighted to see a clear sky the following morning, and started off early to climb a nearby mountain. It was a stiff, steep climb to the summit. But the view alone well repaid the exertion. There were mountains in every direction, many with snow and glaciers on them; and far away, deep down in a valley curling about their base and looking like a tiny stream, was the Henry River. Long before I was through admiring this splendid outlook, yes, almost as soon as my eyes could move, I was eagerly and hastily glancing over the ground to see the floral treasures that were there. Myriads of tiny, deepest blue *Aconitum delphinifolium,* the very dwarf form with single large blooms only a couple of inches tall, were springing through patches of gray lichen. The pretty white flowers of *Claytonia lanceolata* grew near the summit, and on and about the topmost rocks were a few plants of *Campanula lasiocarpa.* This campanula stands very near the top as one of the choicest mountain flowers. One of its fine deep blue bells when inverted would frequently cover the entire tiny plant that bore it. North of the Peace River it is usually found at an altitude of about 6000 feet. Further south, near Jasper, I have seen it growing at about 10,000 feet.

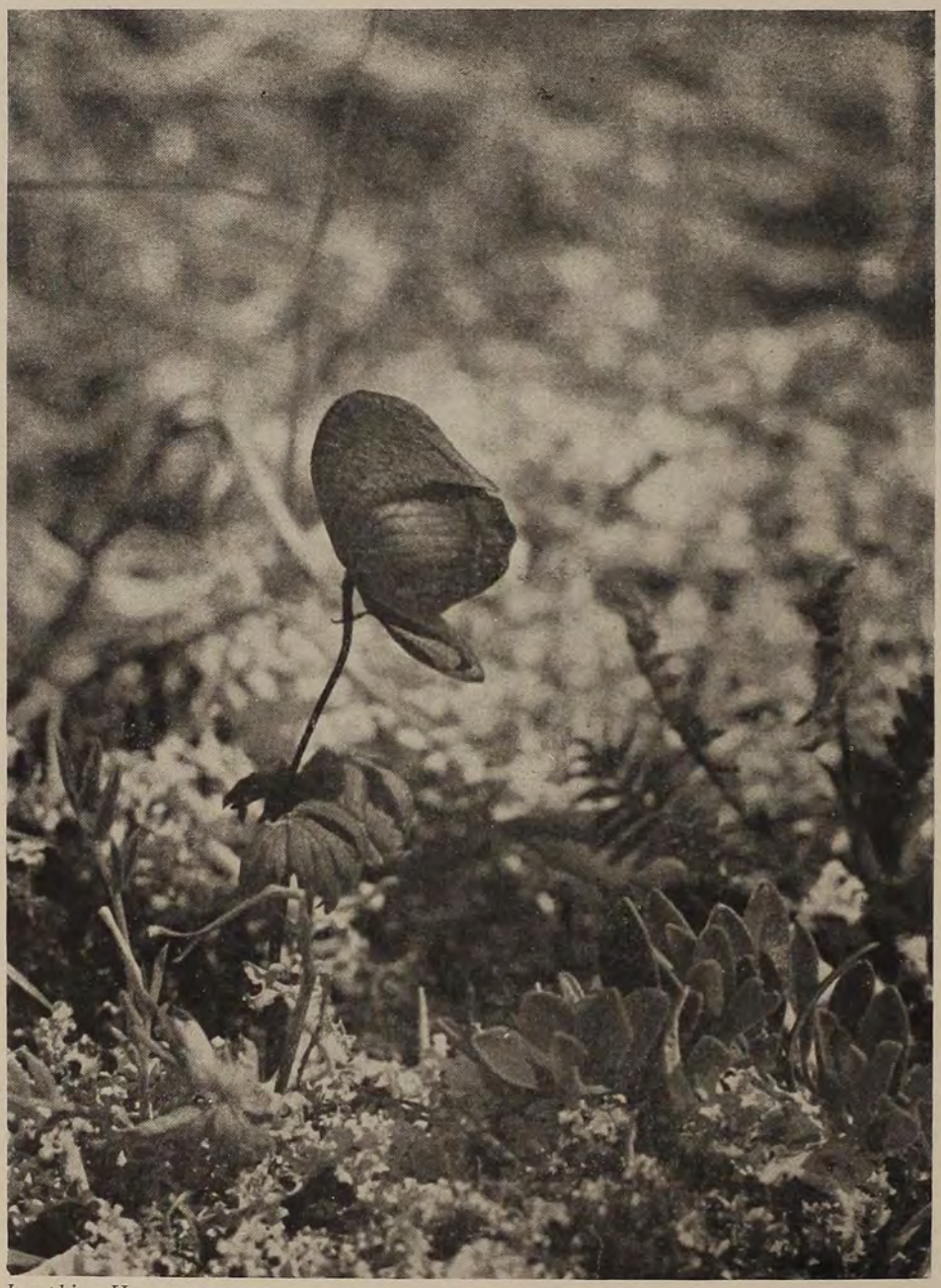
Myosotis alpestris was everywhere just as beautiful as it always is, and nothing could be lovelier than the tiny bushes of *Cassiope tetragona,* with its myriads of tiny white bells. *Vaccinum Vitis-Idaea minus* formed much of the ground cover, and all over the mountain *Linnaea borealis americana* laced itself through the other plants. *Potentilla dissecta's* bright yellow stars were attractive, too. There was a handsome dwarf willow, *Salix brachycarpa* that grew near the top, also *Betula glandulosa.* Both were fruiting at a height of 8 inches.

The next day, August 1st, was one of the few days we spent in camp. We were delayed here because the men went ahead to cut trail. A very pleasant feature of this camp was that there were many birds, white-winged crossbills which sang in a most delightful way all day long. There were lots of them and they were not in the least shy, so we could admire them quite close by. These very beautiful little birds had bright red breasts spattered with white dots, and they were both a pleasure to see and a joy to hear. Their song was much like that of a finely bred canary, only it was more tuneful, and as they sang while on the wing as well as when perched, it gave a curious but very pleasant sensation to hear these lovely songs approaching and disappearing in all directions. Birds have been rather scarce all summer, but sometimes I heard the sweet voice of the white-throated sparrow, the friendly notes of the chickadee, and occasionally lately the song of a wren. There were, however, a good many blue



Mary G. Henry

Evening in camp: Norman and Norman, Jr.



Josephine Henry

Aconitum delphinifolium (natural size)

grouse, spruce hens, and up above timberline, ptarmigan.

The next day we came to the Chandlee River, a very beautiful stream with clear water strongly impregnated with sulphur. In a shallow cave beside the river's edge were many pretty ferns, and they made a picture most pleasing to the eye. *Cryptogamma stelleri* was hanging from cracks in the rocks overhead, while *Cystopteris fragilis* and *Woodsia glabella* grew in the mossy interstices on the sides of the cave, and on the ground *Dryopteris Robertiana* thrust its attractive fronds through the moss. A saxifrage was falling all over the face of the cave, and higher up above the bank *Ribes triste* was carrying its ornamental glossy red fruit.*

(*To be continued*)

*A complete catalogue of all plants collected by Mary G. Henry, and botanical descriptions of new plants of both her 1931 and 1932 expeditions into this little known country, with brief itineraries of both trips, have been included in a book by Dr. Hugh A. Raup and published recently by the Arnold Arboretum of Harvard University, entitled "Phytogeographic Studies in the Peace and Upper Liard River Regions, Canada."

Filberts for the Amateur

By G. L. Slate

In recent years considerable attention has been directed towards the filbert in the northeastern states, particularly in New York and Pennsylvania. The difficulties that for many years prevented the successful culture of this nut stem not to be insurmountable at present. The collection at the Jones Nurseries in Lancaster, Pennsylvania, has been growing satisfactorily for a number of years. Near Rochester, New York, the Vollertsen orchard thrived for about 20 years, until its abandonment recently when the land was taken for city purposes. On the grounds of the Experiment Station at Geneva, New York, an orchard of 280 trees comprising approximately 40 varieties was set in 1924 and has been growing very satisfactorily since that time. This collection now numbers 120 varieties. Many farmers and amateurs have also planted a few trees for home use.

Considerable breeding work is being done with filberts in an attempt to develop varieties superior to those now being grown. The late J. F. Jones of Lancaster, Pennsylvania, crossed the Rush variety of *Corylus americana,* a native hazel, with varieties of *Corylus avellana,* the filbert, and produced a number of very promising hybrids. Two of these have been named and there are others of considerable merit. The United States Department of Agriculture and the Experiment Station at Geneva have made many crosses and are now raising the seedlings. The primary object of breeding is to develop varieties fully hardy in wood and catkin. Until we have such varieties, the commercial culture of filberts is an uncertain proposition in western New York at least.

Filbert plants are easy to grow, requiring no spraying or care that may not be given by the amateur. The trees come into bearing relatively early and bear annual crops which ripen sufficiently early in the fall to assure the proper maturity and harvest of the nuts well ahead of the first arrivals from abroad. They are easily propagated, easily harvested, and may be stored for many weeks under conditions available to anyone. The trees are small, may be grown as trees or large bushes, and tolerate shade and crowding somewhat better than fruit trees.

Before planting them extensively their disadvantages should be considered. Severe winters may cause winter killing of the wood. Mild weather often brings the flowers, both staminate and pistillate, into bloom so that they are injured by subsequent cold weather. Thus far mild winters have done more damage at Geneva than moderately cold winters.

The filbert is probably best adapted to those portions of the northeastern quarter of the country where peaches and sweet cherries are grown successfully. Since the limiting factor in filbert culture will probably be the killing of the catkins by severe cold following periods of warm weather during the latter part of the winter, regions not subject to prolonged warm spells during the winter will be most satisfactory. Such regions

will be found near large bodies of water such as the Great Lakes. For the same reason the site should preferably be a north slope or the north side of buildings. Warm southern slopes or warm sheltered spots near the south side of buildings should be avioded. Exposed sites should also be avoided. Exposed sites should also be tinuous winds is a factor in causing winter killing. If native hazels are nearby they should be destroyed owing to their tendency to harbor filbert blight, which is apt to be fatal to the European varieties.

The average farm and garden soil is suitable, but light sands or heavy clays should be avoided. Whatever the soil, it must be well drained. In wet locations growth will continue late, the wood will be immature and easily winterkilled.

In general the soil should be managed as with the tree fruits. Shallow cultivation until midsummtr followed by a cover crop to ripen the wood has proved a satisfactory practice at Geneva. The cover crop is all important, since filberts grow rather vigorously and unless they are checked in the fall the wood will be tender.

Some varieties of filberts send up many suckers from the roots and, unless these are subdued as soon as they appear, a veritable thicket will result.

Filberts may be trained either as bushes or standard trees, but the tree form is preferable and easier to manage. For a hedge the bush is better. Since the filbert fruits on wood of the previous season's growth, it should be pruned sufficiently to stimulate a moderate amount of new growth each year. In general, moderate thinning without heading back will be all the pruning that is necessary. Some corrective pruning may be needed while the trees are young.

Filberts are readily propagated by the amateur who may easily increase his stock by some form of layering. The easiest method is to mound up the earth around the suckers to a depth of several inches. By the following spring a good root system will have developed on the mounded portion of the sucker, which may then be taken up and set in the nursery row for a year, when it should be ready for the orchard.

The nuts ripen in September, drop to the ground and are picked up promptly before becoming dirty. They should be dried thoroughly before being stored. After drying the nuts should be stored in an unheated room where the air is moist. If kept in a heated room the kernels soon become dry, hard, and eventually rancid. Outdoor temperatures and humidity are satisfactory throughout the winter months.

Filberts bear young and annually unless injured by freezing. Four-year-old trees have yielded up to one and one-fourth pounds at Geneva. Five-year-oid Barcelonas averaged three pounds to the tree. Nine-year-old trees of Italian Red averaged eight pounds to the tree.

Filbert varieties are as distinct as varieties of tree fruits, and each variety has its faults and merits. In selecting varieties one should be certain to include some with fairly hardy catkins. This is necessary because all varieties of the European filbert, so far as is known, require cross-pollination in order to set satisfactory crops, and unless the catkins are hardy no pollen will be available at blooming time. Italian Red and Kentish Cob (Du Chilly) are among the best sorts at Geneva. Barcelona, Cosford and

Medium Long are fairly good. White Aveline is a good quality nut but difficult to husk. Purple Aveline is similar, but the foliage is a rich dark red in the spring, becoming duller as the season advances. Cosford, White Lambert, Red Lambert and Early Globe have the hardiest catkins. Rush and Winkler are the best of the native sorts. The Jones hybrids are very promising, but stock is still scarce. Buchanan and Bixley (Jones No. 200) are the best known to the writer.

Associate in Research
N. Y. State Agricultural
Experiment Station
Geneva, New York.

The Gerardi Hican

By Joseph Gerardi

During the late eighties and early nineties there was considerable talk in the southwestern part of Clinton County, this state (Illinois) regarding a certain nut tree in a deep forest in one of the bottoms of that section. No one knew what to call it, as it was obviously not a pecan and the nuts did not resemble any of the hickories with which the people of that region were familiar. It had certain characteristics of both the pecan and the hickories but no other tree or nuts like it had ever been known or heard of in that region. The nuts were large and fine, being more like pecans than hickory nuts, yet they were several times as large as the pecans grown in the neighborhood and of a different although highly pleasing flavor.

I lived in the neighborhood at the time but did not see the tree. I moved away in 1893 and heard no more of it. However, my brother George remained on a farm near by, and in 1931, after I had developed a small nursery of ornamental and fruit trees at O'Fallon he sent me specimen nuts, assuming that I would be interested. I forwarded these to Dr. A. S. Colby, Chief in Small Fruit Culture at the University of Illinois at Urbana. He was so impressed that he at once named the nut the Gerardi hican, explaining that it was an evident hybrid between the pecan and shallbark hickory, similar to others already well known, such as McCallister from Indiana, Rockville from Missouri, Burlington from Iowa, and various others.

At the suggestion of Doctor Colby I forwarded specimens to Mr. J. F. Wilkinson, Rockport, Ind., a prominent member of the Northern Nut Growers' Association, and also to the federal Department of Agriculture. In each case, including that of Doctor Colby, the replies indicated that this was apparently as promising a pecan hickory hybrid as had yet been brought to light. Thus assured, I attempted to graft it upon pecan stocks which I had in the nursery, but I failed to get a single union. However, I shared scions with Mr. J. G. Duis, an ex-schoolmaster of Shattuc, a town not far away, who succeeded in obtaining 35 trees during the summer of 1931. I have since learned that since the tree first became known many others vainly attempted to graft it. So far as I know, Mr. Duis was the first to do so successfully. My own success-

ful attempts were first made in 1932, or a year after Mr. Duis had it growing.

The parent tree of the Gerardi hican stands several hundred yards from the border of a dense forest in Sugar Bottom, 2 miles southwest of Damiansville, Clinton County, Illinois. No one knows its exact ownership, although it is claimed by two persons. It is near an uncertain property line where there has been no recent official survey. The Court may yet have to step in to clear up the situation.

This tree is now about 80 feet tall and has a trunk diameter at breast height of about 2 feet. Being much crowded, it has not a normal limb spread. The bark is considerably more scaly than is characteristic of native pecan trunks near by. The leaves are larger, more glossy, and more like hickory than pecan foliage. Locally, the tree has the reputation of being a good bearer, contrary to what is said to be the rule with most other similar hybrids.

All nuts of the Gerardi hybrid which I have seen have been well filled. I may have seen only the best, but these have certainly been fine. The young trees grafted by Mr. Duis in 1931 are growing nicely and promise to make attractive ornamentals. Very likely they would do this considerably north of our latitude. At this latitude and somewhat farther south they would no doubt bear good nuts. The evil tendency of poor filling may yet develop, but it would seem that if it were going to do so, it would have done so with nuts on the old tree, which is still thoroughly sound and vigorous. Everything considered, I believe that this hican promises to be a real contribution to northern nut horticulture.

O'Fallon, Ill.

Anton G. Hodenpyl, Master of the Art of the Out-of-Doors

An Appreciation by a Neighbor

Mr. Hodenpyl said, "I used to bring wild flowers from my home in Michigan, and they failed. Now I fit them to the soil, and they thrive and spread."

He was one of the earliest to apply the recently increased specific knowledge of the soil preference of plants. In *Taming the Wildlings* by Herbert Durand (later republished by Putnam's as *Wild Flowers and Ferns in Their Homes and in Our Gardens*) is a soil acidity map of Mr. Hodenpyl's estate at Locust Valley, Long Island, made by Dr. Edgar T. Wherry, then of the Bureau of Chemistry and Soils of the U. S. Department of Agriculture. The topography of the estate is essentially a series of ridges of about fifty feet. The highest acidity is on the ridge summits, where according to Dr. Wherry's scale the specific acidity reaches 300. In the valley-bottoms the acidity diminishes to as low as 3. The water in the pond is intensely alkaline from the

limy clay. The amount of humus, soil- and air-moisture, temperature, and sun- and wind-exposure are carefully ocnsidered in locating plants. Happy plants make a pleasing landscape.

Nearly thirty years ago Mr. Hodenpyl started his estate with the aid of Mr. O. C. Simonds, Landscape Architect, of Chicago. The house was located in an open field on the plateau. Two vistas were cut through the woods to Long Island Sound and to the east bordering Oyster Bay and Cold Spring Harbor, and four vistas were cut down the hills into the valley to the south-east. The tall forest has been progressively and sympathetically thinned, and is now open, sunny, and cheerful. Mr. Hodenpyl went about with white paint and marked the trees to be cut in the winter-time. Many side vistas have been opened from the paths and drives. The stumps are cut low, and it takes careful search to find them. This is a little detail of economy compared with removing the stumps.

Just the cutting of vistas and thinning the forest has made a beautiful landscape. "Study the old places and see that which endures" would be a test this landscape would pass after many years of neglect. The vistas would be narrowed and the trees again crowded, but the good design would be a pleasure to study.

An extensive collection of plants has been added to this landscape with the minimum of inharmonious results. First there were planted the usual large-growing shrubs along the drives and woodland borders. These blocks of ten or a hundred viburnums, forsythias, and similar plants have been largely taken out, and groups of new and unusual plants have been arranged harmoniously and thoughtfully. Many are back in the open woodland where they have space to spread. To collect these has required many years of scientific ability and skillful nursing of the seedlings and little plants. To map, record, label, and keep labelled these plants is a final service preparatory to making them known. "It is important that these plants be disseminated" is an index to Mr. Hodenpyl's generosity.

He had the happy faculty of meeting plant explorers in their interests, and to aid plant scientists to investigate and publish. To them he was an enthusiastic and sympathetic coworker. Sargent, Wilson, Frank Meyer, Fairchild, Wherry, and landscape gardeners of this country and Europe were his friends, as were the collectors and growers of plants of all kinds. Friends also were his neighbors, from the smallest child to the laborer new to the country. In time of adversity their support was his burden. A big area of his property above Kaintuck Pond and Beaver Lake is planted and equipped for community gardens, and people are working there industriously. The unemployed thinned the woodland and cut vistas for building sites, according to the plans of Mr. Simonds.

An interesting feature of Hill House, and one of the newest, is the rock garden or moraine. The conditions at the edge of a glacier are closely reproduced by broad reservoirs or pools above a spring. Moisture and coolness come up from below through broken stone and grit. Perfect drainage is secured, and the moisture of mountain mist is sympathetically given with a sprinkler. Here one may imagine oneself on the high summits of the Alps or Rocky Mountains. Each little plant is happy, and best of all, for the

hungry plant-lover, is a tiny green label.

The development around another series of springs is the center of a charming woodland picture. The springs flow into a little amphitheatre sixty feet across and perhaps ten feet deep. It is arched by white oaks of a century and a half and pepperidge, sweet birch, red maple, and scarlet oak of similar maturity. On the banks of the amphitheatre are Carolina rhododendron and *Azalea rosea* of cinnamon perfume. In the high-bush huckleberry is a brown thrasher's nest. Another part of the bank is covered with *Leucothoe Catesbaei* and *L. axillaris, Chamaedaphne calyculata,* and cinnamon ferns. Climbing hydrangea goes up the old oak. The voice of running water and waterfalls is almost unknown on level, sandy, bed-rock-free Long Island, but here it is brought in by boulders and cobbles almost as naturally arranged as by the glacier. Japanese primroses, gayer and taller and happier than phlox, make a panorama of red, white, and pink. One other color sets it off—the yellow of double buttercup, a double globeflower, and ragwort. Forget-me-nots and bluets grow in the sphagnum-carpeted path. Drinking water flows from a pipe under a rock. Hartstongue fern and Shortia hang over the water. Sheets of moss and Canada mayflower make a path and a happy birthplace for seedling rhododendrons. The brook disappears under a tall thicket of rhododendron, and soon makes a waterfall of six feet. The ravine below the waterfall is shaded with white cedars. Pink columbine, ferns, and Canadian yew complete the picture. A bench opposite the waterfall offers a restful invitation any time of the day.

On a steep hill above Mr. Hodenpyl made an alpine garden twenty-six years ago, but after two years' trial he decided this country was not favorable to alpines. This development has, however, formed a happy home for bearberry or deer-food, collected from the beach at Bayville, Scotch broom, various junipers, and broad sweeps of Scotch heather, which supplies the occupants of the neighboring beehives.

Visitors to Mr. Hodenpyl's estate will not find great sunken gardens and terraces and statuary. They will find a high development of that improvement upon nature which uses all her forces for the production of food, comfort, and beauty.

HENRY HICKS.

May, 1933.

Ilex Cornuta

By Donald James

Ilex cornuta was described in the Gardener's Chronicle of England in 1850, and plants were distributed by the Bureau of Foreign Plant Introduction of the United States Department of Agriculture several years ago, but it is still very little known to horticulturists and is grown by only a few nurserymen. The parent plants of those distributed by the F. P. I. were imported from China. In California it has stood unofficial temperatures of 10 degrees F. and has not been injured by sustained temperatures of 115 degrees F. with very low humidity. It is the only Ilex I have found that will thrive in the long, hot, dry summers of Southern California, but as yet I do not know how hardy it is.

In habit *I. cornuta* is an evergreen shrubby plant with short spreading branches. The leaves are generally quadrangular oblong with three spines at the apex, the two outside ones being larger than the center one with a hornlike appearance from which it gets the specific name, with one or two spines on each side, dark glossy green above and lighter underneath, one and one-half inches to three inches long and three-quarters inch to one and one-half inches wide. The fruit is large, bright scarlet, short stemmed in heavy clusters and is born on second year wood. At Santa Barbara it ripens the last of October and hangs on the plant until May or June when not eaten by birds.

Propagation is not especially difficult, although it took me some time to find a satisfactory method. No method was found which would make the seed germinate in less time than one year. Best results were had when the seed was planted in the open ground. Most of my seed was obtained from China, some of it from the parent plants at the F. P. I. Gardens at Chico, California. The seedlings are easy to handle and develop a very vigorous root system. Top growth is rather slow the first two years, but after that, fairly rapid. As yet I do not know the ultimate height. We have six year old seedlings seven feet high. Among five thousand seedlings from two to five years old there is an astonishing variation from the type described in Bailey's Encyclopedia of Horticulture. Two five year old plants are only seven inches high and the same in diameter with leaves about five-eighths inch wide and five inches long. Some plants are tall and slender and very open in habit while others are low, spreading and very compact. The leaves on some plants bear no resemblance at all to the type. Seedlings bloom in from two to five years and about one-half of them produce fruit. Although the type is described as dioecious, I have polygamous-dioecious plants with complete self-fertile flowers.

Well calloused cuttings in healthy condition were kept in a cold frame for twelve months without developing roots. In the summer of 1932 we put an electric heating cable with thermostat temperature control in a cold

frame. Cuttings in this frame calloused and developed very strong roots in four months, when they were put in pots. There was about three hundred cuttings in this group from plants with self-fertile flowers and ninety per cent of them were potted off and are all in good condition one year later, having made a much stronger growth than the seedlings do the first year. About ten per cent of them bloomed and set fruit while in the cutting bed. All the rest bloomed and set fruit a short time later.

The seedling plants sucker too freely to be useful as a rootstock for fruiting plants. No other species was tried. Root grafts on its own root were invariably successful, but very slow.

Although this ilex is very tolerant of our hot, dry summers, it is not drought resistant. The five thousand seedlings I have mentioned are in the open field and receive the same water and cultivation as most of the field grown ornamental plants in this locality. One large dwelling near Santa Barbara has about forty seedling plants in the entrance court which are six years old. The other plants in this court are *Stephanotis grandiflora, Trachelospermum jasminiodes, Jasminum azoricum, Magnolia grandiflora* and hybrid Camellias. About one-half of the Ilex plants are against a brick wall with a northern exposure. In the winter they receive no sun at all and only about one hour in the morning in the summer. The others are against a brick wall with a southern exposure. They receive sun all day summer and winter. Those in the shade are not quite so thick and compact as those in the sun but all have thrived equally well for four years on the same treatment the rest of the plants have received. They seem to grow equally well in light or heavy soils providing there is sufficient drainage. Plants up to four feet high have been balled very successfully in Santa Barbara without being defoliated or trimmed.

An eight year acquaintance with *Ilex cornuta* makes me wonder why it is not more widely planted. I am very sure it will thrive in a large section of the southern part of the United States and part of the Atlantic slope, as it is tolerant of a wide range of conditions and requires no especial care other than plenty of water and drainage for the roots. It is very useful and interesting as an ornamental plant, besides furnishing a good type of traditional Christmas decorations.

HENRY HICKS.

A Book or Two

Gardener's Handbook. By L. H. Bailey. The Macmillan Company, New York City, 1934, 292 pages, illustrated with line drawings. $3.00.

The Gardener's Handbook is intended to replace the author's older work, The Gardener. It is arranged like an encyclopedia from A to Z with descriptions under the entries of Latin names but a cross reference of common names. The descriptions are brief but include the essntial matters. The illustrations are interesting and usually accurate, but for the most part are rather ugly. Besides flowers, there are fruits and vegetables, as well as entries under "Insects and Diseases," "Mulches," "Land and Soil," and similar important topics.

New Gardens for Old. By H. Stuart Ortloff and Henry B. Raymore. Doubleday, Doran & Co., Inc., Garden City, New York, 1934. 196 pages, illustrated. $2.00.

This is a simple book with directions and suggestions for the home garden maker who does not need a trained assistant so much as a garden helper, in other words the gardener who wants to do his own job but needs some professional advice. Among the lucid text, the informative photographic illustrations, and the line drawings, he should find help here. The plants discussed will be of greater use in the north and northeast than elsewhere.

Year Book, The American Amaryllis Society, 1934. 106 pages, illustrated. Mr. Wyndham Hayward, Secretary, Winter Park, Florida.

The first volume, showing the work of this Society, founded during 1933, as announced in our pages, brings to our attention a great order of plants known to northern gardeners only in the hardy genera or as genera suited for pot cultivation.

There are included memorial notes for the late Doctor Nehrling, who did much for amaryllis in Florida, a copy of the Constitution and By-Laws of the Society, a tentative classification of amaryllis flower types for exhibition, a bit on color classification, an outline of botanical descriptions, a check list, and papers on breeding, propagation, and diseases, and the like. In short the young Society has touched on almost all the topics it is likely to cover more fully as time goes on.

All southern gardeners will need membership in this Society and northern gardeners will want to know more as to what they can have in pots.

Daylilies. By A. B. Stout. The Macmillan Company, New York, 1934. 120 pages, illustrated, color and half-tone. $3.00.

Doctor Stout has worked for many years with this handsome genus of plants and produced thousands of seedlings, some of which are beginning to be in commerce and many more of which should be. His present book represents, therefore, not only the fruits of labors but of his personal interests.

As a book it falls into a usual pattern. Several chapters related to the botanical aspects of the genus, a bit of history, an enumeration, botanical

and horticultural, and chapters for uses and propagation.

The book is beautifully made with interesting and charming illustrations. The text is not too technical for the amateur and is written with an enthusiasm that should be infectious. The weakest part of the book is probably that part covered by chapters seven and eight, but since the matters discussed have always to be rediscovered for each situation and each grower, this is scarcely important.

Lily Year Book, 1933. The Royal Horticultural Society, London, England, 1933. 243 pages, illustrated. 6 shillings.

This year book reflects the findings of Tht Lily Conference of July, 1933, already reported in our pages by Mrs. Mortimer J. Fox. The first paper of the book, following Mr. McLaren's gracious welcome, is Doctor Stoker's work on "The Environment of Lilies in Nature," giving a long list of lilies, their range, plant association, light conditions, soil characteristics, in short the key to their requirements. This is followed by "A Survey of Lily Soils," by Sir A. Daniel Hall and Doctor M. A. H. Tricker, reporting on pH concentration, lime content, moisture content, and various other observations, based almost entirely on cultivated plants.

Cultural matters touch on Pot Cultivation, Nomocharis, Vegetative Propagations by our own Doctor Griffiths, Propogation of Lilies by Seed, Sterilities, Hybridization, and Diseases, wth final notes on the exhibition.

The illustrations are charming, particularly those in the closing pages of the book where the hybrids are discussed.

Small Fruit Culture. By James Sheldon Shoemaker. P. Blakiston's Son & Company, Philadelphia, 1934. 434 pages, illustrated. Price $3.50.

The author of this treatise, who is Assistant Professor of Horticulture at the Ohio State University, expresses the hope that it will serve as a text and reference work, and also as a guide for field practice.

The six parts of the book are devoted, respectively, to grapes; strawberries; bramble fruits (raspberries, blackberries, dewberries, and loganberries); currants and gooseberries; blueberries; and cranberries. The culturt of each fruit or fruit type is discussed fully from many angles such as the areas of commercial cultivation, varietal characteristics, propagation, soil and climatic requirements, fruiting habits, tillage, recommended fertilizers, pruning, marketing, and diseases and pests.

Fifty-two text figures supplement the text, while the value of the book for reference purposes is increased greatly by forty-three statistical tables and an excellent bibliography of 389 references on small fruit-culture in general.

While of undoubted value for field use, the book would appear to be particularly desirable as an up-to-date textbook and work of reference.

Gardener's Pocketbook

New Plants

Among the flowers that have appeared for their first time in the garden is *Anthemis Hausknechtii* which was recommended by an English gardener as a plant that would probably enjoy our American heat. Although the familiar and more or less useful *A. Kelwayi* has been inclined more or less to weediness here and given all the anthemis a cloud of suspicion, I succumbed to this and was rewarded by a plant much more vigorous than *Kelwayi* that was covered with flowers of a far deeper orange hue than that species, sufficiently darker that one looked twice to be sure that it was only an anthemis. Not flowering in the garden to be sure but sent up from Mrs. Benner's garden in Dallas, Texas, came a wonderful lot of the prairie gentian, *Eustoma Russelliana,* an annual that should be worth untold sums in the country of its origin and certainly worth some effort to use in the North. The stalks were well clothed with rather glaucous leaves that clasp the stems and crowned with several stalks each topped with a lovely light lavender flower, five-lobed but with a general contour of a platycodon. At the base of each lobe on the inside is a deep patch of purple, just as many malvaceous plants have a signal at the base of their petals. As a member of the order of the gentians, it may be that this presents some difficulty of cultivation but possibly our Texas members can give us a hint of that.

Washington, D. C.

Iris Wattii, Bibliographic Literature

Because of space requirements on page 161 ith was not possible to have Dr. Berry's bibliography follow his text. It is given here with apologies to him and the reader who must look for it.

Anon. :25. New and rare plants.—Iris wattii. The Garden, 89:249, May 2, 1925.

Baker, J. G. :92. Handbook of the Irideae. p. 17, 1892. (Bell, London & N. Y.)

Berry, S. S. :27. A new Himalayan Iris treasure. Garden & Home Builders, 45: 158,200, 3 figs., April, 1927.

Dykes, W. R. :13. The Genus Iris. folio, Cambridge, 1913. :15. Iris Wattii. The Gardeners' Chronicle, Feb. 20, 1915. :24. Handbook of Garden Irises. 80-81, 245, pl.13, (Hopkinson, London), 1924. :30. Dykes on Irises. Compiled and edited by George Dillistone. 204-207, 247 (Tunbridge Wells), 1930.

Hort, A. :28. The Unconventional Garden. p. 186, (Arnold, London), 1928.

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Ilex cornuta (top). Ilex cornuta var. Burfordii (center and lower) showing the type of foliage. Notice the quantity of fruit and also the smooth dark leaves of the latter.

Ilex cornuta, "Horned Holly" or "Chinese Holly," and *Ilex cornuta* var. *Burfordii,* "Smooth-leaf Holly."

Of the Ilex genus, the species *cornuta* is perhaps the most curious and interesting, and certainly is a sight well worth seeing when in fruit. When mature it forms a comparatively low, bushy-headed tree with very curious, thick, leathery, glossy leaves. The

leaves are very peculiar in shape. They resemble an oblong sail with the sides bellying in the wind.

Mr. W. Dallimore in his book on "Holly, Yew, and Box" states that, "each leaf has usually five spines, which are strong and sharp. Two of these appear at the base and three at the apex arranged in a horn-like manner which has given rise to the common name of 'Horned Holly.' The margins of the leaves are very thick in texture, revolute, and sometimes produce here and there additional tiny spines which have an inward tendency. From a fruiting specimen in the Kew Herbarium, collected by Fortune in 1846, it appears that the upper leaves on mature trees vary in shape, sometimes being spineless and sometimes bearing but one or two spines." This point has been called to the attention of the author by Mr. S. R. Howell, prominent nurseryman, Knoxville, Tennessee. It so happened that Mr. Howell visited the Westview Cemetery in Atlanta, Georgia, a few years ago and was attracted by a large plant of Ilex (18 feet tall and 20 feet in diameter as measured by the author in June, 1931). It possessed only the type of leaves described by Mr. Dallimore from the specimen collected by Mr. Fortune. Mr. Howell readily saw the possibilities offered by this fine specimen of holly for use in cultivation, so he selected cuttings and propagated plants; and offered them in the trade as Ilex Burfordi, stating in his catalogue, "This is undoubtedly the greatest acquisition to the broad-leaved evergreen family which has been made in recent years."

The author was interested to delve into the history of this "Smooth-leaf Holly." Accompanied by Mr. Norman C. Butts, Ashford Park Nursery, Atlanta, Georgia, a trip was made to the Westview Cemetery, and on inquiring of Mr. A. J. Scott, the superintendent, it was recalled that the plant was originally sent by Mr. W. R. Smith, Botanical Gardens, Washington, D. C., to Mr. T. W. Burford, the former superintendent of the cemetery, about 1895.

Since cuttings from the smooth-leaf specimen produce plants identical with it, since these plants are darker in color than the true *Ilex cornuta* type, since the habit of *I. cornuta* is more stiff, upright, and rigid, whereas, the so-called *Ilex Burfordii* is more globose, the branches more drooping in habit, and of more rapid growth than *I. cornuta,* the author suggests that the plant be called *Ilex cornuta* var *Burfordii,* out of due respect for Mr. Burford and for Mr. Howell's foresight in propagating this splendid holly. When seeds of *I. cornuta* var. *Burfordii* germinate they produce seedlings similar to *Ilex cornuta.* This point was called to the author's attention by Mr. L. A. Berckmans, Augusta, Georgia, and also by Mr. A. J. Scott. The foliage of *I. cornuta* var. *Burfordii* resembles somewhat the foliage of *Ilex aquifolium* var. *Hendersonii,* but the fact that the seedlings are similar to *I. cornuta* most certainly leads one to consider it as a variety of *I. cornuta,* but not as a distinct species of Ilex.

Mr. Scott reports that the variety Burfordii has stood uninjured in weather below zero. This is a fact which leads one to believe that *Ilex cornuta* and *I. cornuta* var. *Burfordii* might possibly be hardy and enjoyed in the Northeastern States.

Dr. J. A. DeFrance,
Cornell University, Ithaca, N. Y.

Ilex cornuta, "Horned Holly" or "Chinese Holly." Plants of this type were recently distributed by the Division of Plant Exploration and Introduction, U. S. D. A. Rehder, in his "Manual of Cultivated Trees and Shrubs," gives the date of introduction as 1846, from East China.

The Maroon-Throated Erythronium.

One day last spring (April 10, 1933), I discovered in the vicinity of Rockville, Maryland, about 15 miles from the nation's capital, a small colony of strange looking trout lilies, which I have termed the maroon-throated Erythronium. This trout lily was so different from the common yellow trout lilies (*E. americanum*) which surrounded it that it attracted my attention at once. A few days later a friend and I dug a few of the bulbs, which varied in depth from 3 to 7 inches, and planted them at our homes in Washington.

I believe that the "maroon-throat" is a seedling derivative of the yellow trout lily. It is possible that it has been found before, though no specimens of it were found in the National Herbarium in Washington, nor is it recorded in a bunch of clippings and photostat records of distribution. Britton in his Manual of the Flora of the Northern States and Canada states that the flowers of *Erythronium americanum* are yellow, or rarely purplish tinged. The flowers of the strange trout lily from Rockville were not tinted with purple; they were of fairly solid maroon color, extending well up toward the tip of the petals, the tip being yellowish. The color is deeper in the throat than on the outer part of the petals, the outer part being tinged with yellow. The anthers were reddish brown, and the style reddish purple in color. The petals of one flower measured 31 mm. in length, in contrast to 35 mm. the length of the petals of a common yellow trout lily picked nearby. It is true, however, that the length of the petals varies in the species so that this distinction of having shorter petals may not always hold. The leaves of the maroon-throat are similar in shape to those of the yellow trout lily.

In order to be sure that what I had found was really a rarity, I scouted in the vicinity of the colony for other maroon-throats, and though I observed hundreds, perhaps thousands of blossoms, I found only the common yellow trout lily. The colony of maroon-throats was less than 10 feet in diameter, and had in it perhaps six or eight groups of flowering plants, and perhaps others not old enough to flower. In digging a few bulbs of the rarer variety, we were careful to leave several groups undisturbed so that it might perpetuate itself in its native habitat. From the smallness of the area and the scarcity of flowering plants in it, it would seem that either the variety is of somewhat recent origin on the spot and that it multiplies very slowly, or that one or more bulbs procured from elsewhere were planted on the spot and tha they had only recently become established. Conditions on the ground seem to point to the former hypothesis but the latter must not be thrown aside as impossible.

The writer would be interested in learning whether others have found this maroon-throated Erythronium in their woods in the East, and if they have been able to propagate it successfully from seed. I am hoping to secure seed from the transplanted bulbs so that I can grow seedlings therefrom and determine whether this rare variety always comes true from seed. I have two flowers of this variety which have been pressed since last April, and they have retained their color very well.

Roy G. Pierce.

Washington, D. C.,
January 12, 1934.

Eric Walther

Rhododendron tephropeplum

Notes from Golden Gate Park, San Francisco, California.

Of quite different type from the rhododendrons previously pictured here from Golden Gate Park is the subject of the present illustration, *Rhododendron tephropeplum* Balf. f. & Farrer. As evident from the author's names, it seems first to have been found by Reginald Farrer, but the plants grown in Golden Gate Park are from seed collected in

southeastern Thibet by Dr. Joseph F. Rock.

Its dwarf habit coupled with the abundance of its gracefully nodding, clear rose pink corollas serve to make it one of the choicest items in any collection, and particularly for the more discriminating rock gardener. Two forms are grown in the park, one of which may be more truly named, *R. spodopeplum* Balf. f. & Farrer, which is a name reduced to a synonym of the name adopted here, in "The Species of Rhododendron," with which treatment Mr. W. W. Smith is in accord, specimens of both our forms having been submitted to him.

R. tephropeplum is an anomalous member of the Series Boothii, most of whose members have yellow flowers. Our photograph is about half natural size, the leaves normally being about one and one-half inches long, and the bright rose pink corolla slightly over one inch in length. From the fact that it occurs in nature at an altitude of 14,000 feet, we may conclude that it should be fairly hardy and perhaps suitable even for the colder parts of the United States.

ERIC WALTHER

Prunus serrulata Lindl. Oriental Cherry. Variety Taki-nioi. (See page 199.)

In any collection of oriental flowering cherries there is a strong temptation to allow the more striking double-pink sorts to predominate, resulting in the lack of a pleasing contrast. Even though a suitable background of evergreens has been provided, the general effect may still be too colorful. Such a situation may be relieved by including a few trees of one of the white-flowered cherries, and the subject of this note has a number of characteristics that command it for this purpose.

Taki-nioi, in Japanese, signifies "fragrant cascade," a name that is well justified because of its great wealth of fragrant white flowers. The tree is relatively small, usually not more than 12 feet high, with many slender dark-brown branches, and develops a compact, rounded and somewhat flattened crown. The young foliage is reddish brown, and appears just about the time that the flowers are out in full, so that the whiteness of the flowers is scarcely darkened by the brown of the young leaves. When full grown, the leaves are about 5 inches long, coarsely and doubly serrate-aristate.

The narrowly ovoid flower buds are faintly pinkish at the tip, and the rather large narrow-triangular, often reddish sepals are either entire or serrate. The single, fragrant, pure-white flowers are usually 1¼ inches across, with narrow petals, and are in rather stiff clusters of 3 to 6. The small, globose, black fruits, like those of other single-flowered oriental cherries, are practically without flesh.

In fragrance Taki-nioi is slightly excelled by Jo-nioi, but that variety is conspicuously lacking in other attractions; for one thing it has a stiffly upright habit of growth.

Since its time of blooming practically coincides with that of the better double-pink forms, being only one or sometimes two days earlier, it serves admirably to lighten the color effect where pink varieties are planted in quantity. Taki-nioi is not one of the better known oriental cherries in cultivation. It is represented in the Potomac Park collec-

E. L. Crandall

[*See page* 198]

Oriental Cherry, Taki-nioi

tion at Washington, D. C., and is offered by one or two nurseries on both coasts. It usually bears a good crop of seeds, from which seedlings may be raised for use as stocks. These stocks are satisfactory for all but the northermost range of oriental cherry cultivation, approximating the peach in winter hardiness.

Two other varieties grown in Japan, Gozanoma-nioi and Ozumako, are probably identical with Taki-nioi.

PAUL RUSSELL.

Washington, D. C.

Notes on Winter Injury.

Among the species of cotoneaster that have been most promising in the evergreen section, *C. lactea* succumbed during the past winter with our low of 12°F., in spite of the fact that it was represented by three old bushes fully ten feet high with wood large enough and firm enough to make this surprising. As there are few dependably evergreen sorts in this climate this is more of a loss than might appear when one remembers that this is a large genus. The species that it most resembles, *C. salicifolia rugosa* growing nearby came through unscathed. This might make the loss seem relatively less, but this is not so as *C. lactea* blooms about ten days later and makes an even greater floral display with rather whiter flowers that are delightfully fragrant.

Just where the line of hardiness comes, is difficult to judge since these same plants earlier in their life had survived temperatures well below zero.

Another loss in the shrubbery border appeared in the Chinese pyracanthas. Large plants of the yellow-fruited forms of *P. crenulata* that were well-furnished with ten foot shoots covered with fruiting spurs, were cut to the ground so that all the years of making tops must be repeated. Fortunately the roots do not seem to have suffered for the basal shoots now appearing show all the vigor one might expect from a large root system.

Farther away *Pyracantha Gibbsi yunnanensis* suffered the same degree of injury but the European *P. coccinea Lalandi* lost only its foliage and is now reclothing itself in verdure.

Curiously enough the so-called hardy orange, *Poncirus trifoliata* which one might expect to be hurt was not injured even in the flowering buds that developed as though they had come through an ordinary winter. On the other hand, old plants of *Aucuba japonica* which looked fairly well with the arrival of Spring have gradually sickened until all their tops have been cut off and new shoots must develop to cover the damage.

Similarly *Escallonia glasnevinensis* which had survived for year and several species of cistus, looked well in March but are now stumps with new growth.

Photinia davidiana showed injury only by the indecision with which it started into growth, with a shoot here and there as if the effort were not worth while. Now that warmer weather has set in, new growths are breaking freely and the first delay will soon be hidden.

Washington, D. C.

Campanula lactiflora Bieb.

(See page 201)

This plant which comes from the Caucasus and Siberia is an interesting and very useful addition to the perennial border where a tall plant

Michael Carron [*See page* 200]

Campanula lactiflora

is needed for midsummer bloom. Like *Nepeta* Souv. de André Chaudron that shows masses of violet flowers through the same period, it does not like to be disturbed too often and when left alone for several years will form a large clump. From each crown it produces a number of stems from three to five feet tall, that bear above their delicate pale green foliage, masses of starry slaver-shaped blossoms about an inch across varying from milky white to pale gray-blues. After the first flowering smaller panicles develop from the upper axils. Unlike many of the taller campanulas it spreads slowly from the roots. Its variety *caerulea,* with its pale blue flowers appearing in June and early July, through the season of the early mid-season hemerocallis, and extending into the season of the garden phloxes, makes a charming combination also with *Achillea millefolium roseum* or Shasta daisy, Mrs. C. Lothian Bell. It is also useful to follow nepetas and delphiniums in the blue garden.

Like most campanulas, it is easily raised from seed but the seedlings do not flower until the second or third year. When grown from division the flowering is often poor the first year but good thereafter. It grows well in any garden soil with partial shade or in full sun but a more lucious growth is obtained when the supply of moisture in the soil is not too limited. Nevertheless, I have grown it very successfully in soil that became very dry after its period of bloom was passed. Although Farrer reports that it self-sows abundantly and although Mr. Bowles uses it in his wild garden where it makes masses of color in the bit of rough grassy meadow, it has not shown any tendency to self-sow here. It is, however, a plant to be considered for such uses.

I. N. ANDERSON.

Ballston, Virginia.

Spring Notes, 1934.

Nearly everyone feels a peculiar anticipation in spring and for those of us who have succumbed to the thrill of daffodil growing, spring comes to mean daffodils more than anything else, with the danger that we fall into repetitions of our pleasures at the expense of all listeners. There is some excuse, however, in mentioning them, for soon the season for their lifting and resetting will be with us and final decisions will be made for the new sorts that are to be ordered.

Two points might be given in regard to planting that have been useful here. Because they are plants that give rapid increase for the most part, one has to decide how much room can be given up to the more prolific sorts, a very real problem if space is limited as it is in most gardens. In my own case this has been a particular problem with some of the smaller Leedsii varieties, which I cannot abandon and certainly do not want to have by the thousand, or even by the hundred. Having read that varieties like the bicolor trumpet, Victoria, must be planted deeply to keep them from multiplying too rapidly, I risked the experiment of too deep planting on some of the Leedsii sorts, like White Lady and Evangeline, and set them about ten inches deep at the base of the bulb. The result has been ideal, for the increase has almost stopped and yet the bulbs continue in health and flower regularly each season. Having read also, if I remember rightly

in Mr. Bowles' Book of the Crocus, that crocus stocks can be hastened by shallow planting, I ventured to plant rather shallowly some solitary bulbs of sorts that I could afford only as single bulbs. The first season, they gave a fine flower, the one already formed when the bulbs were purchased, and the second season, a mass of small divisions and practically no bloom. When these bulbs were lifted, the mass of small bulbs was separated and the little pieces set out at a proper depth to fatten and return to normal living. Apparently this will be an entirely safe procedure, if one does not mind the interval in which there will be no flowers.

In the garden, there are masses planted as one would do in any case and other beds in which special attention is given to the health of the plants with the expectation that they would yield particularly good blooms for showing or especially vigorous plants to be used in seed-bearing. The question is often asked as to what treatment these receive. As it is no secret, but really a variation of advice given by Guy L. Wilson of Irish daffodil fame, I pass it on.

These beds are made as a trench, a matter of convenience here, with an excavation of about eighteen inches. The bottom of the trench is then dug with a spade until it is loose. Eight inches of old, well-rotted manure is then dug into that loose soil, which fills the trench somewhat. If no manure is availalbe, I must resort to old leaf compost and bonemeal, the latter generously dusted in to form a solid coating. On top of this layer of fertilizer is then laid a layer at least six inches deep of top soil in which there is no manure. On this the bulbs are set and the trench is then filled in with whatever soil is left, usually the poorest from the excavation. This may not look well in the garden where one likes to have the evidence of good soil in plain view, but the results in growth are the best, for daffodil roots grow down and the reservoir of food should be below the bulbs, but never touching them.

If there is time to attend to it, these trenches are remade every two years. The first year after setting, the flowers will be superb from all bulbs that are large enough to give good flowers. The second year, one gathers the increase in new bulbs.

One of the things that each grower seems to have to discover for himself is that most varieties of narcissus cannot be expected to give equally good flowers each year. The new bulb as received is chosen by the dealer from a size that should give you a good flower at once. This means that it has reached a certain stage in its cycle of growth and that after that stage one should look forward to the division of the bulb into smaller bulbs, none of which will be strong enough to equal the flowering of the first year. When one has a single bulb of an expensive variety, this is often disappointing and I have heard gardeners say that they did not care for such a variety as it always went back. This is not the case if they will stop to think. As one grows on the progeny of the original bulb the different parts are not of the same size and so do not come into their prime simultaneously and thereafter one will usually have at least one bulb that is in its prime each season. Eventually when the increase has amounted to ten or more

bulbs, the flowering is always enough so that one can be sure to have enough flowers of quality to fill any required exhibition class that takes three stalks. This is a point that beginners in the business of exhibiting should recall.

Having made the point, it is only fair to continue and say that there are enough sorts that do not follow this cycle so obviously. Although no careful data have been collected on this, I suspect that the varieties that form the larger bulbs and so are somewhat slower in their increase are more likely to remain in form than the sorts that make smaller bulbs and more rapid division.

One of the growers in England from whom I bought bulbs urged me to withhold judgment on all varieties from abroad until they had been in the garden for three or better four years. As the new bulbs usually flowered well enough I did not appreciate this advice at once, but when the same bulbs had been here four and five years and I was getting flowers from bulbs that had actually been made in my own soil I commenced to see that he was right.

The garden season here this year brought very few new bulbs to flowering, as no purchases were made in 1933. From two other gardens there had been gifts and the first flowers of Mrs. Foote's exquisite Leedsii Gracious opened their beautifully modelled flowers in all their perfection. The problem of describing Leedsii sorts is almost as difficult as that of differentiating among the *poeticus* varieties. They are so close and yet so different. This one, belonging in the Giant Leedsii section, has excellent stem and carriage, fine symmetry of bloom and extraordinarily smooth clear coloring. It is to be watched until it becomes one of the standard forms. From Mr. Root's garden came a bulb of Fairy Circle, a variety that should delight all comers. One might best describe it as a poet with a green eye and a fine apricot pink edge to the white eye instead of the poet's edge of crimson. Absolute symmetry makes it even lovelier. The color here is a little more definite than the somewhat similar color in Mystic, a variety of similar lineage doubtless, but with more wayward grace in the perianth as if there were some hint of old *poeticus recurvus* in its blood. Fine flowers too came on Killigrew, with its widely expanded and brilliant cup of yellow toned with orange and deeper orange.

As our season was slow and relatively cool, all the daffodils had ample chance to develop gradually and show themselves at their best. The whites were never whiter, the colored cups never more brilliant, with the single exception of Fortune, which gave superb flowers but not as highly colored as last season. For this I have no guess. Rosary was exquisite and even Suda, which usually fails to show even a hint of pink in its cup, distinguished itself, although its color was far from that that shows in Ireland.

As a variety for the future, one might watch Forfar, which has a very shapely perianth, almost white in color, and a wide flat eye that shows a bit of green in the tube, and fine orange to red orange over the rest of its surface. Here it stands on almost two-foot stalks with lush foliage abundantly produced.

Washington, D. C.

THE AMERICAN IRIS SOCIETY

The American Iris Society, since its organization in 1920, has published 45 Bulletins which cover every phase of iris growing and should be useful to all gardeners. The Society has copies of all but three of these Bulletins for sale. A circular giving list of contents of each Bulletin, price, etc., may be secured from the Secretary, B. Y. Morrison, 116 Chestnut St., Takoma Park, Md. **In order to dispose of surplus stocks of some numbers we offer 6 Bulletins (our selection) for $1.00.**

Through an endowment given as a memorial to the late Bertrand H. Farr the American Iris Society is able to offer free to all Garden Clubs or Horticultural Societies the use of our traveling library. This library contains all books ever published on Iris and a complete file of the bulletins of this society and The English Iris Society, and miscellaneous pamphlets.

The library may be borrowed for one month without charge except the actual express charges. Organizations desiring it should communicate with the nearest of the following offices:

Horticultural Society of New York, 598 Madison Avenue, New York City
Mrs. Katherine H. Leigh, Missouri Botanic Garden, St. Louis, Mo.
Sydney B. Mitchell, School of Librarianship, Berkeley, Calif.

The American Horticultural Society

INVITES to membership all persons who are interested in the development of a great national society that shall serve as an ever growing center for the dissemination of the common knowledge of the members. There is no requirement for membership other than this and no reward beyond a share in the development of the organization.

For its members the society publishes THE NATIONAL HORTICULTURAL MAGAZINE, at the present time a quarterly of increasing importance among the horticultural publications of the day and destined to fill an even larger role as the society grows. It is published during the months of January, April, July and October and is written by and for members. Under the present organization of the society with special committees appointed for the furthering of special plant projects the members will receive advance material on narcissus, tulips, lilies, rock garden plants, conifers, nuts, and rhododendrons. Membership in the society, therefore, brings one the advantages of memberships in many societies. In addition to these special projects, the usual garden subjects are covered and particular attention is paid to new or little known plants that are not commonly described elsewhere.

The American Horticultural Society invites not only personal memberships but affiliations with horticultural societies and clubs. To such it offers some special inducements in memberships. Memberships are by the calendar year.

The Annual Meeting of the Society is held in Washington, D. C., the second Tuesday in February and members are invited to attend the special lectures that are given at that time. These are announced to the membership at the time of balloting.

The annual dues are three dollars the year, payable in advance; life membership is one hundred dollars; inquiry as to affiliation should be addressed to the Secretary, Mr. C. C. Thomas, 211 Spruce Street, Takoma Park, D. C.