

BULLETIN

of the

AMERICAN ROCK GARDEN SOCIETY

Vol. 12

JULY, 1954

No. 3

.....

Astragalus and Oxytropis—Robert M. Senior.....	61
The Hemlock—Ralph M. Warner.....	64
A Dwarf Hemlock—G. G. Nearing.....	67
Double Flowers in the Rock Garden—Stephen F. Hamblin..	68
<i>Phlox stolonifera</i> "Blue Ridge"—E. T. W.	70
Seed Exchange.....	71
Some of This Year's Crop—Doretta Klaber.....	71
Tiny Treasures of the Heath Family—W. H. A. Preece.....	73
Living Rock—G. G. Nearing.....	79
Letters to the Editor.....	81
Little Rosettes for the Rock Garden—Stephen F. Hamblin....	82
Crevice Creepers—Stephen F. Hamblin.....	84
Spring Show of the Northwestern Unit—Pat Ballard.....	84

DIRECTORATE

BULLETIN

Editor Emeritus

DR. EDGAR T. WHERRY, University of Pennsylvania, Philadelphia 4, Pa.

Editor

G. G. NEARING, Ramsey, N. J.

Associate Editors

MRS. EDWARD M. BABB, Portland, Maine DOROTHY EBEL HANSELL, New Providence, N. J.

CARL S. ENGLISH, JR., Seattle Wash. MRS. J. NORMAN HENRY, Gladwyne, Pa.

MRS. G. R. MARRIAGE, Colorado Springs, Colo.

Exchange Editor

HAROLD EPSTEIN, Larchmont, N. Y.

AMERICAN ROCK GARDEN SOCIETY

Honorary President.....MRS. CLEMENT HOUGHTON, Chsetnut Hill, Mass.

President.....HAROLD EPSTEIN, Larchmont, N. Y.

Corresponding Secretary.....DOROTHY EBEL HANSELL, New Providence, N. J.

Recording Secretary.....MRS. IDA A. THOMAS, Paterson, N. J.

Financial Secretary.....MRS. J. B. JOHNSON, Pompton Lakes, N. J.

Treasurer.....ALEX D. REID, Mountain Lakes, N. J.

Vice-Presidents

LEONARD J. BUCK

MRS. HARRY HAYWARD

MISS ELIZABETH GREGORY HILL

ARTHUR R. VIRGIN

BRIAN O. MULLIGAN

MRS. COULTER STEWART

Directors—

Term Expires 1954

MRS. WALTER D. BLAIR

MRS. J. M. HODSON

E. L. TOTTEN

MRS. MORTIMER J. FOX

MRS. CLEMENT S. HOUGHTON

Term Expires 1955

KURT W. BAASCH

MRS. M. J. FITZPATRICK

MISS ALIDA LIVINGSTON

PETER J. VAN MELLE

DR. C. R. WORTH

Director of Seed Exchange

BERNARD HARKNESS, 5 Castle Park, Rochester 20, N. Y.

REGIONAL CHAIRMEN

Northwestern.....PAGE H. BALLARD, Issaguah, Wash.

Oregon Sub-Group.....FLOYD W. McMULLEN, Portland, Oregon

Western.....MRS. COULTER STEWART, San Anselmo, Calif.

Rocky Mountain.....MRS. G. R. MARRIAGE, Colorado Springs, Colo.

Central.....MRS. GLENN FISHER, Oshkosh, Wisconsin

Lakes.....ROBERT M. SENIOR, Cincinnati, Ohio

North Atlantic.....E. L. TOTTEN, Ho-Ho-Kus, N. J.

New England.....DR. HELEN C. SCORGIE, Harvard, Mass.

Maine Sub-Group.....PHILLIP C. KEITH, Cape Elizabeth, Maine

Published by the American Rock Garden Society, incorporated under the laws of the State of New Jersey. You are invited to join—annual dues \$3.50. Address communications regarding membership and dues to Mrs. J. B. Johnson, Box 151, Pompton Lakes, N. J. other matters relating to the Society, Mrs. Dorothy E. Hansell, 66 Pittsford Way, New Providence, N. J. Address to G. G. Nearing, R.F.D. Box 216, Ramsey, N. J., manuscripts and other matter relating to the Bulletin.

BULLETIN

of the

AMERICAN

ROCK GARDEN SOCIETY

G. G. Nearing, Editor

VOL. 12

JULY, 1954

No. 3

With the current issue of the Bulletin, the editor makes his exit bow, yielding place to an old and trusted friend, Dr. Carleton R. Worth of Groton, N. Y. All future communications to the Bulletin should be addressed to Dr. Worth.

Members who have belonged to the Society for any length of time need no introduction to the new editor. His explorations and his work with new and rare plants are too well known to require comment. For the benefit of new members let me state briefly that Dr. Worth, Commander, United States Naval Reserve (Retired), in nine collecting trips has searched many of the higher mountain ranges of North and South America for alpine plants, concentrating especially on the Wasatch Mountains of Utah. His contributions to the Bulletin during past years have told of his adventures and his efforts to introduce into general cultivation some of the rarest and most treasured miniature plants native to our continent.

His intimate knowledge of alpinism in their native haunts is matched by an equal acquaintance with their eccentricities under cultivation. His own rock garden has played host to countless direct introductions from other lands through E. K. Balls, Peter Davis, Kingdon Ward, Ludlow and Sherriff, and other famed explorers. He is also in charge of the rock garden at Cornell University.

In retiring, I wish to thank all those who by their written contributions have made possible continued existence of the Bulletin, and to remind members who have never passed the stage of good intentions, that now is the time to join those seasoned and dependable writers, all of whom must support Dr. Worth if the Bulletin is to go on serving us all and rise to new heights of success.

ASTRAGALUS AND OXYTROPIS

ROBERT M. SENIOR, CINCINNATI, OHIO

TO WRITE IN DETAIL about the related genera *Astragalus* and *Oxytropis*, both belonging to the Legume family, would require the knowledge of a specialist, who would probably have to spend many months, even years at his task. For, since many of the different species have similar flowers and leaves, he would have to examine the plant in fruit in order to determine the species. Moreover the range of these two genera is tremendous, for they extend over a great part of the

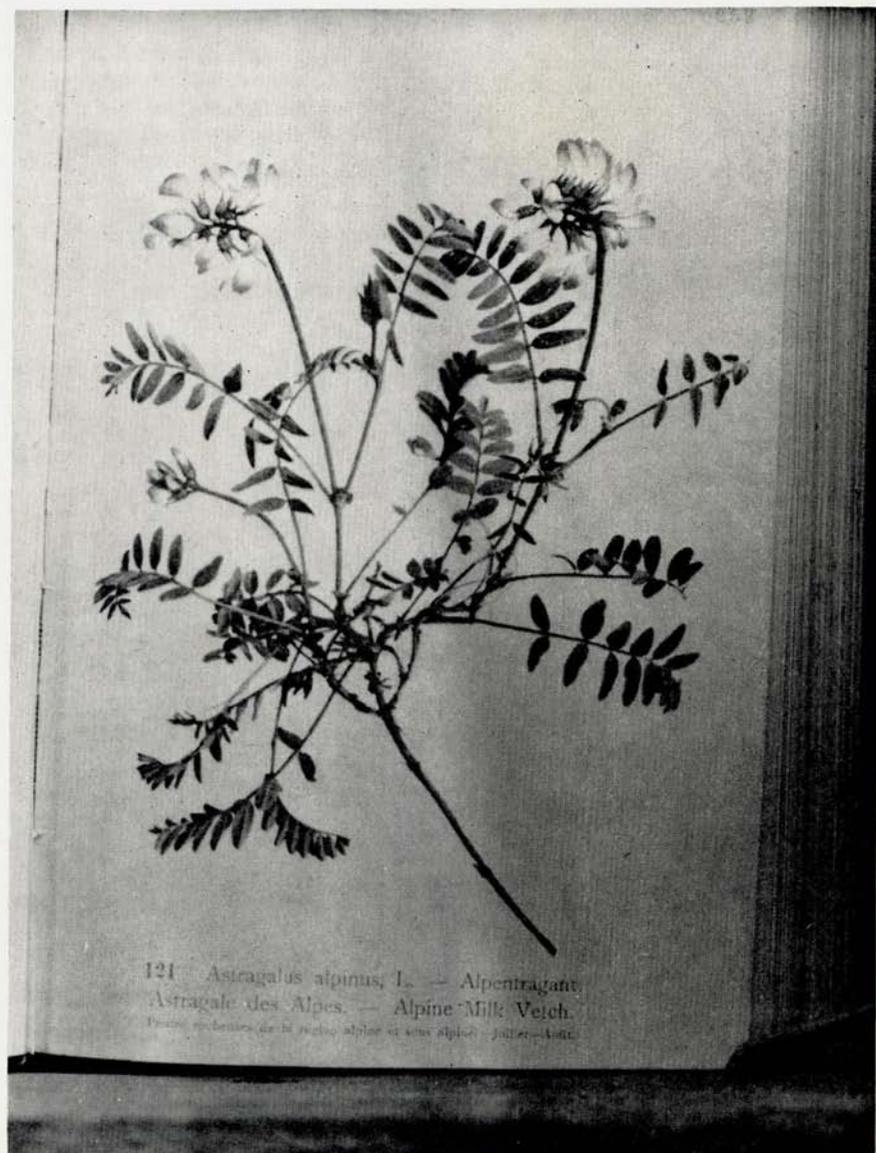


Illustration of *Astragalus alpinus* in Correvon's "Atlas de la Flore Alpine."

North Temperate Zone. Probably there are well over a thousand species. To get an idea of their range in North America, we find them extending from Texas and California to British Columbia and Alaska, and eastward even as far as Newfoundland. In Arizona alone they comprise the largest group of flowering plants in the state.

The reason we have been somewhat attracted to these plants is because several of those that we found in the Rocky Mountains are of horticultural value,

and could well find a place in the rock garden. Moreover, it is of some interest to recognize a few of those species that, in particular, are the abomination of the cattle men, who call these plants "Crazy" or "Loco Weeds". Incidentally the word "loco" is of Spanish origin, and means "crazy". Horses eating them often become addicts, lack muscular coordination, develop faulty vision, are hard to handle, and often die within a few months. Sheep and cattle are poisoned in much the same way.

Formerly many of the genus *Oxytropis* were classed as *Aragallus*, but generally this latter name has been abandoned, and I believe most taxonomists now class them under *Oxytropis*. For example, one of the most poisonous and yet one of the most attractive, *Oxytropis Lambertii*, was formerly called *Aragallus Lambertii*. (Note that *Aragallus* is not a misprint for *Astragalus*, but a different name.—ED.)

Apparently the botanical differences between *Oxytropis* and *Astragalus* are slight. The easiest way to differentiate the two is to examine the keel of the flower: in the former the keel is tipped by a sharp appendage or beak. In *Astragalus* the end of the keel is blunt. For the rock gardener interested in growing some of these plants, the distinction would seem to be unimportant.

If you succeed in raising any species from seed, it is probably well not to transplant them, as I believe many of them are mycorrhizal plants that would probably resent a disturbance of their roots. However, of the few plants that I have raised, I have found that cuttings root rather readily.

If in summer one travels among the foothills of the eastern Rockies, he is almost certain to encounter *Oxytropis Lambertii*. It is about 12 inches high, possibly a bit lower, and has good sized attractive purplish or dark bluish flowers in terminal clusters on stems that are leafless. From the base there also arise stems each bearing 10 to 20 silk-hairy leaflets. The pod is leathery and also silk-hairy. Thinking it might be an attractive plant for the rock garden, we once brought some seeds home, and though they germinated, the plants died before blooming. Incidentally, several years ago a nurseryman offered a white variety which he called *O. Lambertii* var. *spicata*, but I judge this must have been misnamed.

Another "Crazy Weed" which grows in Texas, and is less than a foot high, with good sized purple flowers, is *Astragalus mollissimus*. One writer describing the plant, says that "it is unfortunate for flower lovers that so beautiful a flowering plant should be so baneful."

Those readers living in Vermont or Maine possibly have seen or grown *Astragalus alpinus*, a pretty low-growing plant with rather light violet flowers, the keel being a bit darker in color. There are about 12 to 25 leaflets to a stem. In Correvon's "Atlas de la Flore Alpine" this plant is pictured in color. In this country it has been found as far west as British Columbia, and its range extends to Europe and Asia, so it might be said that it has traveled almost around the northern hemisphere. It would be interesting to know whether any of our members have ever raised it, or for that matter, whether they have grown any other plants belonging to these two huge genera.

EDITOR'S NOTE.—In the article which follows, as elsewhere in the Bulletin, the name hemlock follows common local usage, and refers to the hemlock spruce. Actually hemlock is a poisonous weed belonging to the Parsley Family, found in ditches and meadows, the same plant of which Socrates was forced to drink a decoction, the ancient Greek form of execution.



Tsuga canadensis Bennett, also known by other names.

THE HEMLOCK

RALPH M. WARNER, MILFORD, CONNECTICUT

THE HEMLOCK has been my favorite conifer since earliest childhood. The first hemlocks of dim remembrance appeared yearly at Christmas loaded with popcorn balls, oranges, presents and so on.

All aspects of the hemlock are pleasing—the unfailing bright green foliage even in the coldest winter when the ground is covered with snow, the pungent odor of twigs, bark and wood, the deep shade, the tiny cones high on the branches, and finally the cheerful crackling when hemlock wood is burned in the fireplace.

About fifteen years ago we purchased our present place of 22 acres, mostly woodland with thousands of hemlocks from tiny seedlings to large timber trees. An opening was cleared and a hemlock nursery started. It is safe to say we have the largest and most varied collection of nursery plants to be found anywhere in the world. We have plants in several sizes of all the seven hardy species which are: *Tsuga canadensis*, *caroliniana*, *Mertensiana*, *heterophylla*, the American species; *chinensis* from China; and *Sieboldii* and *diversifolia* from Japan.

Of *T. canadensis*, our common hemlock, we have three dozen worthwhile ornamental mutations and quite a few more on trial. Several of these mutations or sports are dwarf enough to be excellent rock garden ornamentals. One such is Horsford's dwarf, the original plant of which may be as much as 100 years old, yet it is only 12 inches high by 20 inches in diameter — a perfect hemisphere! It was found in a cow pasture in northern Vermont. Fortunately cuttings from it root readily when started about August 15th in a cold frame. Another form found in the same pasture is now about four feet high and has borne cones every year for the last six years. Two cutting-grown plants from it have cones at one foot in height. I hope to offer plants in 4 in. pots with cones. Aurea, the golden hemlock, makes a splendid accent point in a garden. This hemlock furnishes the points of the compass, the northern side being much greener than the south side even when planted in full sunlight. If planted in shade most of the golden color disappears.

Probably the finest of all hemlock mutations is Sargents weeping, which is completely prostrate when grown from cuttings, and is almost a must for larger gardens. Cole's prostrate is a much smaller and even more persistently prostrate form with branches that hug the ground.

The tiniest of all dwarf hemlocks is the form called *minuta* which is extremely compact and slow growing. Our present stock is four plants all grown from cuttings with considerable difficulty. Since the loss of even a single cutting is painful we are trying the experiment of mound layering.

A most excellent hemlock is one with three names — *nana*, *minima*, or the Bennett hemlock. The late Charles F. Jenkins whose Hemlock Arboretum was located near Fairmount Park in Philadelphia always insisted that the last name was correct. By any name it is a unique hemlock; semi-dwarf, spreading but not prostrate, multibranching, dense, always neat and pleasing and never in need of shearing.

It would require several pages to adequately describe the almost innumerable variations in which our native hemlock seems to delight. The variety *alba-spica* always excites interest. A frequent comment is "Oh, look at the flowers" — but the apparent flowers are merely the white tips of new growth.

Tsuga Mertensiana, or mountain hemlock, is a very rare hemlock in this part of the world, and while it is not a dwarf except near timberline in its native habitat, still it has been slow growing with us and appears to be hardy and reliable under suitable conditions. It is the truest Rock Garden hemlock of them all, requiring air drainage as well as root drainage. It varies from the other hemlocks in having the needles on all sides of the twig and the color may be green or a bluish tint similar to that of a good Colorado spruce. The plant is upright and quite irregular in form. It is easily grown from cuttings and we have a few plants from seeds. The cones are said to be 2 - 3 inches long.

With very few exceptions our plants are grown from cuttings, a large percentage of which came from Mr. Jenkins' Hemlock Arboretum. Nursery plants were purchased where available, but few nurseries offer much in hemlock varieties and then mostly grafted material which is seldom satisfactory. Our President, Harold Epstein, contributed two or three good dwarfs and much helpful information. Dr. John Hanley of University of Washington furnished *T. Mertensiana* from their arboretum. Prof. Doran of Amherst sent rooted cuttings of a very good unnamed dwarf and two prostrate forms. Mr. Harold Rugg of Andover gave cuttings of an extremely neat fine foliated globose dwarf. Mr. William Horsford of Charlotte, Vermont, found the dwarf named for him and the form which bears cones every year. He continues to send us new hemlocks for trial.

Anyone who enjoys walking in the woods and fields may find variant hemlocks and perhaps some precious ornament for our future gardens — who knows? We are always anxious to obtain new hemlocks or cuttings from them. We plan to concentrate on the dwarfer forms and to eliminate those which quickly grow too large for one person to manage.



Tsuga canadensis Horsford's Dwarf.

All hemlocks delight in a moist, acid, humid soil, and wind protection. It is a mistake to plant any hemlock in a dry gravelly soil in a windswept location. The ground that suits blueberries or azaleas is excellent for hemlocks and is better if somewhat on the heavy side. Pine trees will grow better in sand than hemlocks.

While hemlocks are shade tolerant to a remarkable degree they will do their best when grown in full sunlight.

The enemies of hemlocks are few. Strawberry beetles feed on the roots, but since this pest cannot fly it is easily destroyed by chemicals; we have had none here. The only other pests are the mites or red spiders that feed on many plants.

A DWARF HEMLOCK FROM NEW JERSEY

G. G. NEARING, RAMSEY, NEW JERSEY

Years ago, perhaps in 1940, I was leading a botanical trip in extreme northern New Jersey, three or four miles south of Port Jervis, N. Y. Having crossed a wooded ridge at one point, I felt it would prove more interesting on the return to recross elsewhere, and in so doing became somewhat confused as to exact location, though sure of the general direction.

Somewhere on top of the ridge we came upon an unusual hemlock about five feet high, but apparently very old, for on the fan-like tips of the branches the new growth was extremely short. In heavy shade at the root of a large white oak, it had not grown particularly dense. However the foliage texture was remarkable, and I reflected that in open sunlight this specimen might assume a highly decorative habit. To hunt out the owner of the land and ask permission to transplant it would have been useless, because the roots could not have been extricated from the base of the oak.

A deep bed of decaying leaves had accumulated under the hemlock, partly burying the lower branches, and to my surprise I found that some of these boughs had layered themselves, and were rather heavily rooted. Hemlocks seldom form such layers. Here was a suggestion that propagation might prove easier than with most specimens of *Tsuga canadensis*. It took only a few moments to cut off two of the smaller layers, wrap them in leaves, and stow them in my hiking pack.

These layers were taken to the nursery and planted in 6-inch pots, one soon dying, the other living but making little growth. I kept it in a coldframe for two or three years, then having no appropriate place to establish it, gave it to Edward A. Thuem of Harrington Park, N. J., who made a place for it in his rock garden.

There it did all I had expected of it, forming a small, dense specimen. He has propagated it rather extensively by cuttings and grafts. The reason for grafting was that the brevity of annual tip-growth made it necessary to include two-year-old wood in any cutting large enough to handle satisfactorily, and old wood does not usually root well. Eventually he worked out a method of rooting a very short cutting, which of course took a long time to form a plant large enough to sell.

Most of those sold have been called var. *Hussi*, on advice of a hemlock expert, but this name is not at all satisfactory, because the plant does not resemble other material offered as *Hussi*. I have suggested the name *Jervis*, and I hope this will be used for it in the future. Strange to say, my only idea of the habit of *Jervis* is a dozen-year-old recollection. Mr. Thuem propagates so enthusiastically that almost every available tip is used for a cutting. Consequently no plant in his hands can assume the natural habit. I hope soon to trace one or two of the earliest sales, in the hope that these plants will have had a chance to develop normally.

As soon as the worth of *Jervis* became evident, I offered to guide Mr. Thuem to the place where I had found it and make an effort to rediscover the original plant. The search proved fruitless, as did three subsequent ones. Later, talking with a farmer in the nearby valley, I learned that a florist from Newark cuts hemlock greens in those woods every year. Did he chop out the whole plant? Did someone attempt to dig it? I shall probably never know, but am convinced it is no longer there.

In searching for it, many other dwarfs were found, none with any hint of horticultural merit. It is usual for the smaller forms to occur in this way, a number scattered over an area of a few acres, and the late Charles G. Curtis of Callicoon, N. Y., discovered the reason. Certain compact and slow growing hemlocks give a large proportion of dwarfs in their seedlings. He showed me a dense tree less than twenty feet high, and a field of its offspring, including a most extraordinary diversity of low types.

Almost any region where hemlock thrives, if hunted over carefully, will yield a few stunted and abnormal individuals, hardly any of which deserve a second glance. The qualities which make a good horticultural form are rare, and are best judged by an eye trained in landscape art, coupled with a good deal of horticultural imagination. For the wild plant, through the accident of its position, and the competition of encroaching neighbors, almost never gives more than a suggestion of what it can look like when isolated and framed in an appropriate setting. The most likely location where a wild form can be seen to advantage is a pasture, and even there the damage done by cattle must be carefully assessed.

When the hemlock of unusual beauty and individual charm has been found, there still remains the question whether it can be propagated readily enough to justify naming. For horticulture is already overloaded with names, and to attach yet one more to a clone which stubbornly refuses to be multiplied, merely adds to the clutter, without offering anything whatever to the person who wishes to plant an ornamental garden.

DOUBLE FLOWERS IN THE ROCK GARDEN

STEPHEN F. HAMBLIN, LEXINGTON, MASS.

JUST TO START A DISCUSSION, "Should double flowers be admitted into the rock garden?" In theory, of course not. The rock garden is a presentation in miniature of natural conditions, either a copy of a certain spot, or a composite of places where small plants grow among rocks. Double flowers are garden forms, which appeared in gardens and propagated and cultivated by man. Nature does not like double forms (yet she alone produced them), and usually will deny them natural increase. But we see now double *Trillium* and double *Bloodroot* in many a "wild" garden, plants produced by nature as freaks, and gladly adopted by man.

Many families of plants have few or no double flowers, as Pea, Mint or Gentian, while Mustard, Pink and Campanula Families frequently become joyful under cultivation and throw extra petals. If the doubling is from added sepals (as *Clematis*) or extra petals (as *Buttercup*), then there is usually seed and perhaps doubled forms will appear again in the seedlings; but if stamens are transformed to petaloids, then the chances of viable seed are reduced (as in *Rose*), and if the pistil breaks into petaloids (as with *Peony*), then there is no seed at all and man must propagate wholly by cuttings or divisions.

From the angle of "nature" in a rock garden, double flowers could be omitted or kept in a special area, but there are practical factors in their favor. Doubled flowers give a greater amount of color and a longer blooming season, often later than the wild type of flower. In case of *Helianthemum*, whose single flowers drop their petals early in the day, the double "buttons" stay in good show for late afternoon visitors, and even to next day. As no seed, or but little, is produced with double flowers, there will not be the endless seedlings to be weeded out, as of many *Dianthus* and others of the Pink Family.

While many plants of size to fit rock planting are known to have double forms, many of these are not ever seen in gardens (as double Scotch Bluebell), and others, once listed by dealers, are now rarely offered, as double Helianthemums.

Following the example of greenhouse Carnations and Grass Pink, several doubled forms of Dianthus are known at height of a few inches. Many of these are orphans (parentage unknown, or forms of Cheddar Pink), and are sold by personal names:

Rose Queen is a small rose-colored Carnation;

Rocknoll Imp is a double pink; so are Inchmary and Sammy;

Tiny Rubies is a minute double red.

There is a dwarf and doubled form of Cheddar Pink (*D. caesius* or *D. gratianopolitanus*, if you are accurate), and seed is offered which produces some double forms. Watch all your seedlings in Dianthus to find dwarfs, single or double.

After the manner of tall double Bristol Fairy Babysbreath, there are doubles in the creeping *Gypsophila repens*, either pure white or the taller two hybrids, the American Bodger's form, with double pale pink flowers on one-foot stems, or the German seedling Rosy Veil (Rosenschleier), dark pink and very double. These two doubles bloom practically all summer. A sort of Babysbreath is Tunic-flower (Tunica), with minute white or pink flowers in misty profusion all summer. Double white and double pink are now offered, the flowers still so small that a dozen plants are required for any show.

There are double forms of some species of Silene, as of *S. alpestris*, double white. It seems to grow only in foreign literature. Many doubles in Lychnis, Silene, Saponaria, etc., are known, but they are too tall and weedy for our rock garden.

Of the Mustard Family many doubles there are, as of annual Stocks. The rock garden quartet is Arabis, Iberis, Alyssum and Aubrieta, all also with double flowers. *Arabis albida fl. pl.* is very robust and long in bloom, a double white perennial Stock. The doubles are as yet only white, but pink is now common in the single form.

Alyssum saxatile fl. pl. is its counterpart in yellow, a real daub of mustard yellow. Would that the pale yellow single form (var. *citrinum*) would become double also! *Iberis sempervirens plena* and White Spire have double clustered white flowers above the mat of evergreen foliage. Why are they so rarely offered? Aubrieta now has doubles, as Barker's Double, purplish red, and Dawn a soft pink. These have been offered, but are rarely in gardens.

A rare double in the Pea Family is *Lotus corniculatus plenus*, a sort of creeping Clover, with three leaflets, but the flowerheads yellow. The double is in tiny yellow balls, tinted red.

The doubles of Helianthemum (Sunrose) have already been praised. Listed is Boule de Feu (Ball of Fire or Fireball), like minute double red roses, in bloom each flower for several days. Rarely offered in this country (but prized in Europe) are other doubles, the colors double yellow, double scarlet, double orange, double rose and even Snowball, double white. If any of us have any of these we should exchange cuttings, as our dealers seem not to be interested.

There are known doubles in Campanula, in dwarf plants as well as in tall species. Somewhere in New England or Nova Scotia the Scotch Bluebell (*Campanula rotundifolia*) bears its bells doubled and split into tiny blue rosettes (var. *soldanellaeflora*). While botany has listed it, no garden to my knowledge

grows it, and no dealer offers it. It is one of the few double blue flowers for the rock garden. *C cochlearifolia*, var. R.B. Loder, has tiny blue doubled flowers, solitary, erect above a mat of small shining oval leaves. It is in European gardens, but not easily transported to America. Some day a double will appear on Carpathian Bellflower.

Our American Violets are never double, but in the moist or somewhat shaded parts of the rock garden the fragrant old Sweet Violet will bloom as well and spicy as in florists' windows, in doubles (purple or white), as well as normal single. In my grandmother's garden, under a grapevine, there grew the old "double Russian" far more fragrant than what the greenhouses now offer. The fact that the stems were so short that the flowers could not be seen beneath the foliage did not matter — they were a treat for the nose this time.

Some interesting small excursions in the field of rock gardening can be found in searching for double flowers there. While my scientific mind suggests that they be excluded, my inconsistent garden mind insists on being interested to see them and grow them.

THE SOURCE OF PHLOX STOLONIFERA 'BLUE RIDGE'

THIS LOVELY SHADY ROCK GARDEN PHLOX has recently been put on the market in America as having originated in England. In the interest of historical accuracy, this Phlox was collected in the Blue Ridge of North Carolina by Mrs. J. Norman Henry in the 1940s, and was soon placed on the market, being listed in the fifth edition of the Plant Buyers Index (1946). Mrs. Henry subsequently presented a clump to the Royal Horticultural Society of Great Britain, and this was the source of the material now being distributed.

E. T. W.

BOOK REVIEW

Phlox, by B. H. B. Symons-Jeune. Collins, London, 1953. 127 pages, many illustrations.

Much of this book is devoted to the border hybrids derived from *Phlox paniculata* (*decussata*), and in this field the author writes admirably, evidently from wide personal experience. The first and twelfth chapters, however, dealing with the dwarf Phloxes of primary interest to rock gardeners, are less capably handled. There are over 50 serious errors in spelling of names and other matters.

Since any book on this subject is bound to be read with keen anticipation, it is particularly unfortunate that this one did not receive more careful proof reading. To avoid at least some of the resultant confusion, owners of the book should mark the following name corrections:

Page 13, *Nelsonii*. P. 14, *Moerheimii*; *setacea*. P. 16, *bifida*. P. 20, *ozarkana*; *virens*. P. 21, *verna*; *Buckleyi*. P. 22, *caerulea*; *Buckleyi*. P. 24, *heterophylla*; *glaberrima*. P. 25, *pyramidalis*. P. 26, *Lingard*; *suffruticosa*; *Van Houttei*; *suaveolens*. P. 29, *stellaris*. P. 30, *andicola*. P. 109, *Covillei*; *condensata*. P. 111, *mesaleuca*. P. 112, *triovilata*. P. 113, *sibirica*. P. 120, "abris *Pungins glanca*" should be *Abies pungens glauca*. Authors' names: P. 15, *Nuttall*. P. 19, *Clute*. P. 107, *Britton*. P. 108, *Coville*. Other errors are of less importance to the reader.

Until a more accurate book is published, this one must serve as our best guide to the subject.

SEND SEEDS TO THE EXCHANGE AT ONCE

SINCE THIS ISSUE OF THE BULLETIN, like its two predecessors, arrives very late, and the October issue, in spite of the fact that it will have a new editor, can hardly be expected on time, a last reminder from the Seed Exchange is called for here. All seeds should be in the hands of Bernard Harkness, 5 Castle Park, Rochester 20, N. Y., before the end of November. Any arriving as late as December create a difficult problem for the Director.

Many of the recipients of seed expect to sow in January, especially in the case of those perishable seeds whose viability lasts only a few weeks under the best of conditions. The compilation of the list takes at least a week. The printer cannot be expected to send it out in less than three weeks after he receives the manuscript, for in addition to the work of setting up, days must be spent reading proofs and sending them back and forth in the mails. This places the earliest possible date for mailing out the list in the first week of January if all seeds are received before the end of November. Days later the member receives the list, studies it, and sends in his request, often from a distant point. This too must traverse the mails. It cannot be filled instantly, but must be considered along with other requests. When finally the seeds are mailed out, another journey through the mails brings them to the sower sometimes almost too late to sow and expect results.

Members must know all this, and must know also that in the Christmas season which intervenes, mails are even more painfully slow, and holidays interfere with production. Yet every year seeds collected in September or October are sent in late, even as late as January and February. Often they are highly prized items and many of them cannot be held until next year. It is therefore necessary to mail out a supplementary list at considerable expense to the Society, and too late to be of much use to the members. And all the time it would have been just as easy to send in those seeds before the end of November.

It is your Seed Exchange. Why not make it as useful as possible to yourself and others by sending in your seeds now?

SOME OF THIS YEAR'S CROP

DORETTA KLABER, QUAKERTOWN, PA.

IT IS A MATTER of continuous amazement to me how difficult it is to describe flowers so that others can "see" them, and that even a photograph rarely gives you a perfect picture. Drawings sometimes come nearer but can only give an impression, not the color or texture. For instance, take *Primula secundiflora* and *P. alpicola violacea*. These bloomed for me for the first time this year. Farrer in his inimitable style gives a long description of *secundiflora*, but its appearance was none the less surprising. It does have hanging bells, but small and cone-shaped—nearer to a cowbell than to the usual flared shape that "bell" brings to mind. It grew to be twelve inches high before blooming, and the near magenta color with the silver of the stems and calyxes was a fine combination. The rosette of rather smooth upstanding delicately toothed leaves, only a few inches long at blooming time, are gradually stretching out.

P. alpicola violacea has leaves much like *acaulis*, but with a definite short stem to each leaf, and it was only six inches high at blooming time. It has flaring bells in varying tones from gray to purple with a bloom on the outside, more

bluish tones on the inside, and fragrant. The flowers are smaller than the vernal primroses.

Primula polyneura is reported to be most variable. Mine were crimson, some of them brilliant. Their stalked low hairy leaves are decorative in themselves, and the stems were six to eight inches high with up-facing flowers, smaller than "primroses" but in good proportion to the leaves.

Edraianthus dalmaticus has leaves more like a bunch of grass than most of its clan, and pale to deep purple up-facing bells held four to six inches high.

Geranium Farreri has decorative small leaves on four-inch stems, and its pale but lovely flower blooms just above the leaves.

A *Kabschia Saxifrage* bloomed with its delicate pink stars.



Draba Dedeana has showy white flowers on its tiny woolly rosette.

Ranunculus glaberrimus a shiny yellow buttercup emitted from smooth un-buttercuppy firm green leaves, pale in color.



Aquilegia Jonesii actually bloomed. The leaves are enchanting, almost blue and curled like fairy lettuce, and then the comparatively large flower of a dull reddish purple (not as lovely as the leaves) with a spire of golden stamens staring up at the world. The leaves grow from one to three inches after it has bloomed, but keep their compact and delicate appearance.

Veronica gentianoides has large glossy leaves suggesting some of the procumbens type gentians, and then a twelve-inch spike of too pale flowers.

Veronica fruticulosa also disappointed me for the same reason. The foliage is so glossy and compact and evergreen until it begins to bloom, when the stems stretch out and produce undistinguished washed-out pink flowers on six-inch stems.

Potentilla rupestris alba might look well on a wall, but growing on the ground, as mine did, I found the flowers a bit straggly and weedy-looking, coming as they did from tidy and promising clumps of leaves.

Gentiana Farreri bloomed in late summer last year. The foliage is too grassy, but the flowers! They really do fit the descriptions — amazing greenish blue trumpets.



Alpine Poppy, apricot, golden stamens, silver leaves — a precious plant.

TINY TREASURES OF THE HEATH FAMILY

W. H. A. PREECE, VICTORIA, B. C.

(Reprinted by permission from *Real Gardening Magazine*)

SOONER OR LATER, almost inevitably, keen plantmen fall beneath the spell of the lesser members of that vast plant group which is represented, in the minds of most of us, by the Azaleas, Rhododendrons and Heathers, but which are known to botanists as the Ericaceae. Many have tried to lay bare the secret of their power to charm, but none have succeeded.

In exercising their fascination these plants do not depend entirely on their beauty of blossom, though they have that in generous measure — quiet and unassuming, but genuine beauty. Their blossoms flaunt no brilliant colors, for these are restful plants, enduringly lovable, and by no means dazzlers to excite instant admiration and be almost as speedily forgotten. Then too, they are not plants that can be set out in the garden and left indefinitely to their own devices; complete success with them requires devoted care, frequent attention and understanding, all of which they will repay in full measure.

Perhaps it is just as well that the secret of their power to charm us cannot be parsed and analyzed and set down in black and white, for then it might vanish entirely; almost certainly its potency would be diminished.

These little Ericaceous species are, to a considerable extent, individualists; most of them have their own particular little idiosyncrasies, so that it is possible to give only general suggestions for their culture; in fact, about all that can be usefully said is that all the species require regular, constant moisture in moderate quantity. They most certainly do not like being water-logged, but it is highly important that they never be allowed to become completely dried out.

It seems to me probable that the most convenient way to deal with the species to be discussed is to take them in alphabetical order, so the first on our list is *Andromeda polifolia nana*. Many of you, no doubt, are familiar with the Bog Rosemary, *A. polifolia*, which is to be found in sphagnum swamps throughout most of the Northern Hemisphere; it is a delightful subject for moist, acid situations in the garden, and rightly numbered among the most desirable of our native plants, but as a real treasure it falls far short of its own variety, *A. polifolia nana*.

This variety was, I believe, found originally in the mountains of Japan, and first brought into cultivation by some of the nurseries of that country; it may be said to have enhanced all the virtues and evaded all the vices of the typical form. Instead of being a somewhat straggling bush of open habit, *A. p. nana* forms a comparatively dense, bushy little clump of usually less than six inches in height, and has much less inclination to run around all over the place and colonize than has the species. The narrow, linear leaves, deep green above and silvery below, are slightly shorter than those of the type, and are carried in greater abundance and at closer intervals on the branches.

The blossoms are borne freely in late spring, and though a very little smaller than those of the type (the urn-shaped bells are just under one-half inch across), are much more striking since they are a rich, warm rose-pink, a far more telling shade than the pale blush tones usually exhibited by the typical form.

This little shrub is quite easy to manage in the garden; all it asks is a moist, acid soil and a cool situation, though, if grown in a bog, it will stand full sun; otherwise it is better planted in a position where it is in shade during the heat of the day. Propagation is by summer cuttings.

It is too bad that *Arctericia nana* does not appear to be available from nurseries in the United States, for it is one of the most fascinating of all the many charming plants which have come out of Japan, where it grows on the wooded mountainsides. While not at all difficult to grow, it is, like so many of the Ericaceous species, apt to be slow to become established and really take hold in the garden; once it does get under way, however, away it goes and sends forth underground runners in all directions, gradually building up a close, quite dense carpet. Do not let me mislead you into thinking that *A. nana* may become a spreading weed or a subject to be used for covering the forest floor! On the contrary, a foot-square mat is something to be pointed to by its owner with high and not unjustifiable pride.

This species makes a close mat about 1½ inches high, composed of wiry stems quite densely furnished with tiny, somewhat rigid, dark green, polished leaves which persist the year around and are often reddish or bronzy in their youth. Above them in early spring are borne the many arching racemes of wee Lily-of-the-valley-like bells of pearly white with pink pedicels and calices. The main flowering season is early spring, but the mats are rarely entirely flowerless, and odd sprays appear in succession all summer long.

This species has a somewhat unusual and most attractive habit; it gets busy and forms its next season's flower buds before the seed pods of the current season have ripened, so that the plants are decorated with arched racemes of pink buds throughout the late fall and winter.

All *A. nana* needs to make it happy is a cool, moist situation in lime-free woodland soil; it is very much at home under cover of the lesser Rhododendrons. The simplest way to propagate it is to remove carefully some of the underground stolons which will be found to be well furnished with fine, hair-like roots; it is advisable to establish such stolen morsels in pots before you plant them out again.

The Copper Bush, *Cladothamnus pyrolaeiflorus*, in its typical form, is a most interesting and unusual deciduous shrub which attains a height of several feet and is quite widely distributed through the mountainous regions of the Pacific Northwest, but it is its alpine form, *C. p. montanus*, which I want to discuss here. This is extremely rare in nature and is known from only a few stations at considerable altitudes; it is very dwarf in stature and very slow in growth.

The alpine characteristics of this little shrub are fully retained in cultivation; a specimen in my garden which was collected over a dozen years ago is still less than nine inches high, while seven-year-old cuttings are still comfortably accommodated in four-inch pots. Seedlings are equally slow; in fact, I am beginning to wonder if I shall survive long enough to discover whether or not they will retain the dwarf habit of their parent.

C. p. montanus takes quite kindly to garden life if supplied with the usual moist, acid, peaty soil in which most Ericaceous species delight, and is best grown in a cool northern exposure or light shade. Even in quite heavy shade it will retain its dwarf habit and flower freely, but the pink-flushed, pale copper-colored blossoms are particularly lovely when touched by the rays of the sun.

The foliage appears about the middle of spring and consists of smooth, grass-green, oblanceolate leaves, $1\frac{1}{2}$ inches long and $\frac{1}{2}$ inch across; they are much beloved by the leaf-cutter bees—which is a little unfortunate, since an irregularly scalloped margin does not improve their appearance.

Very quaint and beautiful are the solitary, terminal blossoms which are carried for several weeks in early summer. They are shaped like five-pointed stars $1\frac{1}{2}$ inches in diameter, and have their segment tips curling slightly forward. Their oddest feature is the stout, yellow-green style which rises erect from a green, boss-like pistil base at the center of the blossoms, to a height of $\frac{1}{2}$ inch and then curves up, over and back like a fish-hook, but terminates in a flat, blunt stigma instead of a point and barb.

This miniature form of the Copper Bush is really something quite unique and, combining oddity and rarity with genuine beauty, as it does, can hardly fail to rouse the interest of even the most fastidious of plant connoisseurs.

If all that has been written about Trailing Arbutus (*Epigaea repens*) and how to grow it could be gathered together and reprinted, it would, I am sure, fill a volume of considerable size, so you may wonder why I am prepared to have still more printer's ink expended on the subject. Well, I have two reasons: First, considering the title of this article, it seems to me that it would be treating this lovely and lovable species with rank injustice to exclude it from such a galaxy. And second, almost everything that has been said and written about it has been based on experience with it in the Englands, Old and New, whereas my notes are the result of observations of its behavior in the gardens of the Pacific Northwest.

Trailing Arbutus has all too frequently been given a bad name and has become widely regarded as "difficult", which in my opinion is both untrue and

most unfair; this species is not difficult with me, but it is fastidious and must be given what it wants when it wants it. The real secret of success, I feel sure, is to start with a comparatively small plant with a complete root-system, the sort of plant you may be able to obtain in a pot from your nurseryman or raise yourself from seed or summer cuttings. Collected plants, even quite small ones, very rarely re-establish satisfactorily in the garden.

I am the proud possessor of a happy little colony in my own garden, which came about in this way:

Some years ago, having several seedling pines about four feet in height and some seedling Trailing Arbutus in four-inch pots, I decided to plant them all out together. The Epigaeas were placed on the north side of the pines and close enough to them to be in full shade, and the soil in which they were set out consisted largely of leafmold, peatmoss and coniferous refuse. The pines are now about 15 feet high and the Epigaeas a good two feet cross; all of them took hold right away and have flourished mightily, though they have received no extra-particular care beyond an occasional watering in very dry weather; from time to time I have had to remove a lower branch or two from the pines to prevent the Arbutus from being completely lost to sight. The dead needles which fall from the conifers appear to constitute an adequate top-dressing; they almost cover the plants during the winter months.

From Japan comes a sister species, *Epigaea asiatica*, which is very similar in appearance, habits and tastes. English growers claim that it is more amenable to cultivation than our famous native, but my own experience with it is as yet too limited to enable me to make any comment which would be of any use or value.

Bog Kalmia (*Kalmia polifolia*) itself is too large a plant to come within the scope of this article, but it has two alpine forms, both of which are well worthy of inclusion. *K. p. montana*, the first of these, is found in the northern Rocky Mountains and makes a sturdy, somewhat erect little shrub of rather open habit and six to eight inches in height. The flower buds are formed in autumn and commence to swell in early spring, transforming themselves into deep rose-pink little balloons, and opening in the latter days of spring to $\frac{3}{4}$ -inch wide puckered blossoms which are of a slightly paler shade of pink and fade to a white zone around a green eye. They are carried in loose trusses of a half-dozen or so, each flower set on an inch-high, erect pedicel which is stained with reddish orange.

The second little Laurel, *K. p. microphylla*, in addition to having the size of its leaves reduced by half, differs from its sister in its habit, which is tortuous and horizontal—in fact, at very high altitudes, it is quite prostrate and mat-forming. The blossoms seem practically identical but the trusses contain fewer of them. This is the form which occurs in the mountain ranges of the Pacific Northwest and in the southern Rocky Mountains.

Both these forms respond to the same sort of treatment in the garden: a moist, acid soil and an open situation with a cool exposure such as at or near the foot of a steep bank which slopes to the north or northeast; they do not like tree shade, which transforms them into scrawny, leggy, flowerless abominations. Cuttings of the current year's growth taken in early summer root quite quickly in a mixture of sand and peatmoss, but they are decidedly slow in reaching flowering size; seedlings are even more deliberate.

There has been a good deal of gossip lately about *Kalmiopsis Leachiana*, but it may quite justly, I think, still be described as a "new" plant, since it was discovered only in 1930. The happy finder was Mrs. John R. Leach, who came upon it in the Siskiyou Mountains of Oregon—in Curry County, to be exact. It would seem that in its natural habitat it is always found growing beneath the shade of conifers, and so far, I believe, it is known to occur only in three restricted localities, so it is evidently a very rare plant.

This species was first described by Professor L. F. Henderson who, in view of its close botanical relationship to the Rhododendrons, named it *Rhododendron Leacheanum* in honor of the discoverer. Later, since it was found to be just as closely related to both *Loiseleuria* and *Kalmia* as to *Rhododendron*, a special genus, *Kalmiopsis*, was set up for it.

In their natural habitat old plants of this shrublet sometimes attain a height of two feet, but normally they do not much exceed eight or twelve inches. Established specimens spread, albeit very slowly, by means of underground runners and by the self-layering proclivities of the lower branches, so that an old plant may cover an area of several square feet.

In the garden *K. Leacheana* makes a delightfully compact, tidy little shrub with rather rigid, obovate, shining evergreen leaves, minutely dotted with gold beneath. The inch-wide, *Kalmia*-like blossoms of glowing cherry pink are borne in erect racemes; their flowering season is of long duration, and individual plants vary considerably in their time of coming to bloom. I have had them in full flower in early March, while others nearby have not reached their zenith until June, and sometimes those that bloom in earliest spring flower again in autumn. (These, of course, are garden observations, and I do not know whether the plants are similarly erratic in their native haunts.)

This species has the same quaint habit as *Arctica nana*, of forming its next season's flower buds before it has finished ripening the current season's seeds. Though sometimes a little reluctant to become established, *Kalmiopsis* is happy enough once it has taken a firm hold, asking only a well drained, lime-free soil. In my garden here in Victoria, B. C., it appears to be very well content in either a cold exposure or a shaded nook, growing in an open soil fortified with humus, largely consisting of coniferous refuse and rotten wood. The Heath family may well count this little native among its very choicest treasures.

The two Sand-myrtles (*Leiophyllum buxifolium* and its even lower form, *L. b. prostratum*) have already been discussed on other occasions in *Real Gardening*, so there is no need for me to add much beyond some comments on their behavior out here in the West—in fact, I am including the species here for precisely the same reason as those which prompted me to make mention of *Epigaea repens*.

A cool, reasonably moist, acid soil with good drainage is presumably necessary wherever *L. b. prostratum* is grown, while the requisite amount of exposure to sunshine must depend on local climatic conditions. I have grown this species here in full sun, but that was a success only so long as I kept it copiously supplied with water. I have tried it as a crevice plant in full northern exposure, and it did not like that at all.

In fact, I have tried it in all sorts of aspects, exposures and situations, but the only conditions under which it has proved a real success here, and shown an ability to look after itself, is where it is planted more or less on the flat and is exposed to sun in the early morning and shaded all the rest of the day. So treated, it makes healthy, hearty growth, and blooms profusely with no care beyond an occasional watering in very dry hot spells, and a generous top-dressing of sand and leafmold in fall.

The Alpine-Azalea, *Loiseleuria procumbens*, is a truly lovable little shrub—there can be no gainsaying that fact. Though very widely distributed, it is always rare and of local occurrence; its range is circumpolar and it grows at comparatively low altitudes in and near the Arctic, but can be found only at the highest elevations in its more southerly stations. On the North American Continent it occurs most frequently in Alaska and on the mountain peaks of British Columbia; it is also known from a few stations in the Queen Charlotte Islands and on Vancouver Island, as well as on the higher peaks of the White Mountains in New Hampshire.

L. procumbens, by the way, was at one time known as *Azalea procumbens*, a name which has not yet fallen into complete disuse.

In its natural habitat this species almost invariably chooses ridges and ledges which are very well drained and which would be distinctly arid situations were it not for the frequent rains and mists and the humidity of the atmosphere which prevail in its native haunts. It is frequently stated in garden literature that this tiny shrub requires moisture and shade. Moisture it does demand as compensation for the lack of atmospheric humidity at low altitudes, but such moisture, though constant and regular, must not be stagnant. As for shade, I would emphatically say "no", since to do well, flower freely and retain its natural habit, *L. procumbens* apparently insists on considerable exposure to the sun.

In shade, or even part shade, it acquires a sparse, scrawny and partially erect habit, and it may or may not grudgingly produce a few pallid blossoms. In sun, however, provided that ample moisture is available and that the ground slopes rather steeply to the north, it makes quite dense, ground-hugging mats of gloss, dark, Thyme-like evergreen foliage, abundantly starred in late spring and early summer with a host of blossoms — tiny carmine buds opening to shell-pink Azalea flowers less than $\frac{1}{4}$ inch across and carried at the tips of the branches in close trusses of a half-dozen or so.

This species needs an acid soil and, with me, flourishes in a mixture of two parts granite chips and one part humus (leafmold, peatmoss and rotten wood). Propagation may be effected by cuttings taken rather late in the year when the wood is considerably more than half ripe.

Just one more — *Pernetia tasmanica*. Don't grow this in expectation of a brilliant flower display, for its blossoms are tiny greenish white nonentities — so much so that, unless you keep your plant under very close observation, you will not realize that it has bloomed at all until you happen to notice that berries are forming. It is these berries that are the particular glory of this little species; they are rather flat, a good $\frac{1}{2}$ inch in diameter and vivid carmine-rose in color, or sometimes white heavily flushed with carmine.

P. tasmanica makes an absolutely prostrate mat, spreading outward in all directions and layering itself as it goes; on a flat surface it forms an almost perfect circle, sitting on the ground like a pale green plate. The tiny evergreen leaves are somewhat Thyme-like, though considerably smaller, and their fresh, pale green is almost exactly the same shade as that of the foliage of the white form of *Thymus Serpyllum*. The berries become conspicuous in August and persist for a very long period, often through the winter; they are borne in such profusion that the whole of your "plate" is thickly covered with them except for a green rim all around, which is the growth made after the berries had set.

It is really an extraordinarily appealing little plant, and may be increased quite easily by seed or the removal of rooted runners. Seedlings are easily raised and many of them will produce a few berries in their second year. The species likes a cool, acid, reasonably moist soil and not too much sun in dry climates, though it is well to plant it where it can receive some sunshine either in early morning or late afternoon, since a fair share of sunlight is needed to color the berries; in full shade they remain white with hardly a trace of pink. Though this miniature *Pernetia* comes from pretty high up in the mountains of Tasmania, it is well to remember that it is nevertheless an Antipodean, and so, I fear, unable to be able to withstand subzero temperatures without being given protection.

It is quite probable that a number of you will wonder why I have failed to include any of the species of *Gaultheria* here, so let me hasten to say that this omission is not because I consider them unworthy. The difficulty was that too many of them are good, and their inclusion would have doubled the length of these notes, so it seems wiser to devote a future article entirely to them.

THE HOME HAUNTS OF LIVING ROCK

G. G. NEARING, RAMSEY, N. J.

IT IS OFTEN STATED that limestone should be preferred for rock garden building, and prize-winning exhibits at flower shows have employed it so frequently that it is now usually associated with most ideas of the ultimate in rock garden beauty. Reginald Farrer, one of its most enthusiastic advocates, knew well how to advocate in superlatives. Yet some of the world's most famous rock gardens contain little or no limestone. That at Kew Gardens contains the native red sandstone, and a similar stone gave character to the once imposing ravine at Leonardslee. I have not seen the Edinburgh garden, but seem to remember from descriptions that it too is largely of sandstone.

However, certain limestones do lend themselves to artistic construction, and do support more growth of plants directly on their surfaces (which often are completely mantled with mosses and lichens) than do most other rock types. But there are limestones and limestones, and yet again other and totally different limestones. Tufa has been described at length in the Bulletin by the late P. J. Van Melle. I have seen, to make an utter contrast, shapeless chalky masses in Vermont, on which no plant life at all could cling for long, making cliffs about as decorative as industrial concrete. The limestone faces at the summit of the Helderbergs, west of Albany, N. Y., though varied somewhat because of the different rates of erosion in their horizontal strata, look drab and dirty rather than decorative.

To make attractive rock gardens, a limestone should usually be most impure, for calcium carbonate in its purest form, white marble, while ideal for libraries, statuary and tombstones, is not adapted to naturalistic effects. A glaring white or very pale gray rock garden with crumbly surfaces, would detract from the beauty of everything planted in it. Rocks should know how to darken with age, taking on a firmness and permanence of texture that makes them look eternal.

The type of limestone selected by our most skillful practitioners of landscape art, comes near not being limestone at all, and occurs only in certain limited areas. With its calcium carbonate is included a high percentage of magnesium carbonate, making it approximately dolomite. Often it is strongly and irregularly veined with quartz and flinty chert. The wavy, deeply pitted surface so popular because *Sempervivums* and other rock-covering plants will thrive in its hollows, is produced by intrusions of these more durable substances in the limestone, which as the surface around them becomes eroded by the weather, stand out in ridges that give character to the rock.

Limestones occur in almost all parts of the country, sometimes as ridges and mountain ranges, but more often in valleys, for rainwater with its dissolved carbonic acid eats them away at the surface, and deep in the earth even more rapidly, because of the added soil acids, hollowing out caves which in the course of time collapse into what are known as sink holes, or remain as the beds of underground streams. Such a limestone valley lies to the southeast of the Blue Ridge, Pocono, Kittatinny and Shawangunk, stretching through Maryland, Pennsylvania, New Jersey and New York, and on more irregularly into Connecticut and Vermont, while in Virginia and southward, there is a different arrangement.

For the most part the limestone lies between the foot of the mountain and a system of lower ridges that border the coastal plain. It is often obscured by glacial deposits, soil washed down from the hills, or the accumulating peat in

extensive bogs. The purest having weathered away ages ago, what stands out now in cliffs and hillocks consists chiefly of the harder dolomites and quartz-veined deposits. Each ridge has a character of its own, often with an inclusion of lead or zinc ores which the miners prize. Interrupting hills of slates and granites separate one type of limestone from another, while on the mountain above, crumbling shales alternate with fine-grained sandstones, some of which contain a little lime, the summit capped with a hard, metamorphosed sandstone.

The valley ridges in this area generally parallel the Blue Ridge, running from northeast to southwest. Whether you cross them or follow the hollows that lie between, you meet frequent abrupt changes in the character of the rock. On the geological map, much of this valley consists of many irregular, roughly parallel stripes, most of them only a few miles long and a fraction of a mile wide, limestones of many kinds, alternating with the slates, shales and granites.

The best way to find a suitable type of stone is to drive here and there along the country roads, examining outcroppings in the banks and on pasture slopes. Old stone walls between the fields offer handy samples, but these may include glacial or alluvial drift foreign to the immediate locality. If the contemplated rock garden is to be a shady one, ledges and cliffs in wooded areas are to be preferred, for the manner of weathering, as well as the growth of mosses and lichens, differs with the degree of exposure to sunlight. Rocks for a garden in full sun are best chosen from an open pasture.

Mossy growths on the stone surface will not remain there unless the conditions of light and moisture under which they developed can be duplicated in the new location. Rocks moved from deep shade into full sun are soon stripped of all their adornments, and the same happens, though more slowly, when the moving is converse, from full sun to deep shade. For each of the many hundred species of this tiny vegetation must have the degree of illumination that suits it or it will not thrive. If the rock garden is to be built in a heavily populated area, then stone without surface growths should be chosen, since the smoke and gases in the air of cities kill nearly all lichens and most of the more delicate mosses. Dead moss is unsightly and difficult to remove.

The suitability of a particular limestone must be judged by the eye and the imagination. No rules can be written to tell you what type to choose, but once your eye lights upon it, there should be no doubt remaining in your mind. If it makes a pleasing picture, then it is the limestone for you. That which breaks naturally into uniform rectangular blocks is of course least desirable. Diversity of shape and size, with variety in the surfaces, lends interest and permits the arrangement of attractive designs.

One inexperienced in determining the nature of a particular rock may very well ask, "How do I tell whether it is limestone or some other substance?" A chemist might suggest going around with a bottle of hydrochloric acid, for when a little of this is spilled on limestone, it fizzes, while on granite there is little or no reaction. Safer indicators are the presence or absence of certain plants. If the walking fern, *Camptosorus rhizophyllus*, grows on a rock, you may be sure that some lime is present. Also the wall rue, *Asplenium Ruta-muraria* (now *A. cryptolepis*), is found only on limestone. But neither of these species is particularly common.

Two lichens with bright orange fruit disks, *Blastenia rupestris* and *Caloplaca aurantiaca*, both very common on lime-bearing stone, are never found in the absence of lime. In fact, lichens of any color approaching orange are rarely seen on rocks where no lime is present, though the dull yellow *Candelariella vitellina* occurs often on granite. If then reddish orange or brownish orange disks about one millimeter in diameter are seen on a rock, that rock is almost certainly some

form of limestone. There are a number of other characteristic lichens found on limestone only, but these two offer the simplest clue.

Another way to be sure you are in limestone country is to watch for the ruins of old kilns, crude masonry furnaces in which lime used to be burned before the day of modern industrialization.

There was a day when farmers welcomed the chance to get rid of stones. Today's landowner, however, shows more appreciation of the beauty inherent in a fine rock, and may even entertain an exaggerated idea of its value. But even if his demands are moderate, transportation to any great distance is likely to prove expensive, particularly because great care must be taken not to scar the surface. Each piece should be wrapped in canvas if possible, and handled with ropes rather than chains. No matter how carefully covered, no two pieces should be allowed to touch during the journey, for the constant vibration is sure to cause severe scratching through any shielding material.

In spite of the most meticulous care, some defacement is usually unavoidable. Weathering will eventually restore to the scarred surface its natural appearance, or this may be hastened by brushing the whitened bruises judiciously with a very little dry lamp-black, the pigment of which black paint is made, and which can usually be purchased at the paint shop. A little skill will produce the desired shade of gray in a few moments, or spots inadvertently made too dark can be lightened by rubbing with a cloth or chamois.

LETTERS TO THE EDITOR

Desborough
Northants, England

This letter is prompted by the January number of the Bulletin. It concerns the article on "Hybrids Again".

I am in entire agreement with the views expressed in the article, but certain facts to the detriment of hybrids were not, in my opinion, sufficiently stressed. I am writing with particular reference to the rock garden and its surroundings, but the same remarks apply to many of the border plants.

We will imagine that some enterprising gardener makes use of some newly introduced plant for purposes of hybridization and is lucky enough to produce an outstanding plant. That fine hybrid of *Primula Juliae*, P. X. Wanda comes to mind as an example. This quickly became a best seller and thoroughly deserved its success. Nurserymen and amateurs all over the country tried to cash in on this popularity, and scores of the resulting seedlings were given varietal names, and appeared in catalogues with glowing descriptions.

This particular craze was at its height when I first became interested in rock gardens, and much of my scanty spare cash was expended in buying these "wonders". To my disgust, when they flowered many of them were so close to Wanda that if the label happened to be lost I could not tell them apart. Or else the color was not nearly so good, or the constitution was poor. Jewel, Gloriana, Pam, Bunty and many others come to mind, but I don't recall seeing these names in modern catalogues. That was before the war, but two years ago I obtained a dozen of these so-called Juliana Primulas that are still offered by nurserymen. They were planted in a shady border. This year there were many gaps, and only three of the survivors made any sort of a show. I compared these with a border of Wanda in my sister's garden—immense plants smothered with bloom, giving a barbaric display of color under the gray skies of March, and decided that, as with many other things in this modern world, because a plant is new it is not necessarily better than the old ones.

The same can be said about other genera of rock garden plants that have been taken in hand by the hybridist. The *Kabschia* and *Englera Saxifragae* are a case in point. A nursery specializing in these plants used to list over a hundred, but less than a dozen were really worthy and distinct. The time has surely come when no hybrid should be named for sale unless it has first received the approval of some national body, not a commercial association.

The other point is perhaps even more important. We will revert to *Primula Juliae*, which is a most distinct little plant, some forming large mats under congenial conditions, spreading by means of rhizomes. This is a habit not commonly seen in *Primulas*, and in the hybrids this characteristic has disappeared. The charm of many species lies in their distinctive habits and foliage, but in the hybrids floral characters become all important, and after a few generations all are reduced to uniformity except for the flowers. Worse still, the showiness of the flowers causes a demand for the hybrids from the mass of amateur gardeners, and so nurserymen concentrate on them to the exclusion of the species. Thus in the case of those genera worked on by the hybridist, it soon becomes impossible to purchase the species. I still grow *Primula Juliae*, but I should probably find difficulty in replacing it if I happened to lose it, especially as its native home is behind the Iron Curtain.

My points against hybrids therefore are:

1. Far more hybrids are named and distributed than can justify their existence.
2. Distinctive vegetative characters of the species are usually lost in the case of later generations of hybrids.

R. GINNS

EDITOR'S NOTE—If Mr. Ginns will re-read the article *Hybrids Again*, he may observe that later generations can be made to yield almost any kind of plant the hybridist and the public want. What Mr. Ginns really objects to is the taste of the public and the willingness of nurserymen to stretch the truth in order to make more money. Many of us wish that the average person might possess the artistic perceptions of a da Vinci, the self-denial of a Saint Francis and the honesty of an angel. At present we shall have to settle for less.

LITTLE ROSETTES FOR THE ROCK GARDEN

STEPHEN F. HAMBLIN, LEXINGTON, MASS.

IT IS DISCOURAGING to construct and plant a section of rock garden and have a few plants thrive there, bare rock showing almost wholly in later years; but it is even more disheartening to have the plants grow too lustily and cover too much of the rock surface. With narrow crevices in big boulders, or shallow pockets in ledges, it is pleasant to find small plants willing to grow in cramped quarters, yet not hiding much of the rock surface. Such treasures I will call little rosettes or small tufts, typified by Cobweb Houseleek (*Sempervivum arachnoideum*) and its hybrids.

Many of the Houseleeks are far too robust for restrained planting of this sort, but those with the web of white threads across the rosette are the Cobweb or some of its hybrids (usually less webby). Other tiny species are Sand Houseleek (*S. arenarium*), the plant pale green, without hairs, the leaves tinted red on the back. The "chickens" are small, on very short stems, and they roll about but little. The flowers are green-white, the petals erect. Hen-and-chickens Houseleek (*S. soboliferum* or *S. globiferum*) is larger, the rosettes globular incurved, smooth and reddish, the "chickens" on long loose threads, soon break-

ing loose to root in some lower crevice. The flowers, rarely seen, are green-yellow, the petals fringed. *S. ciliosum* grows in flattened gray balls, with long hairs, the flowers yellow. All Sempervivums have petals 6-10-12, while Sedum has 4-5 petals. There are rosette species of Sedum, but they are annual or biennial, so I have not tried them.

Closely related to these two groups are the Navelworts (Umbilicus), often listed as Cotyledon, but truly hardy. The rosettes are small, like a Sempervivum, but the flowers are *tubular*, in a raceme, with 5 petals, yellow, pink to purple. I have seen these, but dealers rarely offer them. Seed can be had from Europe, but germination is poor.

Thrift (Armeria) is wholly a rosette group, the smallest being *Armeria caespitosa*, with one-inch tufts of small leathery leaves and clustered heads but an inch above. It looks like Common Thrift, in very reduced size, the color the usual pink. *A. alpina* also is offered, but through dealer's error you may get the common *A. maritima*, which is too robust for my crevice.

Dianthus is also far too vigorous for this tiny crevasse, but try the very dwarf named sorts (4-6 inches) of Cheddar and other small pinks, as Rose Cushion, Royal Midget, Inchmary or Sammy. Though their minute stature seems to suggest starvation, they are truly happy and always in scale. Most unusual is *Dianthus noeanus*, a tiny, spiny round ball of blue-green foliage, no bigger than your two thumbs. In June slender stems shoot out bearing very small white Pinks, with shredded petals. While of little flower show, the prickly pincushion plants are unusual.

Some of the Mustards (with 4 petals) are minute rosettes, particularly Draba (some are tall and weedy). *Draba aizoon* is a tiny spiny rosette not unlike a Sempervivum in growth, with 3-inch stems bearing a few pale yellow Mustard flowers in April. The plant is finely hairy, while its twin sister, *D. aizoides*, is smooth. This has narrow rigid leaves, and the flowers are deep yellow, in April. Whichever you get (both are listed) you have a true crevice plant. *D. rigida* has been offered, the leaves minute, spiny, deep green. *D. dedeana* has creamy white flowers.

The Saxifrages of the Euaizoon Group, as *S. aizoon*, and all its kin and kindred (in its small species), looks like a tiny Century-plant of one-inch rosette, the tiny strap-like leaves whitened with lime. In May-June there are small panicles of creamy white (with varieties yellow or rose), of 5 petals. *S. longifolia* and *S. Cotyledon* make rosettes 6 inches across, with flower stalks to two feet. Get the smaller sizes of true aizoon type. The Kabschia Group (Cushion Saxifrages), as *S. Burseriana*, etc., make mats of thick spiny tipped foliage with solitary flowers (white or pink) in June, like one white Flax flower an inch above the green tuft. These two Saxifrage groups are specially suited for cracks in a ledge. They thrive at sea-level when watered a bit if withered by summer droughts.

The prize of this rosette group is our Diapensia, from northern mountaintops, impossible to grow at sea-level in full sun, nor in shade, but possible on a north slope with overhanging ledge to cut off all direct sun, and given a bath or two in dry seasons. This is but the beginning of a list of crevice plants of rosette form, but yet this will start you off on what may become an interesting search.

All these tiny tufts (except Diapensia) thrive on lime or endure it. In a rich garden soil, or in shade, they get leggy and discouraged. For planting among marble chips, or a soil of plastering, or doped with lime, they stay small and happy. Of course these plants are all evergreen, so they are on duty every day of the year.

CREVICE CREEPERS

STEPHEN F. HAMBLIN, LEXINGTON, MASS.

SOMETIMES, IN A CREVICE, you wish a tiny plant that will creep along the soil strip, yet not flow out on the rock surface unduly. Many creepers soon get out of bounds and even invade the spaces allotted to their neighbors. Then the more robust, as *Sedum sarmentosum*, will prevail. Certain families seem to produce these tiny creepers.

In Dianthus we are familiar with Maiden Pink (*D. deltoides*), but it is far too willing to thrive. Its form or sister species, var. *serpyllifolius*, grows like a small Thyme, but 2 inches high, with tiny single rose blossoms. Were it not for its flower form and odorless foliage it could be mistaken for a Thyme.

One species of Arabis (*A. procurrens*) sends out thread-like runners that make a low mat. Above this rise in April-May, many slender stems with loose racemes of white flowers of 4 petals. It is very different from the usual Arabis, and not weedy as are many uncommon species. Different also is *Alyssum repens* (and related species), with stems running on the soil, hairy felty small leaves and deep yellow 4-petal flowers in small clusters, each large for the size of the plant.

Many species of Thyme are creepers, hugging the soil closely, but too many sprawl out over the adjacent rock surface and become great sheets of foliage. Smallest is Tiny Thyme (*T. caespiticus*) a mere film of green an inch deep, with a few small rose flowers. While it will thrive in full sun, it grows well also in part shade. It is apparently a close relative of the usual Mother-of-thyme. Of this common sort best for crevices is the dwarf white form (var. *albus*), with grass-green foliage but an inch deep and scattered white flowers. The Woolly form (var. *lanuginosus*), now raised to species rank as *T. pseudolanuginosus*, is gray woolly as a woolen scarf, and rarely shows bloom. These are the smallest sorts of Thyme that I have tested. Very thin and wiry as a creeper is Caraway Thyme (*T. Herba-barona*), with strong Caraway odor, but its wiry stems, red-purple in color, spread outwards widely, hanging down in sheets over a ledge. Corsican Mint (*Mentha Requieni*) is a minute dark green creeper, of heavy Mint odor, not an inch high. It prefers shade and moisture, and as it is native to Corsica it is tender to extreme cold.

Most of the Sedums that are creepers are too robust for these choice spots. First choice is *Sedum hispanicum*, some 2 inches high, very pinkish glaucous, the little flowers pinkish white. Some plants are annual, biennial or killed by winter, but the var. *minus* (Mealymat), is truly perennial in a pinkish fleshy mat.

Many species of Veronica are low creepers, as St. Paul's Speedwell, at home in moist lawns, and such as *V. filifolia* and *V. filiformis*. These really get out of bounds readily, if not killed by summer droughts. The tiniest species is *V. repens*, a film of green stems less than one-half inch high, with tiny opposite leaves, and clusters of pale blue flowers, very large for the size of the plant, in fact, the smallest species with the largest Veronica flowers. As the root system is shallow, water well in dry seasons.

SPRING SHOW OF THE NORTHWESTERN UNIT

PAT BALLARD

SPRING ARRIVED FOR THE MEMBERS of the Northwest Unit with great impact this year when they held their first Spring Show. It was a trial balloon which proved to be such fun that we are already thinking about what we will enter next year. As always, the committee began to have qualms about 4 P.M., wondering if there would be anything to show, but by the time the meeting

convened at 7:30 we were rushing madly around trying to find room for all of the interesting and beautiful plant material.

It was a simple show—only 18 classes and no official judging. Miss Margaret Watt, our program chairman, gave each member a ballot and the prizes were awarded by popular vote.

Class 1—for plants raised by the exhibitor from seed, was taken by Carl S. English Jr. with a *Shortia uniflora grandiflora rosea* that was delightful in its color and its vigor.

Class 2—which was for plants raised from a cutting by the exhibitor was won by Mrs. Florine Housel with a *Rhododendron ciliatum* of spreading habit and many blooms.

Class 3—Plant collected by the exhibitor. This was won by the Page Ballards with a pot of *Fritillaria pudica* collected on Quartz Mountain in Eastern Washington.

Class 4—comprised of specimen of dwarf conifers or trees which had been collected by the exhibitor went to Mrs. Carl S. English Jr. for a stunning *Pinus Jeffreyii* from the Siskiyou Mountains. It was less than two feet in height and was thought to be about 75 years old.

Class 5—for a dwarf *Rhododendron* not over 15 inches high, was awarded to Mrs. Henry Bittman for a *R. spinulosum* with rich foliage and creamy-pink blooms.

Class 6—One ericaceous plant other than *Rhododendron*. A mammoth specimen of *Arctostaphylos nummularia* in full flower sent the rest of us home to weep over our puny efforts and to conjecture over Dr. Leo Hitchcock's secret formula.

Class 7—Any other dwarf shrub not higher than 2 feet. Mrs. Joseph Daniels took first place with an unusually compact form of *Daphne Blagayana*.

Class 8—Primulas, three of a kind. Mr. and Mrs. John Haddock's twenty-year-old *Primula marginata* exhibit made a charming picture which won for them not only the first place in this class but the coveted Best-of-Show Award.

Class 9—for spring bulbs, was also given to Mr. and Mrs. Haddock for a large pot of *Narcissus triandus albus*.

Class 10—This group of interesting rock ferns was topped by Carl English's *Pellaea mucronata*.

Class 11—Sempervivums. A collection of S. Emerald Giant, *S. arachnoideum*, *S. globiferum*, and others gave Mr. and Mrs. Brian Mulligan the award in this section.

Class 12—Sedums. This was also won by the Mulligans with an exhibit of *S. spathulifolium* Cape Blanco.

Class 13—Saxifrages. *S. cochlearis* from the Apennine Mountains gave Mr. and Mrs. Haddock another first place.

Class 14—One gray foliage plant. Mrs. L. N. Roberson led this group with a beautifully textured *Artemisia Schmidiana*.

Class 15—Three rock plants of different genera. Carl English's unusual container brimming with small treasures of *Pieris nana*, *Gaultheria depressa*, and *G. nummularioides* was voted best in this class.

Class 16—was for plants arranged for effect in a dishgarden not more than 150 square inches in area. Mrs. Brian Mulligan was given the award for a collection of *Picea Englemannii*, *Rhododendron radicans*, *Primula rosea grandiflora*, *P. Juliae* "Dorothy," *Erysimum*, *Morisia hypogaea*, *Sedum spathulifolium*, *Sedum oreganum*, and *Dodecatheon*.

Class 17—Any one kind of rock plant not included in previous classes. An enviable display of *Cyclamen coum* in flower gave Carl English another first.

Class 18—Collection of cut flowers of alpine plants. Mr. and Mrs. Had-dock took the award in this class with a container of specimens from many genera.

The consensus of opinion among the members was that the show was a success educationally and esthetically, and that this was only the beginning.

The conclusion of the committee was that they had learned much and they hope another year will bring a show more smoothly run and with fewer pitfalls for unwary committeemen. We are thinking of requisitioning an adding machine. Counting more than fifty ballots of eighteen classes each is a job for a C.P.A. We don't have enough fingers.

These last few months have been rich in pleasure for the Northwest Unit. January brought answers to QUESTIONS BY BEGINNERS from a capable panel of experts consisting of Mrs. L. N. Roberson, Mr. Carl S. English Jr., Mr. Brian Mulligan, and Dr. C. Leo Hitchcock. In February we enjoyed an illustrated lecture on PLANTS OF WESTERN CANADA and ALASKA, with Mr. E. H. Lohbrunner of Victoria, B. C. as commentator. Never will we forget that picture of *Cassiope Stelleriana*, *C. Mertensiana*, and *C. lycopodioides* growing so closely as to be taken in by one camera's eye.

The March PLANT SALE brought many new treasures to our gardens, some funds to our coffers, as well as a good show by auctioneer Jim Fletcher with Carl English, Brian Mulligan and Neill Hall as his able assistants.

One evening a month filled with information, good friends, fine plant material, spiced with good talk over the coffee cups . . . these are the dividends of membership in the Northwest Unit of the American Rock Garden Society.

MAYFAIR'S NEW HANDBOOK OF RARE ALPINES and ROCK PLANTS

Our new Handbook is chuck full of information about the rare al-pines and rock garden plants most suited to American gardens. It gives complete descriptions and detailed cultural directions for about 675 different individual plants. A desired addition to every gardener's library.

PAPER COVER EDITION.....50c

HARD COVER, PLASTIC BOUND EDITION.....\$1.00

(No stamps please)

GET ACQUAINTED OFFER

12 Rock Plants, all different.....\$3.85

25 Rock Plants, all different.....\$7.35

Our selections of the best varieties, F.O.B. Hillsdale

Mayfair NURSERIES

Box 87

Hillsdale, N. J.

Free Price List on Request

SALUDA INN

High in the Blue Ridge, and within easy driving distance of the Great Smokies, a fellow rock gardener would welcome you to winter or summer vacationing or all-year retirement. Simple living, natural beauty, a paradise for botanists and bird lovers. Prices are reasonable. Write to . . .

MRS. C. W. MASON, SALUDA, NORTH CAROLINA



PUTTOR

A NEW TYPE OF
Garden Tool
for EXPERTLY and
PRECISELY
Sowing Seeds and for
EFFECTIVELY and SAFELY
applying Plant Food

\$2.95 Postpaid
RETURN PRIVILEGE
WITH REFUND
WITHIN 10 DAYS

MANUFACTURED AND SOLD BY
ERIC ISCHINGER 86 AVIS STREET
ROCHESTER 15, N. Y.

HARDY NATIVE PLANTS

We carry one of the most complete stocks in America of Rare Trees, Shrubs, Broad-leaved Evergreens, Herbaceous Perennials and vines of the Blue Ridge Mountains.

Send for your copy of our FREE catalog covering the most complete assortment of native plants available.

Gardens of the Blue Ridge

E. C. ROBBINS

Box 8, McDowell County
Ashford, North Carolina

GREAT PLAINS PLANTS

Are Worthy of Close Investigation

Creeping Phlox, non-climbing Clematis, all-season Evening Primroses, brilliant Penstemons, fine dwarf Asters, *Viola montanensis* and *Nuttalli*, a charming dwarf open-sun *Mertensia*, *Anemone caroliniana*, Cushion *Astragali*. Also shrubs, bulbs, seeds.

— Ask for a Catalog —

CLAUDE A. BARR

Prairie Gem Ranch

Smithwick, South Dakota

ROCK GARDEN GEMS

PRIMULA CLARKEI — 75 Cents Each
\$7.00 Per Dozen

PRIMULA JULIAE HYBRIDS

50 Cents Each — Six for \$2.00

DOROTHY, HELENAE, LADY GREER
McGILLIVRAY, NETTIE P. GALE,
ROSEA, SWEETHEART, WANDA

L. N. ROBERSON

1540 E. 102nd Street, Seattle 55, Wash.

DRARF DAFFODILS

for Rock Gardeners

112 Choice Varieties
Old and New Types

Write for our Blue Ribbon List

The Daffodil Mart

Nuttal P. O., Gloucester, Va.

HEMLOCKS

Thirty-six good variants of *Tsuga canadensis* in various sizes. Several dwarf and slow growing forms for rock gardens. Our plants are cutting grown. We have no price list and do not ship. Reasonable prices quoted on inspection. Correspondence invited and visitors welcomed.

Ralph M. Warner

Woodmont Road, Milford, Conn.
Tel. Milford 2-3818

RARE ALPINES

from the

WORLD'S FAR CORNERS

Besides Alpines many rare and interesting varieties of Azaleas, Heathers, Primulas and Rhododendron species are listed in our catalogue.

Please Ask For It

ALPENGLOW GARDENS

MICHAUD & COMPANY

R.R. 4, New Westminster, B. C., Canada

HIMALAYAN FLOWERS SEEDS

Anemone, Primula, Meconopsis, Rhododendrons, Iris, Liliams, etc.

Post Free Collections of
\$1.00, \$2.00 and \$4.00

G. GHOSE & CO.

Orchid Growers and Exporters
Townend, Darjeeling, India

RARE ALPINES

That Are Not Hard to Grow

Special to readers of "The Bulletin"
Three each of the following: ASTER FARRERI, CALCEOLARIA POLYRHIZA, DIANTHUS SAMMY, and IRIS CRISTATA ALBA. Twelve plants freshly dug from the open ground for \$5.40 by mail prepaid.

Order now for Spring delivery, supply is limited.

N. A. HALLAUER

Route No. 2 Webster, N. Y.

Primula Juliae Hybrids
Choice Rock Plants
Dwarf Shurbs
Iris

Catalog on Request

Carl Starker Gardens

JENNINGS LODGE OREGON

Colorful

SEMPERVIVUMS

12 Varieties (labeled)
Prepaid \$3.00

Over 100 Different Varieties

MacPherson Gardens

2920 Starr Ave.

Toledo 5, Ohio



BACK VOLUMES OF THE BULLETIN

The following complete volumes of the Bulletin are available at \$2.50 per volume:

18 Volume 2 (1944)

15 Volume 3 (1945)

9 Volume 4 (1946)

These volumes are a gold mine of information. Many single copies from incomplete volumes are on hand also. If you wish to complete your file, write to . . .

AMERICAN ROCK GARDEN SOCIETY

BOX 151

POMPTON LAKES, N. J.

THE ALPINE GARDEN SOCIETY

This Society, founded in 1930, has well over a hundred members in North America. As distance prevents their taking part in the Society's other activities, it is obvious that they have found the *Quarterly Bulletin* to be good value for their subscriptions.

Further particulars regarding the Alpine Garden Society may be obtained from the Secretary, C. B. Saunders, Husseys, Green Street Green, Farnborough, Kent or, better, from Mr. C. R. Worth, Groton, New York, who is one of the Society's Assistant Hon. Secretaries (foreign).

21st BIRTHDAY NUMBER of the JOURNAL of the SCOTTISH ROCK GARDEN CLUB

5 COLOUR PLATES — 21 BLACK AND WHITE FIGURES

Some of the leading articles:—The Torridon Mtns., Heathers, The Cultivation of Primulas, New Plants from Turkey, Pottering among Primroses, Celmisias, also accounts of trips to the Pyrenees, Tyrol and Cascades; and many more.

Cost, including postage, 50 cents, from Honorary Secretary, Sqn. Ldr. J. J. Boyd-Harvey, Boonsie, Dirleton, East Lothian, Scotland, or included in the annual subscription of \$1.50.

Further particulars may be obtained from:

MAJOR GENERAL D. M. MURRAY - LYON

Honorary Publicity Manager

28a Inverleith Place

Edinburgh, Scotland

THE ARBORETUM BULLETIN

A Journal of Horticultural Information

Distributed quarterly to members of the University of Washington Arboretum Foundation. For Information—write . . .

ARBORETUM FOUNDATION, SEATTLE 5, WASHINGTON

THE QUARTERLIES

of the

AMERICAN PRIMROSE SOCIETY

for 1954 contain a *Pictorial Dictionary of the Cultivated Species of the Primula* besides articles on every related subject. A free 44-page "Planting Guide" is given with each membership of \$2.50 as well as the four Quarterlies.

Mr. C. Y. Griffin

2946 N.E. 58th Ave., Portland 22, Oregon

THE AMERICAN PENSTEMON SOCIETY

Cordially invites you to join its growing list of enthusiastic members. If you are interested in Penstemons, you will be interested in the activities of the society.

Write to the Secretary,

Mrs. Edward M. Babb

213 Lambert Street, Portland, Maine
for Full Particulars