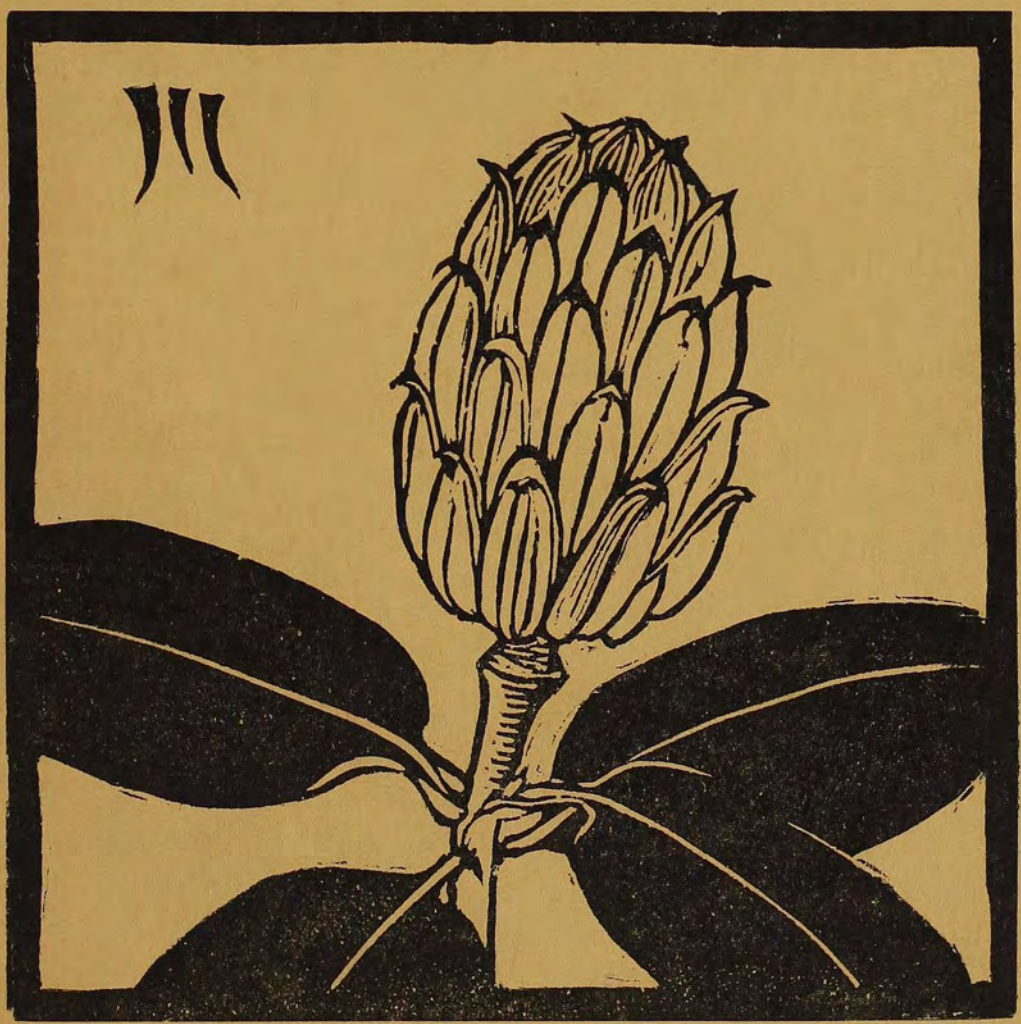
The NATIONAL HORTICULTURAL MAGAZINE



OCTOBER - - - 1930

The American Horticultural Society

Devoted to the popularizing of all phases of Horticulture: Ornamental Gardening, including Landscape Gardening and Amateur Flower Gardening; Professional Flower Gardening and Floriculture; Vegetable Gardening; Fruit Growing and all activities allied with Horticulture.

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The National Horticultural Magazine

B. Y. Morrison, *Editor*

Sherman R. Duffy, Bernard H. Lane, J. Marion Shull, Hamilton Traub,
Contributing Editors

Vol. 9 No. 4

OCTOBER, 1930.

With this issue The National Horticultural Magazine comes to the end of the ninth volume and prepares for its tenth. That fact alone suggests some special features that should come to members since a tenth anniversary is no mean occasion. The exact nature of the celebration we are not yet in position to divulge, but we will admit that it is to be contained in the issue for April in particular and to some degree in all the other numbers. We hope that you will like it as well as we believe you will, for surely nothing could be sadder than a birthday celebration that was not a success. One special request we make. Invite your friends to it! Our number has more than doubled this year as you will see when the membership list appears, but the larger the party, the better it will be. Get one new member at once and he will be sent this October issue free with his or her membership for 1931. To all who have made this year a success, our best thanks—to patrons, contributors, photographers, printers and friends!

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Above—Original planting of Pinus thunbergi set out in 1895 as three-year-old plants. Now 35 to 40 feet high.
Below—Pinus sylvestris growing with Pinus thunbergi.

Pinus Thunbergii on Nantucket[1]

By Bassett Jones

My father, the late Bassett Jones, besides being an architect had the fortunate avocation of arboriculture. I have never met another man who had so instinctive a feeling for the likes and dislikes of woody plants. His knowledge of the ecology of trees and shrubs was uncanny. This ability found its expression in the successful plant groups he brought together on the grounds surrounding the country homes he designed, that to-day, many years after planting, are a treat to those who know little or nothing of trees, and a lesson to those who understand. He knew just what trees would be congenial in close proximity to one another, and the individual preference of each species for soil, slope, air, light, moisture, and exposure.

In 1886 my father bought a little summer place in the then fishing village of Wauwinet on Nantucket Island, thirty miles at sea south of Cape Cod, and probably the outermost island possession of the United States on the Atlantic Sea Board. They say Nantucket is "the home of the winds." It is a wind-beaten scrap of till set down by the glaciers on a much older submerged hardpan of Cretaceous age that forms the surrounding, justly famous, Nantucket Shoals. From every direction the winds blow off the sea, salt laden, at an annual average velocity of nearly 15 miles an hour, reaching an hourly average velocity during January of 20 miles. In the winter a succession of colder northeast, north and northwest gales pound flat, or wind prune, almost every unprotected thing that grows, and during the occasional storms exceeding gale force, carry salt spray across the island.

The island is low and, in the central part, of rolling moor-covered rounded morainal hills reaching a maximum height of 90 feet above sea level. A mat of red bear berry or "mealy berry," Hudsonia, reindeer lichen, dwarf blueberry (*Vaccinium augustifolium*), and other low heath plants cover the hills. Everywhere through this mat threads the trailing arbutus.

In the valleys, frequently the sites of small spring-fed ponds, the dwarf huckleberry (*Gaylussacia dumosa*), beach plum, bay and scrub oak with several grasses form patches of low growth. To the south, the glacial out wash plain covered with scrub oak thickets stretches to a flat moor land bordered by the ocean. North of these hills is a more fertile loamy rolling lowland studded with freshwater ponds, cranberry bogs, and peat bottoms which latter, where protected by the higher hills, support stands of deciduous trees—American beech, red maple (*Acer rubrum*), sour gum (*Nyssa sylvatica*), white, black and scarlet oaks, flowering dogwood, occasional evergreen holly (*Ilex opaca*), all of limited vertical growth. The floor of these "forests" is carpeted with mosses among which are wintergreen and twin flower with decorative clumps of bracken and royal ferns. Some of the beeches are very handsome trees, the boles as much as two feet six in diameter, but only six feet high, the branches spreading over the ground for thirty feet in every direction.

On the dryer lands and low hills, and on the less protected bottoms these stands of larger growth are interspersed with interminable and almost impenetrable thickets of a wide and interesting range of deciduous shrubs and stunted trees with a wide variety of the taller heath plants. These

[1]Latin names of native plants used follow "Flora of the Northern United States and Canada," Britton and Brown. Such names are given only where otherwise the common name alone might lead to confusion as to species. The names of cultivated plants follow "Standardized Plant Names."

thickets, preceded by a dotting of low growing red cedar, gradually encroach upon and occupy any open field left fallow for several years.

The only native conifer is the red cedar (*J. virginiana*) which, here, has a wind habit all its own, bush or shrub like where partly protected from winds, and practically prostrate where openly exposed, yet healthy and very fertile. On Coatue, a curious six-pointed low sand spit seven miles long, enclosing the harbor, the red cedar grow in low dense hedge-like thickets along the ancient spit ridges, the trees a snarl of wind-twisted limbs reaching southwest. Along the high tide mark of beach and swale grows the groundsel tree (*Baccharis halimifolia*). Here, too, in the beech grass between the cedar hedges, grows the eastern cactus (*Opuntia opuntia*), and on the ridges, quantities of pink lady slippers push up through the padding of bearberry, hudsonia and reindeer lichen. In May the hairy Solomon's seal (*Polygonatum biflorum*) often carpets the ground under the cedars. In the open on certain of the ridges are densely grown areas of the star-flowered Solomon's seal (*Vagnera stellata*).

In the southwest corner of the island are patches of the broom crowberry (*Corema conradii*), that strangely distributed plant linking together the now separated elements of this coast from New Foundland to Long Island, and among the Scotch pines inland are a few small clumps of the Scotch heather (*Erica cinerea*), probably the only case of this plant growing wild in this country. On this island is also found the northern wild strawberry native from New Foundland to the Northwest Territory, and the northern gooseberry (*Ribes oxyacanthoides*) also native nearer the Arctic circle. Of this, the largest number of plants grew on the grounds of the Polpis Club, but have been dug up and destroyed as one of the natural enemies of the conifers. The only thorough-going study of Nantucket's strangely mixed Canadian and Carolinian flora is E. P. Bicknell's "Ferns and Flowering Plants of Nantucket," being a series of twenty papers published between 1908 and 1920 in the Torrey Botanical Club Bulletin.

There has been much discussion as to the possibility that Nantucket was ever truly forested. As for myself, I have never seen any reason to think that it was so forested. The soil of the island is generally a shallow sandy loam overlying the clayey somewhat gravelly, glacial till. Stones or boulders of any considerable size are lacking. A boulder weighing as much as several hundred pounds is extremely rare. The till is generally hard and lacking in plant food. Feeding roots do not penetrate it, so that it is hardly possible that any large trees could ever secure sufficient support to resist the winds. On the one site, Coskata, where there is a tradition that tall trees once grew, the underlying till is finely stratified in layers as hard as sunbaked clay—almost impervious to water. I doubt if any tree of any material height, save the surface-feeding tap-rooted conifer, could find a secure footing except, as I have pointed out above, in the low-lying peat bottoms. But even here no native tree reaches above the windbreak of the surrounding low hills.

The climate of the island is mild, cool in summer, and not often below freezing in winter. Snow never stays long on the ground, which rarely freezes and never deeply. The average temperature during February is over 31° F. The only chill winter days are accompanied by north or northwest, often violent, winds, with a clear or partly clouded sky. The Gulf Stream is but one hundred miles off shore, east and south. The spring winds off the cooled ocean are often penetrating. The seasons generally follow the ocean temperature and are about three weeks behind the mainland throughout the year. The climate during September and October is unbelievably fine, and the fall coloring of the moorland is a gorgeous display.

Conifers, both trees and seed, have

been brought to the island for a century or more. The pitch pine (*Pinus rigida*), the Scotch pine (*P. sylvestris*), the white pine (*P. strobus*), and the European larch (*Larix decidua*) have been planted and sowed in the central and more protected land. Here are considerable stands of generally straggly stunted trees. The white pine succeeds in growing at all only where thoroughly protected by the other, here hardier trees. In protected spots a few white spruce (*Picea canadensis*) have been set out and grow to restricted height. Strange to say, a single chestnut tree grows on the island, reported by Bicknell. This lonely tree has been attacked by the blight, and now (1930) is putting forth a few weak shoots.

It was on this wind-beaten ocean-washed island at its narrowest part, at the south end of a wave-built sand isthmus, or tombolo, linking the main island with Coskata—a relic highland to the north—with the ocean at his back door and the harbor at his front door, on a site completely exposed from east to west through the north, that my father set about the seemingly hopeless task of growing trees.

My father first set about finding some spot in the world having a climate similar to Nantucket. After several ineffectual experiments he decided that any trees that grew on the coasts of the northern Japanese islands ought to enjoy Nantucket conditions.

In 1892 the late Dr. Charles S. Sargent of the Arnold Arboretum brought over for my father some seed of the Black Japanese pine (*P. thunbergii*) and of the Red Japanese pine (*P. densiflora*). I believe this was the first importation to America of the former. The seed were planted in the Arboretum. The three-year-old seedlings were sent to Nantucket and set out in 1895, together with young Austrian pine (*P. nigra*), Scotch pine, China pine (*P. sinensis*), Swiss mountain pine (*P. montana*), white pine, Oriental spruce (*Picea orientalis*), Norway spruce (*Picea excelsa*), and Japanese yew (*Taxus cuspidata*). The Jack pine (*P. banksiana*) was planted in clearings made in the deciduous thickets outside the property and here it yet grows in a ragged broad-topped form, much as it appears near the northern limit of its range in the Labrador, but without seeding. These trees were reported by Harshburger as a "find" way south of their range. In an article entitled "Pinus Banksiana on Nantucket" Bicknell in "Rhodora" 18:216, reported that the trees had been planted and were not native. Bicknell also reported the introduction of "one species of Japanese pine" on the island, and one species of China pine. He failed to note that *two* species of Japanese pines had been introduced, but mentions "*P. massoniana*" as the China pine. Probably he mistook *P. thunbergii*, with which he may not have been familiar, for the *massoniana*. The *P. sinensis* had died out before Bicknell reported the planting.

Believing that the two Japanese pine offered the greatest possibilities, they were planted in a quadruple row on the east and northeast sides of the property, the other trees being planted to the west and southwest of this embryo wind break. Swiss mountain pine were planted outside all so that their low spreading branches would form an outlying evergreen undergrowth to keep the winter wind from getting under the taller growing trees exactly as nature thatches the border of a forest.

In addition, a Nikko fir (*Abies homolepis*) was planted in the southwest lee of the house. This handsome tree now has a bole about 18 inches in diameter, and about 20 feet tall where it bursts into a shattering of small branches, the verdure keeping closely to the outline of the protecting roofs.

Of deciduous trees the shining willow (*Salix lucida*) was planted in a damp hollow in the lee of the *thunbergii*. The silver-leafed Poplar and several kinds of fruit trees including the Japanese silver berry (*Elaeagnus*

umbellata), were set out in protected places. A single Norway maple was planted in the protection of a lattice lath trellis, and now, long after the trellis has been removed, its angular wind-pruned branches still retain the shapes given to them by the laths between which they grew. A single English white oak in the midst of some transplanted native oak bears the unmistakable impress of the winds in its low stature and spreading gnarled branches.

Of the other deciduous trees, only the silver-leafed poplars, the low-spreading willows, the silverberry, and a California privet hedge, now fifteen feet high, remain to mark the site of a difficult experiment with deciduous plants.

Of the conifers the *P. thunbergii* proved to be as happy on Nantucket as in its native antipodean home. Straight and sturdy, growing within 200 yards of the ocean beach, they made a foot to eighteen inches a year, until to-day they are thirty to forty feet tall. At seven years they bore cones and began to seed themselves, young trees in plenty rising through the grass, and where the seed were wind carried, spreading south and west outside the property. To-day, the third generation trees are bearing fertile cones. Of all the other conifers, the Scotch pine alone have produced a few and occasional seedlings following a pair of particularly mild winters.

The *P. densiflora* and *P. sylvestris*, planted among the *thunbergii*, have done well but prove the need of slight protection from the northwest, north and northeast. This is even more true of the *P. nigra*, which here does not compare in appearance with the other even partially successful conifers. The white pine, the China pine and Japanese yew have proved unfitted and have passed on together with the white spruce, which latter, however, has recently been replanted in sheltered nooks and, so far, has maintained its growth. The oriental spruce, where well protected, forms a low dense tree of interesting habit, wind burned where exposed.

Of all the other conifers the *P. montana* alone has proved as healthy under exposed conditions as the *P. thunbergii*. It bears cones, but does not seed itself.

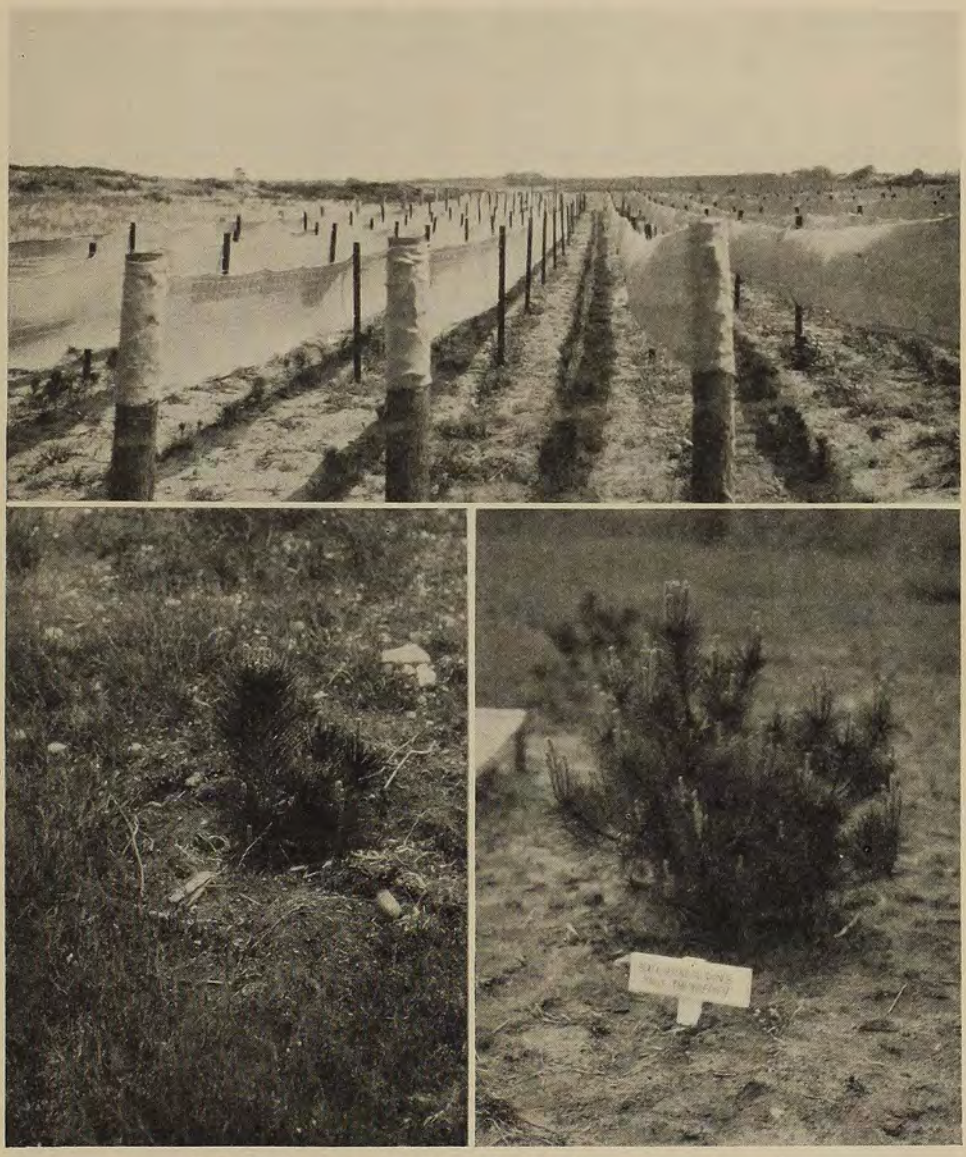
No other tree of any kind, deciduous or evergreen, where not planted in the protected streets of the town, has demonstrated its fitness for these wind and climatic conditions as has *P. thunbergii*. Where meteorological conditions are similar to Nantucket this tree should prove of use along the Atlantic coast from Cape May to Cape Cod[1]—wherever there is no heavy snow, for more than occasional snow it will not stand. It will grow close to the salt water. E. H. Wilson tells me he has seen *thunbergii* growing on the coast of Japan where six feet of the bole was washed by the water at high tide. Our handsomest specimens at Nantucket are single trees fully exposed to everything that comes off the sea from west to east through the north. It seems to love a salty gale, and, as I think, shakes its dense stiff foliage in the joy of struggle with the winds.

After my father's death, the planting received no attention for a number of years. The trees had been set out close together so as to mutually protect one another with the intention of thinning out as they grew taller and larger. By 1916, the place was a jungle of crowded plants and it was in this condition when Bicknell saw it.

[1]As a guide to those who may wish to try the Thunbergii in other locations, I give a summary of the meteorology at Nantucket furnished by Mr. George E. Grimes in charge of the Weather Bureau Station on the island:

Average annual precipitation	38.44 in.
Average annual snow fall	30.27 in.
Average annual wind velocity	14.6 m.p.h.
Average maximum month wind velocity	17.8 m.p.h.
Average lowest monthly temperature	31.1 deg. F.

Due to the high average winter temperature the snow fall stays but a short time on the ground.



Bed of 6000 2-year-old Pinus thunbergi from Nantucket seed
A 3-year-old self-sown in the rough *A 5-year transplant in the wind bed*

Since that time, my brother, Mr. W. F. Jones, has given the trees the large amount of care and attention they needed so that, at the present time, the little place has attracted much attention from visiting horticulturalists and foresters. Protected by the forty foot wall of densely foliaged Thunbergii is the charming bit of landscaping my father had in mind. Here, with wisteria, even cherry and apple trees can blossom contentedly. In June an English hawthorne (*Crataegus monogyna*) crowds its branches with gorgeous pink flowers, and English ivy masses itself on wall and chimney pot.

Having learned from my father the

love of plants and botany, when time was available, in 1925, I began the removal of *thunbergii* seedlings from Wauwinet to the grounds of the Polpis Club on Swain's Neck some three miles distant. Having need of more seedlings than were immediately obtainable in this manner, I ordered a thousand from the Massachusetts State Nursery which turned out to be *P. densiflora*. These young trees, set out on the south slope of low hill, where they get some slight protection from the north, are doing well. Next year I shall crown the hill with *thunbergii*.

Having found that the true *thunbergii*, to be at once known by its dark green stiff needles *and white winter bud*, were not obtainable in quantity, in the fall of 1926, Mr. Lincoln Crowell, State forest warden, and I, collected eight bushels of cones from the original Wauwinet trees. We picked these cones in early October, which, due to the late seasons on the island, was nearly a month too soon. Lincoln Crowell incubated the cones and extracted the seed at the State nursery, sending me half or upwards of two pounds. My share of the seed went to the North Eastern Forestry Co., at Cheshire, Conn., for planting, with the understanding that half of the successful two-year seedlings should be returned to me. The same arrangement was made with the State.

In the spring of 1929 I received in this way 29,000 seedlings. Those from Connecticut were in excellent condition. Those from the State in very poor condition. At the present time over 90% of the Connecticut seedlings are fine sturdy young trees. In spite of the greatest care, less than 50% of the State grown seedlings pulled through the first year at Nantucket, and more have died in their second year on the island.

These seedlings were brought down when two years old because at that age they had not adapted themselves to off-island conditions. They were set out in rows in carefully prepared beds provided with burlap sun shades mounted on chicken wire, the shades being in use during the three hottest summer months. Due to its habit of sun shading during its early life by the mother tree, the young conifer requires such protection until it is four years old.

In 1931, when four years old they will go into the rough and the beds will be replenished in the spring of 1932 with two-year seedlings grown from the cone crop of 1929, of which we took eighteen bushels and obtained upwards of 15 pounds of seed. If this seed proves as fertile as the 1926 crop, approximately a quarter million seedlings should result from the planting.

Mr. E. W. Littlefield of the New York State Conservation Department has also collected seed for experimental planting in New York State. Some of these seed have been planted (1930) at Lake Clear in Franklin Co. at 1600 feet elevation, under a mean annual temperature of 41° F. The result is doubtful.

I have asked the owners of property on Nantucket to take and care for most of the seedlings, I delivering the seedlings free of cost at the steamboat landing. The response has been most willing. Of the seedlings that came down in 1929, six thousand are in my own bed and the remaining 23,000 in beds prepared by others under my direction, so that several centers of distribution for this tree have been established on the island. In ten years the result of this general planting ought to be quite evident as a ten-year tree is at least ten feet high.

The *P. thunbergii* appears to be preeminently the tree for temperate seaside planting. It thrives under the most adverse conditions. The Northeastern Forestry Co. report that a quantity of our seedlings set out on Long Island have taken hold where nothing else would grow. In 1932 I expect to send seedlings to Iceland, near which island passes the same winter isotherm that touches Nantucket. We shall also try some on the

4-year seedlings from Connecticut-grown seed
5-year seedlings in wind bed

4-year seedlings from State-grown seed
6-year seedlings in wind bed

Eastern shore of the Chesapeake, but success there is doubtful.

Around the Polpis Club House, which stands on a hill, is a particularly windy corner. Here I have established an experimental bed. Each year I set out a few new forms of both evergreen and deciduous plants, planting a few in this wind-swept bed and a few each in other locations where different degrees of protection are provided. So windy is it in this bed that two beach plum bushes finding root there, grow flat along the ground. Here are now planted *Pinus thunbergii*, *P. densiflora*, *P. montana*, *P. mughus*, *P. koriansis*, *P. pungens*, *Juniperus virginiana*, *J. depressa*, *J. sargentii*, and *J. sabina*. But so far, only the *thunbergii*, the *montana* and its variant, the low-spreading *mughus*, have held their form and foliage. The *J. virginiana*, being native, is healthy, but hugs the ground in sprawling masses. The *J. depressa*, which does so well on the bleak hills of northern New England, here turns back and browns on the north side. New wood develops only on the lee side. The others are too new to offer any present judgment as to their adaptability.

Ultimately, when the new plantings of Thunbergii have formed a windbreak, a number of the more decorative trees can be grown in sheltered places. In five years I shall begin to put in Scotch and Austrian pines, larches, possibly a fir or two, the spruces, and clumps of hardy decorative juniper. Last year (1929) and this year (1930) I set out the Sargent crab (*Malus sargentii*) discovered by Dr. Sargent growing about the borders of salt marshes in northern Japan. Its growth is much like our beach plum.

In the thirty-five years that the *thunbergii* have been growing on Nantucket, the only disease or pest that has affected them is an occasional attack by the ribbed pine borer (three cases among the older trees at Wauwinet). The stands of Scotch pine and pitch pine in the central and southwest part of the island have been seriously injured by the tip moth, which seems to particularly prefer the pitch pine. If the pitch pines were removed and replaced by *thunbergii* and *densiflora*, I believe this pest would be practically eliminated.

Pitch pines growing in close proximity to *thunbergii* have been badly infested, while the adjacent *thunbergii* have shown no signs of attack. It seems that the moth will attack the *thunbergii* only where no immediate other choice is at hand and then but occasionally. During my annual early summer inspection of several thousand trees, I have found but a few cases where a *thunbergii* bud had become the home of larva. In 1929, purposely, I did not remove some of the infected young wood, and found that recovery was apparently complete; this, in spite of the fact that the buds removed were dissected and the coffee-colored black-headed larva found within. For some reason a single, and apparently healthy specimen, of the *mughus* has been mildly attacked for the past two successive years. *P. densiflora*, older and younger, have never been attacked.

Here let me knock on wood!

Now a word on setting out trees under conditions where the struggle for existence is so hard. Because I see so many mistakes made in handling evergreens, I say give the young trees a chance! Do not try to plant large trees that have acquired a different wind adaptation. A tree, even two feet high, planted in an exposed position on Nantucket, requires secure guying until it is set, and the slamming it will get is very likely to injure its form and break its limbs. The young three- and four-year *thunbergii* grow very dense and hug the ground with their lower limbs, building a broad-based cone. A four-year tree is the oldest that should be tried.

Even though it costs more, and, even for such young trees, dig a proper hole, say 18 inches in diameter, or the round of a shovel, and a foot deep, so as to clean out grass and other roots for the first two years. Do not expect

12-year Pinus thunbergi, self-sown, in fully exposed situation

the young surface-feeding conifer, while it is getting set, to successfully compete for food with the hungry grass. Lay in a spade of well rotted manure and cover with, say, four inches of loam. Then set the tree, stamp down firmly, and if the weather is dry give it a half bucket of water on the ground, *not on the foliage*. Now mulch, but keep manure away from the trunk. Never plant evergreens in earth mixed with manure. Keep their roots moist. We use a bucket of very thin mud in which the young trees are carried while planting. If the trees come out of the nursery bed, the ground is wet down the day before transplanting. Then, out of the ground, into the bucket, and back into the ground. So as to be ready for quick moving in the spring, the holes are dug in the fall (with us, even during the winter), the bottom covered with manure and loam over.

Do not hill up about evergreens, and do not dig in the surface mulching.

If you plant evergreens this way, they make a healthy start, and, if they live at all, will not disappoint you at the first drought or particularly severe season. I remember a Nantucketer remarking to my father, "You don't expect those trees to grow, do you? No trees will grow down here." And my father's answer, "I should not expect them to grow if I planted them the way you do."

If there are wild rabbits about, in the fall following the spring planting guard the young trees with a cylinder of 18-inch-wide chicken wire supported by three galvanized wire rose stakes 24 inches long threaded through the mesh. These guards can be easily and quickly made of this material, and used over and over. Leave them on the trees two years, or until the bark has hardened and is not to the liking of hungry rabbits.

The above precautions, while well known, are too often neglected, even by people who ought to know better.

The Sempervivums—Les Joubarbes

By Henri Correvon

(Translated and published by permission.)

(Continued from page 134.)

Group II. Pubescentiae—Leaves of the rosettes downy on both surfaces and short-ciliate on part or all of the margins, hairs silky and wooly; flowers rose colored, 10 or 12 parted. In habit low; type, S. montanum.

S. alpestre Lamotte, Mèm. Acad. Sc. Clermont, VI, 1864, p. 308.

Related to montanum from which it differs in its rosettes of a bright and not ashy green and in its deep rose colored flowers, with narrower and more long-acuminate petals.

Found in the Spanish Pyrenees, in Corsica, in the Alps, the Appennines the Sudete, Carpathia and Delmatia. We received it in 1886 from Chaté in Paris.

S. anomalum Baker, Gard. Chron., 1879, II, p. 107. See S. pumilum M. Bieb. and S. pauciflorum Baker.

S. bambergi Hamp., De la Soie, Bull. Soc. Murith., 1874, p. 15.

A montanum with small stiff rosettes, without hairs at the tips of the leaves, that abounds in the neighborhood of Bourg-Saint-Pierre (Valais) and that is believed to have originated in the Jardin de la Linnaea.

S. burnati Wetts.

This is another montanum, more developed in all its parts; rosettes large and with long stolons; stalk taller in that summit and the inflorescence are covered with a soft down, glandular and abundant, that recalls that of tectorum (Burnat, Flore des Alpes-Maritimes, Vol. IV, p. 41). It is perhaps a lime-loving form of montanum.

I have found it abundantly on the very calcareous slopes of Mont Mounier (Maritime Alps) in company with montanum which appears to be the type of Linné. I have found it also in the Pyrenees and it was reported by Cairos in 1910. Sundermann sent it to us in 1909.

S. candollei Rouy & Cam., Flor. Franc. Vol. VII, p. 139. See S. montanum L.

S. caucasicum Rupr., Boiss. Flor. Or. Vol. II, p. 796.
S. montanum C. A. M.

Rosettes of medium size, with oblong-obovate leaves, sharply attenuate to a point, with strong marginal hairs; few-flowered corymbs with two scorpioid branches bearing 10–12 flowers; petals spreading like a star, linear-lanceolate, acuminate and 2 or 2½ times longer than the calyx, rose-striped purple in the center. (Boissier gives it 14 petals but at Floraire it has never had more than 12.

Rocky slopes in the Western Caucasus. We received it from Prague in 1890 and from the Botanic Garden at Giessen in 1904.

S. clusianum Tenore, Flor. Nap., IV, p. 268.

This is a montanum with glabrous leaves and narrower petals that grows in the Abruzze near Majella.

Received from the Botanic Garden at Lausanne in 1920.

S. dahuricum Hort. See S. stenopetalum Lehm. & Schnittsp.

S. debile Schott, Oestr. Bot. Wochenbl., II, 1852, p. 18.

Differs from montanum in its strong-

er stalk, ascending or prostrate, very leafy, and in its narrow lanceolate petals of reddish-brown.

Western Tyrol, in granite. We received it in 1890 from Prague and from the Botanic Garden in Giessen in 1904.

S. DOLOMITICUM Facc., Flora, 1854, p. 482.
S. oligotrichum Baker.

Rosettes small and incurved; leaves insensibly acuminate and aciculate; petals lanceolate, rose. Related to MONTANUM from which it differs in the strong, dry hairs which edge the leaves of the rosettes and to FUNKII from which it differs in the more elongate, oval-lanceolate leaves of the rosettes, with shorter hairs, and in its red-brown petals.

Dolomites at 1,500–2,000 m. altitude. Possibly a hybrid? We received it from Prague in 1889, from the Botanic Gardens at Innsbruck in 1895, and from Giessen in 1904. I believe I have found it on the walls of the Tombea (Judicarie) but it has never been reported brought back from their base.

S. ERYTHRAEUM Vel., Flor. Bulg., I, Suppl. p. 111.

Related to MONTANUM, from which it is distinguished by reddish leaves much longer acuminate than in the type; the stem-leaves being thicker, oblong-lanceolate, and gradually attenuate to a point; flowers smaller, with long attenuate sepals; petals a beautiful rose color, linear; calyx glandular-tomentose.

Mont Rilo in Bulgaria and probably elsewhere in the Balkans.

S. FLAGELLIFORME, Lehm. & Schnittsp. Flora, 1865, p. 18.

A very distinct MONTANUM. Rosettes small, intensely green, sending out long stolons which sometimes reach 20 cm.; stalks with few flowers ascending or bending; flowers brownish-rose, appearing in May, long before any other species.

This plant was sent by its authors from the Botanic Garden at Carlsruhe. Baron Perrier de la Bâtie cites the plant at Vallorcine (Haute-Savoie), after De la Soie, which point is open to question (Cat. rais. pl. vasc. Savoie, Vol. I, p. 307). We have received it from Paris in 1884, from the Botanic Garden at Brunswick in 1895, from Carlsruhe in 1897, and from Giessen in 1904.

S. FRIGIDUM Lamotte, Mèm. Acad. Sc., Clermont, VI, 1864, p. 310.

This is a MONTANUM of great dimensions; clump large, sometimes 15–25 cm.; rosettes 3–4 cm. in diameter; leaves long-attenuate to a point; stalks and panicles abundantly covered with short glandular hairs, alternating with long soft hairs, also glandular; petals lanceolate, of a pale rose color; filaments glabrous.

High Alps, about Viso; Haute-Maurienne; cliffs of Mont Blanc (where I have never found it); Tyrol; finally, Ariège and the Western Pyrenees. I have found superb specimens at the foot of the source of the Arc (Haute-Maurienne) and in the High Queyras about Echalp.

S. MINIMUM Timb., Bull Soc. Bot. France, XI, 1864, p. 136.
S. pygmaeum Jeanb. & Timb.

Plant slender with small rosettes (1–3 cm. in diameter); petal lanceolate, brownish-rose; filaments hispid-glandular at the base.

Mont Cenis, Tyrol, Pyrenees (at Esquierri, Llaurenti, and in the center of the range), Monts Corbières.

S. montanum C. A. Mey., Verz. Pfl. Cauc., p. 152. See S. CAUCASICUM Rupr.

S. MONTANUM Linn.
S. candollei Rouy & Cam., Sp. Pl. 465, Fig. Col; H. Correvon, Atlas de la Flore Alpine, p. 185; Flore Alpine, pl. 39. *S. thomasii* Lagg.

Rosettes small (4–5 cm. in diameter)

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Sempervivum cornutum, mettenianum, fimbriatum

with rather long stolons, more or less spreading, furnished with leaves that last rather long; leaves oblong-cuneiform, covered with short glandular hairs, longer on the margins; stalks 10–15 cm., with oblong-obovate, very obtuse leaves; panicles small, short-glandular, tomentose; corolla rather large (3–4 cm. in diameter); petals pubescent, brownish-rose, nearly three times as long as the sepals; filaments glandular-hispid, at least on the lower range; carpels glabrous on the back.

Abundant in the granitic Alps (1,000–2,500 m. altitude) or in lime where the soil is decalcified, except in the Pyrenees where it is common on the whole chain, especially near Gavarnie. It is found in Corsica and according to Welenowsky in the Balkans (Monts Kom, Rilo, etc.).

S. MONTANUM var. PALLIDUM Wetts.

Has yellowish-white flowers.

S. MONTICOLUM Jord. & Fourr., Brev. Pl. Nov. fasc. II, p. 37.

A MONTANUM with leaves of a very uniform green, and panicles trifid with bifid branches; flowers smaller, of a purplish-rose, almost white at the base of the petals.

La Grave (High Alps).

S. MONTICOLUM Lamotte, non Jord. & Fourr., Brev. Pl. Nov. fasc. II, p. 37.
S. subalpinum Rouy.

Differs from MONTANUM in its gray-green rosettes, with leaves sharply attenuate to a sharp point, in its calyx divided to the base and in its narrower petals, very pale rose color below.

This plant belongs in the Pyrenees and I believe that it is the one I found abundantly at Pic Piméné and on the Spanish side of the slopes of Marboré at the bottom of the valley of Arrazas.

S. oligotrichum Baker. See S. DOLOMICUM Facc.

S. pauciflorum Baker. See S. PUMILUM M. Bieb. and S. ANOMALUM Baker.

S. PENNINUM Lagg., Bull. Soc. Jurith., III, 1875, p. 15.

A MONTANUM with denser rosettes (as are found in the type in dry places) and with more strongly ciliate lanceolate leaves, that has been found in the neighborhood of Bourg-Saint-Pierre.

S. PUMILUM M. Bieb., Boiss. Flore Or. Vol. II, p. 796.
S. anomalum Baker.
S. pauciflorum Baker.

Rosettes small, about the size of a large hazelnut; leaves oblong-lanceolate, pointed, hairy and ciliate; stem leaves tenuous, small; panicles corymb-like, carrying 2–7 flowers; petals rosy-purple, lanceolate, downy, three times as long as the calyx.

Rocky cliffs of the Western Caucasus, near Daghestan, above the river Samur at 2,000 m. altitude and at Tuschettia near Diklo.

Obtained from seeds received from the following Botanic Gardens: Petrograd, in 1895; Munich, in 1896; Erlangen, in 1896; Varsovie, in 1899; Tiflis, in 1910.

S. pygmaeum Jeanb. & Timb., Mass., Llaurenti, p. 367. See S. MINIMUM Timb.

S. STENOPETALUM Lehm. & Schnitts., Flora XXXVIII, 1855, p. 18.

Rosettes of medium size; leaves oval, elongate, of a beautiful gazon green with red lips; stolons 5–8 cm., trifurcate, and branches 3-parted; petals narrow, acuminate, 3 times as long as the calyx, rose with white margins.

Introduced by the horticulturist Borck of Frankfort in 1848, under the name *dahuricum*.

Origin unknown. We received it from Paris in 1884, and from the Botanic Garden at Brunswick as seed in 1895.

S. subalpinum Rouy. See S. MONTICOLUM Lamotte.

S. thomassi Lagg., Bull. Soc. Murith., III, 1875, p. 17. See S. MONTANUM L.

Group III. BARBATULAE—Hairs of the basal leaves longer than in the preceding groups, those at the tips as long again and soft, resembling a tuft or wisp of white wool more or less well developed; flowers rose with 10 or 12 divisions. Type: S. FAUCONNETI.

S. ALATUM Scheele, Flora XXVI, 1843, p. 453.

Rosettes small, with obovate-lanceolate leaves, with recurving points, glabrous on both faces, ciliate, carrying on the tip a tuft of woolly hairs not like those in ARACHNOIDEUM; stalks furnished with two wings and downy; petals bright rose, elongate.

A very distinctive species of unknown origin that seems to have been lost in cultivation.

S. ANGUSTIFOLIUM A. Kern, Oestr. Bot. Wochenbl. 1870, p. 285.

Rosettes small, with leaves narrow, lanceolate-acuminate, glabrous on both faces, bordered with long articulated hairs and with shorter glandular hairs; stalks and panicle lax, flowers rose, striped with deep carmine, with lanceolate petals three times longer than the calyx; carpels nearly oval.

Grows on the shining slates of the Oetzal (Tyrol) at 700–1,300 m. altitude. Received from Kesselring in 1911.

S. BOULANGERI Hort.

A small species with modest ciliate rosettes; hairs weak at the tips of the leaves; flowers bright rose.

Received from Chaté in 1885, from Prague in 1890.

S. CHAVINI Lagg, Bull. Soc. Murith., II, 1873, p. 32.

Rosettes of medium size; leaves brownish, obovate, ending in a short, brown point and bearing at the tip, during their early years, a sheaf of whitish hairs; stolons short, the young rosettes springing up in the old ones; stalks 10–15 cm.; panicles corymbiforme, covered like the calyx, with white hairs mixed with other shorter ones; flowers rose striped with bright carmine in the center.

It is again one of the forms having a very confined area, that one found in 1868 on the rocks of the tunnel of Sembrancher (Valais) where I collected it in the company of many other related forms differing very little from one another.

We received it in 1911 from Kesselring.

S. FAUCONNETI Reut., Cat. Pl. Vasc. Genèv. ed. II, p. 298.

Here is a *joubarbe* very particularly interesting in regard to its isolated and confined location. Rosettes of moderate size, with leaves somewhat spreading, oblong-spatulate, short-acuminate, strongly ciliate with hairs long and flexuous that grow longer toward the tip and form a spiderweb-like tuft; leaves studded on both faces with glandular hairs and with small elongated purple dots, stem leaves oblong-lanceolate, acute, strongly ciliate and cottony at the summit; stalks 12–25 cm., furnished particularly toward the top with long woolly hairs; flowers with 9–12 divisions, 2–5 cm. broad; petals broad-lanceolate, short-acuminate, once again as long as the calyx, of a beautiful rose color, ciliate and glandular; filaments rose purple and one-half shorter than the petals; carpels glandular.

This curious species was discovered by Reuter, Aug. 20, 1860, on the rocky cliffs of the western part of Reculet (French Jura) on pure limestone. All the botanists in Geneva have been making pilgrimages ever since to this dry ridge, where I myself collected the plant in 1885. Some have believed it a hybrid form between TECTORUM and ARACHNOIDEUM; but how do they explain such a cross as the latter does not grow in the Jura nor on the limestone cliffs of the Haute-Savoie connected with the Jura. One must go more than 100 kilometers distance, in Valais, to find ARACHNOIDEUM in a spontaneous station. I believe that

it has been discovered on the Tournette (Haute-Savoie) and at Montferron, but they are at least 60 kilometers distant as a bird flies. Like others, S. FAUCONETTI reproduces itself from seed, which indicates that it behaves like a rather well fixed type.

It has been found since then in several places. Dr. H. Goudet collected it on the rocks of Trient, where I, myself, found it in 1912; I have gathered it in the valley of the Drance in Valais, and it is said to have been found at Jalouvre (Haute-Savoie). It will certainly be recognized elsewhere.

S. FUNCKII F. Braun, Flora XV, p. 4, 1832. Figures colored and black; Jord. & Fourr., Icones, fig. 218; Belgique Horticole, 1873, pl. 12; Garden, 1910, p. 91; Farrer, English Rock Garden, Vol. II, p. 356; Correvon, Atlas de la Flore Alpine, pl. 210.

Rosettes of moderate size, globular in form; leaves very green, narrow oval-lanceolate, covered on both faces with long, simple hairs; flowers bright rose, large, with linear-lanceolate petals, acuminate, marked in the center with a darker stripe.

It grows in the Alps on the Tyrol, in Styria, in Carniolia, in Carinthia and Transylvania, at between 1,600 and 2,100 meters altitude. It has been credited to the Haute-Savoie, but Perrier de la Bâtie (Catal. pl. vasc. Savoie, p. 305) doubts if this is really Braun's plant.

We received it from Paris in 1884, from Van Houtte in 1886, from Tottenham (Holland) in 1895, from the Botanic Gardens of Laybach in 1895, of Brunswick (as seed) in 1895, as well as the Paris Museum in 1915.

S. OBTUSATUM Hort.

Related to FUNCKII; clumps compact, not stoloniferous; rosettes small (2.5–3 cm. in diameter); leaves strongly ciliate with small wisps of white hairs at their tips, green toward the base and brownish on the reverse and toward the tip.

Received from M. Pauli in 1921.

S. PILOSELLUM Schnittsp., Bull. Soc. Murith., 1874, p. 15.

Very closely related to FAUCONNETTI; leaves of the rosettes furnished with small tufts; a reduced form of the type.

Rocks of Sembrancher (Valais).

S. RUBICUNDUM Schur., Oestr. Bot. Zeit., 1858, p. 22.

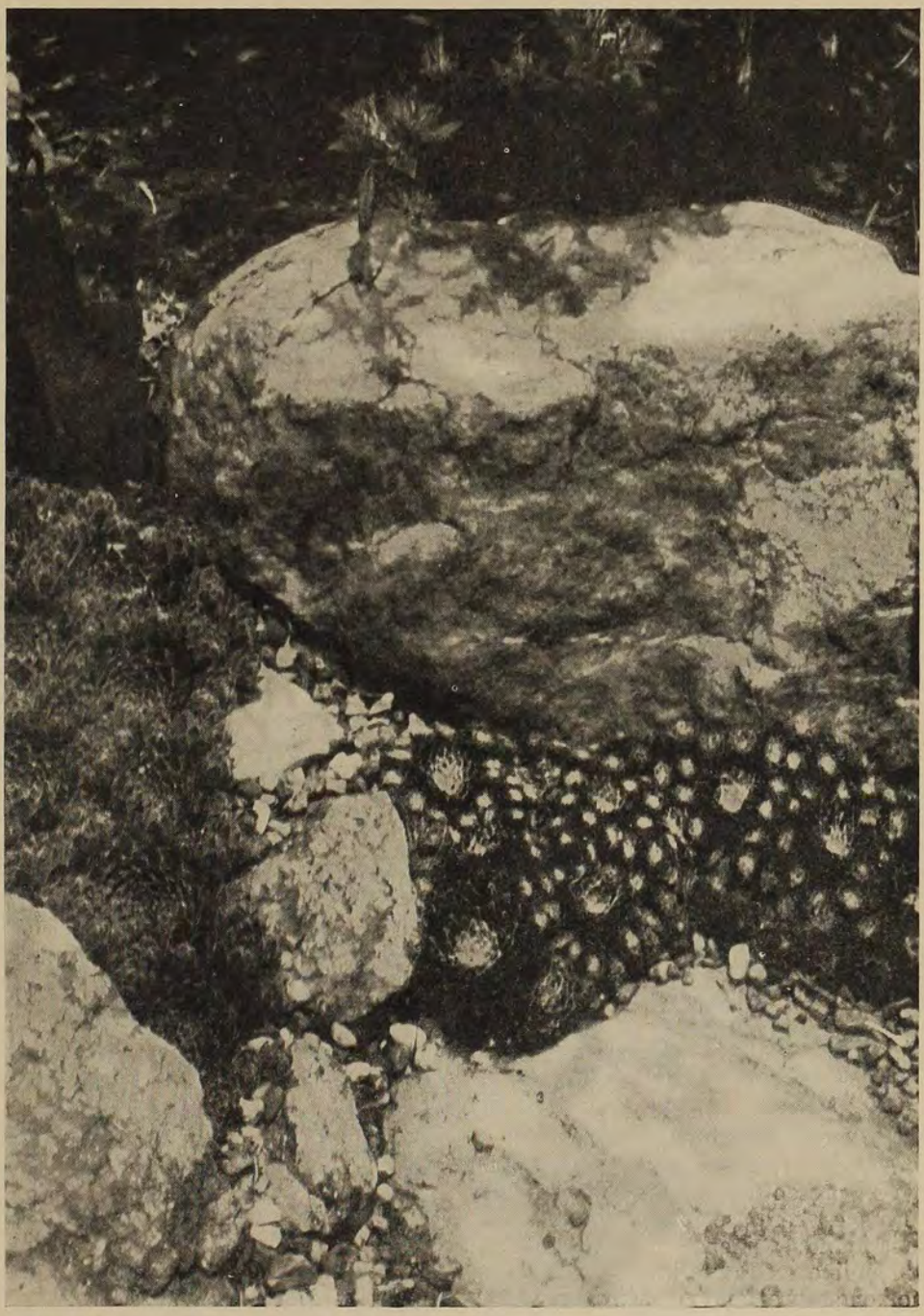
Rosettes of medium size, of a bright rose, with leaves obovate-lanceolate, truncate at the base, suddenly acuminate at the tip, downy-tomentose and ciliate on the margins; stem leaves oblong-lanceolate, gradually acuminate, nearly auriculate at the base; long stolons with open rosettes; stalks 20–30 cm.; flowers rosy-purple, with widely opened petals, oblong-linear, long-acuminate, ciliate.

This is a pretty plant with red foliage that grows in Carpathia and in the Alps of Transylvania. We received it in 1890 from the botanist Roemer at Cronstadt, Transylvania.

S. TISSIERI Lagg., Bull Soc. Murith., II, 1873, p. 32.

This again is one of the innumerable forms found in the valley of the Drance in Valais, at the place where two geologic formations come together and each clump of sempervivum has its own particular physiognomy. It is considered here as a form intermediate between TECTORUM and the BARBATULAE. Rosettes of medium size, with pale green leaves, strongly ciliate and ending in a tuft of white hairs; stem leaves oval-lanceolate, ending likewise in a white tuft; stalks 15–20 cm. with short, glandular hairs; flowers pale rose; petals acuminate, with an elongate and ciliate point, with a short stripe in the center.

Rocks near Sembrancher, Valais. I reported this station in 1910 and we received it from Kesselring in 1911.



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Sempervivum assimile and fauconnetti

S. VALESIACEUM Lagg., Bull. Soc. Murith., II, 1875, p. 15.

All we can say of this is that this species belongs in the group Barbatulae, in that it has linear-lanceolate leaves and beards! Go then and find it again! Reported from Catogne (Valais).

Received from Kesselring in 1911.

Group IV. ARACHNOIDEAE—Low plants in compact tufts, with rosettes bound together by long, soft hairs like a spiderweb springing from the margins and especially from the tips of the leaves which are, on both faces, equally furnished with small glandular hairs; panicles corymb-like, short-tomentose.

S. ARACHNOIDEUM L., Fig. Col.; Bot. Mag., tab. 68; Garden, 1884, I, p. 323; Garden, 1914, II, p. 436; H. Correvon, Atlas de Flore Alpine, pl. 186 et Flore Alpine, pl. 39. Black and white figures: Silva-Tarouca, Freil. Staud., fig. 364; Farrer, English Rock Garden, Vol. II, p. 346.

Compact clumps of small rosettes covered with spiderwebs, with oblong-obovate leaves, attenuate to a small obtuse point; stolons very short, without leaves for their entire length; except toward the tip; panicles short, glandular-tomentose; flowers very bright rose, with 10–12 divisions; petals acute, glabrous, ciliate toward the summit, one to one and one-half times as long as the calyx; stamens with filaments hispid their entire length; carpels closed.

A very variable and polymorphic type, presenting itself in as many forms as there are conditions in which it is found. Like the type TECTORUM, it has liberated a veritable debauch of nomenclature and certain botanists of the past century have multiplied the species according to their fancy. Under cultivation these varieties preserve certain characters, but not always. One should have the patience and the time to reproduce them from seeds. Then, if the characters persist, one might classify them definitely.

S. ARACHNOIDEUM appears in the flora of all the granitic Alps at between 600 and 2,500 meters. One finds it in the Pyrenees at Cévennes, in Auvergne, as well as in Transylvania and Roumélie. Cultivated on the roof of a terrace at our University where it never loses a ray of sunlight, it reaches a superb development and flowers again in autumn, but it is exposed to the depredations of crows that hunt for spiders.

S. ARACHNOIDEUM ALBUM Hort.

Mlle. E. Monnard of Mont-sur-Rolle, Vaud., has reported from the neighborhood of Zermatt (borders of a footpath that leads from Ryffelhorn to the cottage Bétemps) a S. ARACHNOIDEUM with pure white flowers, which she sent us in 1908. This plant, which is probably more delicate than the type, perished during the following winter.

S. ARACHNOIDEUM ATROPURPUREUM Beauv., Bull. Soc. Bot. Gen. 1910, p. 59.

A form with darker flowers, that the botanist Naville found on the summit of Mont Méry in 1909. Leaves, carrying at their tips wisps of hairs as in FAUCONNETTI; petals large and of a very deep rose.

This form is widely spread in the chains of the Vergys and at Méry (Haute-Savoie) and is to be met with again in the Alps of the Tarentaise. I believe that I have found it at the base of the Haute-Maurienne.

S. ARACHNOIDEUM GLABRESCENS Willk., Fuhr. Pfl. Deutsch, p. 614.

A local form with a slender stem and nearly glabrous leaves.

Burnat records it in the Maritime Alps on limestone and on granite.

S. arachnoideum gnaphalium. See S. TOMENTOSUM Lehm. & Schnittsp.

S. BARBULATUM Schott, Oestr. Bot. Wochenbl. III, 1853, p. 91.
S. piliferum Jord.
S. cerbarum Gaut.
S. spectabilis Schnittsp.

Considered by several authorities to be a hybrid of MONTANUM and ARACHNOIDEUM and by other authorities as a distinct type. Plant stoloniferous with many rosettes; less woolly than ARACHNOIDEUM, it differs in the fact that its hairs are less thick at the time of flowers, the want of webs connecting the rosettes, in its leaves (rosulentes) oblanceolate, sharply transformed to a narrow point (aristées), by its oval-lanceolate petals, twice exceeding the sepals.

Swiss and Italian Alps above 800 m. and the Tyrol. We received it from Vilmorin (Verrierès) in 1905, the Paris Museum in 1915, and I have gathered it in the Oberalp and at Bernina (Grisans).

S. BRYOIDES Schnittsp.

This is a HETEROTRICHUM in very reduced form, the smallest known species of sempervivum. Plant minute, with silvery tomentose rosettes, tinted with bright rose.

Granitic Alps from about 1,800 m. Dr. H. Goudet sent it to us from Zermatt in 1900.

Received from the Botanic Garden of Brunswick (as seed) in 1895 and from Kesselring in 1911.

S. cerbarum Gaut., Flor. Pyr. Or., p. 184. See S. BARBULATUM Schott.

S. DOELLIANUM C. B. Lehm., Flora XXXIII, 1850, p. 449; colored fig., Seeboth, Alpenflora, pl. 89; half-tone, Farrer, English Rock Garden, Vol. II, p. 352.

Related to arenarium, from which it is distinguished by its weaker webs, disappearing from the old rosettes, and by its slender wisps of hairs on the leaf tips; petals twice as long as the calyx, borad-lanceolate, of a less bright rose color, turning to a brownish-purple; filaments yellowish. Brueg-ger (Jahresb. Nat. Ges. Graub., 1870–80, p. 93) describes this plant as very distinct from BARBULATUM with which many botanists identify it.

This is a rare species which grows in the alps of Western Switzerland and in the Tyrol above 1,500 m. Perrier de la Bâtie (Cat. pl. vasc. Sav. Vol. I, p. 307) cites it on many summits of the Haute-Savoie and of the Savoy, and Burnat finds it in the Maritime Alps. We received it in 1884 from M. Boissier, in 1895 from the Botanic Garden of Brunswick, in 1897 and 1911, from Kesselring, in 1914 from the botanist, Beauverd, and in 1915 from the Paris Museum.

S. ELEGANS Lagg., Bull. Soc. Murith., II, 1873, p. 50.

Rosettes small, closely contracted in winter, with linear-lanceolate leaves ending in short, downy points, bearing a soft wisp of webby hairs, pale green in color, somewhat ciliate; stolons short; stalk slender, and furnished with remote, glandular hairs; stem leaves closely imbricated, brown at the points, tipped with a weak wisp of hairs; petals two and one-half times as long as the sepals; flowers rosy-amaranth, bordered with glandular hairs.

Found at the Grand Saint-Bernard in 1863.

S. FIMBRIATUM Lehm. & Schnittsp.
S. foucaudi Gaut., Flora, XXXVIII, 1855, p. 17; half-tone figures, Garden, 1914, I, p. 47; Farrer, English Rock Garden, II, p. 356.

Rosettes medium-sized; leaves obovate, broad lanceolate, acuminate, ciliate on the margin, glabrous on the faces, those of the stalk slender, bordered with long jointed hairs and short glandular hairs; stalks compressed; petals linear, twice as long as the sepals, clear rose color; stamens glabrous; carpels lanceolate.

Alps in the Tyrol, from 1,900–2,200 m. altitude, in upper Italy and the Dauphine. Dr. Gaudet reported it to us from the foot of the Piora and we

have received it from Chaté in 1884, the Botanic Garden of Brunswick (as seed) in 1895, of Giessen in 1904, from Kesselring in 1911, and the Paris Museum in 1915.

S. foucaudi Gaut., Flor. Pyr. Or., p. 184. See S. FIMBRIATUM, Lehm. & Schnittsp.

S. HASTIPETALUM Lagg., Bull. Soc. Murith., 1874, p. 15.

This is an ARACHNOIDEUM in which the petals are all lance shaped.

Found at Bourg-Saint-Pierre in 1860.

S. hausmanni Auersd., Nym. Consp. 259.

One of the innumerable forms of ARACHNOIDEUM.

S. HETEROTRICHUM Schott, Oestr. Bot. Wochenbl., III, 1853, p. 83.

Distinct from ARACHNOIDEUM in its less tall stalk (7–10 cm.), in its long spidery hairs covering its different parts (the hairs are very long, tangled, and spreading); it is distinguished on the other hand by the short pubescence of the leaves and by its sepals ending in long, white tufts of hairs; petals rose with a central carmine stripe.

Alps of Salzbourg.

S. HOOKERI Hort. Van Houtte.

A very downy form of ARACHNOIDEUM with large rosettes, completely whitened by their hairs.

Received from Van Houtte in 1885, from Kesselring in 1911, and the Paris Museum in 1915. E. H. Jenkins distributed it in England from 1900–1910.

S. LAGGERI Schott, Oestr. Bot. Wochenbl., 1853, p. 90.

Plant tufted, with dense and compact rosettes, flattened above, the leaves deep red-brown without, green within, and entirely covered with a thick, white down, pressed and tangled, especially toward the center; stalk 5–8 cm., few-flowered; stem-leaves small; flowers small (1.5–1.8 cm. in diameter) with oval-lanceolate petals, attenuate toward the tip, one and one-half times as long as the sepals.

The Alps, here and there, especially in the west. We have received it from the Cambridge Botanic Garden in 1887, from Prague in 1890, the Botanic Garden at Brunswick in 1895, from Vilmorin (Verrières) in 1905.

S. leucopogon Schnittsp.

Mentioned by De la Soie (Bull. Soc. Murith, 1874, p. 15) as a form of BARBULATUM. It has never been published.

S. MOGGRIDGEI Hook. f., Pl. Col. Bot. Mag. tab. 6610.

Differs from ARACHNOIDEUM in its basal leaves, shorter and more oblong, forming a rounder ball, in its more obtuse stem leaves and in its few-flowered panicles. It is a plant much more beautiful than arachnoideum, which Hooker described from specimens which were sent from the horticulturist, De Smet of Ghent, that were said to have been obtained in the Maritime Alps. Burnat (Flor. Alp. Mar., IV, p. 49) considers it a hybrid between TECTORUM and ARACHNOIDEUM.

We received it from Backhouse of York in 1888, from Defregger at Kufstein in 1895, and from Haage & Schmidt in 1904.

S. piliferum Jord. See S. BARBULATUM Schott.

S. SANGUINEUM Jeanb. & Timb., Massif Llaurenti, p. 366.

This is an ARACHNOIDEUM with a compact and reddish aspect, with rosettes covered with white tomentum, depressed, flattened above, covered with very abundant hairs forming a thin woolly tissue; stalks low and slender up to 5–8 cm.; few-flowered, with slender erect branches in the panicles; stem-leaves small; flowers relatively small (1.5–1.8 cm. in diam-

eter); petals oval, sharply acuminate, more than once again longer than the sepals. Plant redder, more thick-set and more compact than S. LAGGERI.

Grows in the Western Pyrenees and Ariège. We received it from Petrograd in 1892.

S. spectabile Schnittsp., Bull. Soc. Murith., 1874, p. 14. See S. BARBULATUM, Schott.

S. TOMENTOSUM Lehm. & Schnittsp., Flora, XXXIX, 1865, p. 57.
S. webbianum Lehm. & Schnittsp.
S. arachnoideum gnaphalium.
S. transalpinum Hort.

This is a very vigorous ARACHNOIDEUM, with large flat, horizontal rosettes, covered with a very delicate down of tangled hairs which stretch from point to point in the rosette until one can not see more than the white tissue; stalks 10–18 cm.; flowers very large, of a clear carmine.

Alps in Western France. We have received it from Chaté in 1886, and from the Botanic Garden at Zurich in 1895.

S. transalpinum Hort. Froebel. See S. TOMENTOSUM Lehm. & Schnittsp.

S. webbianum Lehm. & Schnittsp., Flora XXXIX, 1856, p. 57. See S. TOMENTOSUM Lehm. & Schnittsp.

(*To be continued.*)

Some Species of Tulips

By Alfred Bates

With the craze for rock gardens—fully eighty per cent of those we see prove that it is merely a craze by the way they are built and the plants put in them—tulip species have come more and more to the attention of the gardening world. And rightly so, for they do not have to be taken up and replanted each year and on account of the variation in the size of their flowers they fit into many places where garden tulips would be glaringly out of place. I have found that they are quite easy to manage and even increase freely provided they are given good drainage, a hot summer baking—this means no shade or ground cover—and bonemeal and lime.

Sir A. Daniel Hall in his Book of the Tulip makes a more or less blanket statement that these tulips are not permanent even in the rock garden (real rock garden) and that they should be given protection. This may hold true for English gardens where the summer sun is not as hot as it is here. He also advises early lifting and storing in sand, which is not at all necessary here in America. But he does make one point which I think holds true for America as well as for England and that is that they should be planted deep, "at a depth that may seem excessive for some of the small bulbs." E. A. Bowles, in his book on the crocus, calls attention to the fact that deeply planted crocus corms stay healthy longer and bloom better than shallowly planted ones where the tendency is to increase abnormally. I think this also applies to most other bulbs and corms.

In the following notes on the different species which I am growing these facts should be borne in mind: the soil was prepared to a depth of eighteen inches by digging in a liberal quantity of bonemeal and old lime mortar, with some of the pieces as large as a marble, and some humus as the soil was rather sandy. The bulbs were planted on a thin cushion of sand at a depth of seven inches for the large bulbs to four inches for the small bulbs, and this means from the neck of the bulb not the base. In heavier soils I would not decrease this distance by more than an inch. Each location gets the full sun all day. Most of the varieties were planted in 1925 and only one has been lifted, and that only because it had to be moved this year. And they were all planted as early in the season as I could get them in. Any variation from the above is noted in the following list.

T. australis (*celsiana*) was planted November of 1929 and did poorly on that account. Another year may tell a different story.

T. clusiana has done exceptionally well both in the rock garden and in a raised border; has had a light ground cover, *Phlox divaricata* in the border and *Sedum sieboldi* in the rock garden.

T. carinata rubra, while not considered a species by most botanists, has behaved like one, growing sturdily into a handsome clump and flowering profusely each spring. It is a deep rich red with a bright green midrib two-thirds up each peranth segment, an attractive flower which is not held too stiffly and is not too large for its height, 20 inches.

T. eichleri has only been in since 1928 but shows no signs of deteriorating.

T. hageri is the lovely little gem that Farrer, in his British Rock Garden, says it is; its six inch high mahogany-colored flower is the most charming of tulips, at least to my mind, and why Hall speaks so lightly of it I can not understand. Mine were bought just before Christmas of

1925, because I was talked into it by a clever saleswoman and I hurriedly slapped them into a pan and almost forgot them. But when they bloomed! I have been trying to get more of them ever since but until this year I have not succeeded. They are offered now in one catalog where they are described with a height of ten inches; don't believe it, for they are only six inches, at least if they are true.

T. kaufmanniana has not increased and the flowers are no longer of the same size as they were the first two seasons after planting. On the other hand, it still blooms to a bulb and after five years in the same place I don't think I can complain. Besides, it gets more shade than I think it wants, as it is shaded by a rose arch throughout the afternoon. This year it and *clusiana* have had a liberal dose of bone meal grubbed into the soil over them.

T. marjoletti, which had been scattered through a border instead of planted in a clump as it should have been, has on account of this bad planting received harsh treatment; nearly every year a bulb or two are cut into when iris are being replanted, but it still lives on and while not a glory of the garden I would not like to be without it.

T. montana was at last located and late in November of last year planted in what I thought to be the very choicest spot in the garden. In mid-January it was budding at the height of four inches and then came that cold spell and the plants were a mass of mush. Because of the lateness in planting I had put it down only three inches, intending to replant this summer; had it been planted deeper I am sure it would still be alive.

T. persica has gone on increasing since its second season and this year when I had to take it up to make some changes I found thirty-one bulbs in place of the six I had planted.

T. primulina is the one casualty. I think it was because of too shallow planting; the bulbs were so small that I couldn't bring myself to plant them as deep as my better judgment told me to.

T. praestans, in the driest height of a small rock garden, has done better each year until now I am afraid it is beginning to be too crowded and will have to be lifted.

T. silvestris is increasing like mad, even passing from the border and growing up thrugh the grass; but it only blooms after very hot, dry summers and I am inclined to think that it should have more food (lime) than I have been giving it.

T. sprengeri did well until this year, when as a result of a multitude of ants deciding that the sand cushion under its bulbs made a good home for them and so left the bulbs suspended; there was only one healthy plant. Hence the advice of a thin, not more than a scant half inch layer of sand under the bulbs and if you are troubled with ants in your garden I would advise using plain unfertilized soil in place of the sand. I have a fear of getting any kind of fresh plant-food too near the base of any kind of a bulb, corm, or rhizome.

As for combinations of plants I can not imagine anything lovelier than *persica* at the foot of *Chamaecyparis obtusa nana compacta* with *praestans* on the west side of the evergreen, which will shade this early flowering species and so retard it enough to help it from being nipped by early frosts. *Hageri* against the gray stone of a ten-inch wall with the fern *Woodsia ilvensis* starting into growth in the foreground makes another happy picture. *Cotoneaster adpressa* forms a good background for *sprengeri*. One spring I had *marjoletti* blooming with Narcissus Mrs. Thompson over a carpet of aubrietia, blue-purple and *Alyssum montanum* and it was very gay but it never repeated its glory. *Clusiana* with the young growth of *Sedum sieboldi* at its feet and on the rocks behind it a soft white mass of *Sempervivum arachnoideum* makes another pleasing group.

Roosevelt Cabin—III

By Fannie Mahood Heath

Now our prairie flowers are really coming into their own. Try as you may, you will find it impossible to find such brilliant colors among the shade-loving flowers as now adorn our prairies. If you are a fortunate tourist crossing our State, you are cheered by the thousands of harebells (*Campanula rotundifolia*) that gaily nod to you as you swiftly pass. It seems to me that our western forms are larger than those from farther east as bells an inch broad and long are not uncommon. Growing with them and blooming at the same time one finds the snowy blossoms of *Galium boreale* or Bedstraw and about the Fourth of July *Lilium philadelphicum*, our prairie lily (erroneously called tiger lily by nine-tenths of our populace), is doing its best to make a patriotic display by adding its bright red to the white and blue. The harebells give a very long period of bloom as we find them doing faithful service from mid-June until late October.

North Dakota has eight varieties of *Senicio*, some of them very beautiful. One variety has handsome greyish foliage. Most of them are pretty and respond wonderfully to cultivation and a chance to increase their holdings, and soon form very showy colonies.

We also have seven varieties of Pentstemons, *cristatus*. The crested pentstemon with light lavender blossoms and bright orange crest or beard while not as pretty as some is one of the most interesting. *Grandiflorus*, considered by many the most beautiful, with varying shades of orchid blossoms over two inches long by an inch and a half wide, grows on stout stems from two to three feet high and has rather striking gray foliage, and has but one failing, that it blooms only a short time. *Pentstemon glaber*, that is a trifle less showy but blooms for several weeks, is of a delphinium blue color with white throat and has glossy, dark green leaves.

A strikingly handsome plant, and one that I am going to call *Phlox wherryii*, as Dr. Wherry, of Washington, D. C., tells me that so far as he can learn has never been classified, has been masquerading for years as *Phlox pilosa*. Yet it is not *pilosa* at all, for it blooms later and is a clear pink in color with no trace of the magenta color that is so common to *pilosa*. It is a real gem for any sunny location and increases splendidly in cultivation. The illustration shows a single clump grown from a single stem plant set the year before. I am sorry to say this phlox is rather rare here. The individual florets are almost an inch across.

Another plant that always attracts attention is *Malvastrum coccineum*, or false mallow, also called wild geranium by many, with prettily cut, gray-green foliage and flowers varying from deepest salmon to almost an orange scarlet blossoms depending on how poor and dry the soil may be. The poorer soil, the brighter hued the flowers will be. This good plant is a gem as a ground cover once it gets started. It is rather slow about colonizing in new surroundings but is very permanent when once established and will give continuous bloom from early June until late August. A tea made from its leaves and applied to poison ivy poisonings is a certain and speedy cure for that dread affliction of our best picnicking days. It grows about a foot tall and has inch wide, hollyhock-shaped blooms, in terminal spikes.

Onosmodium occidentale, or false gromwell, when growing with *Anemone pennsylvanica*, or prairie snowdrop (as they are commonly called here),

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Pentstemon grandiflorus

makes a very good combination. The onosmodium is of strong enough growth to withstand the dense foliage of the latter and the pearly white seeds that cling to the plant throughout the winter makes the onosmodium a thing of beauty for a very long time.

Gaura coccinea, or waving butterfly, belonging to the Loosestrife family, is another good ground cover for dry, sunny ridges, where it forms dense mats of greyish foliage that lasts throughout most of the summer. It bears quantities of small flowers, either white, pink, or red.

Psoralea esculenta, the Indian breadroot, is now at its best. This plant grows about a foot tall, has greyish, lupine-like leaves and dense clusters of pale blue and white blossoms. The root, a thick somewhat turnip-shaped one, has a thick woody covering that when slit down one side will peel off like a banana skin. They are nutritious and not unpleasant to eat and were used both cooked and raw. The tops break away from the plant as soon as the seeds are ripe and are blown about by the winds, scattering seeds as they go. They are never very plentiful, but traditionally the several branches of each plant were arms

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Onosmodium occidentalis and Anemone pennsylvanicum

that pointed to other plants. Thus the mothers once instructed their children who helped in the gathering of the roots always to note the direction pointed. The fleshy part of root is usually several inches below the surface, and with the crude implements that were used in their harvesting must have required much patient toil to secure the winter's supply of food.

Our two tradescantias, *bracteata* and *occidentalis*, are both doing splendidly at the Cabin, the one with bluish-green leaves and sky-blue blossoms, the other with dark olive green foliage and blooms ranging in color from violet purple to brightest carmine with orange anthers. So luxuriant and thick are they growing that I overheard one gentleman caller remark to a companion, "That is a fine clump of quack grass they have there." What seemed strangest of all to me was the finding of these tradescantias growing at the very edges of some of the highest sandy cliffs in a boiling sun during a very dry spell of weather, yet they were just as fresh and pretty as the cactus among which they grew. The freshness and beauty of these plants were greatly admired by some of the "Plains People" and the young men of the Dakota Nation when

coming upon them in their solitary morning walks would stop and tell them of the many ways in which they resembled their sweethearts, and their name for them when transplanted was "Flower-of-Romance," much nicer, to my way of thinking, than "Widows Tears" as they are sometimes called.

Our three amorphas are *fruticosa*, *canescens*, and *nana*. This latter as a miniature shrub for the tiny rock garden has few equals, growing less than two feet high and with a very shrubby, compact habit. It has fern-like dark olive green leaves from an inch to three inches in length, with from nine to twenty-five elliptical leaflets. The many branches carry a solitary spike from two to three inches long of light purple flowers with deep red protruding anthers.

A. fruticosa makes a growth of from three to five feet, has dark green leaves from 3 to 7 inches long by two wide, and dark purple blossoms with golden anthers. *Canescens*, with greyish leaves and violet blooms well spangled with orange anthers and stamens, makes a more upright growth than the other two and the flowers are in clustered, terminal spikes sometimes fully a foot in length.

Astragalus bisulcatus, the giant of our astragali, is making bright patches wherever well grown. This giant grows into huge oval mounds fully five feet across and two to three feet high. A single fully developed plant will have hundreds of six-inch spikes of blooms with rosy purple petals and bright carmine calyxes in perfect condition at one time, so that it may be seen easily from a distance of half a mile.

Gaillardia aristata makes a very satisfactory companion plant as its plants have stems strong enough to hold the two- to three-inch yellow blooms with deep maroon centers erect even after heavy winds and rain. In this respect I think them far more desirable than the highly improved strains which are always so hopelessly dejected looking after storms. I counted 20 blooms in perfect condition on a single clump in my own garden and they combine so nicely with the bright colors of *Astragalus bisulcatus*.

Our oxytropis of various kinds are also very beautiful and, blooming as they do at different times, keep their portion of grounds gay for many weeks. We have at least four distinct species of the oxytropis or aragallus as it is sometimes called, *deflexus*, *monticola*, *lambertii* and *splendens*, and a number of intermediate forms. All have very delicate foliage that forms pretty rosettes that are very fresh and pleasing late in the fall after most plants have dried up and gone to rest. *Oxytropis splendens*, the "Showy Loco," is especially pretty in this respect. The compound leaves, up to six inches in length in all except *splendens*, are in opposite pairs; in *splendens* they are in whorls of from 4 to 6 leaflets, very silky, and of a grayish green. The flower spikes are also very silky and about 10 inches high with close clustered blooms of brightest pink.

O. monticola has sulphur yellow blossoms and is smaller and much less showy than the other varieties.

Yucca glauca is another interesting and desirable acquisition. *Yucca filamentosa* of the East is not hardy here, but *glauca* or *angustifolia*, as it is sometimes called, is apparently indifferent to cold as I have often paused to admire its deep green, white-edged, needle-pointed leaves sticking up through the snow in a 30-below zero temperature. They showed not the faintest traces of being injured by the cold when spring came. It has 2- to 3-foot flower spikes hung with pendulous creamy bells two inches in length. The root is from 2 to 6 feet long and as thick as a man's arm and supplied the plains nations of Indians with soap and was highly esteemed as a shampoo. Among its common names are Soap Lily, Beargrass, Spanish Bayonet, Dagger Weed, Soapweed and Adam's Needle. And indeed the sharp points served as needle and the macerated sinews as thread while the peeled

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Tradescantia occidentalis

and dried stalks were used just as the timber-inhabiting people used punk.

Petalostemons—*candidum*, a white variety, *purpureum* mostly a deep crimson but sometimes both light and royal purple, also light pink—are all very good midsummer bloomers and very desirable as dried blooms for winter bouquets. All plants here mentioned are not difficult to establish and have no special requirements except an abundance of sunlight and good drainage.

A Book or Two

David Fairchild's "Exploring for Plants": an Appreciation

By L. H. Bailey

The later years have given us books of travel in which the author's primary interest is the admiration and study of the vegetable world. Here we have another one, original and entertaining from beginning to end. Every one who knows plants broadly knows David Fairchild. He has spent a lifetime in the pursuit of plants, on a foundation of good botanical training; he has established the United States Government service in the introduction of plants from everywhere for the enrichment of the lives of the people; he has seen gardens and farm fields around and about the earth; he has a genius for friendship, and meets everybody, and everybody remembers him; his correspondence and personal relationships are world-wide. All this is reflected in his book, "Exploring for Plants," not because he designed it should be so but because he writes spontaneously and naturally; those who know David Fairchild personally will feel as soon as they begin to read the book that here are his manner of speech, his enthusiasms, his points of view, his fresh decisive comments on human affairs, the instincts of the naturalist. It makes a charming book of travel.

This particular book is a running record of the Allison Vincent Armour expeditions in 1925, 1926, 1927 for the United States Department of Agriculture. It is a noble contribution that Mr. Armour has made, in the outfitting of an exploration of this kind; much will come out of it. The travels were from Florida to Panama, Sweden, England, Holland, Belgium, France, Switzerland, Algeria, Morocco, Canaries, Spain with the Balearic Islands, Italy, Ceylon, Sumatra, Java, Singapore, and the west coast of Africa including Gambia, French Guinea, Sierra Leone, Liberia, Cameroon and the Gold Coast. The mere recital of the regions gives one an anticipation of the vast variety of plant life and human interest that came within the experience of the travelers. Much of these countries had been visited before by Fairchild, and he had made important connections. Everywhere the primary quest was for plants that promise well for introduction into the United States, for agricultural or horticultural purposes; and the running remarks on the agriculture and the plant-growing of the countries are illuminating and worth quotation. One finds the judgments also of the discriminating gourmet, and realizes how much is yet to be accomplished in the introduction and breeding of the finer food plants. The food habits of the various peoples were always under observation and comment. The yacht Utowana was supplied with laboratory, books, and facilities for preparing and keeping seeds and wardian cases for living plants; and there was always an interesting company aboard.

The book is notable throughout for the interesting pungent personal remarks on everything, giving the book a freshness all its own. The author is strongly drawn to the diligent industrious folk who have accomplished something of their own, and he wonders "if this modern craze of quick travel gives us the right idea of romance." M. Vuylsteke breeding his orchids "has the quiet lasting satisfaction of having created something, rather than the evanescent one of having merely seen something." Standing in an African garden of delightful handicraft, he remarks, "I sometimes

think as I shudder before some frightful residence or some perfectly terrible bedding on a lawn, that we Americans are too self-conscious to do things simply."

The informal observations are characteristic and the reader wants to know the author. He tells us how much a sickness cost and why he missed being a missionary; that a man he mentions "deserves a medal, but I don't know just how he is going to get one"; of great African snails that "like the crabs of Florida pop when one runs over them on the roadway"; of the ways in which "I spent days poking around"; of the workroom in Algeria that was "a fascinating mixture of plant materials, books, microscopic apparatus, pamphlets, photographs and herbarium specimens, as though he [the owner] had gone about filling his pockets with everything he saw that interested him and had then just emptied them out on the table and left them there," and the traveler could not help making a comparison: his own study had been moved bag and baggage eight times since he last saw this work room, and "I often think there is something wrong in the discontinuous life of the average American scientific man. He shifts his college, his post in the experiment station, his room in the building, his location in the town, his home on the street or his study in his home. He is always just settling down but never does it."

The book abounds in good suggestions on all sorts of things, and illustrates the vast satisfactions of the fellowships of science. The author is sympathetic, for example, with the saving of animal and plant life, "but it strikes me that it is much more important that the savage human being should not become extinct. Since the time of Darwin the theories of the evolution of human societies have been based on a comparison of primitive savage communities with the life of so-called civilized man. With the disappearance of the savage, this primitive life becomes only a tradition."

Yet the burden of the book is never forgotten in the narrative. The exploration for plants is constantly in evidence, and here the student and plant-lover may go for reliable information and for knowledge of plants probably wholly strange to him. There are histories of them assembled with much study from old authorities. There are visits to botanical institutions and experiment stations. The index carries a wealth of plant names. Many of them will appear in our cultures as the result of this expedition. One day he is after *Cytisus monosperma*, a sand-binder on the coasts of Algeria; another day it is seeds of *Juniperus cedrus* on Teneriffe; or it is poplars at Kew and their possibilities in forests; again it is fruits and seeds of a strange citrus in Sumatra to be tried in America as a stock or an element in breeding; then it is medicagos for our arid lands; again in French Guinea it is the red fruits of *Cnestis ferruginea*, which he wanted to see "in the tangle of hammock vegetation of south Florida and collected some seeds"; or it is the grasses Eragrostis and Panicum and Cymbopogon in the Gambia; palm seeds in Ceylon; bamboos in Java; clematis, barley, columneas from France; and always the Garcinias or mangosteens on which he has set his heart for many years.

The descriptions of scenery, customs of the people, birds, insects, and all kinds of natural history experiences are arresting. Thus in the Cameroon: "Arriving at the buildings our ears were deafened by the chatter of a thousand weaver birds which had appropriated a ficus tree overhanging one of the sheds. I never have seen such activity, so much saucy back talk, and such quick nest building, for when Mr. Whitehouse came back next day with his pocket movie camera, the nest making was finished and the place was as quiet as if there never had been a building boom."

Again on the Oasis of Saäda after quoting Faust: "It is not the Devil

who moves you on when you are traveling in your own car, it is the setting of the sun and the coming on of night. What a strange thing it is to realize that with the approach of the great shadows, multitudes of men, like stalks of grain during a storm, lie down, to rise again when the shadow passes and morn comes in. Out of the thousands of memories of days with their thrills somehow that first day on the desert stands out and refuses to be treated without emotion."

The sempervivums of Teneriffe were "spattered like green dinner plates against the almost perpendicular walls of the barranco, * * * some of them sixteen inches across." And here is a memory of East Indies: "The monkeys chattered from the tree tops. The most amazing chorus of tropical birds used to awaken us at dawn. The shrill scream of great green-banded cicadas was earsplitting. The sound of water coursing down the pebble-lined waterways through the garden and the hum of insects at night, all come back to me as I write. How I should love to stand once more at moonlight on the cliff near the guest-house in Sibolangit and look out over the great tree-ferns across the sleeping valley filled with its thousands of species of living forms, the virgin tropical forest."

This article is not a book review, but only a note of appreciation. It attempts to portray the book as the expression of a finished and sympathetic traveler trained in accurate observation, who brought home the things for which he set forth. The work is published by the Macmillan Company in New York City, a volume nearly 600 pages and many pictures of plants, persons, scenes, and situations.

We need another book (or set of books) by David Fairchild. His many introductions of plants to the United States, and by his associates, will come more and more in evidence as the years go on. They are yet mostly in the trial or novelty stage. The records will not be lost, for they are in Washington; but there are narratives and personal histories connected with the discoveries of these things that should be preserved for us to the end that emotion may not be divorced from the rearing of plants. Let us have books in which the names of the plants are entered alphabetically or on some other plan, with statements of dates, adaptabilities, and suggestions for uses, and then the record of discovery:

Cytisus battandieri: [dates, propagation, etc.] Almost under the very branches of the trees on the Atlas Mountains of Morocco I saw for the first time a shrub that struck me as having the softest, most velvety leaves I ever felt, and I have in my lifetime touched a great many leaves of different kinds. I saw it later in bloom farther down the mountain. It suggested a beautiful yellow-flowered lilac, were there such a thing. The clusters were about the size of those of the lilac and the glorious flowers stood out against the leaves as though they had been placed against a background of green velvet. I lost my heart to it at first sight, and the fact that my friend Maire had discovered it there under the Atlas cedars and had named it after the distinguished French botanist Battandier, the almost life-long associate of Trabut, added much to my sentiment about it."

Some Familiar Wild Flowers, compiled by James Edmund Jones of Toronto, with illustrations for the most part by Richard S. Cassels, K. C. The Macmillan Co., New York, 1930. 80 pages. $1.50.

This little book is attractive, but then any book with pictures of flowers would appeal to most people. It is presumably a book for the girl or boy scout, small and convenient to put into one's pocket. But to my way of thinking it is entirely too superficial. By all means encourage the young to learn the names of the wild flowers,

but what does a name hanging free in space mean, or merely grouped by color? One can so easily teach the relationships of flowers in families and their gradual evolution from the simple to the more complex forms. Lead children to notice the characteristic flower forms of the mints or compositae and the leaf arrangements in dogwoods and viburnums and they have a sense of the order and beauty in nature. But by merely knowing names one does not get under the skin of the subject at all. Schuyler Matthew's "Field Book of American Wild Flowers" is infinitely superior to this book and is the one I give my young friends who show an interest in the study of flowers. H. M. F.

Modern Roses, by J. Horace McFarland. The Macmillan Company, New York, N. Y., 1930. 284 pages, illustrated. $5.00.

Such a book as this is practically impossible for review. One can only report what it is and urge all workers to own it and read it constantly. In brief, it represents the assembled data on over twenty-five hundred roses in cultivation at the present time. The information is concise, arranged in comparable form and vocabulary, and of historical as well as horticultural value.

As compared with some older surveys of rose varieties edited in tabular form, this is a vast improvement with a paragraph for each individual name, classification of the variety, name of introducer, date of introduction, parentage when known, description of flower, bush, and habit, and record of honors received, if any. The descriptions were prepared for the most part by the originators and are, therefore, all positive in character, not reflecting adverse criticism such as appear in cultivators' notes. Of the many admirable accomplishments of The American Rose Society, certainly this is not the least.

The Chrysanthemum and Its Culture, by Edward A. White. Orange Judd Publishing Co., Inc., New York, N. Y., 1930. 192 pages, illustrated. $2.00.

Professor White's interesting volume reflects an interest in the chrysanthemum as a greenhouse crop rather than as a garden flower. There are, however, chapters on chrysanthemum history, botany, and breeding that are of keen interest to the amateur gardener. This is particularly true of the last mentioned chapter, a reprint of Bulletin No. 126 of the Michigan Experiment Station by Elmer D. Smith and Alex Laurie.

The book is clear, concise, and definite with instructions where instructions are needed and suggestions elsewhere. There are enough pictures to illustrate the many types of flowers and species but most of them are distinctly ugly and no recommendation of the varieties grown.

Alphabetical Iris Check List. Edited by Mrs. Wheeler H. Peckham, The American Iris Society, Baltimore, Md., 1929. 300 pages, illustrated.

Underlying the recent publication of an "Alphabetical Iris Check List" by The American Iris Society, grown from a pamphlet to a 300-page book in ten years, is one of the most interesting facts of present day horticultural development in the United States. The iris has created a nation-wide army of plant breeders among amateur gardeners. The need for the publication of this list arose from the great number of new irises named and introduced into trade each year and the desirability of clearing up and avoiding further confusion of identities through the same name being applied to different irises, or various names being applied to the same iris. At least 90 per cent of the list shows irises not more than 20 years old and a majority less than that.

In the issuance of the volume,

although some weeks after the originally announced date of publication, a tremendous task has been accomplished and in record breaking time, although late as to schedule. The editor, Mrs. E. A. S. Peckham, deserves congratulations on the completion of a list entailing, at a casual estimate, the checking over of more than 12,000 names as to spelling, synonyms, and preemption when there was more than one iris bearing a name. It was an enormous task of myriad details and so far as the names themselves are concerned seems to have been done with great thoroughness.

In going through the lists only one suspected misspelling has been detected. This is Germaine Perthuis, usually spelled with the "h," which the check list gives as "Pertuis." This may be right. "Oliver Perthuis," however, retains the "h" in the check list. In a work of such extensive detail, mistakes naturally would be expected. So far as the names go, they seem to be astonishingly few.

The faults of the book do not lie in the names but in the accompanying data, really of much more interest than the names, but not the essential part of the book. They may be attributed fairly to the lack of time to check detail, entailing fully as much or more work than the names themselves and some of it to no good purpose.

Since Farr thrilled the gardeners of the country with his first catalogue of seedlings of his own raising, this phase of iris culture has spread most astonishingly until rarely do we find a gardener with modern, first class iris in his garden who has been able to resist the temptation to try making a few crosses among his finest varieties to see what he could do in the way of seedling raising. It is an enterprise in which the amateur may compete on even terms with the professional dealer and some of our finest irises have come from the gardens of amateurs.

The widespread interest in iris breeding has had a strong influence commercially as well as horticulturally. In a very interesting address on the commercial phases of iris growing before the Commercial Peony and Iris Growers' Association's annual convention last winter, Mrs. Douglas Pattison of the Quality Gardens, Freeport, Ill., placed the adaptability of the iris to cross breeding by amateurs as the most important reason for the popularity of the plant and its value commercially. "At least 40 per cent of the retail demand for fine irises now is from the amateur hybridizers who are increasing by thousands each year in America and Canada," she declared. Mrs. Pattison arrived at this estimate through an informal check on her customers.

Countless thousands of home-grown seedlings bloom each year in the gardens of the country. A select few, usually not more than 25, find their way into commerce. There is the commercial incentive to the grower as an outstanding iris is readily salable to a commercial dealer at a profitable price although the grower's chances of producing such an iris are very small unless he grows a tremendous number of seedlings.

He does, however, provide himself with fine garden material for any color plans he may have. Many of the named irises in the Check List are not in commerce but confined to their originator's garden or have been distributed only among his intimate friends.

Another incentive in the way of horticultural honor, having an international flavor which is yet to be developed, is the annual award of the Dykes medal offered by the English Iris Society for the most outstanding iris introduced during the year, similar medals being offered in England, France, and the United States. Little has been made of this award so far in the United States, but should The American Iris Society establish an orderly, fair, and competent method of selecting a Dykes medal winner

each year, it would become one of the most important of horticultural events. At present there is no regular method of making nominations for the award. It is voted months after the irises eligible for it have bloomed and it isn't even necessary for the directors voting the award to have seen the irises upon which they vote. Apparently, in making the 1929 award, they had not.

To the great army of seedling raisers, the pedigrees of the best irises are a matter of intense interest. The Check List is rather faulty in this respect, many pedigrees of record being omitted and others incorrectly given. It is surprising to find the breeding of San Francisco, Dykes medal winner in 1927 and forerunner of a new type of giant plicatas, incompletely and incorrectly given when it is a matter of record in the American Iris Society bulletins.

Admitting that a complete list of breedings is impossible because many breeders either refuse to give them or have not kept complete or accurate records, many omissions may be filled in from the descriptions published from time to time by Mr. R. S. Sturtevant in the bulletins of the society and one of their most practical and valuable features.

Of the pedigrees given, most interesting are those of the new yellows of *mesopotamica* origin, introduced by Prof. Sidney B. Mitchell of the University of California, Mirasol and Rayo de Sol. This is (Shekinah x Argentina) x (Mrs. Neubronner x Marian Mohr).

The parentage of the huge rose-toned Frieda Mohr is really a curiosity of iris breeding, as shown in the check list. This is (Bosniamac x Mesopotamica) x Gaviota, Bosniamac being *reichenbachii* x Amas, the former a dwarf yellow. That a dwarf yellow and a yellow *plicata* of medium size and stature should go into the makeup of this rose giant is one of the surprising facts that make iris breeding so fascinating.

A check of the Check List reveals two general trends of iris breeders. These are the use of *Ricardi-mesopotamica* blood and the use of the Dominion race, pollen of which seems to have been tossed at almost every iris in the garden while the Dominions have served as most promiscuous mothers. The crossing of these two lines now seems to be an interesting development as evidenced by the magnificent Blue Velvet in which are mingled the *mesopotamica* and Dominion races, the iris being a seedling of Dominion x Balboa, one of the Mohr-Mitchell Parisiana x *mesopotamica* series.

This iris was introduced with 30 available roots for sale its first season. It was oversold at $30 a root by 13 orders with 15 orders for future delivery, indicating the competition for seedling material.

The Check List shows about an even division of *Ricardi* and *mesopotamica* derivatives as compared with Dominions.

The Check List says that Dominion is "probably a seminal sport." Mr. A. J. Bliss, its originator, has expressed the opinion in print that it is a mutant. It does not seem to this writer to be a discontinuous variation as the Dominion characteristics appear to be a mingling of *variegata* and Amas blood with some other species as a carrier, authorities telling us that *variegata* and Amas do not cross directly. Dominion types have been produced by this union without the use of any of the Dominion race, notably Mr. Mead's Ion, Mr. Morrison's Kestrel, and others.

Shekinah, from its strong influence in breeding, seems much more entitled to consideration as a sport, it seems to this writer, than Dominion and to approach more closely to the dignity of a species than some species already established in that rank. In pedigrees of record in the Check List, Shekinah appears 20 times as a parent, the offspring being yellows, whites, and blends of various colors.

While the first lists of The American

Iris Society showed less than a half dozen each of yellows and whites, the present Check List has 62 yellow selfs and 77 white selfs listed, the introduction of Shekinah and its influence accounting for a majority of the yellows and some of the whites.

The feature of the new Check List most open to criticism is the catalogue listing which might better have been omitted as one dealer, who, to the best of this writer's knowledge, issued only one complete iris catalogue, gets major credit for having listed a majority of the modern iris and that in 1928 when older, well-established dealers issuing catalogues annually are ignored although they listed many of the irises mentioned several years earlier than the Check List would indicate. As this feature is unimportant and a fair, impartial and complete list would swell the volume to at least double its present proportions, there seems little reason for including it.

Criticism of the system of adding the name of the grower to the given name in the cases of duplications has aroused much criticism, particularly in England. There has also been considerable ridicule attached to this method. It is a simple matter to arrive at ridiculous combinations if one cares to do so. The system, however, while open to certain objections as cumbersome and at times ridiculous follows the botanical precedent of adding the name of the botanist where two species have been given the same name.

As the writer is informed that the American Iris Society received no co-operation from either English or French growers in an effort to do away with these duplicates, criticism does not seem particularly gracious unless accompanied by a better suggestion.

A justifiable criticism in the writer's opinion is the summary cutting off of titles such as Mr., Mrs., Lady, Madame, Monsieur, Duke, etc. There seems no good reason for this. One case which has been criticised is that of dropping the M. from M. Arnal which leaves it confused with Arnols and Arnold.

The dropping of the French mortuary tributes in the way of Souvenir de and Deuil de will meet with approval. Changing of the spelling of names such as Ruby to Rubyd and Sapphire to Sapphid has not met with general approval. It would seem that in case of duplicates, the best plan, especially when one is far finer than the other, such as Cayeu's Ophelia, the name of the inferior variety should be changed or bear the name of the introducer.

An ingenious code system indicating in a general way the color effect of the irises listed is a novel and most valuable feature of the book. It doubles its value in the writer's opinion. It is particularly valuable, as discovered this summer, in judging iris shows where there is question as to the placing of irises in color classes. There was some confusion of this kind at the Freeport show. With the check list at hand the trouble could be avoided easily.

The check list should discourage the reckless and wholesale naming of seedlings until the owner has reasonable assurance that the candidate for favor is something really new or sufficiently better than similar introduced varieties to deserve a name. The vast flood of new irises has become a problem of vexing proportions and one likely to work injury to the commercial growers as well as to discourage gardeners in the purchase of new varieties from catalogue lists.

The Check List is a reference book that every iris grower needs. Its value will increase as acquaintance is made with it. Omissions may be filled in by the individual owner until its value is much greater than at present. One suggested improvement is adding to the color code system a height code. Succeeding editions, if any, may see these improvements and corrections made. S. R. D.

The Gardener's Pocketbook

NOTES ON SEED GERMINATION.

In an article on seed sowing in the April number of the NATIONAL HORTICULTURAL MAGAZINE it was said that trollius seed would not germinate the same year that it was sown. The seed must have been stale, and trollius seed is, as a rule, difficult in that way. A year ago last February—February 29, 1929, to be exact—we sowed some seed of trollius that had been sent us by a large grower of same. The seed germinated beautifully, I am sure a hundred percent. The little plants were set out last fall and bloomed this spring. Some of them are now blooming for the second time (July 30). Some of the same seed (a quantity had been sent us), was sown later in the spring. It did not germinate until this spring, and at the same time with it some trollius seed sent us this last season, and sowed around February, came up; making a batch of the older seed and one of the newer come simultaneously. In each case, of course, they had been frozen.

This proves that fresh seed germinates much quicker than seed that has been kept a while. We have had the same experience with seed other than that of trollius. In case of Primulas we have had the seed germinate one, two, and even three years after sowing. Even in the same sowing of seed some has germinated immediately, and stragglers have come up the next spring. So it is never safe to disturb or throw the soil out of the containers. In the case of andresaces we have had the same thing happen, i. e., part of the seed come up the season it was sown, and part the next.

Three years ago we had some cactus seed from Mr. Andrews of Boulder, Colo. We had about eight plants from the seed that year. The following spring several more seeds germinated. The cold frame in which the seed had been sown was then dismantled, part of the earth used in another frame and part used around in various places. A few days ago, while weeding out the primrose border, the writer came across a cactus seedling, and to-day in a cold frame another seedling evidently from this three-year-old seed. The seeds must have lain dormant for three years and then germinated in this soil which had been carted round from one place to another. As we have had no blooming cactus of the same variety in bloom in the garden, there is no other way to account for these seedlings. I might say that the original seedlings have grown splendidly, and have been perfectly hardy, but have not as yet bloomed. There are several different varieties.

We made a new annual border this spring, and as we had sown neither verbenas nor nicotine, were surprised to find both of these plants growing in the border. Several years ago we had had a border in the same place, which had been abandoned, so that these annual seeds must also have lain dormant for at least three or four years in a blue grass sod in the lawn.

The little *Rosa polyantha nana* comes very easily from seed, and blooms the same year. It blooms all season, and is very fragrant. *Armeria caespitosa* is almost impossible, even with seed saved from our own garden. We had one lone plant come up several years ago in a flat where it had been sown at least a year before. This plant has waxed fat, and increased, and this spring several tufts were taken from its ever widening mat and put in as cuttings. They are doing nicely.

The most exciting experience in raising plants from seed, in our garden, was that of getting the fringed gentian to germinate. We tried it several times, and were at last rewarded last fall by having two small plants bloom.

This year we have several groups of thrifty plants from last year's seedlings, this gentian being, of course, biennial. Last spring we had a number of seedlings. At first we transplanted them very gingerly, cutting out small clumps like miniature pieces of cake from the flat; and afterwards as the remaining seedlings grew larger, we grew bolder, and transplanted them singly. We left some of them in the original flat and transplanted them this spring. This summer has been so dry, and it has been so difficult to keep every thing watered, that they have not all lived, but there will be enough to make a fair showing. Last year it was almost impossible to get any seed of this gentian, as in this region they were not plentiful, and the friend on whose bluffs they generally grow luxuriantly, had only two pods of seed, one of which she gave us, but unfortunately they failed to germinate. The pods on our own plants I had sent to a friend in England, never dreaming but what we could get plenty more. In the case of the fringed gentian it is imperative to have fresh seed.

In many cases the action of frost is necessary to assist in the germination of difficult seeds, and a good covering of snow helps, but the most important thing is to have fresh seed.

JENNIE TILT ARMSTRONG.

Glencoe, Ill.

Prunus serrulata Lindl. Oriental cherry. Variety Fugenzo. (See p. 218.)

More than a thousand years ago it was observed by Japanese flower-lovers that occasionally double-flowered forms appeared among the wild mountain cherries which grow so abundantly in many parts of Japan. From time to time particularly attractive strains were brought in and planted in private gardens, especially those of the more wealthy families. Stimulated by the favorable growing conditions of these gardens, the tendency toward variation in these selected cherries was strongly accelerated, and there appeared forms of great beauty with large and very double flowers of white and various shades of pink. Even as far back in Japanese history as the Nara period, over a thousand years ago, there is reason to believe that double-flowered cherries were in existence. In the time of Prince Yoshimitsu Ashikaga, about 500 years ago, the variety Fugenzo, still widely planted, was well known.

Most of the varieties of Japanese flowering cherries in cultivation at the present time are included in the group which botanists refer to *Prunus serrulata*. By some authorities this species is sometimes divided, and forms with smooth, pale-grey bark, green or slightly reddish young leaves, and long aristate leaves are referred to the closely related *Prunus lannesiana*. The variety Fugenzo, which is commonly known in English gardens as James H. Veitch, and occasionally as Kofugen, belongs to the typical *P. serrulata* group, with characteristic smooth reddish-brown bark. In habit the tree is widespreading and relatively large, forming a rather flat crown. The young leaves, which begin to show when the flowers are fully open, are coppery-brown, with a slight reddish tinge. The flower buds are truncate and dark pink, with a peculiar and characteristic smudgy brown tinge which persists and can be detected on the lower sides of the petals in the fully opened flower. The flowers, up to 2½ inches across, are rosy pink when first opened, but soon fade to very pale pink or nearly white. They are borne in drooping, long-stemmed clusters of two to four, and the green leafy carpels protruding from the flowers are a conspicuous feature. In some respects Fugenzo resembles Kwanzan, but the former is a larger and more wide-spreading tree with inter-crossing branches, and the flowers are lighter pink, with a brownish tinge on the lower side of the petals. The two varieties bloom about the same time, rather late in the season. Fugenzo is as hardy as any

E. L. Crandall

[See page 217]

The Japanese Cherry, Fugenzo

of the double-flowering cherries, and is propagated in the same manner as Takasago (*Prunus sieboldii*), described in the NATIONAL HORTICULTURAL MAGAZINE for July, 1930, page 160. Because of its wide-spreading habit, Fugenzo is eminently suited as a park tree, rather than for planting along avenues. A background of evergreens is highly desirable to bring out the full beauty of the flowers in early spring.

PAUL RUSSELL.

Washington, D. C.

THREE INTERESTING WESTERNERS.

Ceanothus prostratus.

One of the most interesting, procumbent shrubs available for the rock garden and but little known is *Ceanothus prostratus*, Mahala Mat or Squaw Carpet. It is found only on the Pacific coast and its range is from southern Washington to northern California, east of the Cascade Mountains. In California it covers most beautifully the raw banks of the highways and in southern Washington it carpets the open floor of the proud and handsome *Pinus ponderosa* aggregations. An ancient plant may be five feet or more across. The soil which is most acceptable is of granitic origin and dry and loose in character.

The plant lies flat on the ground, sending out several long, tough and woody branches which re-divide and may arch and curve sufficiently to carry them above other arms which have chanced their way. It comes from a main root system much reinforced by rootlets arising on the branches.

The leaves are opposite and evergreen, dark and leathery and glossy, one-half to one inch long, with one chief vein from the base with numerous, straight, parallel, lateral veins. In this characteristic it differs from most of its kin. The leaves are roughly wedge-shaped with three or more coarse teeth at the apex, reminiscent of a very small holly leaf, and when young, covered with a down of silky hairs. If there were no flowers at all, the evergreen leafage and rugged habit of the plant itself were enough to recommend it strongly to rock gardeners.

The blossoming comes on in the spring and effects a powder-blue cloud of finest lace above the plant. The flowers are in small umbel-like clusters, forming panicles on the short branches. The individual flower is small and five-parted. The sepals have blue, petal-like borders and are incurved. The petals are of the same color but longer and are arched to form a tiny hood. The five stamens are long and protruding which adds to the feathery delicacy of the flower.

The fruit is a three-celled drupe (a stone fruit), dry and oily, which finally separates into three nutlets, each one with a horn-like crest below the summit.

Ceanothus prostratus does not delight in being transplanted but it may be transported if the journey be not too long, and this is done with the least loss when it is dormant. It does, however, come readily from seed and pot-grown plants are tractable though the slow growth demands patience. Cuttings of the mature wood in fall, placed in cold frames, are said to give a fair percentage of plants. Friability of soil and good drainage are most important. In its natural habitat, when once it is covered by the snow, it is well guarded against too cold and drying winds. In gardens, also, protection from evaporating blasts must be afforded, although at its lower elevations it endures a temperature of six degrees below zero.

Lutkea pectinata.

One of our very interesting and most endearing western plants is *Lutkea pectinata*, named after F. P. Lutke, a Russian explorer. It is an arctic species, brought in the wake of glacial drift to our mountains, and is found from Alaska, throughout the Olympics, Cascades and into the Blue Mountains. This very thing is occurring before our

eyes at the present day. On White Horse mountain it has been carried lower and lower till we may find it forming dense carpets even at an altitude of less than 1000 feet.

It is a low, creeping thing, quite prostrate, with stoloniferous branches woody and thready. The leaves are three-lobed, the lobes again two- to three-palmately cleft, almost evergreen and of a very vivid color, emerald green, glad and refreshing. The inflorescence is carried above the mat, three to five inches high—the short and fat raceme being only one to one and a half inches in length. The small five-petaled flowers are of a creamy color and the stamens numerous and fuzzy.

It is a gypsy in its way, partridge-foot is its common name, and no more minds being brought from the mountains to gardens than from the arctic regions to less rigorous mountains. In my own garden it makes wonderful curtains and garlands among rocks and creeps daintily about a little bird bath on the ground. In its native habitat it often follows the branches of rills, but when transplanted it makes no great demands upon water. It is very easily propagated by cuttings or division.

Mimulus lewisi.

During August *Mimulus lewisi*, the crimson mimulus, is a shining glory of most vivid pink and rose on the wet slopes of the Cascades, Rockies and Olympics where it abounds. It often follows mountain rivulets and creeks to lower levels where it takes shelter on the banks and little islands amid-stream.

The stems are erect, up to two feet, but more often one to one and a half, branching mostly from below so that it forms a rounded mass, the whole viscid pubescent. The leaves are opposite, oblong-ovate, denticulate, one and a half to two inches long with at least five conspicuous parallel veins.

The flowers are solitary in the axils of the upper leaves—eight or more pairs. The calyx, three-quarters inch long, is persistent, tubular, flattened on the under side, five angled and sharply toothed. The corolla also is tubular, an inch and often much longer, and of that wonderful live color more often seen in mountains than elsewhere. It is two-lipped. The upper lip is two-lobed and the lower three-lobed, all rounded and delicately ciliated on the margin. Against the upper lip but not extruded, rest the style and four stamens which are in two rows. Opposite these on the lower lip are two golden, hairy stripes, finely spotted with dark red.

Mimulus lewisi is easily transplanted, comes readily from seed and blooms most generously in sun or shade wherever planted. Perhaps it is because it is so often growing almost in water that it seems to promise to be a very perfect plant for the margin of some little rock garden stream or waterfall.

ELSE M. FRYE.

Seattle, Wash.

Dragon's Tongue.

The accompanying photograph is of a strange looking and uncommon plant grown in Ashland, Va. The

common name is "Dragon's Tongue," but according to Dr. Frederick Coville, United States botanist, it is *Dracunculus vulgaris*. The root of this plant is a division of one brought from an old garden in eastern North Carolina. There is a legend in the family of the owner of this garden that the original plant was brought to Morehead City, N. C., by the captain of a coffee ship from Brazil, early in the nineteenth century. The serpent-like, white-spotted leaf stalks, growing directly out of the ground, appear in early spring. At the end of each stalk is a whorl of graduating leaves. The bloom, on a similar stalk, pushes up from the ground about the middle of June. It is a rich garnet in color, shaped similar to the Calla lily, although much larger. The spathe, prettily fluted along the outer edge, turns completely away from the spadix, which is satiny in texture and darker in tone than the spathe. When the bloom first opens it emits a most unpleasant odor which lasts only a short time. The plant disappears completely after the blooming period, until the following spring. It grows to the height of twenty-four to thirty inches and forms an increasing clump like the peony.

C. W. M.

Syringa sweginzowii Koehne et Lingelsheim. (See page 222.)

The plant from which the illustration was made was imported from Lemoine as *swegnizowii superba* but Mrs. McKelvey believes it to be identical with the type and so dismisses the varietal name.

It is noted here for the particular purpose of calling attention to this late-blooming species flowering about the same time as *Julianae* and *tomentella*. All of these later blooming species are as yet so little known and valued that their mention can not be too frequent. To be sure all differ markedly from the familiar forms of *Syringa vulgaris*, the common lilac of our dooryards and hedgerows, and have to be loved for other qualities than the heady fragrance of that species.

The plant of this note comes from Szechuan in Western China and has proven hardy here in the Eastern States, certainly as far north as Massachusetts.

Like many of its relatives, it makes a tall, rather open bush, not so well covered with dense foliage as our common lilac, but bearing its flowers in much the same fashion.

The buds are white, so flushed with a warm pinkish-buff as to make a striking contrast with the open flowers which appear white from the white lobes. The figure shows the type of the inflorescence but of a rather small specimen.

Washington, D. C.

Lilium bakerianum Collett & Hemsley. (See page 224.)

Although this very attractive lily has a wide range from Eastern Upper Burmah across Western China and has been introduced into cultivation many times, it does not appear to have found a satisfactory home in any other country. It is recorded here chiefly to show a record of its form and pattern.

As grown in pots in the greenhouse, it makes a slender plant about two and one-half to three feet high with scattered, rather broad leaves, arranged as suggested in the illustration. The flowers have the characteristic shape shown in the illustration, rarely opening wider than the flower on the left and so somewhat hiding the dense spotting of chocolate or reddish-purple that covers the throat. The ground color varies from pale greenish-yellow to a dull white with more color at the base of the petals than elsewhere. There is a distinct but not very pervasive perfume that is difficult to describe since it differs from most of the lily scents known to the writer.

Washington, D. C.

Dorothy Colvin

Syringa sweginzowii

[*See page 221*

Cotoneaster bullata Bois. (See page 225.)

For some who know only the dwarf and rather elegant forms of cotoneasters, such as the now rather well-known *horizontalis*, a robust plant like this species may be a surprise for it forms an erect or wide-spreading shrub six to eight feet high and almost as much in spread. The plants do not make as many shoots as some of the species, but grow to larger sizes with fewer large branches and many twigs.

The leaves, as can be seen in the illustration, are large and deeply veined. The flowers are not conspicuous, with small pinkish petals and a reddish calyx that develops into a brilliant red fruit, ripening in October. The leaves color somewhat in the fall but do not form the chief feature of the plant.

For large borders of shrubs and small trees, this robust cotoneaster should certainly have a place.

Washington, D. C.

Iris longipetala Herb. (See page 226.)

Among the many iris species native to the Pacific Coast, none is less difficult to manage than the charming species so familiar on the hills below San Francisco.

In a general way it suggests on one hand common iris of China, *Iris ensata*, and in other ways a sort of miniature *Iris spuria*. Like the former it makes fair-sized tussocks of stiff foliage on the grassy slopes of bare hillsides, but will grow well enough in the ordinary garden border. Here it makes its firm clumps from which rise the slender stalks bearing three or four flowers in early May.

The illustration shows both the general style and pattern of the flower, but can not suggest the clear and porcelain-like quality of the lavenders that tint the standards or that vein both standards and falls.

Possibly in the East the clumps are not as floriferous as in their native country, but even so this plant, like the related *Iris missouriensis* shown in the last issue, should be tried in all places where the winter is not too severe.

Washington, D. C.

Allium ostrowskianum Regel. (See page 228.)

If one mentions onions, there is usually an opinion immediately forthcoming, but it rarely has anything to do with flowers, for few gardeners seem to know that many onions have fine flowers. Aside from the characteristic odor of the leaves, an odor not usually conspicuous unless the leaves are handled, some species are not suited for garden cultivation, because once planted they can never be gotten rid of, an objection that can be made of grape hyacinths and ornithogalums as well. Probably one is safe in saying that species that produce heads of little bulbils, like our common garlic, should not be admitted to any garden. The other difficulty comes from species that are too prolific in increase of bulbs.

The species shown here comes from Turkestan and was described by Regel in 1880 but is not a common sort in gardens. The illustration was made this year, from plants from seed sown in 1925. As compared to blooms from old established bulbs, there are too few flowers on each umbel.

The illustration shows the size and character of the bloom but does not indicate the color, which is a deep rosy pink with darker midribs; nor can it suggest the delicate and very pleasant perfume that the flowers possess. As the flower passes, the color fades and leaves a clear, papery sheath that hides the developing seed capsule.

The pale blue-green leaves are flat and of fair size, but at flowering time, early June, have already begun to wither away and by July have entirely disappeared. For the fore part of the border, then, one might find a place for this species, remembering

Lilian A. Guernsey

Lilum bakerianum

[*See page 221*]

Lilian A. Guernsey

Cotoneaster bullata

[*See page 223*]

Lilian A. Guernsey

Iris longipetala

[*See page 223*]

that it may be a perpetual resident when once established.

Washington, D. C.

Bloomeria aurea Kellogg. (See page 230.)

Bulb planting should become a fixed habit of all gardeners, with as regular observance as all other good habits. It should have its major and its minor departments with proper regard for the standbys and a watchful eye for novelties.

The present species of course is no novelty as it has been known for many years and has been offered in catalogs for almost as many. In spite of this, the writer had never chanced upon it in any Eastern garden and tried it as a possible adventure, consigning the small bulbs to a position on a south slope in a soil to which enough sand had been added to make it very gritty and enough small stones to insure perfect drainage. The small somewhat crocus-like corms were planted about six inches deep.

Early in March the solitary leaves commenced to push through the soil and suffered a bit from late frosts. The leaves finally develop until they are ten to twelve inches long and look quite insignificant until the slender flower stems show. These, too, look small and insignificant, but the little envelope that holds the flowers finally bursts and releases the umbel of starry flowers borne on slender, wiry stems. The illustration, which is about natural size, shows clearly the type of bloom and flowering, although a day or so later there would have been more flowers open at a time.

The flowers themselves are a brilliant and glistening deep yellow and last but a day or so. As there are often as many as thirty on a stalk, the blossoming continues for at least two weeks, making a gay show in the June border.

In spite of the low temperature of the 1929–30 winter and the extreme drought of the 1930 summer, the plants have made fine new bulbs for next season and some increase. Several years will be needed to determine finally if these will make permanent residents of the Eastern garden, but certainly gardeners from the Southeastern States should consider these showy natives.

Washington, D. C.

Narcissus, Crimson Braid, Sunstar, Bacchus. (See page 231.)

Among the late flowering forms of garden narcissus one finds many that reflect most strongly the influence of their *poeticus* ancestors, with more or less snowy white perianths and brilliantly colored cup.

The uppermost of the trio illustrated is Crimson Braid, originated by Mr. F. Herbert Chapman, the result of a cross of Will Scarlett x *poeticus verus*, the latter chosen to give a refining influence to the other brilliant but ragged parent. The flower shown was chosen carefully to show the variety at its best and is possibly better than the plant from the garden where the perianth segments are more reflexed. It does show, however, the admirable cup with its deeply frilled margin and it does suggest the deep crimson quality of the edge.

In great contrast is Mrs. R. O. Backhouse's very symmetrical variety, Sunstar, with exquisitely overlapping perianth and small flat eye of almost uniformly deep orange-scarlet. The perianth is very smooth and of poeticus-like quality and indeed the sort more resembles the *poeticus* section than it does the Barrii. The flowering is very late, almost with the last *poeticus recurvus*.

The lowermost flower, Bacchus, represents one of Mrs. Backhouse's brilliant *incomparabilis* sorts but not one of the most striking, since the perianth is as ragged and the flower nods its head as one might expect from a Will Scarlett derivative. The broad and well-frilled cup is a most brilliant orange, however, of an exquisite tone

Lilian A. Guernsey

Allium ostrowskianum

[See page 223]

and makes up, to some degree, for the irregularity of the perianth. One feels sure than when some of the better hybrids are less expensive, this sort will drop from sight.

Washington, D. C.

Rhododendron viscosum Torr. (See page 232.)

The person who is particularly interested in flowers with sweet scents should certainly include in his first lists the subject of this note. Unlike some of the other native species in which the scent is sweet in a rather sickish way, this plant has a deep and individual perfume that fills the air for some distance in the warm days of late June and early July. In the wild it occurs chiefly in swampy areas, with *Ilex verticillata* and *Rosa caroliniana* for neighbors, but in the garden it may take its place with other native azaleas in the mixed shrubbery. It will be more impatient of drought than the others, of course, but will accept life if not expected to pose as a xerophyte. It should not be given as conspicuous a place as some, since its flowers appear well after the leaves and so do not make so great a show as the species that flower before the leaves, and of course its taste for acid soil must be remembered.

Washington, D. C.

NEW PERENNIALS FROM SEED.

When we read descriptions of English perennial borders we are sometimes tempted to try some of the material used therein, and invest in named hybrid lupin or delphinium and are inevitaby discouraged by the results; occasionally, however, we are fortunate enough to encounter something that will adapt itself cheerfully to the different conditions found here. Quite frequently the plants are merely returning home, having originally come from this country, but have been so changed by the hybridizers that we do not recognize them.

Verbascum, the humble mullein, is an example of this change. Quite the loveliest flowers in my garden in June were some plants of one of the many improved varieties of mullein, *Verbascum phoeniceum*, whose slender spikes of bloom rise from rosettes of green leaves. The range of color is very good, being soft shades of rose, lavender and purple. The individual flowers are large, and the whole plant grows from two to three feet in height. Verbascums are most easily raised from seed so there is no difficulty in obtaining plants.

The new Iceland poppy *Papaver nudicaule*, Coonara, flowered this summer and proved very attractive. I have had a fondness for Iceland poppies ever since I first made their acquaintance, and Coonara bids fair to be my favorite. Such large flowers of a beautiful shell pink, a new shade in Iceland poppies, crinkled petals opening wide to show the cluster of golden anthers, and sending up blossom after blossom all through the summer in spite of the long weeks of drought and heat. One wonders what Coonara would do in a good season! Another member of the poppy family impervious to abnormal weather conditions is *Papaver rupifragum* from the Pyrenees suitable for the rock garden or perrenial border, though probably more at home in the former. It attains a height of one foot, blooms all summer if not allowed to go to seed, and likes hot, dry situations. The color of the flowers is apricot, they are of large size and the plant has nice foliage. I did not raise my *Papaver rupifragum* from seed but I am sure there would be no difficulty in doing so as I have tried quite a number of varieties of the poppy family and have found that all germinate readily, even the difficult *Papaver alpinum*.

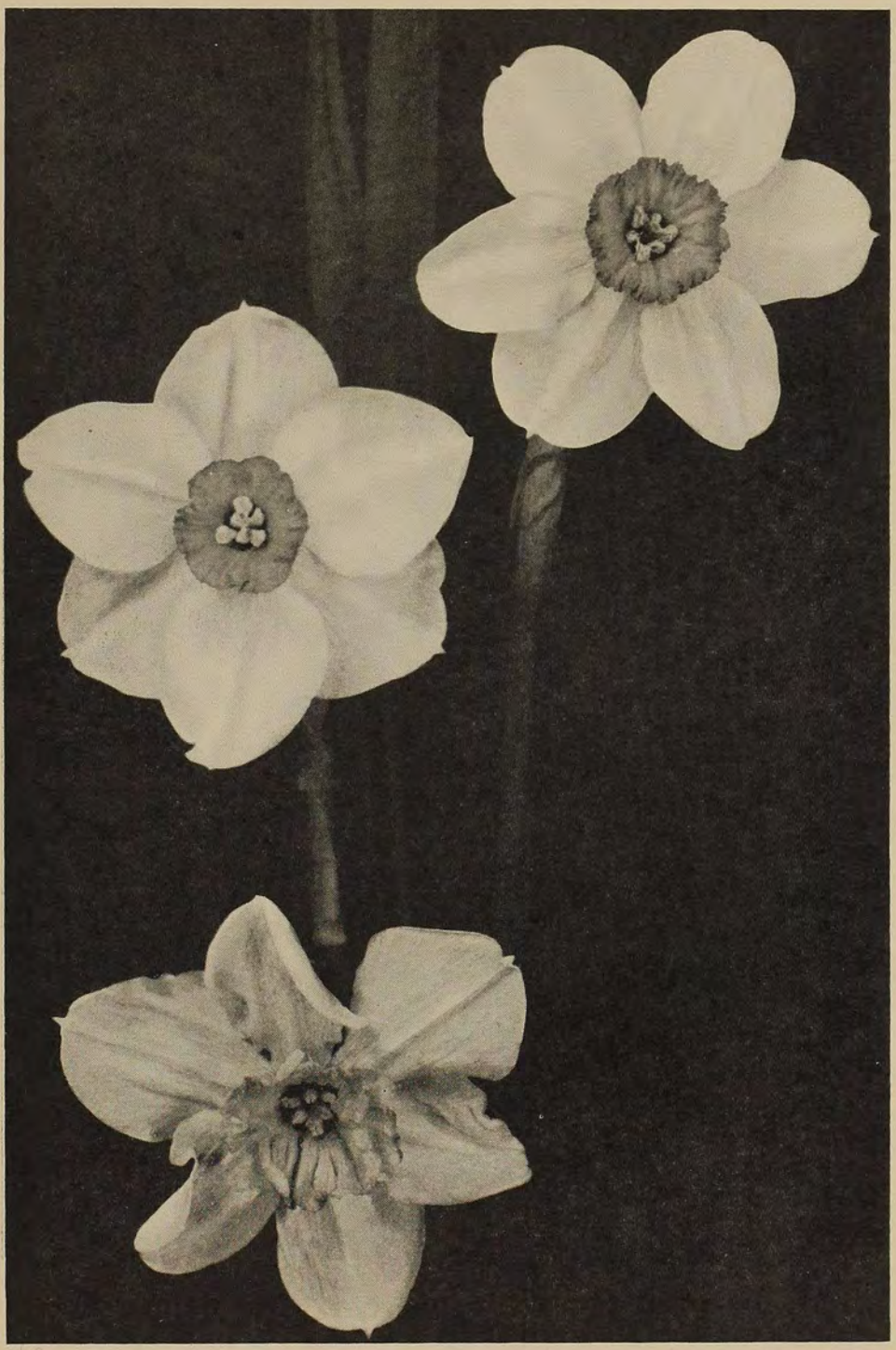
E. RAWLINSON.

Staunton, Va.

Lilian A. Guernsey

Bloomeria aurea

[See page 227]



Lilian A. Guernsey

[See page 227]

Narcissus, Crimson Braid, Sunstar, Bacchus

Lilian A. Guernsey

Rhododendron viscosum

[*See page 229*]

Correspondence

SIR: Can't we get some one to invent a word that means the same in withstanding heat that "hardy" means in withstanding cold? It would be a very useful word to employ for a number of plants that are grown successfully here. I should like to apply it to several that I have been experimenting with lately, and find very well suited to our conditions. The Peach Bells, or Peach-leaf Campanula (*Campanula persiscifolia*), has proven itself a most valuable plant with me. Neither heat nor cold, drought nor excessive moisture seems to bother it. It goes right on growing and persisting from year to year, and blooms beautifully every summer. It is really a charming plant, with its lovely blue or white bells, and much more satisfactory than the Canterbury Bells.

Another flower which I have had in my garden for three or four years, which I think is long enough for a test, is the Coral Penstemon (*Penstemon barbatus torreyi*). There is also a pink variety. This is quite different from the Gloxinia-flowered Penstemon. The flowers are from a half to an inch long, very tubular, and the loveliest shade of real coral or pale pink, and are borne on spikes from three to five feet tall. They are very graceful and lovely.

Maiden Pink (*Dianthus deltoides*) I find easy to grow, but it does not last more than a couple of seasons, sometimes only one. But as it blooms the first year from seed, it can easily be grown as an annual, and is one of the most delightful of the Pink family. I have had about the same luck with *Nepeta mussini*.

These plants are all rare in this part of the country, but I think will be used more and more as people find out their good qualities.

Among the summer blooming bulbs that are doing well here and gaining in favor are the montbretias, and I expect it will not be long before they are one of the commonest flowers in the South. This will necessarily be so, since they multiply so rapidly and must be divided every two or three years in order to continue blooming. So the gardeners will divide their montbretias and give them to their neighbors and soon every garden in the town will have its clump of montbretias, some orange or yellow, and some red, dainty little gladiolus-shaped blossoms, borne on a spike in a spreading cluster.

One of their chief assets is that they begin blooming when most other things have finished, and continue through the heat of July and August. To give best results, they should be transplanted in the fall. As far as I can tell, their method of propagation seems to be different from that of other bulbous plants. The off-shoots grow as plants for a year before they form bulbs and these young plants seem to stand transplanting better in the fall than in the spring. The old bulbs can be transplanted at any time. I do not state that as a fact, only that it has been my experience. It may be that I waited too late in the spring to transplant. If the clump is not pulled apart, but is only broken up into small clumps, they will transplant all right at any time, but of course, for best results, they should be entirely separated. ISABEL B. BUSBEE.

Raleigh, N. C.

SIR: I should be interested to know if any of your readers, especially from the Northern States, have had plantings of the beautiful California brodiaeas in their gardens for more than four years. C. D.

Virginia.

SIR: May I offer my hearty congratulations to you for the addition of the new section, "Correspondence,"

to the quarterly; it is an excellent idea and I hope it will be continued.

Replying to what M. McD. B., Ashland, Va., asks regarding *Fritillaria imperialis*, I should like to give my experience, without, however, giving him any solution of his problem. In the autumn of 1926 I planted two bulbs of the variety "Aurora"; the bulbs were not of the best quality that year, that is not firm and solid. They were planted six inches deep in a rather sandy soil. The next spring they did not come up but the spring of 1928 produced two healthy stems which did not bloom—and were later pulled out for weeds by a benighted day-working gardener; that was the end of that. However, I had planted two more "Aurora" in the autumn of 1927; when I had purchased these two bulbs I was told that they were the best bulbs the seed store had had for years and they certainly looked it. But they did not come up and when I looked for them I could find no traces; as I had this time planted them in a very sharply drained rather dry soil which contained a large amount of hard coal ashes, I blamed the ashes for the disaster.

In the autumn of 1928 I changed varieties and tried the "Common Yellow." When I bought my bulbs I told my experience to the seedsman, who called in an old Dutch bulb-man who suggested a damper location and picked out the firmest bulbs for me. He also told me that he had never known of *Fritillaria imperialis* acting as mine had done. But again the bulbs did not come up; nor have those which I have planted in 1929.

I can remember an old garden in southern Indiana which I knew as a child where a clump of red Crown Imperial grew larger each spring. To the best of my recollection the plants were in half shade and I am sure that the soil was clay and rather heavy. I am trying again this year for I refused to be downed by this plant.

Bridgeton, N. J. ALFRED BATES.

SIR: One of the pleasures of having even a small rock garden is that it furnishes space for many dainty little plants that otherwise would be unknown to our garden because in the flower borders they would be crowded out or made inconspicuous by larger, more flamboyant neighbors. Such a plant is the delicate *Corydalis glauca* with its gray-blue feathery foliage and blossoms that are little pink sacs, yellow at the mouth, hanging upside down along the stem, strongly suggesting the dicentras to whom it is related. Corydalis is a most accommodating plant, for while it is a biennial it self-sows freely, and like one of its relatives, *Dicentra eximia*, blooms all summer, is happy in shade in dry stony soil, a combination of qualities that should commend it to gardeners very strongly. It seems that there are many varieties of Corydalis: *C. glauca* and *C. aurea*, natives of the East, while *C. montana* grows in the Rocky Mountain region. *C. cheilanthefolia*, *nobilis*, and *lutea* are lovely varieties with fern-like foliage. One of the most attractive varieties is *C. thalictrifolia*, which has particularly beautiful feathery blue-gray leaves and yellow blossoms.

It is interesting to note that one foreign catalogue lists ten varieties of corydalis while a diligent search of many of our own show that only a few rock garden specialists carry it and not more than one or two varieties. However, few of us are collectors, and the rock garden boasting any one of these sorts which make themselves so much at home there and are so effective against the gray stones is indeed fortunate. E. RAWLINSON.

Staunton, Va.

SIR: *Sempervivum fauconnetti* as I grow it is a most decorative tiny thing, related to *arachnoideum*, but with rosettes from one-half to one-fourth the size of those of the cobweb. They are less webby, greener, with more or less clearly defined reddish tips to the leaves. A most valuable

P. J. Van Melle

Sempervivum fauconnetti
S. heuffeli
S. reginae-amaliae

thing for shallow soils or stone surfaces. (See page 235.)

S. heuffelli and *reginae-amaliae* appear to be closely related species which differ from most species in that the new rosettes are formed in the axils of the rosette-leaves, which makes for a closely huddled appearance of established colonies. Both flower in August, with pale-yellow, bell-shaped flowers in a round, more or less drooping head, on 6- to 7-inch stems. *Reginae-amaliae* sometimes bears flowers as well from the axils of the upper stem-leaves.

Heuffelli makes a symmetrical rosette, with the upper third of the leaves tinted red. The leaves of *heuffelli* taper abruptly to a point, those of *reginae-amaliae* gradually. These two species are of exceptional interest for their late flowering season. Both are downy. *Heuffelli* is the more attractive looking plant of the two and the slower propagator. It is, in fact, the slowest propagator of all *sempervivum* known to me.

P. J. VAN MELLE.

Poughkeepsie, N. Y.

SIR: Through your correspondence column, Miss Rawlinson asks of the success which has been met in growing various broad-leaved evergreens, including Berberis and Cotoneasters, south of Washington, D. C.

It is with pleasure that I answer even in part, an interrogation which invites the further attention of our readers to the beautiful plant material available for our gardens as presented to us through the alluring photography of this Magazine, together with the very valuable and illuminating text accompaniment.

Simultaneously, with the appearance of Miss Rawlinson's letter in the July issue, answers to her communication are to be found in the photographs of both *Berberis sargentiana* and *Cotoneaster acutifolia* described as hardy at Washington, D. C., and fitting representatives of the two great families of which she makes inquiry.

In my own small garden the above mentioned plants seem well content although *Berberis sargentiana*, planted possibly in too close proximity to

willow oaks, has not flourished as has another evergreen *Berberis wilsonae* which enjoys abundant space with ample requisite for spread.

The latter is a trifle slow of establishment but is worthy of every ounce of care which need be lavished in the start. For all this hot summer through it has seemed unperturbed, delighting the eye with its lustrous fresh green foliage and the additional adornment of yellow berries, crowded in clusters along the slender spreading branches.

But beware! for if one becomes too admiring there are the partially concealed but deadly spines which are a painful reminder of the familiarity which breeds contempt!

Of Cotoneasters, *C. divaricata* is one of my most treasured possessions; low-growing, it hugs the earth beneath a pear tree, edging the rose and boxwood walk-way in the garden, and there I find it both companionable and charming. The fruit is a dull reddish-brown in color and not so profuse as the taller variety *C. dielsiana*. Five of the latter shrubs flourish in a position where they enjoy full sun and are laden with multitudinous clusters of red fruits which form pleasant contrast for the gray-green of the plant's leaves.

C. franchetti, carrying lovely sprays of pink coral berries, was happy with me until it grew too large for the crowded corner which it enjoyed in the company of the ligustrums. Disaster followed close upon the operation of transplanting, a liberty this proud family finds difficult to forgive. One plant succumbed entirely and the other is just manifesting an interest in recovery after many months of stubborn sulking. If such an ordeal becomes a necessity, wait until spring and prune back severely.

C. racemiflora soongarica, one of the most beautiful of the species, appeared content for two long years and then during a trying winter of intermittent thawing and freezing decided conditions were not to its liking and peremptorily departed. But with the spirit of the true lover, whom despite thwarted effort refuses to recognize defeat, there is still the fiery longing of pursuit and a determined perseverance which should eventually achieve!

Of broad-leaved Photinia, my garden note-book records only the one variety, *P. serrulata*, which is ascribed every honor due a shrub of such great desirability and beauty. Its early white flowers are very fragrant and the serrated, long, shiny green leaves particularly ornamental. It is perfectly hardy around Richmond and in the mountainous sections of the State. It has the additional advantage of being equipped with foliage better able to withstand the scars of winter's cold than the more tender, broad-leaved English Laurel and Ligustrum.

Ashland, Va. M. MCD. B.

SIR: I have just been reading the January number and would like to say a good word for *Lilium henryi*. Shrubbery around the base of the house is usually planted thickly and that lily can lift its head high enough to be effective above it. Its greatest

charm is as a cut flower where its tendency to "stand on its head" gives it a lightness and grace not possessed by other lilies. The perfume, too, is not too heavy for the house. MRS. A. C. U. BERRY.

Portland, Ore.

SIR: The "Poet's Laurel" of the Virginia gardens is *Ruscus androgynus* L., or as it is now called, *Semele androgyna* Kunth., a plant of questionable hardiness but one that comes again from the roots if not too severely injured. The name "Poet's Laurel," however, should be reserved for the even more tender tree, *Laurus nobilis* L., the famous bay with which the ancient victors were crowned.

Richmond, Va. M. A.

SIR: The Regal lily as shown in the illustration on page 236 was one of three received as a bonus offered for the renewal of subscription to a horticultural magazine.

The first two years of cultivation consisted only in the ordinary care accorded a garden border planting. But the third year of the lily's growth, it was decided to try the experiment of applying a commercial fertilizer at stated intervals. In early *April*, before the weather was warm enough to risk possible injury through the use of concentrated formula the *first* generous application was made, followed by copious watering every two weeks thereafter.

The result was the gratifying reward of counting 45 blooms carried at one time on the slender stalk, which required firm and careful staking to support its additional weight.

Ashland, Va. ANNE JONES.

SIR: N. L.'s inquiry about rock gardens filled with the inevitable spring cresses leads to many answers! The immediate answer probably lies in the ease with which these plants may be had and kept, the prodigality of their flowering, not to mention the cheapness of the original outlay. If they could be recognized as the possessions of a new rock gardener who would not long be satisfied but would go to other rock garden efforts, no one would mind; but this first easy triumph is often an end to rock garden effort so quickly are gardeners satisfied. Naturally this is the fault of the gardener and not of rock gardening as such. If the same persons undertook a wild garden they might rest from their labors after they had managed masses of *Phlox divaricata*, a few hundred trillium and mertensia and so, come no further than in their other effort.

All gardening must be progressive and the beginnings need not be scorned unless they are allowed to be the final outcome. The same criticism may be leveled at many gardens. How often one sees rose gardens that never pass beyond the Radiance stage, perennial borders that never pass the tulip-iris-peony-delphinium-phlox-rudbeckia-chrysanthemum epoch, while among annuals one sees the alyssum-petunia-ageratum-zinnia combinations until one is quite weary of their easy perfections.

On the other hand one dare not be too scornful of garden staples! They usually must form the background against which one places the accents and highlights of garden adventure.

The real trouble with rock gardening, aside from the inertia of owners, may lie in the fact that few persons know how to arrange plausible rockwork and so achieve only an ugly mass that obscures the interest to be found in the plants grown in the collection. What will bring about the proper balance between the collector's instinct so quickly inflamed and any thought of artistry in the creation of a rock garden, is something that can not well be set down in writing.

Maryland. M. C.

Miss Rawlinson's letter about the broad-leaved evergreens touches on a subject of great interest to the editor,

who has been experimenting a little with plants of that type, in his own garden just north of Washington, on a clayey but distinctly acid soil.

There most of the cotoneasters do well enough though they are not yet so old that they give much idea of what will be their ultimate size and habit. It should be recorded, however, that for them the term "evergreen" is a relative matter as most of them lose their leaves before spring. *Photinia serrulata* in a nearby planting is killed to the ground in severe winters but springs again into good growth the following summer. The two stranvesias are entirely hardy. The variety *undulata* makes a handsomer bush with more compact habit and branches better furnished with leaves, that take on handsome bronze and purple colors in the fall and winter.

Jasminum primulinum died a lingering death after several ordinary winters but probably should have another trial in a sheltered corner before its final dismissal. *Berberis darwini* behaves in much the same fashion but does live along in no way resembling its robust condition on the Pacific Coast. *B. stenophylla* fares somewhat better but usually loses its leaves before spring, presenting a very wretched appearance with its many straggling branches. It does send out a fair number of its brilliant orange flowers in good season and is soon clothed again with green leaves. With *B. sargentiana* the story is quite different for this is entirely hardy and makes a wonderful bush.

If one will tolerate an occasional winterkilling and frequent defoliation, *Lonicera pileata* and the more tender *nitida* may be grown. *Osmanthus aquifolius* should certainly be included as it makes more rapid growth than the holly and in mild Novembers gives a fine crop of small white flowers. Aucubas might be tried with some care for the plain green-leaved forms, if one gives them a northern exposure. In freezing weather they do look cold, but do not burn unless the temperature stays about zero for some time or unless there is both sleet and brilliant sunlight for several days.

EDITOR.

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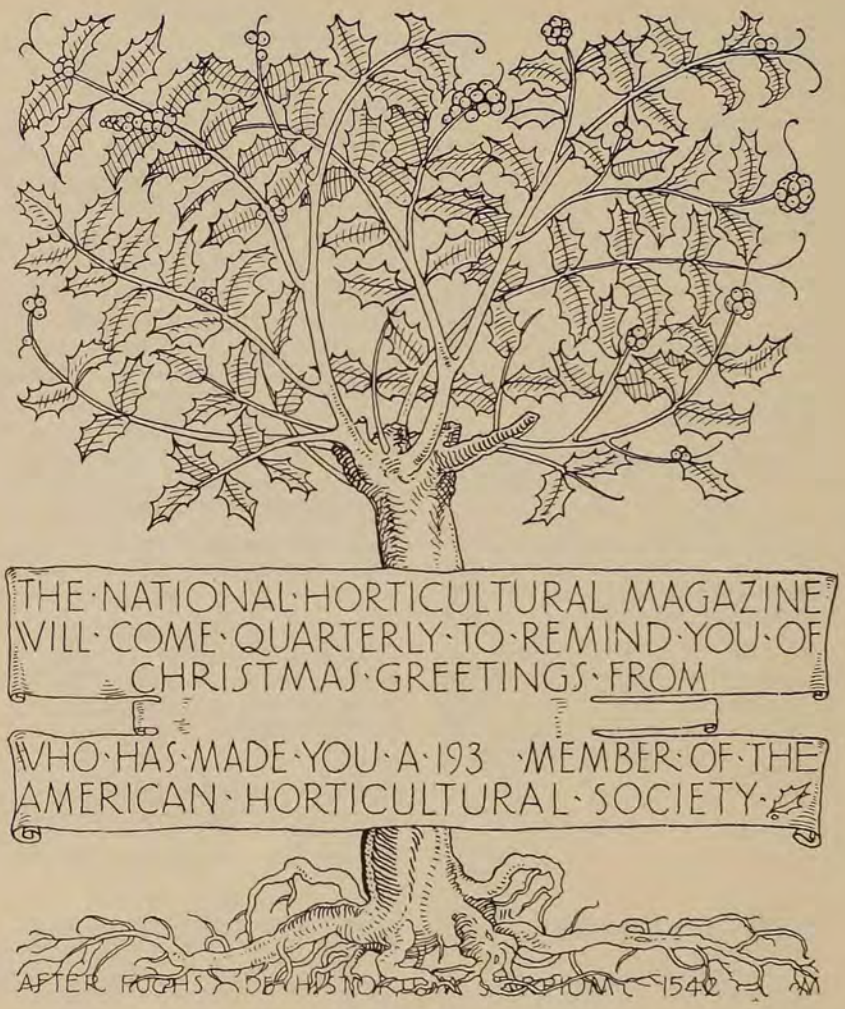

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THERE have been arguments many times as to the advisability of putting the printed form of Application Blank into the pages of the advertising section. One fatal mistake was once made of putting it on the back of the last page of text and then we discovered that it was both read and used. But it is not read or used as much as it might be. If you are reading this at this very moment, can you think of some garden friend who is not a member of the society who could become a member through your efforts or by your gift, who would help to swell the ranks of the growing society? If you can, use the blank now and earn the free extra copy for the new member. In January, under separate cover, we hope to publish the membership list of that date and you will be surprised to discover in how many States of the Union we have members and what excellent garden company you keep! If we become sufficiently hardened, we may even print various letters in praise of our growing selves for we do have letters of that sort many times over.

Do not fail to send in your renewal promptly. It will mean much to all—to us in that there may be no delay in the work; to you in that it will assure you a larger and better magazine than you have had this year. The summer has brought a store of material for next year, not only for each issue but for the special celebration of our first decade. A new serial will commence in the January issue, a collection of new succulents will be featured, a special lily number is in the offing as soon as the material can be organized, a special report on fall flowering crocus species—this gives but a taste of what is in store. We have had 244 pages this year, next year we must have 350 at least. Will you help?

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