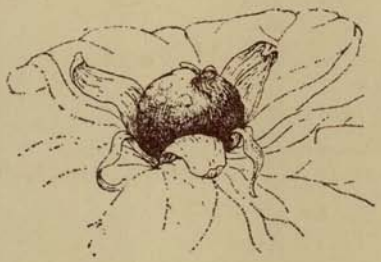

Bulletin of the American Rock Garden Society

Vol. 38 Fall 1980 No. 4

The Bulletin

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Front Cover Picture—*Trillium parviflorum*—Laura Louise Foster, Falls Village, Conn.

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Vol. 38 Fall 1980 No. 4

Bulletin of the American Rock Garden Society

TRILLIUMS WESTERN STYLE

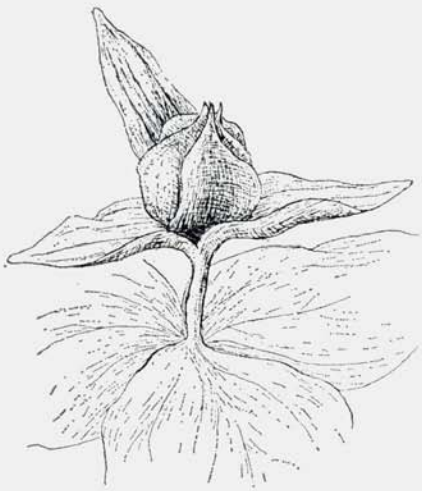
EDITH DUSEK
Graham, Washington
Photographs by the author
Drawings by L. L. Foster

When it comes to species of trilliums, we Westerners got a bit short-changed; of the fifty or so recognized species, by far the greatest number of which are American, we have only about eight. Of these, perhaps three are stemmed. The "perhaps" in the foregoing sentence owes its being largely to *Trillium ovatum*, a stemmed and extremely polymorphic species, which is found from California to Canada and east into Montana and Colorado. Some would carve it into several species, while others opt for mere forms or subspecies. There are those who would toss the tiny *Trillium hibbersonii*, found in British Columbia, into the ovatum pot; others consider it worthy of a specific name of its own.

After tracking *T. ovatum* over a considerable portion of its range, I find that any given stand may show either marked uniformity or an extreme range of forms, many comparing favorably with the best of the eastern *T. grandiflorum*. Generally speaking, plants from moist areas are more robust and with larger blossoms than those from dry situations.

Here in the Tacoma area, ovatums thrive in a thin layer of duff over hardpan. On a recent spring visit to the Cispus drainage of Mt. Adams, we found them growing under rather different conditions. The more recent tummy upsets of the mountain have provided large quan-

tities of pumice grit, which is poorly mixed with small amounts of clay. This is topped generously with leaf mold provided by the coniferous forest. The light mix, when combined with steep slopes, makes for a very rapid drainage. In our area the large rhizomes tend to plunge through the leaf mold to rest on the hardpan, but on Mt. Adams the quite small rhizomes lay in pockets of pure pumice grit. Undoubtedly in summer the grit becomes very dry thus making for marginal conditions for the plants. These resembled dryland forms from eastern Washington in being slender with rather narrow, well spaced leaves.



Seed pod of *Trillium ovatum*

Where the evergreens were very large and close ranked there were no trilliums at all; inded, there was not much vegetation of any kind at ground level. Where there was a bit more space between trees, trilliums did appear but all were slender juvenile looking plants, which gave no evidence of having flowered. Where there was a little more light, plants were in flower, but if there was sufficient light to encourage ground vegetation to build up, trilliums were again absent. All the plants of *T. ovatum* we found in the Cispus area were single stemmed except one that apparently managed to locate in an ideal spot at the edge of a logging road where there was plenty of light but not too much competition. It had two stout stems and broadly overlapping leaves reminiscent of the more robust plants of our lowland woods.

These slender ovatums of the Cispus drainage resembled many seen in eastern Washington, where conditions are also quite dry. The eastern plants are common in the mixed conifer woods but disappear in the dryer portions of the range. (Curiously, trilliums in this region grow under the same conditions as *Calypso bulbosa*, while in western Washington one does not expect to find them together. Apparently calypso is even less tolerant of competition at its level than are the trilliums. Perhaps it is for this reason that in western Washington these orchids confine themselves to heavy, old growth coniferous timber where the dense shade and dry summer conditions under the canopy excludes most undergrowth, including trilliums.) In eastern Washington the general dryness reduces all vegetation so that there is more space between plants at all levels and, in consequence, more light and *T. ovatum* responds to these conditions with generous stands of plants, though these are on the average smaller and more slender than the forms in the wet woods to the west.

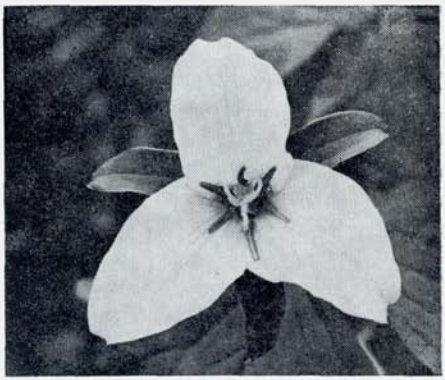
It is interesting that ovatums produce the most fragrance under dry, warm conditions. This is most noticeable if they are in close quarters but a stand of ovatums can scent the woods with their rather acrid sweet odor.

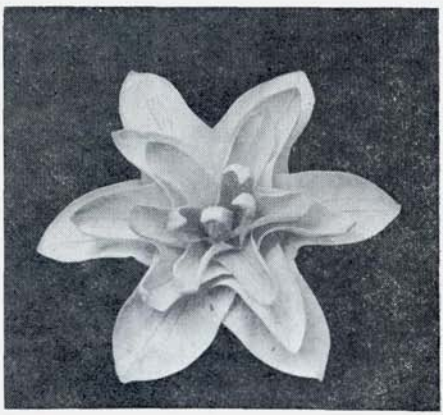
Trillium ovatum is generally mentioned as being white, turning to pink or dark red. While a true enough statement, it only touches the tip of the iceberg. As might be expected, a portion of the plants

appear to be true albinos, which never turn color as they age. The rest bear anthocyanin, which is variously masked when the flowers are fresh. Some show color sooner than others and there is said to be a permanent pink even as there are permanent pink grandiflorums. Since, as they turn, different flowers may become various shades of pink, from a good clear pink to a rather dirty old rose or to assorted reds, it is possible that somewhere there is the genetic potential for permanent reds. For unknown reasons, flowers that turn deep red tend to be smaller on the average than those otherwise colored. Only once have I found a large-flowered red. In addition to these, there are flowers that develop a central stripe of color, or color may be confined to one or both ends of the petals. Perhaps the most versatile plant we have so far found is a double that opens noticeably yellow towards the center, an effect that fades as the flowers change from white through stages of pink to beet red. One wonders at the array of factors involved in such a display.

The condition which results in misplaced color on petals or sepals appears to have no relationship to the controversial green striping effect found in *T. grandiflorum*. Such aberrant plants among *T. ovatum* are rare and in many years of hunting, I have never found two growing together. It takes a lot of walking to find even one. Green markings on petals seem always to be indiscriminently placed and are generally accompanied by constriction of the petal margin beyond the green portion. If such plants are rare, it is even less common to find one in which all petals are marked. In contrast to petal markings, which tend to be rather narrow, misplaced white may cover all or any portion of a sepal. These white portions invariably are considerably larger than their normal green counterparts. I have never found a plant in which all sepals were even partly marked. Misplaced color will frequently accompany unstable polymerism (the production of a surplus number of parts but not to the extent of resulting in a fully double flower) and, as such, is a phenomenon of one season only. Among plants found with misplaced color an occasional one will repeat its performance.

Trillium ovatum





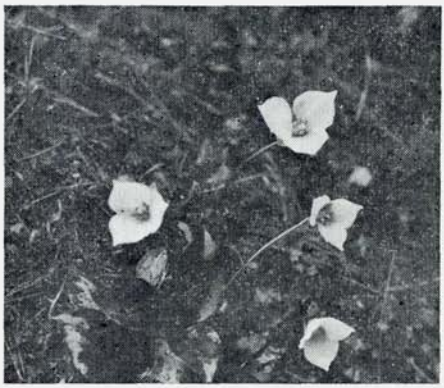
Trillium ovatum 'Edith'

One such was found originally with a single flower. The following season it produced three blossoms each of which had green markings. None of the four blossoms bore identical markings.

Misplaced color may also accompany doubling. It is a common error to refer to "*the* double form" of either *T. ovatum*

or *T. grandiflorum*. Doubling has occurred in both species numerous times and each clone differs more or less markedly from all others. Named clones of *T. ovatum* include 'Kenmore', 'Tillicum', and 'Edith'. I have photos or references to about a dozen others of various merit including one with green flowers. One incomplete double proved itself capable of seed production as are all single flowers having misplaced color.

Unlike the dwarf *T. hibbersonii*, whose status seems to be the cause for some dispute, there is no mistaking the small *Trillium rivale* for a form of ovatum. As with most trilliums, there is a certain amount of variation in the size and shape of the petals but these seem invariably to be rather square. They are fastened at one corner and sooner or later become more or less rolled backward amidship. Petal shape, combined with a decided tendency to freckled faces, make the plants quite unmistakable.



Trillium rivale

Initially the pedicel is of moderate length but it soon begins to lengthen and twist in a most unusual fashion. If fertilization takes place the pedicel then arches downward to place the fruit against the earth. Seeds are embedded in a rather dry mealy substance instead of the sticky goo favored by ovatums. It is interesting to conjecture if this dry substance is of less interest to ants, which act in disseminating trillium seed, and the fact that *T. rivale* presses the seeds to earth is perhaps a means of insuring they are planted. In any event, the plants are found in a somewhat restricted locale. Despite being of dwarf stature, if a mischance causes plants to be buried to a considerable depth, the tiny rhizomes are capable of quite extraordinary lengths of stem to attain the surface.

Little *Trillium rivale* reverses the "normal" habit of stemmed trilliums with white flowers that color in age; not infrequently rivale's buds are pink, the flowers blush for a few days and then turn white. This color-disappearing-trick is more prevalent in sessile flowered trilliums. Rivales vary in depth of color, some being darker and holding at least a portion of the color to the end. While the occasional plant may be pure white or pink, most have tiny dots and dashes of deep maroon on the petals. These are usually more or less congregated toward the center of the flower but some blossoms have so many freckles that to get them all in takes up all the petal surface right out to the edge. Rivale seems to be unique in its freckling habit but it shares with nearly all other species the habit of producing (very rarely) yellow flowered specimens. Curiously, we found that northern California plants flowered somewhat later than those found in Oregon. It is not yet known if they will continue this state of affairs under garden conditions. California plants, growing as they did in a rather dense damp woods, were larger than the Oregon plants in all respects with a strong tendency to produce colored flowers. In contrast the Oregon plants we observed were in dry open woods. Plants were tiny with their white flowers more or less freckled.

My first sighting of that improbable creation, *Trillium petiolatum*, brought to

mind an eye-popping experience as a small country girl when an elegantly formal city lady came to call. Unfortunately, a small brown mouse also chose this moment to visit. With a shriek, the sedate city woman hoisted her skirts to indelicate heights and soared like an eagle to the sanctuary of the kitchen table top where, giving an unseemly display of knobby knees and unmentionable garments, she did a war dance complete with sound effects.

Like this lady, *T. petiolatum* starts out demurely enough. Young ones look not too unlike ovatums, which sometimes rub shoulders with it. It is only with the advent of the bud that matters get out of hand. As if horrified at the sight of the thing, the plants shoot the odd round leaves aloft on very exaggerated petioles leaving the rather mousy flower at a safe distance below. Actually the cinnamon or greenish and brown flower is generally rather larger than those displayed by many of its eastern cousins, but their often subdued color, coupled with a slim shape, make them unable to compete with the amazing gymnastics of the petioles. In the garden the scene becomes even more improbable for the stem of the plant, which is always very short, becomes even more squat (perhaps as a result of reduced competition) while the petioles are not deterred from their aerial flight. In flowering condition, the plants are suitable companions for the Alice in Wonderland world of *Arisarum proboscidium* whose bloom has been likened to the rude end of a mouse disappearing down a hole.

Though the common flower color of *T. petiolatum* is cinnamon to bronze, red, yellow and green forms have been recorded. Those I have seen have been inclined to various softly blended tones, which are quite beautiful when seen with back lighting.

T. petiolatum ranges over portions of three states, confining itself to mountainous areas, which take unto themselves some moisture, in what is essentially a very dry area. This species can be very hard to find or locally common with the reason for its presence or absence not always clear. We have found it in an

Trillium petiolatum

assortment of locations including scrub growth under pines; in short grass-brushy pastures; and in an area kept sopping wet by a small stream that could not decide on the most comfortable route to take through a meadow. In the first two types of conditions *T. petiolatum* is frequently associated with Snowberry (*Symphoricarpos*). In the latter instance it mingled with a gentian (probably *G. calycosa.*) Despite official insistence that this species has immaculate leaves, in this wet location some of the plants had gone in for a modest amount of mottling.

After examining plants of *T. petiolatum* in Washington, Idaho, and Oregon, we came to the conclusion that the absence of a visible stem in flowering plants is not a reliable field characteristic. In many stands all plants were definitely possessed of a stem, indeed they not infrequently displayed several

inches of it. Other stands contained plants with varying degrees of underpinning. Least common were those stands in which all flowering plants were stemless. Elongation of the petioles is invariable in flowering plants but nonflowering plants have short petioles or occasionally none, with the leaves of juvenile plants looking suspiciously like those of similarly aged plants of *T. ovatum*, which quite often grow with it.

While distinguishing *T. petiolatum* from other trilliums is usually a relatively simple task, the separation of the remainder of the sessile flowered trilliums on the West Coast is not. When first discovered a century or so ago, these plants were swept into the same hopper with the eastern *T. sessile* despite numerous differences between the eastern and western plants. Unfortunately name changing in plants is far less easily accomplished than are fashions in dress, and variations of the name *T. sessile* crop up with monotonous regularity to this day. The unceremonious lumping of the western sessile flowered trilliums under the epithet *T. chloropetalum* was the next step; this despite the numerous differences displayed by the plants over their far flung range.

Then in 1975, Dr. John D. Freeman published a monograph on American sessile flowered trilliums (*see Book Reviews, this issue.*) In an attempt to make order out of chaos, he divided the western sessiles (exclusive of *T. petiolatum*) into four species. The name *chloropetalum* has been retained for certain plants found in California *only*. A second species, *T. angustipetalum*, is also restricted to California. The third species, *T. kurabayashii*, is found in northwestern California and a small area of adjacent Oregon. Curiously, the fourth species which Dr. Freeman extracted from the original *T. chloropetalum* classification, giving it the name *T. albidum*, has an extended range reaching from the middle of California to the middle of Washington. Recent investigations of *T. albidum* have disclosed that either Dr. Freeman's description must be extensively changed to cover a wide variety of plants, or this species will have to be divested of some of its populations.

Living as I do in western Washington, I would expect that my initial contact with western sessiles would be with our local version of *T. albidum* as no other sessile flowered species occur until one crosses the Columbia River into Oregon. It was not so. Our version of Freeman's *T. albidum* is quite restricted in range and only a handful of people seem to be aware of its existence. Three small populations have been found south of Puget Sound. In addition to its rarity, perhaps another reason the Washington version of *T. albidum* has not received much notice is that it cannot compete as a garden plant with the form of *T. albidum* found in California. Our Washington plants are neither as buxom nor as showy and have been, as it were, swept under the rug, no one apparently noticing that they are, perhaps, entities of their own. Yet visitors, on being shown plants of *T. albidum* both from the southern portion of its range and from our Washington population have been unanimous in stating emphatically that they could not possibly be the same species. A botanist came, saw, and decided that investigation into the matter was in order. (See p. 167)

The first impression of the western Washington plants is that they are small, about half the height of the southern plants. Flowers average one inch and only rarely is one found that surpasses in petal length the minimum as set by the standards for *T. albidum* in the texts. Petals give the impression of being rather straight sided and are rather blunt tipped. They are white and about ten percent have a faint flush of purple at the base.

All plants also appear to have this color confined to the reverse side (not the receptive portion) of the stigmatic branches. Frequently the base of the stamens is similarly colored. Flowers have a light bitter-rank odor.

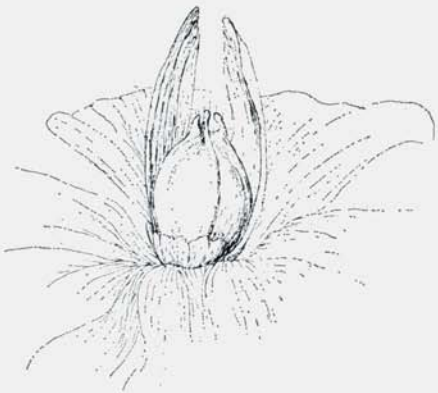
Leaves are usually rather lightly and more or less evanescently mottled. Less often one finds a plant with immaculate leaves or an attractive one in which the mottlings approach black. Prettiest of all are those with strong markings in which chartreuse is added to the mix. Mature leaves are generally broadly overlapping and sessile.

Attractive maroon fruits are prominently displayed by wide spread sepals, their plump roundness only negligibly marred by evidence of stigmatic remains in the form of ridging. Usually these remains are relegated to the top of the fruit and are small; more rarely they take the form of small plump "fingers." The skin has a patent leather shine and is so thin that the seeds announce their presence as small individual bulges. The fruit has a slightly rank smell, which would not entice anyone into eating it.

In the wild it takes a lot of searching to find a plant with more than one stem but in the garden they readily form small clumps. Wild plants grow in a rather specialized habitat of mixed oak-conifer and scrub on gravelly soils made rich by leaf mold. Preferred sites are close to water. With them one finds many *T. ovatum* of a not particularly outstanding form. Immature plants of both tend to have short petioles and are frequently so similar that one can almost imagine one stripling asking another, "What are you going to be when you grow up?" At this stage the albidums lack mottling on the foliage and both species have well separated leaves.

Polymerism or other aberrant forms are rare. The only ones seen to date have been two quadramerous juveniles.

The plants of *T. albidum* from southern Oregon and south into California are very different. It is apparently on these southern plants that the description of the species *T. albidum* Freeman is based. They are much larger than those found in Washington. Plants are robust, clumping as freely in the wild as they do in the garden; specimens with a couple of dozen flowering stems are not uncommon and flowers average three inches, with some attaining four inches or more in petal length. Petals are widest in the middle, half or more wide as long, curving gracefully in one line from tip to constricted base. Generally they are white though Freeman acknowledges a rare pink form. Under optimum conditions their rose scent can be all but overpowering. Leaves may be unmottled or obscurely mottled silvery on green.



Seed pod of *Trillium albidum*, southern form

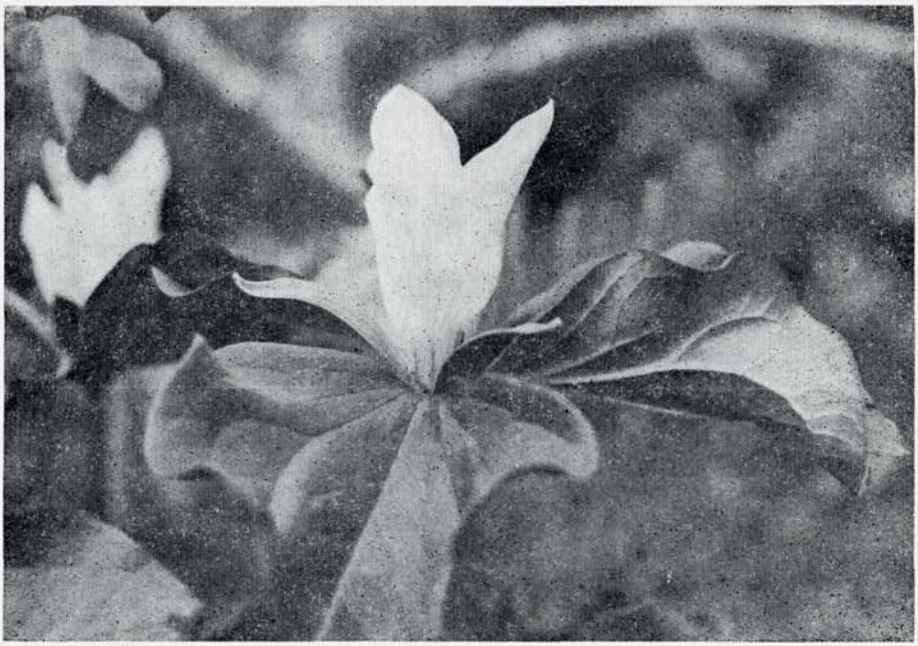
Unlike the shiny maroon seed pod of the Washington trilliums, the dull, greenish fruits of the southern *T. albidum* bear tattered remains of the stigma in the form of strong ridges that often extend all the way to the base. As the fruit is bluntly triangular in outline, these ridges give the capsule the appearance of being constructed of a series of flattish planes.

This rather unattractive fruit is partially concealed by sturdy sepals, which are held stiffly erect, clasping it closely.

In Oregon *Trillium albidum* displays a condition called a "cline" in which plants of two extremes gradually merge from one to the other. In this case, as one moves south, the first change involves the size of the plant and flower. Next the fruit loses the high shine of the northern form and changes from a smoothly round globe to a duller, triangular shape with strong ridging. Last to alter is the fruit color. In some plants the fruit changes color so reluctantly as they mature that it is not until they are fully ripe that they attain a blotchy semblance of purple. Happily this skewbald appearance is largely disguised by the upright sepals. In the Salem-Eugene area variations seem to be at their greatest, with some plants having rose scented blossoms while others retain the ranker odor. Here too we encounter a number of strange plants with sepals bearing misplaced color. (See p. 167.)

In southwestern Oregon, just north of the California line, we found plants that seemingly march to a drummer all their own. I propose that these be named *Trillium confusum*. The name "*confusum*" was chosen because these plants alternately display or omit an assortment of characteristics that would admit or exclude them from several western sessile-flowered trillium as delineated by Freeman.

It is a subalpine species, its flowering delayed by lingering snows to May or early June. Flowers are pale yellow or creamy (not white) with no purple pigments in any portion. (*Trillium albidum*, according to the texts, does not contain any yellow pigment.) Petals, 1¼ to 4 inches long and ¼ to 1¼ inches wide, average slightly smaller in size and are somewhat narrower than those of *T. albidum*. Those with exceptionally long



Trillium albidum, southern form

or short petals are not common. The scent is intensely floral-soapy. Anther dehiscence is introrse. Stamen length is about twice the height of the stigmas. The latter are borne stiffly upright with the receptive surfaces usually touching for a considerable distance.

Leaves are immaculate or (rarely) chartreuse with irregular mottlings of the normal green color. The latter pattern may also be extended to the sepals, which at flowering time are generally stiffly upright but may on occasion be slightly spreading.

Fruits are small, round and creamy with pale green markings along the stigmatic sutures. There is absolutely no evidence of ridging. Stigmatic remains at the apex are reduced to a small dark crumb. The skin of the fruit is so translucent that shadowy brown seeds can be seen within and so thin that these cause individual small bulges. The flimsy sepals curl away so the fruit is prominently displayed.

Plants are most often found in clumps of two to twenty or more stems. Juvenile plants are not common. Rhizome ring-counts for smaller plants gave ages of seventeen to forty plus years. Since in most cases, there was evidence of at least some deterioration of the posterior portions of the rhizome, ring counts can only be taken as approximate. Plants are quite catholic in their choice of habitat, occurring under or near scattered trees on open wet meadows, in moist to dry woodland, or under oaks growing in small isolated stands in dry terrain. It may be of interest to note that the population included samples of polymerism and green striped petals or partly white sepals at about the same rate that these occur in *T. ovatum*.

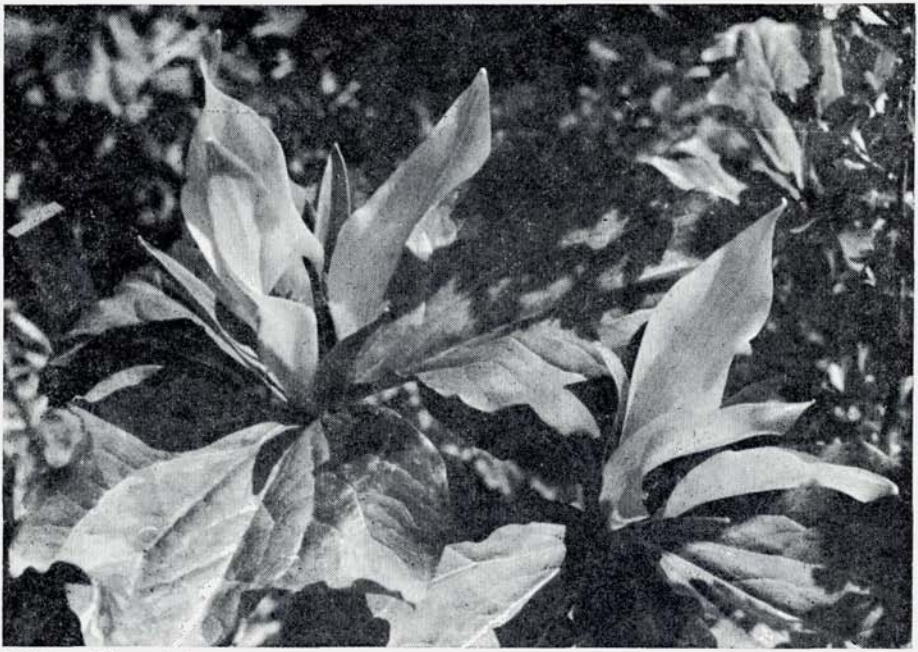
As is the case of our western Washington version of *T. albidum*, these southern Oregon plants are also under investigation to see how they fit into the scheme of things. Like the mills of the Gods, those of Science turn rather slowly, while the wheels of "Progress" spin with increasing speed; let us hope that we will not discover too late that Washington and Oregon have been hiding something unique under the blanket name, *Trillium albidum*.

In the garden all these forms of *T. albidum* have settled down on the dry rim of a small bog where they flower well and produce good crops of seed. Except for slugs, they seem not to have any enemies if one discounts the efforts of an overzealous coyote who plowed a furrow with his nose when in pursuit of mouse or mole. To make amends for any damages, he left behind a fur lined "dividend" at the end of his row.

Trillium chloropetalum, which according to the texts is found only in California, might well be called the prima donna of western trilliums; it has by far the greatest number of color forms. For convenience these trilliums are now divided into two groups. Those in *Trillium chloropetalum* var. *chloropetalum* have flowers containing yellow pigment whether this color is visible to casual inspection or not. These colors include yellows, greens, bronzes, and more or less brownish reds. Plants in which there is no yellow pigment in the blossom are referred to as *T. chloropetalum* var. *giganteum* and here we find white, pinks, and much clearer deep reds. In either case, flowers may be self colored or have beautifully contrasting colors in a variety of patterns. One of my favorites has deeply colored veins etched on a pale background. Regardless of petal color, however, the sexual portions of *T. chloropetalum* are always purple. These trilliums have the potential of developing as wide a variety of color forms as any of our more common garden plants.

Although the somewhat similar *Trillium kurabayashii* has been known for a

considerable length of time, it is only in recent years that its right as a separate entity has been acknowledged. Flowers with petals to 140 mm. long (five and a half inches) have been recorded, making it the largest blossom of all sessile flowered trilliums. Although the species is recognized officially only in its red form, we have found that the reds vary from a deep glowing red through brownish



Trillium chloropetalum

tones, which in turn grade to what might be described as butterscotch tan with more or less of a suffusion of red towards the tips. Probably the most uncommon color is a clear rich yellow. It seemed that in all cases a factor for yellow was present. Leaves might be immaculate to heavily mottled with leaf color bearing no relationship to flower color. Fruits proved to be equally variable in shape and the amount of stigmatic remains displayed. But regardless of flower color the fruits seem always to

ripen to a dark mahogany though some plants were very slow to achieve this hue. Generally the plants are single stemmed and we found no evidence of massive clumps. The only evidence of aberrant forms was a rare quadramerous plant.

As befits its name, *Trillium angustipetalum* has very narrow petals, which exhibit the usual tendency of twisting found to a marked degree in sessile flowered trilliums. Officially recognized only in its red forms, the color may be rich and luminous or dulled by the addition of yellow pigments. Unofficially a yellow flowered plant is reported and there are also dull bronzes of a hue unlikely to endear them to anyone but an avid collector of trilliums. The immaculate or faintly mottled leaves are notable for pinching in suddenly at the base in an excellent imitation of a petiole.

Western trilliums present no particular problems in cultivation. Generally they

respond to easy living by making a clump and increasing in vigor. While it is true that no amount of coddling will make a poor form into a good one, proper conditions do tend to produce an improvement in all.

There seems to be an ongoing argument about picking trilliums. There are those who recommend them as cut flowers while others are equally sure that picking results in the death of the plant. Probably both lines of thought are in part right. Since picking prevents the plant from producing a food supply, it is inescapable that a plant whose above-ground portions have been removed will have a hard time producing a flowering stem the following year. Even so a plant that is large enough to bloom usually has sufficient reserves to see it through a lean year. Young non-flowering plants might not make it.

If merely losing its stem and leaves invariably led to death, *T. ovatum* would have become rare or perhaps extinct long ago since they share the woods with deer who find them a tasty addition to the menu. Gardeners who must also share their gardens with deer sometimes find it impossible to keep trilliums.

In the wild, rhizomes of ovatum can be expected to be singletons varying in size from fingerlings to the dimensions of a fair sized potato depending on age, conditions under which they grow and, one suspects, the individual inheritance of the plant. There is some evidence to indicate that the older portions of the rhizome is sometimes subject to rot. Possibly at times this is fatal but at others the offending portions wither leaving the remainder none the worst for wear.

In the wild, *Trillium rivale* also occurs most often as a single stem from a tiny rhizome. They love garden life. A single plant may readily expand until it produces a dozen or two flowers at a time. Although I have never done so, there is no reason to believe that they would be more difficult to divide than their larger cousins.

Division of the dormant plant is easily accomplished by simply separating the rhizome so that each piece has a few roots and one or more growing points. It is quite possible to successfully remove divisions so small that they produced what appeared to be a seed leaf; however, there is some risk of loss with such small portions. Some parts can be readily broken off, others need to be cut. In either case a dusting with sulphur or other compound to prevent entrance of fungus seems a good idea. Some plants become so congested with stems that division seems as sensible as for any other perennial. In others it is the only means of increasing an unusual plant.

New Trillium Species Named

As a result of his investigations of the populations of *Trillium albidum* Freeman, growing south of Puget Sound in the state of Washington, Dr. Victor G. Soukup of the Department of Biological Sciences, University of Cincinnati, Cincinnati, Ohio believes this trillium should be given specific standing under the name *Trillium parviflorum*. His paper on this species is to appear in *Brittonia*, publication of the American Society of Plant Taxonomists, published for that society by the New York Botanical Garden and is now in press. (See p. 162)

Edith Dusek, whose article on western trilliums appears in this issue of the Bulletin, was to a large extent instrumental in calling these trilliums to Dr. Soukup's attention. As a result of his finding that this western Washington sessile flowered trillium is, indeed, an entity of its own, Mrs. Dusek is now convinced that the cline of sessile flowered trilliums described on p. 164 of her ar-

ticle is a hybrid swarm between the newly recognized species, *T. parviflorum* and the more southerly *T. albidum*. Since these hybrids appear to be confined to the state of Oregon, she proposes that the name *T.* x *oregonum* is appropriate to distinguish this hybrid population from its two parents.

To clarify the differences in the characteristics of *T. albidum* Freeman and *T. parviflorum* Soukup, Mrs. Dusek has prepared the following chart. The directional arrows under the heading *T.* x *oregonum* point toward the parental characteristics that dominate in the hybrids.

	T. albidum	*T.* x *oregonum*	*T. parviflorum*
Height	8 to 26½ inches.	☜	6 to 13 inches.
Stems	1 to 30 (or more) per plant. Large clumps common.	☜	1 (rarely 2 or more.)
Leaves	Immaculate to lightly mottled.	☜	Lightly to heavily mottled, less commonly immaculate.
	Large	☜	Small
Petals	1½+ to 4½+ inches long.	1¼ to 2¾ inches long or more.	½ to 1½ inches long (only rarely more.)
	Widest near middle, narrowing about equally in both directions.	☜	Narrow, appearing almost straight-sided.
	Constricted strongly at base.	☜	No noticeable constriction at base.
Sepals	Erect with tips touching or crossed over fruit.	☜	Cupped at fruit base before flaring widely outward.
Fruit	Green	☜	Maroon
	Dull	☜	Glossy to shiny.
	Triangular. More or less prominently ridged top to bottom resulting in a series of planes. Taller than wide.	☜	Round. Ridging, if any, confined to top of fruit. No indication of planes. Wider than tall.
Scent	Strongly rose (funereal).	☜ ☞	Lightly bitter or spicy-rank, clove-like.

Trillium parviflorum (see also cover picture.)

GROWING TRILLIUM IN ARKANSAS

John C. Lambert
Mena, Arkansas

Many years ago I became enthused about the grandiflorum mutant trilliums. Along about that time, I read Mary G. Henry's account of her trillium collection in the ARGS Bulletin, Vol. 14, p. 52. It inspired me to try to better her collection of trillium species and varieties. Some fifteen years of experience in our Wixom, Michigan wildflower garden proved to me that trilliums from the extreme north to the far south and from coast to coast will adjust and be happy if given the proper soil, moisture and winter protection.

Not so with we humans. At the age of 63, after working in the offices of Fisher Body Co. for thirty-three and a half years, I found that I was not as hardy as my trilliums. Suburbanitis had set in around our lovely swamp and sandy area, so we decided to seek "greener pastures."

It's no small task to pull up stakes and move to a different climate with all your prized plants. But through the help and encouragement of the late Lillian Leddy, an enthusiastic ARGS member, we decided to relocate in the beautiful Ouachita mountains near Mena, Arkansas. Here I found eleven acres of undeveloped wooded hillside and bottom land on the Mountain Fork River. It proved to be an ideal location for a wild flower garden, which has now developed into my

Mountain Fork Arboretum.

I gradually moved all my plants at the proper time, but unfortunately I had to leave them alone at times with no special care of timely watering. The one thousand-mile move was a catastrophe as far as the *T. grandiflorum* mutants were concerned, though we did the best we could for them. Still, at the time we completed the move on July 4, 1972, there was no irrigation system on the place, and our home was sixteen miles from the garden. Altogether I lost some eighty mutants and eighteen double green and white trilliums. Since that time, however, I have added other species and varieties and increased the collection considerably. The main trillium planting sites are located on the north side of a two hundred foot ridge. We are favored with just about the right amount of shade from native hardwood trees.

A six hundred and fifty foot, two inch plastic pipe with outlets every one hundred feet has been installed along the hillside to pump water from the Mountain Fork River. Watering is done with a seventy-five foot garden hose from the outlets to the two hundred planting sites. It takes twelve hours to complete the watering process which must be carried on at intervals between June and September in this area.

There is one serious problem that I hadn't counted on. Armadillos, unknown in these parts ten or twelve years ago, have moved in to raise havoc with my trilliums. It isn't as if they have developed a taste for trilliums. They do their damage by rooting around in the mulched beds seeking grubs and other insect life, not being too careful where they trample. All I can do is to try to slow them down by placing chicken wire weighted down by heavy stones over the planted beds. It seems that the armadillos are deterred somewhat by having their tapered noses come in contact with the wire mesh. Occasionally, one of the armoured creatures blunders into one of my traps and meets an untimely end.

Native trees, shrubs and flowers can live without watering, but plants from other areas must have this special attention. But, just because the natives don't need the added water, it doesn't stop them from sending out roots to the watered area and strangling all the newcomers. It is a perennial problem.

When putting in new trillium plants, I dig a hole about one third larger than really needed to accommodate the plants. To keep the tree roots at a respectful distance, I remove all of them down to about eleven inches deep up slope and eight inches deep down the slope in front of the plant. I return about two inches of the original soil, two inches of rotted hardwood stump material, and one inch of a growing mix. Then I fill the hole with water several times. The rhizomes are placed into position in the watered mass and original soil and growing mix are added half and half for covering. Still more water is added until everything is saturated. For mulch in the trillium beds I use shredded hardwood leaves for acid-loving varieties. *T T. grandiflorum, nivale* and *rivale* species, are mulched with maple leaves.

I have found that the most difficult trillium for me to grow is *T. undulatum;* the easiest is *T. flexipes* forma *walpolei.* My favorites in the sessile type are *T T. underwoodii, maculatum, sessile* (now *chloropetalum* var. *giganteum rubrum* and *californicum* (now *chloropetalum* var. *giganteum*). In the pedicellate type —other than grandiflorum mutants — I lean toward *T T. erectum, vaseyi, ozarkanum, stylosum* (now *catesbaei*) and *cernum* var. *macranthum,* by some authors considered to be *T. flexipes.*

At the present time I am growing forty-six species, varieties and forms of trilliums, plus two Japanese species

which I obtained last fall. (It's anybody's guess as to whether the latter species will make it.)

Here at Mt. Fork Arboretum I have tasted challenge, anger, success, elation, beauty and the thrill of working with many kinds of flora. Seeing the first plants come up in the spring (erythronium) and the last blooms of the fall (hardy cyclamen) at my own arboretum fulfills a dream of a lifetime. God is a great God and I am thankful that He has given me all of this.

COLLECTOR'S NOTEBOOK

Roy Davidson
Seattle, Washington

Phoenicaulis cherianthioides

This is a most cunning, sweetly fragrant "pink wallflower" of the basalt scabrock from sagebrush to Yellow Pines east of the Cascade-Sierra axis in central Washington, Idaho, Oregon and Nevada. It has been variously considered in the past to be a *Parrya*, *Cheiranthus*, *Hesperis* or *Arabis*, and is another of Douglas's discoveries, although Nuttall's name pertains as encompasing a monotypic genus, the lone species of which may be variable in plant, herbage and floral color. Northernmost representatives tend toward a more appealing soft rose pink flower and rather silvery leafage.

In the native state *Phoenicaulis cherianthioides* flourishes with such other mesophytes as *Viola trinervata*, *Lewisia rediviva* and *Balsamhoriza hookeri* and certainly in cultivation it demands a high and dry position in bright sun with the quickest of drainage. When made at home it will form multi-tufts of slender oblanceolate felted leaves, topping deeply plunging multi-branched rootstocks, crowded in early spring with flowers reminiscent of hyacinth, but with the wallflower's unmistakable scent.

Lupinus sabinii

This foot-high prairie lupine may well be the best of all the golden flowered ones. It is a well marked endemic of the Blue Mountains of northeast Oregon and southeast Washington, found in the Yellow Pine grassland arid transition zone. It is at its finest on deep loess soils, where it forms, in good seasons, wide patches of rich color with the added attraction of silvery pubescent foliage. As with most deep rooting prairie plants this would likely succeed best in cultivation given rather rich fare and maximum sunshine. Each crown will in time give multiple spikes.

There are perhaps more than two hundred species of *Lupinus* (though some authors accord only half that number) and of them about half are indigenous to North America; the rest extend to all other continents except Australia. *L. sabinii* was first found by David Douglas and is one of the few of its genus not to have been confused with a long list of synonymous names.

This is a plant well worth bringing into cultivation both for the color of its blossoms and its attractive foliage.

The Joys and Problems of Our Seed Exchange

William C. Dilger
Freeville, New York

If one looks through the past volumes of our Bulletin and the similar publications of our sister organizations, the Scottish Rock Garden Club and Alpine Garden Society, it is apparent that it is usual for seed exchange directors to present a kind of "state of the union" message to their fellow members. This is my excuse for the following paragraphs. Also, our experiences have led us to believe that our members might profit from learning more about our exchange: how it works, why we do the things we do, and what their money is used for. We used to wonder about some of these things ourselves.

The Ithaca, New York area has a few enthusiastic rock gardeners and we are a close, congenial group. We meet informally rather often and from time to time speculated on the possibility of "doing the Seed Exchange sometime." Nothing came of this and I rather suspect that each of us was appalled at the temerity of the idea: intimidated by the awesome responsibility and by the grim thought of global ire should we prove lacking; I know I was.

There matters stood until one day Mimi Sumner (now Vogt) and I were visiting Bill and Nellie Hamilton. During this visit Bill asked if I would like to be the new Seed Exchange Director. Those of you who know that extraordinary plantsman, either in person or by reputation, also know what an inveterate joker he is; consequently, I replied, "Sure", in the tone one might employ upon being asked, "How would you like quack grass in your scree?" I didn't know at the time that he had been in contact with our former president, Harry Butler, who was looking for a new Seed Exchange Director. So I chuckled appreciatively and forgot the matter. Late one evening, some days later, a voice on the telephone began asking me rather detailed questions about my desire and qualifications to be Seed Exchange Director. In fairness I must confess, my caller did introduce himself, but I almost immediately forgot the name he gave and I *knew* this was simply an elaboration on Bill Hamilton's joke. Naturally I played along and was again agreeable in much the same kidding way. After this affable conversation, I tried to remember who my caller said he was. I finally conjured up the name and checked a recent Bulletin. I was beginning to feel a chill of apprehension. This was in no way alleviated when I discovered that I had, indeed, been talking with our president. The small sounds of the house suddenly became much louder as the full import of what I had done dawned on me. I hadn't even consulted with my potential helpers to see if they would be willing. Moreover, Jack and Nina Lambert were in England at the time. I didn't feel it ethical to ask for help after the fact, but it is a matter of history now that all rallied around and for that I am eternally grateful. I can never thank them enough and neither can our other members. All put in long hours, day after day, in high good humor.

Soon vast quantities of cardboard cartons were piling up on our front porch, all sent by the previous Seed Exchange Director, Dr. Ewert. They were packed solidly with big manila envelopes, empty seed packets, file boxes, 3x5 cards, and a puzzling great quantity of longish, open topped, stout cardboard boxes. Var-

ions miscellaneous items capped the mountain.

This all happened at the time we were confronted with the death of a treasured member of our group, Dr. C. R. Worth and all of us were presented with the task of salvaging what we could of his extensive collection of wonderful plants, but that is another story.

I wish I could adequately describe the expression on Nina Lambert's face when she came through our front door for the first time after returning from England and heard my reply to her question, "What are all those boxes on the front porch for?" She, too, to my immense relief, joined in with never flagging energy to help see us through the ensuing two years. Her husband, Jack, and daughter, Sarah, were no less stalwart mainstays. I rather suspect Bill Hamilton felt a bit guilty about how we got into this, but needn't have if he did; I would like to have an *Eritrichium nanum* in flower for each of the countless hours he and Nellie spent packeting seeds and filling orders. This brings us to the actual mechanics of the exchange itself.

Dr. and Mrs. Ewert were most helpful in explaining in detail just how they had handled the exchange. With this basic information as a start we set up our own system. The greatest secret of an exchange is to develop a workable system and always stick to it without fail. Mimi Sumner, secretary of the exchange, has a mighty talent for organization and it is to her we are grateful for the details of our system, which worked so well.

Most of you know the basic idea: seeds are collected and sent to a central location where they are listed and from whence the list is distributed to members who can then receive seeds in return for those they contributed. The system is expanded to include non-donors, although donors do receive preferential treatment as will be described later. It is definitely *not* a seed sale: the small sum requested is only to defray the considerable cost of the exchange service. Postage alone costs many hundreds of dollars. In addition there is the impressive cost of printing the list and buying the seed packets, scotch tape, pens, manila envelopes, and so on. The exchange has to be self sustaining. Those who may think the cost is high should look at the commercial seedlists of alpine plant dealers. Packets are commonly two dollars or more *each*.

Another consideration: what is a packet of seeds really worth in terms of long term pleasure and enjoyment? For example, one can easily spend many dollars during a single evening dining out, not to mention the cost of a single viewing of a motion picture. A single packet of seeds can give continuous pleasure and instruction for many years. Think of the excitement when your seeds appear in the mail. How much further excitement there is in checking the packet numbers against those in the seed list to see what you have received. What a thrill it is to see the new seedlings pushing their way through the top dressing of grit in the seed pots. Even the thrill of anticipation before they germinate, be it a few days or two to three years, cannot be discounted. This, of course, is only the beginning. Your plants still must be grown on and, finally, planted out, you hope to bloom in splendor year after year until they become as old friends. Actually all of this can be had from a single seed, let alone a packet.

Our seed exchange has to be one of the greatest bargains of all time. Many years ago while doing some consulting work for a well-known firm I used to hear them say jocularly, that the ideal product was one that cost a dime to make, could be sold for a dollar and was habit forming. I think we do far better than that.

Other Seed Exchange Directors must use systems similar to ours, but I am

sure the details vary. Anyway, let's get started. Here is an exciting looking box, perhaps with strange stamps and paper worn from a long journey, or, perhaps, one from Massachusetts or Oregon. In any case, you realize you are holding many hours of devoted labor by someone as enthusiastic as yourself. This is one point in the process where responsibility weighs heavily.

The hope is, while carefully unwrapping the package, that the seeds are in leakproof envelopes, arranged alphabetically, and cleaned. One also hopes that they are clearly and correctly labelled. An included list of the contents is also most helpful. All too often one or more of these hoped for features is lacking, however. Illegible names and leaky packets are perhaps the least joy inspiring. The former costs a great deal of time, which is often futile. The latter is simply a shame: a shame that the donor worked so hard to save and send seeds that are ultimately wasted, and a shame that someone can never receive them.

Each donor's name and address was then written opposite a number in a list of consecutive numbers in a notebook and a card of thanks, which included this donor number, was mailed to him.

I next checked the name on each packet for correct spelling and agreement with the name as listed in Harkness's *Seedlist Handbook*. We arbitrarily used this book, because it includes most plants likely to appear in a seedlist and because it is so easily obtained by our members. We intended to promote no taxonomic opinions of our own. If a name did not appear in the *Handbook*, I checked *Hortus II* (later *Hortus III*, when it became available). If this failed I gave the names to Prof. William Dress. His willingness and good humor never faltered even though the lists were sometimes long. He also spent many hours at the seemingly endless chores to follow, such as order filling and proof reading.

As soon as each batch of names was correctly ascertained we made out a 3x5 card for each species. On this was also written the donor's number. These cards were filed alphabetically and, as later donations of the same species were received, the donors' numbers were inscribed on this same card. In addition, a manila envelope was made out for each species. These were also filed alphabetically (in those previously mysterious cardboard boxes). If I remember correctly, Roxie Gevjan had these made up and they have been passed from director to director ever since. The seed packets, as they came in, were slipped into the manila envelopes, each species to an envelope. All of this was somewhat easier the second year because so many of the cards and envelopes were already made up, although I remember that we were astonished that there was not more overlap between the kinds of seeds donated the two years.

After all the hundreds of seed packets were thus processed, we ended up with over three thousand cards in their file boxes and over three thousand manila envelopes standing upright in their cardboard boxes. Each manila envelope typically held several packets as originally sent to us, but, of course, quite a few had but one or two.

At this point two things had to be done. The card file was checked to be certain that all were in correct alphabetical order after which each card was numbered consecutively. The manila envelopes were similarly checked and numbered according to the numbers on the cards. We had to be absolutely certain that the numbers on the cards did, indeed, correspond to those on the envelopes because the seedlist was typed from the cards and, of course, the seed orders were filled from the envelopes. I think all of us had nightmares about discovering a

discrepancy after the list was printed. This seems a simple enough, if tedious, task, but consider we had over three thousand kinds of plants listed each year — over six thousand opportunities for a mistake. If one number had been off, all the following numbers would lack correspondence between the seedlist and the supply envelopes. The consequences would have been most interesting.

So far one person *could* do the job, if full time could be devoted to it, but two or three others are enormously helpful. Too many helpers at this point would only cause distractions and confusion, which would increase the chance of errors. The Lamberts, Mimi and I did this part. Then the list was typed from the file cards, proof read carefully, the introductory material and directions written and typed, and the whole thing taken to the printer. One can readily perceive by this time the absolute necessity for a seed donation deadline.

While the list was being printed, we had to divide all that seed into individual packets suitable for distribution. Between late November and early January we prepared somewhere between thirty thousand and forty thousand packets of seeds, each packet marked with its appropriate number. One problem was deciding how many packets to make of each kind. If the total donation was small or the plant known to be particularly popular we prepared as many packets as possible, sometimes putting as few as three to four seeds in each packet. Otherwise we packeted the amount we thought might be requested based on records from Dr. Ewert and Roxie Gevjan. However, the demand for many species varies widely each year. As the orders poured in we often had to make additional packets of items we had underestimated.

We were still packeting seeds when the lists became available from the printer. As soon as the seed lists were ready we mailed them immediately to those fifteen hundred or so anxious members. Foreign members and donors received lists automatically. Other members send a request slip, which served as an address label. Lists addressed to donors were kept separate from those for non-donors and each pile was further divided according to distance from our post office. All the donors' lists were mailed first but in both cases the requests from the greatest distance were mailed first and, on successive days, envelopes with closer and closer addresses were mailed until all were gone. We did this because many of the seeds in most demand were also in short supply. We hoped by this complex mailing schedule to give everyone an equal chance to obtain the scarce items. The system worked. The first day we received orders they came from all over the world including both coasts of North America.

We thought that once the lists were mailed we would have a few days in which to finish packeting and breathe deeply — Wrong! — if there is anything faster than light it is a member returning his order of desiderata. Most members realize that their best chance of receiving the greatest number of their first choices is to return their request sheets as quickly as possible. Our experience was that the number of requests received each day peaked rapidly and fell off gradually until just before the deadline for ordering, when there was a small secondary peak.

Request blanks received each day were placed face up in a pile, with requests from donors on top. To fill an order each of us would take an order blank, a pen, a shipping envelope and a small box. We would then do our best to find each of the first choices, put each in the box and mark them off on the request sheet. Next we would go around again and make up any missing number of packets from the second choices. If, as

often happened later in the distribution, there weren't enough second choices listed, that order was perforce short of its full entitlement. This is why it is so very important that *all* of the choices be filled in.

The boxes holding the manila supply envelopes were arranged so that the envelopes were in numerical order along a table set against one wall and around another table in the center of the room. We had a natural flow of traffic down one table and around the next. Typically, there were several of us working at a time. This is why it is so important to list choices in *numerical order*. Otherwise one of us would find it necessary to work back and forth against the normal flow of order filling to the confusion and detriment of all.

When an order was filled the packets accumulated in the little box were slipped into the shipping envelope together with the original order blank. Then the whole thing was handed to the folks who were responsible for double checking the order and for sealing and putting stamps on the envelope. Those completed each day were mailed the following day. We were able to keep up with the orders for a short time at first but soon the orders piled up faster than we could fill them. We nearly despaired at these times. Could we ever get them all filled and mailed? However, we all kept shuffling one after another around the tables until all the orders were eventually and miraculously gone.

We were fortunate in having a nice mix of "day" and "night" people. A typical day began with Bill Hamilton at about 7 A.M., overlapping with Virginia Briggs around 10 A.M. She was usually displaced by Carol Sienko early in the afternoon. Carol usually stayed until near supper time. After supper Jack, Nina and Sarah Lambert would be joined by Bob and Toni Wilkinson along with Bill Dress who often stayed on until the small hours. The order checkers often tried to add to members' first choices by robbing a seed or two from each of several packets in previously filled orders. This was very time consuming but we all had in our minds the eager anticipation of all those impatient folks out there. We often imagined we could almost hear such pleas as, "I hope I get *Aquilegia jonesii* this time." Try as we did, many were inevitably disappointed, but I can honestly say we did our very best. Seeds stretch only so far.

As soon as all of the orders were filled and the deadline for orders had passed, we divided up the remaining seeds among the various chapter chairmen for local distribution. By the time this was done it wasn't long before seeds began arriving for the next exchange. Remember that our fellow members south of the equator are making their fall harvest during our spring.

Once in a great while we had difficulties with filled orders. Twice orders were returned to us with a note to the effect that if we couldn't supply *any* of the seeds requested none were wanted. One was cleared up quickly when we checked the names the recipient had written on the envelopes against the names in our seedlist and found they didn't match. We discovered he had used the previous year's seedlist to identify his seeds. The other case is still a mystery. He had identified each packet correctly and they were exactly what he had requested. But we never heard from him again.

Although we spent long hours, worked hard, and were glad when the last order was filled, we honestly enjoyed ourselves. We even had rather frequent moments of hilarity. Our midnight snacks were most enjoyable and our feeling of camaraderie was enhanced by the experience. And we all learned a lot. Aside from the botan-

ical knowledge we gained and the increased contacts with many of our fellow members, we learned that it doesn't take a lot of people to run an exchange. It does take a good system and a few really dedicated people willing and able to spend considerable time at it. Too many people would get in each other's way. More people could be used in packeting but this could even be done by mail. One does have to have a room that can be devoted to the exchange, however. We used my study *cum* library which is usually used chiefly for cheese and wine making. We simply moved that stuff elsewhere for the duration.

One of the most rewarding aspects of the exchange was receiving all the many expressions of thanks and appreciation pencilled on seed orders and sent on cards or in letters. There is no way I can adequately express how these boosted our morale and gave us a feeling that there were fellow members out there who were appreciative and anxious to encourage us. These communications were particularly emphatic from members of former exchanges. Many came from other countries, such as Czechoslovakia, Great Britain, and Japan, to mention a few. The letter from Iceland was worth the effort we took to have it translated. Many thanks to all of you. You did more than you may realize to ensure our success.

I believe all of us were astonished and finally quite fearful when our Seed Exchange faltered and nearly died last year and no doubt would have if Mrs. Freeland had not come to the rescue at the last moment. We have more members than ever before. Why is finding a group to take on the Seed Exchange so difficult. I believe Timmy Foster must have come close to the truth in the summer 1979 issue of our Bulletin when she suggested that we have grown to the extent that a certain feeling of unity and responsibility is lost. Surely we have many knowledgeable members with a spare room and a handful of willing helpers. One member of the group, presumably, but not necessarily, the director, should have at least a rudimentary knowledge of plants and plant taxonomy. It is helpful and much more fun if all have a reasonable knowledge of such things, but it is not absolutely essential. Anyone, who can count to over three thousand, who can match numbers and knows the alphabet could do most of the work. Having a damp tongue for sealing envelopes and for putting on stamps is a decided asset too. A good system, strictly adhered to, is a must. It is quite time consuming from October through March, but it really is not very difficult.

This is our society and we must all share the work the best we can, as well as share the benefits. Collect and send in those seeds. No amount is too small, no plant too common. Two incidents that happened to me will illustrate these points. I once requested *Crocus minimus* from the Scottish Rock Garden Club. I received a packet of three seeds along with a pencilled note to the effect that they were sorry, these were the only three seeds they received of that species. I planted them (feeling considerable guilt, but not enough to spoil the fun) and was rewarded with two green "whiskers" which ultimately grew to flowering size. I now can send seed of this plant to the exchanges. On another occasion, as Bill Hamilton was leaving my driveway, he noticed some *Iberis sempervirens* in seed and admonished me to collect some for the exchange. I nearly didn't, thinking it such a terribly common plant, but I did and that year I was the only donor of it. So be sure to collect seed and send it in. It has always seemed odd to me that so many who want seed do not donate. Remember, we have fewer than 500 donors but around 1500 requests for seed.

Our experience has been that tree and

shrub seeds are requested about as often as anything else. We have had requests for nothing else. I feel that it would be a serious mistake to exclude them. It is probably true, for most of us, that rock garden plants are our first love, but rock gardeners are essentially lovers of *wild plants* be they of the high places, meadows, forests or bogs. Shrubs and trees are widely used for background, approach and accent planting for rock gardens as well as to augment or to establish woodlands. I, for one, would deplore seeing them dropped from our lists. In many cases they are difficult to obtain elsewhere.

In any event the sheer length of the list doesn't add that much to the difficulties of a seed exchange group. The two most time consuming jobs are seed packeting and order filling. The seed packeting could possibly be alleviated by simply sending some of it by mail to willing packeters. I, for one, would be happy to help with this.

There really isn't much work to do until October when the bulk of the seeds arrive. From then on there is much to do. I can't emphasize enough the importance of observing all the deadlines. It is important that the seedlist be sent out as soon as possible, so a closing date for accepting seeds is necessary. It is also very disruptive of order filling if seedlist requests are received at that time. The closing date for requests is necessary so that the chapter chairmen can receive surplus seeds for local distribution at a reasonable time and also so the Seed Exchange Committee can tend to their own seed sowing and gardening and get ready to receive the first of the next year's seed donations.

If no one in your group has the facilities or the taxonomic knowledge to check some of the names, I am sure there would be many fellow members happy to do so via the mails.

We must remember not only the responsibility we owe to our own society but also that which we owe to the members of the Alpine Garden Society and the Scottish Rock Garden Club who have come to depend on our seeds as we have come to depend on theirs.

Remember, your seeds are needed. Without them we couldn't have an exchange. Make a special effort to collect seeds of all the small bulbous and cormous plants. They are always in short supply and such plants frequently set seeds copiously. All of the Primulaceae are in great demand (*Androsace, Cyclamen, Cortusa, Dodecatheon, Douglasia, Primula, Soldanella,* etc.). The following are some others in great demand also: *Aquilegia,* small campanulas, *Dianthus, Draba, Epigaea, Gentiana, Iris, Penstemon, Phlox, Pleione* (pseudobulblets), *Ramonda* and its kin, *Rhododendron, Saxifraga,* and *Viola.* In short supply are seeds of plants from which it is difficult to collect for whatever reason. In demand are seeds of any plants that form cushions or "buns"; have specific epithets such as *nana, alpina, minima, pygmaea,* and *compacta;* or have recently been the subject of articles or pictures in recent publications. The above are only samplings of plants that come to mind as I write this. We have never had seeds of a species someone somewhere didn't want.

Another comment I feel I should make is in regard to censorship. I do not feel it is the responsibility of a Seed Exchange Director to censor seeds for any reason. For instance, I have been criticized for including seeds of invasive plants. I have to assume the person who orders the seeds knows what is wanted. Some might want an invasive plant. Some plants are invasive in one garden and not in another. Some invasive plants are easy to control and perhaps desirable such as *Viola tricolor* or *Silene armeria.*

No one in his right mind would plant *Campanula rapunculoides* in a scree or anywhere else in the rock garden for that matter, but it looks lovely indeed along the edge of a woodland or in a meadow. If the director starts to censor plants, where should it end? Should one exclude plants that are "too tall," "too coarse," "not floriferous enough" and so on? Of course not. I am personally biased against horticultural developments, which almost never are as charming as their wild progenitors in our type of gardening. However, I never excluded them from the seedlist. If a member was interested enough to send it in, another member might be interested enough to request it. The Seed Exchange Director is not an arbiter of taste in the garden.

Please clean your seeds carefully and carefully packet them in *leak proof envelopes*. Coin envelopes are best. *Use a glassine envelope or a carefully folded bit of foil to enclose very fine seed* and put this in a coin envelope. *Label the envelopes clearly.*

We have received seeds in a bewildering array of containers. Aside from coin envelopes we have received many in baggies, film cassettes, plastic bottles and various enclosures made of folded paper. Some of these latter were marvels of the art of origami; they were usually acceptable, but the trickier ones are difficult to open without spilling seeds. The bulkier containers, such as cassettes and bottles, just won't fit conveniently into our manila supply envelopes and have to be repacketed. Try to avoid these. Also such containers, being so tightly waterproof, tend to allow seeds to mold if they were not absolutely dry when put in. Above all, *please do not contribute seeds wrapped in tissue bound round and round with scotch tape.* These are nearly impossible to open safely. Coin envelopes are best, but be sure the corners are made so that seeds don't leak from them.

We were glad when our stint was over, but all agree that it was an enjoyable and rewarding experience in many ways. I encourage others to volunteer. The experience is well worth the effort.

(Mr. Dilger was Seed Exchange Director in 1976 and 1977. — Ed.)

THE SHOW BENCH

Annual Meeting 1980 Plant Show

Class 1: 3 pans of rock garden plants of distinct genera in flower. *Lewisia cotyledon* 'Apricot-Orange', *Viola pedata*, *Anemonella thalictroides* 'Schoaff's Double Pink' — Marjorie Walsh; 2nd *Geranium* hybrid 'Ballerina', *Primula sieboldii*, *Dianthus haematocalyx* — E. LeGeyt Bailey; 3rd *Dianthus microlepis* 'Schacht's Variety', *Primula algida*, *Lewisia wallowensis* — H. Lincoln Foster.

Class 2: 1 pan of rock garden plant in flower. 1st *Ramonda myconii* — H. Lincoln Foster; 2nd *Jasione humilis* — Donald Hughes; 3rd *Armeria girardii* — Mark McDonough.

Class 3: 1 pan rock garden plant, new, rare, or difficult in cultivation. 1st *Androsace cylindrica* — Bozidar Bergine; 2nd *Polygonatum falcatum* — E. LeGeyt Bailey; 3rd *Amistostigma keiskei* — Ed Leimseider.

Class 4: 1 pan Primula species or hybrid. 1st *Primula* x *auricula* '*Show Alpine*' — G. K. Fenderson; 2nd *Primula* x *auricula* — Roberta Berg; 3rd *Primula sieboldii* — Wally Alberts.

Class 5: 1 pan Primulaceae other than primula. 1st *Androsace primuloides* 'Chumbyi' — E. LeGeyt Bailey; 2nd *Androsace lactaea* — H. Lincoln Foster.

Class 6: 1 pan Phlox. 1st *Phlox* x *subulata* — H. Lincoln Foster; 2nd *Phlox bifida* 'Starbright' — Marjorie Walsh; 3rd *Phlox stolonifera alba* — Gladys Zimmerman.

Class 7: 1 pan bulbous or rhizomatus plant suitable for the rock garden. 1st *Hexastylis speciosa* — Kenneth Wurdack; 2nd *Arisaema sikokianum* — H. Lincoln Foster; 3rd *Iris gracilipes* — Gladys Zimmerman.

Class 8: 1 pan rock garden plant grown from seed by the exhibitor. 1st *Leiophyllum buxifolium* var. *prostratum* — E. LeGeyt Bailey; 2nd *Kalmiopsis leachiana* — H. Lincoln Foster; 3rd *Edrianthus dinaricus* — Anita Kistler.

Class 9: 1 pan silver foliaged plant. 1st *Primula auricula* 'Mist' — G. K. Fenderson; 2nd *Leontopodium niveum* — Anita Kistler; 3rd *Androsace sarmentosa* — Roberta Berg.

Class 10: 1 pan dwarf shrub other than Ericaceae. 1st *Penstemon davidsonii* — Mark McDonough; 2nd *Salix nivalis* — H. Lincoln Foster; 3rd *Buxus nana compacta* — Marjorie Walsh.

Class 11: 1 pan Ericaceae. 1st *Menziesia purpurea* — H. Lincoln Foster; 2nd *Rhododendron indicum balsaminaeflorum* — E. LeGeyt Bailey; 3rd *Leiophyllum buxifolium prostratum* — Marjorie Walsh.

Class 12: 1 pan dwarf conifer, not bonsai. 1st *Chamaecyparis obtusa spiralis* — Anita Kistler; 2nd *Juniperus 'Echiniformis'* — Fran Lubera; 3rd *Chamaecyparis obtusa flabelliformis* — H. Lincoln Foster.

Class 13: 1 pan bun, cushion or polster plant. 1st *Androsace pyrenaica* — Donald Hughes; 2nd *Draba mollisima* — Roberta Berg; 3rd *Armeria* x *caesalpina* — D. Clark.

Class 14: 1 pan hardy fern. 1st *Asplenium trichomanes* — Fran Lubera; 2nd *Adiantum pedatum* var. *aleuticum* — Elva Link; 3rd *Athyrium georingianum* var. *pictum* — Don Hughes.

Class 15: 3 pans of native American rock plants of distinct genera. 1st *Hypoxis hirsuta, Solidago* sp., *Linnaea borealis* var. *americana* — E. LeGeyt Bailey; 2nd *Cypripedium acaule, Iris cristata alba, Viola pedata* — Gladys Zimmerman; 3rd *Tiarella wherryi, Trillium vaseyi, Phlox stolonifera alba* — H. Lincoln Foster.

Class 16: 1 pan Lewisia. 1st *Lewisia cotyledon* — H. Lincoln Foster; 2nd *Lewisia cotyledon* — Robert Means; 3rd *Lewisia cotyledon* — Marjorie Walsh.

Class 17: 3 pans of Crassulaceae of distinct genera. 1st *Sempervivum arachnoideum* 'Tomentosum', *Sedum spathulatum rosea, Rosularia pallida* — Fran Lubera; 2nd *Sedum spathulatum, Sempervivum* x *cranat, Orostachys iwarenge* — Anita Kistler; 3rd *Sempervivum* 'Quintessence', *Orostachys spinosa, Sedum* 'Capo Blanca' — Marjorie Walsh.

Class 18: Container of 3 or more plants of distinct genera arranged for effect — 1st Fran Lubera; 2nd Joan Means; 3rd Anita Kistler.

Special awards were as follows:

Highest aggregate score — H. Lincoln Foster

2nd highest aggregate score — E. LeGeyt Bailey

3rd highest aggregate score — Fran Lubera

Best in Show: Class 18 — Fran Lubera

Pennsylvania Horticultural Society Silver Certificate: Class 8 — E. LeGeyt Bailey

Delaware Valley Chapter Award: Class 1 — Marjorie Walsh

Connecticut Horticultural Society Award: Class 10 — Mark McDonough

H. Lincoln Foster Award presented by the Connecticut Chapter: Class 15 — E. LeGeyt Bailey

Hudson Valley Chapter Award for Cultural Excellence: Class 7 — Kenneth Wurdack

Eastern Chapter of American Primrose Society Award: Class 4 — G. K. Fenderson

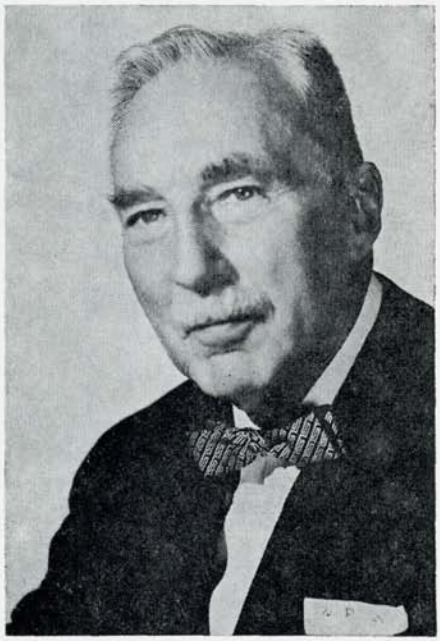
The Smallest Ivy

At the Washington, D.C. Study Weekend, East in 1978, Pam Harper of Seaford. Virginia showed a slide of a truly miniature ivy. *Hedera helix* 'Minima' ('Gnome'). This is much smaller than H. h. 'Conglomerata' and very suitable to the rock garden. Several people asked Pam about it and she distributed a few but found it very slow to propagate. Pam says her plant came from England as 'Minima' and she believes this to be the valid name, being the 'Minima' of Shirley Hibberd, circa 1864. However, a quite different plant (unworthwhile, according to Pam) has been in the American trade for many years under the name 'Minima'. ARGS members, who are interested in getting the true plant as shown by Pam, will find it under the name 'Gnome' at The Alestake, Elkwood, Va. 22718. Their catalog costs a dollar.

Champion of Native Flora:
M. WALTER PESMAN

WES WOODWARD
Drawings from *Meet the Natives*

During all his years in Colorado Walter Pesman studied the native plants of the Rockies, traveling constantly in his spare time, with glass and notebook, in search of every variety growing in the region. After his marriage in 1923 to Anna Elizabeth Hyde, a Denver school teacher, Mrs. Pesman drove the car, stopped when Walter sighted a plant he hadn't recorded, waited while he examined it, and then made notes while he described it. A strong personality in her own right and a wise woman, Elizabeth ably supported and encouraged Walter for the next forty years. Back in Denver Orland Maxson would draw a picture from Walter's description and the dried remains of the plant. All this grew into a book, *Meet the Natives*, which was published in Denver in 1942 and immediately became a popular handbook. It is presently in its 7th edition. (*See Book Reviews*).


M. Walter Pesman

Michiel Pesman was born in Thesinge, Groningen, The Netherlands on May 28, 1887. Growing up, he attended high school in The Netherlands. It was a six year stint in which a student went far beyond the American high school curriculum, went half-way through college, as we measure education. After a year of invalidism in Holland due to tuberculosis, he emigrated to the United States and Colorado. When he applied for admittance to Colorado Agricultural College in 1908, his high school credentials gained him admittance as a Junior.

Pesman found that Americans pronounced Michiel in a way he didn't like: instead of saying "Mi-sheel," as was proper, they said Michael or Mike or called him the Irishman from Holland. So he adopted the middle name of Walter, which suited him and the Americans both. It became official when he was naturalized as M. Walter Pesman.

At "Aggies" he majored in botany, graduating in 1910 and staying there to teach botany to others.

A strong desire to be doing creative work took the young Walter Pesman from college to employment with the Chamberlain Landscaping Company in Denver where he began his career as a landscape architect. Very soon he was making a name for himself as an early advocate of conservation and as an or-

ganizer and leader of affairs in his profession. By 1917 he was secretary of the Denver Society for Ornamental Horticulture and was contributing articles to its publication, *Garden Hints*. And soon he was writing for the Colorado State Forestry Association on a wide variety of subjects. He taught classes in landscape architecture, botany and horticulture at Denver, Colorado, and Colorado State Universities almost continually and the young people who came to hear him loved him for his knowledge, enthusiasm and sense of humor.

BLUE MARSH GENTIAN
Gentiana affinis

In 1930, it was Walter Pesman and George Kelly who took over the job, almost at the last minute before the opening of the first Central City Opera, of clearing the opera grounds of debris and providing an attractive setting. They obtained a truck load of pine trees from the Forest Service, mounted the trees on Christmas tree standards, and buried the stands in the ground. Overnight a grove of evergreens appeared next to the opera house. The next year Pesman and Kelly obtained a collection of ornamentals — spruces, spireas, lilacs and other shrubs from a builder's display house in Denver that was being moved — and transplanted the lot to the opera house grounds, establishing a garden there.

Walter Pesman cared about nature, about his community, and about the people of the whole world, and he was a leader in the organizations that cared about these things. In 1943 he was president of the Colorado State Forestry

FALSE FORGET-ME-NOT
Hackelia floribunda

Association and brought about a consolidation of the forestry, horticulture, gardening and landscaping interests to form the Colorado Forestry and Horticulture Association. He served briefly as its first president and was a member of

FRINGED GENTIAN
Gentiana thermalis

its Board of Directors. He was instrumental in the merging of the organization with the Denver Botanic Gardens, Inc. and he continued to serve actively as a member of its Board of Trustees.

When, in 1954, George Kelly, the editor of *The Green Thumb*, asked for an editorial committee to aid in his work, Walter Pesman immediately assisted in forming the committee and became its chairman. From that time on, for the rest of his life, Pesman worked long and faithfully for the magazine, contributing over 110 articles on all kinds of subjects.

STAR GENTIAN
Swertia perennis

In April 1958 he was invited to speak before the delegates of the Fifteenth International Horticultural Congress in Nice, France, at which he introduced his audience to his favorite subject, the flora of the Rocky Mountain region. Tall, handsome, silver-haired and courtly, aristocratic in appearance, speaking with ease and authority, M. Walter Pesman made a strong impression on the world's assembled horticulturists. The title of his paper was "Little-known Ornamentals from the Land of the Rockies" and in this important paper, Walter Pesman gave Europe and the world a thoughtful report on the flora of the Rockies and suggested that some of the plants native to that area might be induced to live and thrive in more humid climates, even in Europe. He identified the plants and singled out those that should be tried elsewhere. "It is", he said, "an almost

BLUE FLAG
Iris missouriensis

unexplored field of plant introductions." Then, characteristically, he got started on his introduction of Rocky Mountain plants to the rest of the world by distributing packets of seeds of the Colorado Columbine to the delegates.

Reading the reprint of this paper, one is impressed by Walter Pesman's habit of looking into the future. Speaking of the alpine zone conditions found in the Rockies and in Lapland and the Swiss mountains, he said, "It is my conviction that we shall see — in the future — a number of 'cold-houses', in which alpine conditions can be reproduced to a very high degree."

Walter Pesman presented these facts in English. The Pergamon Press reprint is in English, French, and German. If it had been necessary, Walter could have repeated his talk in all these languages and in several others as well. He had even studied Russian although he found little opportunity to use it.

In these later years he and Mrs. Pesman traveled several times to Europe to visit his relatives in Holland, to study Italian gardens, and the alpine flora in Switzerland and Austria. And they went to Mexico, year after year. While in Mexico Walter studied the native plants, as he had done in the Rockies, then went to the botany books and Mexican botanists. Out of these studies, again came a memorable book. *Meet Flora Mexicana* was published in 1962 and was greeted with cheers from the plant lovers. Containing 270 drawings by the author, it has been described by Richard Henry "as a treasure-trove of folklore and history as well as of botanical information."

Recognition for his accomplishments came to Walter Pesman almost too late. Denver Botanic Gardens and the U.S. Forestry Service established on Mt. Goliath the M. Walter Pesman Trail and a similar trail in the Ladder Creek area near Grand Junction was opened later. The Colorado Nurserymen's Association chose Walter Pesman as its Man of the Year in January, 1963, a posthumous award, for Walter had died in November, 1962.

Excerpted by John Worman with permission, from an article in The Green Thumb, publication of the Denver Botanic Garden, Vol. 32, No. 3.

MEET THE NATIVES

by M. Walter Pesman 1942, Denver Botanic Gardens, Denver, Colo.; 7th edition, ringbound paperback. Available from the Denver Botanic Gardens Gift Shop $6.50.

If you want to know what flowers you see when you climb the hills and mountains of Colorado you need *Meet the Natives*. It is a companionable book, making allowance for our ignorance of native plants and leading us, by a simple system of zones, color coding and clear drawings, to the proper identification of over 700 Rocky Mountain plants.

It is for amateurs, as Walter said. He began his introduction: "Just between you and me — don't buy this book if you know too much. It is not a book for botanists. . . ." Says Richard Henry: "The originality of his mind as well as the accumulation of his learning found its way into his classic little handbook."

Perhaps it all might be summed up in the simple words inscribed on a memorial plaque at the Mt. Goliath M. Walter Pesman Trail: "He made the native plants our friends." —W. Woodward

REVISION OF TRILLIUM SUBGENUS PHYLANTHERUM (LILIACEAE)

by John D. Freeman. Reprinted from *Brittonia*, Vol. 27, No. 1, January-March 1975, pp. 1-62, New York Botanical Garden, New York, N.Y.

The above monograph is exceedingly informative but seems to be little known. I am sure others will find it of considerable help, as I have, in untangling the sessile trilliums.

It isn't necessary to delve very deeply into what has been written about the genus *Trillium* before discovering that various sources can't possibly all be referring to the same thing. Any lengthy investigation of the subject is almost sure to leave one wondering if he wouldn't have been wiser to accept the first source as gospel and let matters go at that. There is an unfortunate tendency for "Smith" to quote "Brown" to quote "Jones". If what "Jones" had to say in the first place was more or less garbled, mere repetition does not automatically bestow on his words the aura of truth. Even botanies would seem to have fallen into this trap on occasion. There is an almost standard tendency to fall back on these dried bits of botanical hay so revered by students of plant life.

In an attempt to make order out of chaos, Freeman went to work on the sessile flowered trilliums using both standard materials and fresh specimens from the field. His work represents the latest and most thoughtful attempt to put the information into some semblance of order. He assigns twenty-two species to this portion of the genus, giving scientific basis for so doing. Many of these species have been known under an assortment of names; others have been known but mistakenly included under names to which they patently have no claim. Mr. Freeman's work includes range maps which should be helpful in assigning names to plants observed in the wild.

Freeman, who worked in the East, admits to being somewhat less acquainted with our western sessiles than he would like to be. In attempting to use his framework for our westerners, it is possible to find populations that tend not to "pass the physical", never-the-less, the work gives an excellent set of ground rules as a place to start further study.

There are those who would avoid the issue of things that don't fit by the ostrich approach of declaring a few, very broad specific designations. This may have been satisfactory when the country was new, but now that people are crowding out all forms of wild life, it behooves us to take a very close look at our vanishing plants while there is yet time. Half the battle of saving something is knowing that it's there to be saved. Trilliums, whether they are separate species, or varieties or forms within species, are prone to be extremely variable. It seems time that we gardeners, who specialize in the plants which nature and not man has created, become aware of what we have been missing. A similar in-depth study of the stemmed trilliums would seem long past due. — Edith Dusek

THE PRINCIPLES OF GARDENING

by Hugh Johnson, 1979, Simon and Schuster, New York, $29.95.

Who needs another book on gardening, especially one of the "coffee table" variety that costs $30.00? In the case of *The Principles of Gardening* authored by Hugh Johnson, editorial director of The Garden Journal of the Royal Horticultural Society the answer is simple and straightforward — EVERYBODY!!

Everybody, that is, who cares about

plants and gardens whether they be growers of vegetables and petunias or the proud possessors of alpine houses full of eritrichium and paraquilegia species in bloom; whether they have a back yard to shape up or acres to garden with.

I came across this book inadvertently while supposedly shopping for Christmas presents in an overstocked Fifth Avenue book store. Bewildered and somewhat overcome by the plethora of titles and subjects (there are just too damn many new books), I drifted over to the gardening section for a moment's respite knowing that there was little chance that this particular store would have anything I wanted. And sure enough I was right, it was the same old overdone collection, until my eye caught *The Principles* and I stooped down to give it the flip through that would confirm my suspicions.

Hmmm!! A survey book — "a review of the art, history, science and practice of gardening." Let's look at the alpine section; that will be a good test. WOW!! Good Grief — what pictures! *Daphne striata,* Wilhelm Schacht photographing *Potentilla sulphurea* on an alpine slope, Clarence Elliott peering proudly out of his bunnery, beautiful shots of the rock garden at Edinburgh and a section devoted to highbrow alpines with a picture of *Diosphaera (Trachelium) asperuloides* that was so much of a spellbinder I didn't even notice the beautiful color shots of *Lewisia tweedyi, Phlox nana and Anchusa caespitosa* surrounding it for, weak-kneed from shock, I was groping for the nearest support and trying to read the text.

"The miraculous beauty of some of these plants can only be seen either by climbing the right mountain at just the right moment, or by visiting a show where the crack alpine gardeners are competing. It is not just the plants that are worth seeing but the way they are presented, in hand-made pots that are almost heirlooms, the pot in proportion to the plant, the surface dressed with stones that set off, in color and size and texture, the characters of the 'subject'. Even the labels are considered part of the exquisite still life: the favorite being a narrow ribbon of dull lead with the name embossed, curling round the rim of the pot."

That was *it;* the author, whoever he was, knew what he was talking about and the book was worth getting — if only for the pictures which looked equally impressive under the myriad of other headings. Forgetting about my original intentions of buying books for others, I plunked down the $30, headed home and began to read.

The jacket blurb, in the usual puffy style of the slicker publications, states — "Destined to be a classic *The Principles of Gardening* examines the art and science of gardening from every possible point of view: horticultural, historical, aesthetic, and practical." Yeah — sure!

Well they're wrong! It *is* a classic; and what's more it's the best damn book on gardening that has ever been written. It is a work of genius, beautifully produced, masterfully lucid and pertinent without a wasted word or an inadequate note anywhere in the vast realm that the book covers. (Though at one point the author refers to Adrian Bloom when he means his father, Alan Bloom). If one could only have one book on gardening this would win the prize hands down. It is a bargain, a real bargain, at $30 because it offers so much to the enthusiast whether he or she is a bewildered novice or an acknowledged master of the craft. Don't put off getting your copy for a moment since it can only increase in price once it is out of print.

Why is it so superb? In part because it covers the whole spectrum, leading us from the elements, the wind and the rain, and their effect on the living soil and the roots that must live in it, through a superbly illustrated and condensed analysis of how plants work — to the use of these plants — from bulbs to trees, from grasses to vegetables — in the landscape

— helping us compose the picture by showing us how others have done it. It is all there and is beautifully described. Mr. Johnson's sense of style, his taste in plants, his imaginative examples of how to raise the lowliest annual and the most sophisticated exotic are inspiring. There is no other word for it and one puts down the book the richer for the ideas within it and dreaming at night of the beauty of the photographs and the vistas they open to one's own gardening and landscape future.

Nicest of all, Mr. Johnson really respects alpines and those who grow them. He is a consummate and eclectic plantsman, despite his modest professions to the contrary (his own delightful garden is anonymously rendered in the centerfold on pages 82 and 83) and loving his subject, he embellishes his observations with grace and wit.

"The Japanese live on rainy islands, yet instead of turning their backs on rain as commonplace they revel in it as a sensuous experience. This is the secret of using water, as it is of using plants."

• • •

"Failing the underpinnings a garden really needs to give it its sense of sure foundation, it is better to achieve what you can with flights of fancy and imagination — the art of horticultural theatre."

• • •

The ideal is a garden that fits the habits of the household and at the same time makes the most of its site; that works as outdoor living space and yet uses the relevant resources of nature to make it beautiful, refreshing and inspiring.

The first part is rarely achieved by amateurs; the second not often by professionals.

There is a section on plant introductions, another on garden history, a glossary on the terminology of design and a gardener's directory — an inventory of garden terms, tasks and tools; of gardens and gardeners, garden designers, plant collectors and writers.

What Mr. Johnson has achieved is a timeless bit of perfection that will improve all of us who are touched by and respond to his principles. He has produced something which, in retrospect, has been needed badly and got it all between the covers of one volume (the only omission being the description of a woodland or wild garden as we know it in America). It is a well-executed, edifying tour de force and Mr. Johnson deserves not only a surfeit of author's royalties but a horticulturist's sainthood to boot. — Francis Cabot

More Information Needed

Anita Kistler has reported that there has been very little response to her plea to send her information about individual results with the seed from the Watson-McPhail Expedition to Turkey. She had hoped, and still hopes to write an article for the Bulletin about it if enough information comes in.

Now that winter is approaching perhaps those that received some of the Turkish seed and have not yet responded could find the time to send Anita information on the following: number of shares bought, seeds received, what germinated, grew on, bloomed, lived, died. Also information on how they were planted, where, in what mixture, at what temperature, etc. Please send this information to Anita Kistler, 1421 Ship Road, West Chester, Pa. 19380. Our thanks in advance.

THE LITTLE SNOWFLAKES

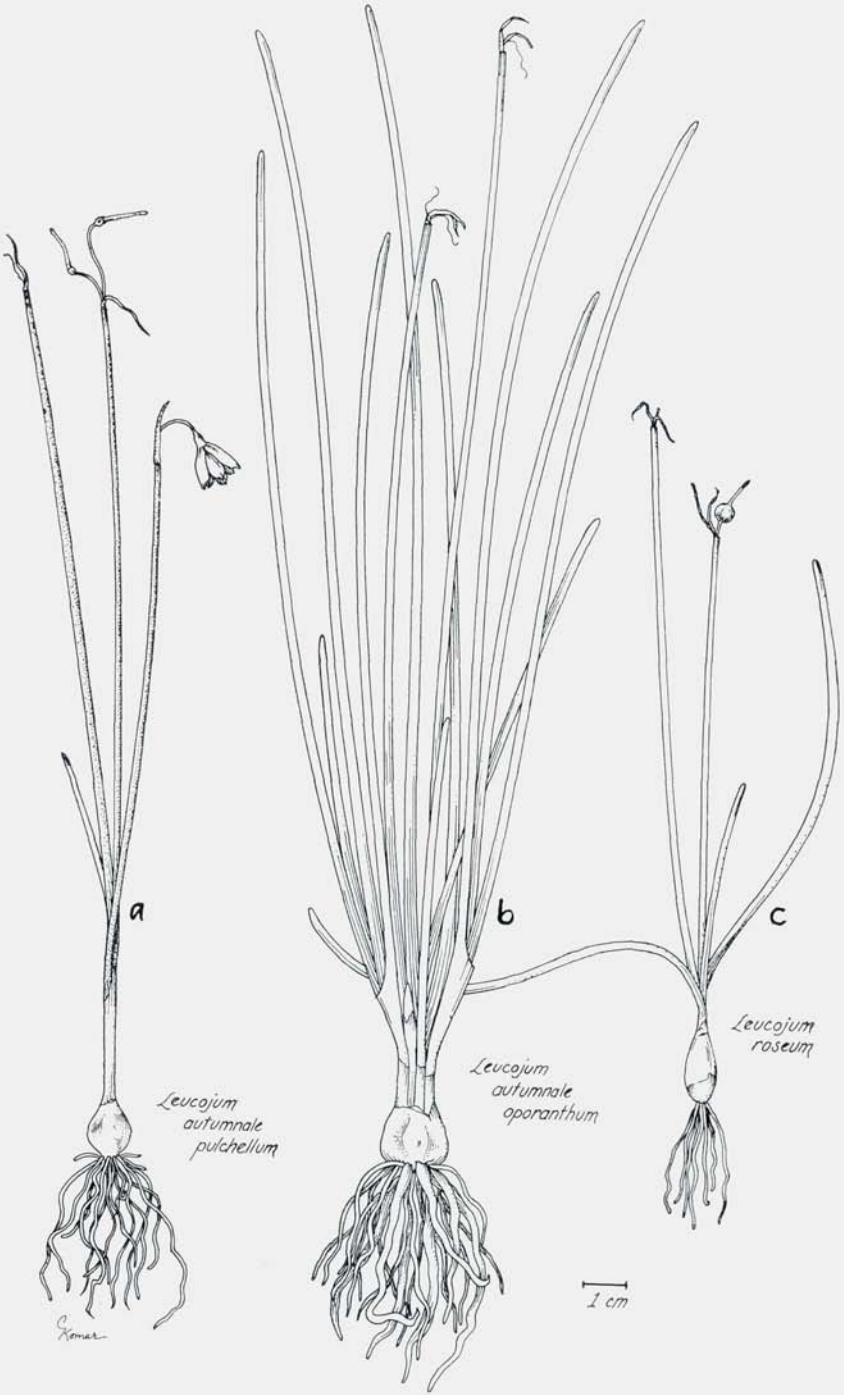
W. J. Hamilton Jr.
Ithaca, N.Y.
Drawing by Cathy Komar, Ithaca, N.Y.

The snowflakes are bulbous plants native to Europe and the Mediterranean region. Not so popular as the snowdrops, to which they are closely related, these choice plants are less often seen than *Galanthus*. They differ from the snowdrops in having all the segments of equal size. The old Greek name *Leucoium* was given by Theophrastus, and is still widely used by British writers. In *Species Plantarum*, ed. 1, p. 289 (1753) Linnaeus described two species, *Leucojum vernum* and *L. autumnale* and in the second edition of this work he added *Leucojum aestivum*. The question whether the genus should be written *Leucojum* or *Leucoium* is answered in Linnaeus's annotated copy of Caspar Bauhin's *Pinax*, p. 55 (1671). In this book the genus is written *Leucoium* but Linnaeus corrected this in his own handwriting and has written *Leucojum*.

Of the smaller snowflakes, *Leucojum autumnale* is more widely grown than all the other species, and is the only reliably hardy one for our northern gardens. It ranges from Portugal to Sicily and North Africa. It has two recognized forms, *oporanthum* of Morocco which has a scape of ten inches or more, and the smaller *pulchellum* of North Africa and the Gibraltar area. The latter is said to produce the leaves and flowers together, but in our garden both varieties exhibit this trait. The distinguishing feature of *autumnale* is the spathe and the larger pedicel which exceeds the spathe in length (fig. a and b). Most writers state that the filiform leaves, numbering up to six, usually appear after flowering. Our plants have vegetative growth much of the year, the leaves often appearing well before the flower stalk. C. H. Gray in his *Hardy Bulbs*, states that it is perfectly hardy if grown in well drained sandy loam, and, to name a flower of its own size, is as charming as *Linnaea borealis*. Its elegant characters are well illustrated in a pot grown plant figured in Stern's monograph of the snowdrops and snowflakes.

The white, rarely pinkish flowers, carried in an umbel, may number three or four, but rarely does more than one blossom appear at a time. They are not unlike a Lily-of-the-Valley flower. Few bulbous plants can vie with this species for length of bloom. We have enjoyed the flowers of *autumnale* for more than three months. There are apparently two clones growing in England, the one profligate with its seed, the other increasing by vegetative means alone, the plant rapidly forming clumps of bulbs.

Another late summer and fall bloomer is *Leucojum roseum*. This diminutive charmer is indeed a treasure, but it demands a bit of cossetting. Seldom growing over four inches, the slender leaves persist throughout most of the year, but since they too are largely evergreen, will not do in our harsh winters. It is a Corsican native, growing in almost pure sandy shores. The tiny petals, flushed with pink are scarcely a half inch long with a comparable width. These are held on half inch pedicels (fig. c). The thread-like leaves persist throughout the year, and are continually replaced as they die off, provided they are not sub-


a
b
c
Leucojum autumnale pulchellum
Leucojum autumnale oporanthum
Leucojum roseum
1 cm

jected to freezing temperatures. Grosvenor (*A.G.S. Bulletin* 1950:136)) tells us that *roseum* flowers in his Cotswold garden from the last week in June through mid-October. He adds that it sets seed freely, and if these are sown, they may be expected to produce flowering-sized bulbs in three or four years. We grow no more exquisite bulbous plant than this elf, but it must be placed where its tiny features can be seen at close quarters. The seed pod quickly swells after flowering, and as it is pendent, the black seeds will quickly drop out and be lost unless kept under daily surveillance.

The Spanish *Leucojum valentinum* is also a late summer bloomer but is rare and little known.

Of the little snowflakes that flower in the spring, *Leucojum nicaeense* is perhaps the best known and most widely grown. Occurring in the Maritime Alps and the Nice-Monaco area, it is restricted to the rocky ground of that area. This is the best of the spring flowering miniature snowflakes. One or two white flowers are carried on the two to four inch scape. Its best field mark is the distinct horny point of the outer flower segments. Most authorities state that the two to four dark green leaves are three to seven inches long. Our bulbs produce narrow leaves that often exceed ten inches.

Leucojum trichophyllum is a lesser known species from southwest Spain, southern Portugal and Morocco. The dependent and campanulate white flowers rarely have a pinkish blush and also support a sharp point at the tip of the perianth segment. This is not an easy doer and presumably needs a summer baking.

Summarizing the experience of our British friends, all of the little snowflakes are of doubtful hardiness in the north of England; *autumnale* is the species most widely grown and undoubtedly the most satisfactory for the outdoor garden. Most are grown in bulb pans and flowered in the cool greenhouse or bulb frame.

How are we to treat these precious little bulbs in our northern gardens? The seed exchanges give us no clue, for seed donors do not indicate the conditions under which their bulbs were flowered. Where are we to get an initial stock? In the past decade, the several seed exchanges have offered *autumnale*, *nicaeense* and *roseum*, albeit they are almost always in short supply. The Alpine Garden Society and the Scottish Rock Garden Club have been more generous in their offerings, even though the packets contain few seeds. For fresh seed, then, the most likely source is directly from one who grows these little bulbs.

Bulbs are not often offered by the trade. Usually *Leucojum aestivum* and, less often, *L. vernum* are the stock in trade. All too frequently the latter turns out to be *aestivum* or even a snowdrop. One overseas advertiser in our bulletin offers *autumnale*. He also carries *L. vernum*, a species increasingly difficult to secure at home. Moreover, his stock is dug fresh, a tremendous advantage over dried bulbs, which so often sulk and disappear.

Years ago I grew *autumnale* from seed. The seed germinated within a month, and the little bulbs grew well in their first summer. My error was in transplanting to the open border in their first year, before they were really mature. The young plant with growing leaves simply could not withstand our frigid winter. The same situation obtained with the less common scillas and ornithogalums. We changed tactics. Several containers of ¾ inch pine were constructed. These measure eighteen by twelve inches and are six inches deep. Several drainage holes are provided and the relatively deep flat is painted with green cuprinol. These are really nothing

other than wooden sinks. Pieces of hardware cloth are placed over the drains and an inch of cinders or broken crocks are are laid in the bottom. A mixture of one third good soil, sharp sand and peat provides a suitable seed bed. The great advantage of such a container over pots is that they are not subjected to rapid drying and can tolerate a bit of neglect. Seeds are planted immediately as they are collected or received, after soaking for a day or two in rain water. If the seed is sown thinly, the plants will not need transplanting for two years. The seed boxes are placed under cool white and warm white fluorescent lights on our cool sunporch, where they get some daylight. A plastic bag from the dry cleaner drawn over the flat will minimize the need for constant attention. A number of writers speak of the long time necessary for germination. Some of our snowflake seeds have germinated in twenty-eight to thirty days, and a good share are up in six weeks. We can expect flowers from *roseum* and *autumnale* nineteen months from seed. Norman Priest of South Windsor, Connecticut writes me that his *Leucojum roseum* is also grown in wooden boxes in a cold greenhouse. He remarks that much is necessary for it to thrive.

When danger of frost is past, the flats are moved outdoors, onto a large table that stands three feet high. Several of these tables are placed under tall red pines, which provide high shade. Direct sunshine seldom strikes the tables for more than half an hour at a time. A variety of containers are placed on these tables. The advantage of growing in this manner is that the plants can be observed and studied at close range.

The light weight of the filled containers make it an easy task to move them about. My heaviest planted containers do not exceed twenty pounds. After the first frost, the containers are moved into an unheated basement garage, adjoining a heated cellar. The temperature varies from 34-35 F. during subzero outside temperatures. The young snowflakes get a bit of light from several windows and remain evergreen, even sending up a slender leaf or two in this cold retreat.

The following spring, *Leucojum autumnale* can be planted in the open ground. I have a stand of a dozen bulbs set in a northern exposure alongside a walk. Snow, even when scanty, can be shovelled over this planting in the early winter. I am not sure such protection is necessary, but the snow has to be banked somewhere. I shall continue to treat the other little snowflakes with greater deference. They are surely worth a little extra consideration.

Winter Damage — Heaths vs. Heathers

On one side of my driveway I have ericas (heaths) and on the other side I *had* callunas (heathers). At the end of last winter, characterized by considerable *(though not extreme)* cold and wind, but very little snow, the ericas were in fine condition, but almost all of the callunas were dead. To my eye the root systems appear identical.

My experience was by no means unique. I would appreciate the thoughts of others on this "puzzlement." *(As would many others in the Northeast. — Ed.)*

— Lawrence Hochheimer, Norwalk, Conn.

THE JOY OF BULBS

Francis H. Cabot
Cold Spring, N.Y.
Photographs by the author

Most of my experience has had to do with growing bulbs under glass rather than in the rock garden and so, with your permission, I shall confine my remarks to those bulbs that we have grown under glass and become particularly fond of because of either their beauty, their reliability or the length of their flowering season. Many of them are easy and familiar old friends; others are more recent arrivals on the scene; several are rarities that are hard to come by and one is brand new and just being introduced to cultivation.

The imaginative use of bulbs, corms and tubers in pots to enliven the alpine house or pit house during the winter months is one of the indelible impressions one takes home from a visit to the gardens at Wisley, Kew, Edinburgh or Munich, or to one of the English or European alpine plant nurseries.

At Wisley on a February weekend the alpine house is filled with enthusiasts of all ages drinking in the harbingers of spring that are spread before them; a Lucullan feast for the plantsman and a joy to anyone who has the least interest in the beauties of nature.

Of course part of the charm is the fact that the pot of that rare colchicum species is placed between a pan of *Jankaea heldreichii* on the one hand and a large bun of *Gypsophila aretioides caucasica* on the other. Or the profusion of bloom in the pot of *Iris histrioides major* is seen to advantage when flanked by a dwarf narcissus, *Saxifraga grisebachii* and a host of Aretian Androsaces.

While only a few twice-blessed magicians can grow the aretian alpines in the climate we live with in most of the United States, any of us can grow the bulbs in pots and experience the same breathtaking results that captivate horticulturists and the public alike in the alpine houses of England and the continent. Neither is an alpine or pit house essential, although it is probably the best way to insure good results, especially if clay pots are used and are plunged in sand. A cool window with an eastern or northern exposure will suffice if nothing else is available. The important point is to provide the coolest temperature short of freezing so that the blooms will emerge at the appropriate moment and will last as long as possible. If the bulb pans are brought into a warm room and exposed to a lot of direct sunlight their period of bloom will be shortened commensurately.

Beside the aesthetic and decorative pleasures given by pots of bulbs in bloom in the house, for the hardy bulbs there is much to be said for the practice of potting bulbs for the first year and then placing them out in the garden the following autumn. By following this practice the species is easily observable and one gets to know its habits intimately. The excitement of the emergence as growth begins is followed by an awareness of the particular bulb's characteristics. Will it ever flower? Do the flowers precede the leaves or vice-versa? What will the flowers look like? The leaves and flowers of *Bulbocodium vernum* unfold simultaneously in orderly fashion. *Scilla tubergeniana* emerges surrealistic-

ally in full flower from the surface of its pot with barely a leaf in sight. The pot of *Cyclamen cyprium* is suddenly filled with blossoms overnight and one waits patiently to find out what the leaves are like.

The apotheosis of flowering is also a most varied and intriguing experience. Crocus blossoms are constantly in motion during the day: tightly furled in the morning, opening gradually as the day progresses, invitingly widespread and receptive in mid-day, then prudently closing again in late afternoon. A boldly striped variety such as *Crocus biflorus* 'Alexandri' or *Crocus chrysanthus* 'Lady Killer' or *Crocus minimus* presents a different aspect at each stage — three blossoms in one — every day, for as long as a month if it is cool enough.

The intimate appreciation thus gained of the bulbs' habits, height, coloring and duration of bloom will prove invaluable when it comes to placing them in the garden the next autumn. Those species that tend to be leggy can be placed appropriately while the dwarfer varieties are saved for the choicest site in the scree. It will be clear that some species are best planted as specimens or in twos and threes in a rocky niche. Others are naturals for mass planting such as the *Chrysanthus* hybrids and *CC. angustifolius* (*susianus*) and *sieberi*.

The majority of bulbs seem to flower just as well the second year, whether left in their pots or planted out. Of course some bulbs are best renewed yearly, whether in pots or otherwise, such as *Iris danfordiae*, which seems never to recover its initial bloom but splits irritatingly into a myriad of bulblets that then annually put up leaves and nothing else. It is sufficiently inexpensive and beautiful however to warrant the annual renewal.

Others, such as the Juno Irises, will multiply but with less dramatic blossoms each year until one divides them and gives the new division a year to regain its former vigor. Some of the choice dwarf narcissus species may not survive being planted out from Zone 5 northward and here there is no substitute for trial and error. For those bulbs that require a summer baking one *cannot* leave them in the garden with our summer climate and one must be prepared to put them under glass in full sun where the pans can become thoroughly frizzled.

The worst problem with bulbs is that they have to be found and paid for. The next problem is to decide what bulbs are of particular interest given the number of genera involved and the myriad of species and varieties.

For the past two seasons we've kept a bulb bloom-list at Stonecrop noting the initial flowering dates and the duration of flowering. Interestingly enough the flowering times in each of the two seasons were quite different until late March but the pattern, succession and duration of bloom were much the same. We're still not clear as to just what made the difference but presumably it had to do with the bulbs' response to moisture and temperature.

A bloom list is a handy thing to have. There are some bulbs that bloom for a very long time while others are fugacious, a kind of flash in the pan so to speak. We have found that there are about a dozen or so trusty, long-flowering species that yield the greatest rewards for our efforts. There are also some of the more fleeting varieties that we can't be without because we find them irresistible. It is probably best to review these bulbs in the chronological order of their bloom.

Colchicum agrippinum is indispensable and starts off the season for enjoying bulbs. With us the blooms begin at the end of August and last well into October, never failing to stop one as one walks by. Pleasantly chequered, and fol-

lowed by short, broad, bluish-green, undulate leaves, the flowers are pinkish lilac with pointed segments that open flatly to a wide funnel shape. Its origin is not known but it is probably a hybrid or clone of *Colchicum variegatum*, which species is found in the Eastern Aegean Islands and Western Turkey up to 4500 feet and which, alas, is not readily available in cultivation. In the garden *Colchicum agrippinum* is said to prefer a dryer and sunnier and more sheltered location than most *Colchicums*.

Colchicum sibthorpii (latifolium) is another interesting chequered autumnal species. It grows in profusion in the mountains of Attica in Greece.

Contemporaneously with colchicum the autumn-flowering cyclamens come to life, after enjoying a dry, mid-summer rest period, and begin that happy progression that keeps our interest up until the following May with a new species blooming almost every month.

Cyclamen cilicium blooms at Stonecrop from late August into November, its elegant lilac-veined flowers giving off a honeyed scent reminiscent of its homeland in the coniferous forests of southwestern Turkey. A variety commonly (but not botanically) known as variety "alpinum" is one of the smallest of all the cyclamens and an unending source of pleasure. It was found by E. K. Balls among limestone rocks at Burujik near Asia Minor in 1934. The whitish flowers are half the size of *cilicium* and are distinguished by a pale grey veining, beautifully set off against the scalloped-edged, kidney-shaped, brownish-green leaves. Unfortunately variety "alpinum" has no scent.

Another related species is *Cyclamen mirabile*, which blooms for us from mid-September into early December and which is delightful. Quite similar to *cilicium* it is distinguished by its kidney-shaped leaves with a median zone of pink or silvery-grey markings on their upper surface.

Cyclamen neapolitanum (or *hederifolium* as it is now called) is a much more familiar species and is one of the few species that can be grown outdoors in northeastern American gardens. Its availability in no way lessens its charm or beauty, however, and there is always the hope that a seedling will turn out to be a distinctive and appealing form of this highly variable species.

The autumn-flowering *Crocus* are another mainstay of October. *Crocus banaticus*, which is also known as *C. byzantinus*, and *C. iridiflorus*, hails from Roumania and grows in moist meadows and woodlands. The distinctive habit of its long outer segments flopping outwards in full sun while its shorter inner segments remain erect give it an iris-like appearance. Its flowers vary from white to deep purple with its pinkish forms particularly attractive.

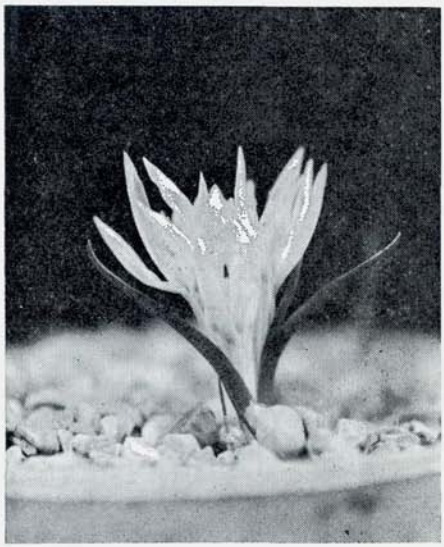
Crocus medius is a highly satisfactory autumn bloomer, a lot dwarfer and choicer in my opinion than its contemporaries *Crocus sativus* and *speciosus* which tend to get rather leggy. It is generally similar to *sativus* in its colouring and has a brilliant red style that contrasts well with its yellow anthers. In keeping with the environment of its southern French and northern Italian habitat it thrives best of kept somewhat dry in summer.

Around the first of November *Crocus laevigatus fontenayi* comes into bloom and keeps plugging away into January, one of the two or three bulbs that wish us a Merry Christmas and Happy New Year. Not only does it bloom its head off but it increases readily so that one soon has several pots of different-sized bulbs growing on for the future. Though *C. l. fontenayi* does perfectly well planted out doors, if its winter blooming habit is to be enjoyed indoor treatment is, of course,

necessary. Its feathery orange stigmata, white anthers and yellow throat are a cheery sight when the wind is howling and the snow beginning to fall. Remember that it is endemic to Greece and needs that summer baking to do its thing.

A week to ten days after *Crocus laevigatus fontenayi* appears on the scene a friendly if tousled species, in appearance roughly somewhere between colchicum and bulbocodium, pokes its head sheepishly above the pebbly surface of its pot and then proceeds to hang around until early March — that is four long months — the longest blooming bulb of the lot. I started out with a rather patronising attitude towards *Merendera trigyna* often passing it by or cutting it dead. Over the years, however, I've become emotionally attached to this frazzled waif and discovered that it is a true friend with a heart-of-gold despite the fact that it looks hung over much of the time, especially on New Year's morning. The thing is Merendera has no illusions. It's aware of its homeliness and has developed that inner peace that comes from accepting oneself the way one is and not giving a damn that all sorts of alluring good-lookers are about to burst on the scene in mid-February. Now I'm hooked by Merendera's ingratiating ways and by its disheveled cheerfulness during the dog days of winter and the most extraordinary thing is that when I began to care about it I swear I noticed a response and an extra effort to shine on its part. But perhaps I am just dazzled by the luminous soul that lurks within its swollen corm and that responds so well and so gratefully to a thorough baking in summer to remind it of its native haunts in Turkey and Iran and Daghestan.

The third bulb to tide us over the holidays is *Narcissus cantabricus monophyllus*, which starts blooming at Stonecrop in mid-December and which is the first bloom that carries with it a whiff of spring. In keeping with its North African background it thrives on a summer baking and blooms into early March, its pale yellow flowers a harbinger of the *Narcissus bulbocodium* group to follow from *nivalis* to *remieuxii* to *tenuifolius*.



Merendera trigyna

Within a week after New Year's Day signs of life invariably appear in the many winter and early spring flowering varieties of the *Cyclamen coum* and *vernum* group. In most cases the buds of these cyclamen lie formed but furled waiting for January to pass by. In the case of *Cyclamen ibericum*, however, there is no such hesitancy and by mid-January its attractive pink flowers with their pale purple "eyes" are beginning to dance just above its silvery heart-shaped leaves preparing to bloom away until well into April. We have had pans of *Cyclamen ibericum* at Stonecrop untouched since the early 1960's that bloom brilliantly every year. In terms of abundance and duration of flowers no other winter cyclamen can touch it and one is

in need of colour in January to tide one over until the glories of the crocus flush in mid-February.

At this point it becomes harder to pick favorites or even to keep track of what is coming into bloom. In the Stonecrop pit house the crocus bloom from early February to mid-March with the *chrysanthus* and *sieberi* varieties winning the longevity race every time. They are easy, inexpensive and unbeatable. What more can one ask?

The first crocus to fulfill its promise in the spring is *Crocus sieberi* and it looks as well in a pan as it does in the garden where it naturalizes more readily than any other crocus. Easy as pie in cultivation it is found wild in the Greek islands and mainland and in Crete with the common form originating in the mountains of Attica and Mount Parnassus.

Crocus chrysanthus is found wild in Yugoslavia, Bulgaria, Greece and Turkey while *Crocus biflorus* ranges in variable forms from Italy to the Caucasus. Most of the chrysanthus hybrids have resulted from crossing the two species. One of the most attractive variations of *biflorus* is *Crocus weldenii*, from Dalmatia, a delicately coloured, stellar performer but, alas, one that is not as long-lived as the others.

Other crocus that stand out among the myriad species include *Crocus alatavicus*, a rare, expensive and choice species inducing patience in the grower as one waits for the bulbs to multiply. The whitish flowers are stippled with greyish-blue. This lovely bulb is found in the Ala-Tau Mountains near Tashkent and in the Pamir-Altai Mountains and, in our humid clime, insists on the parched baking in summer that is characteristic of its homeland. With us it blooms from about February 15 to March 7, but its beauty is such that we are grateful for every bit of this short glimpse of Central Asia.

Crocus corsicus is another short-lived beauty and is native to the rocky hillsides of Corsica. Its outer segments are a pale lilac buff heavily feathered with purple, while its inner segments are lilac-mauve, with the scarlet style and yellow anthers set against a whitish or pale lilac throat. One of the best of the lot, it blooms in the pit house at Cold Spring from February 21 to March 7 and requires a drying out in summer.

Crocus minimus is also endemic to Corsica and related to *Crocus corsicus;* but it often has completely dark purple outer segments much as in the case of *C. chrysanthus* 'Ladykiller' or *biflorus* 'Alexandri'. (In all three it is a show-stopper combination.) However, *C. minimus*, as one might expect, is half the size of the other two. Again, bake it well.

What a sight the flora of Corsica must be in early spring with those two species running up high in the mountains and *Morisia monantha* sheeting the rocky beaches.

Crocus scardicus, found near melting snows in the high mountain pastures of southern Yugoslavia, is a luminous yellow-orange. I don't know when or for how long it blooms since I haven't yet been able to obtain it.

Once the crocus are under way the bulbous iris are not far behind and here the longest single bloomer is that old faithful *Iris histrioides major* which lasts for almost a month from February 15 to March 12. Wild in Asia Minor and northwest Persia, Patrick Synge has likened it to a sturdy little blue oak with its squat habit and large horizontal flowers which have the grace to bloom before any leaves get in the way. Used for hybridising with *Iris reticulata*, its most interesting hybrid form is *Iris* 'Katherine Hodgkin', the result of a deliberate cross made in E. B. Anderson's garden in 1955 with *Iris danfordiae* as the pollen parent. This choice iris should be repotted reg-

ularly since, like its parents, it divides into many small bulblets that need to be grown on to flowering size.

The *Iris reticulata* forms are colorful and, while any given form does not bloom for as long a time as *Iris histrioides*, by planting all the varieties one can achieve a succession of bloom over a longer period. 'Springtime' and 'Clairette' are early bloomers, 'Wentworth' and 'Cantab' follow and 'Harmony', 'Jeanine' and 'J. S. Dijt' complete the cycle, which lasts for four weeks at Stonecrop.

The most thrilling of all the bulbous iris that we have tried is *Iris* 'Sindpers', a hybrid of the Juno Section developed by Van Tubergen between *Iris sindjarensis* and *Iris persica*. The bulbs are enormous and require a deep standard pot and intensive summer baking. The blooms last for only ten days, usually in the first half of March, but the impact of their low, four to six inch wide pale, irridescent azure blue standards with yellowish-green and orange markings on the falls is an unforgetable sight. *Iris* 'Sindpers' is easier and more satisfactory in cultivation than either parent and we find that it increases slowly but surely and benefits from division every third year. Unfortunately its rarity makes it very expensive. We hope to have surplus bulbs for distribution at Stonecrop in 1980. Both parents come from Asia Minor, especially Iraq and Iran.

Iris winogradowii, a rare and beautiful species that grows in the Caucasus near Tiflis, is one that hasn't yet bloomed for us under glass. It is said to be very hardy so we are trying it outside this winter in hopes of success.

With the advent of the dwarf narcissi in mid-February we know that the bulb season under glass has begun to run its course and that we soon will be examining the garden to see how it has come through the winter. In the pit house we have found that three varities provide the greatest and longest show. *Narcissus asturiensis* (minimus), an eary indestructible minuscule trumpet daffodil that never fails to give its all and which blooms from February 18 to March 20; the distinctive *Narcissus cyclamineus*, which blooms from February 18 to March 25; and the tiny jonquil *Narcissus rupicola* with its solitary deep yellow flowers that is found up to 6000 feet in the wild and which blooms from March 12 to April 12 under glass in Cold Spring.

Iris 'Sindpers'

I'd like to conclude by reviewing a few less well-known species and genera that seem to give pleasure in the rush of spring in the world of bulbs under glass.

Chionodoxa sardensis from the Anatolian mountains of Turkey is inexpensive and worth seeking out. Rare in cultivation it has a deeper blue than the more commonly used varieties.

Hyacinthella dalmatica is a perennial favorite at Stonecrop. Most of the species in this genus have been included in *Hyacinthus* or *Bellevalia* in the past.

Found on the limestone 'karsts' of Dalmatia near Dubrovnik we are surprised it is not more generally available. Rupert Barneby says that it is as hardy as nails in our climate. Its subtly shaded bright mid-blue spikes give much pleasure in the first weeks of April. We are hoping in time to grow surplus stock from seed.

Ornithogalum balansae is one of the more attractive members of the genus growing no higher than four inches. It is found in the Pontic Alps, blooms under glass for most of March, and should be used more widely in gardens.

Scilla tubergeniana (or *mischtschenkoana*) is neither rare nor overly expensive but is certainly one of the ten best bulbs for growing in the garden or under glass. Found in northwestern Persia and the southern Caucasus its flowers open as they emerge from the ground and are rather similar to *Pushkinia scilloides*. But we find it far more attractive than the latter with its very pale bluish-white flowers with narrow central band down the center of the back of each perianth segment. No garden should be without it. Under glass at Stonecrop it blooms from February 12 to March 7.

Even though *Anemone blanda 'White Splendor'* gets rather leggy under glass and does not show itself to advantage, it has to be included in this sort of review as one of the great tuberous plants for the garden. Planted in full sun in as large a mass as possible it is irresistible.

And this brings us finally to *Corydalis*, another tuberous-rooted genus that is ideal for growing under glass.

Corydalis cashmeriana, if one can obtain a tuber, grows readily and happily under alpine house conditions. At Branklyn near Perth, Scotland, it relishes the cool damp, peaty, partly shaded conditions of that superb garden and, under the impression that it is still in the Himalayas, seeds itself about profusely.

A very attractive Japanese species is *C. ambigua*. Growing about six inches tall, it has, in its best forms, blossoms of sky blue (not unlike those of *C. cashmeriana*.) They can also, alas, be of various shades of muddy mauve and from seed one can never be sure whether one has a treasure or a dowd until it blooms. It is, on the whole, an easier plant than *C. cashmeriana* and does well in a pot in the alpine house and, I understand, in cool, peaty situations in shade in the garden.

Corydalis diphylla is another Asian species; in this instance found up to 12,000 feet in the mountains of northwestern China and the western Himalayas. With us it thrived under glass but succumbed when placed in the garden since it probably needs a dry summer dormancy.

Corydalis ochroleuca is an easy, hardy species from the countries bordering the Adriatic and makes a fine mass of dissected leaves and long-lived flowers twelve inches high in the shade garden or the partly shaded border. It is also delightful as a young plant under glass with its clean refreshing racemes of yellow and white flowers.

Corydalis solida is a popular and easily grown species that grows throughout much of Europe with variably coloured flowers. Taxonomists differ on whether it is synonymous with *Corydalis bulbosa* or *Corydalis cava*, but there is no argument about its beautiful form, known as *transsilvanica*, a charming plant with pinkish terra cotta flowers. It was found in Roamania and provides a striking bit of color in the alpine house. It took me five years to get a tuber and then it was inadvertently heaved out while dormant in the belief it had died. For the past three years I've been back on the waiting list, to no avail so far.

Corydalis wilsonii from central China with its canary yellow flowers and fine bluish-gray foliage is another gem and

one that we see more and more on the show bench in the U.S.

At the beginning of this review there was a reference to a plant that is just being introduced to cultivation.

One of our excursions in the Caucasus in recent summers took us up the Ardon River gorge to the Tzei Valley on a side range on the northern flank of the Central Caucasus. Known as the "Pearl of the Caucasus", Tzei is one of the principal mountaineering centers in that impressive series of mountain ranges and is surrounded by four great peaks which rise to about 15,000 feet. The cliffs flanking the glacier that pours into the Skazky Valley, one of the two terminuses of the Tzei Valley, were skirted with *Rhododendron caucasicum* and abounded with many forms of *Primula amoena* and with *Primula bayernii* of the Nivalis Section.

While scrambling back down the scree to make our rendezvous for the homeward trip I slipped and sat down unexpectedly. Being rather myopic, it was only from this undignified position that I noticed that the entire scree was dotted with a tiny corydalis similar to but somewhat paler than *Corydalis cashmeriana*, a delphinium rather than an electric blue.

When we got back to our agreeable hotel in Ordzhonikidze I looked through what literature I had with me and announced that we had seen *Corydalis caucasica*. I mentioned this to John Watson on our way back home and, subsequently, he was kind enough to send me the references to *Corydalis caucasica*, *conorhiza* and *alpestris* from the Turkish flora. He wrote that the description of the plant "set his pulses racing" in hopes that it would turn out to be *Corydalis alpestris* (and I quote) "a marvelous species that we badly need in cultivation, and I, for one, shall remain restless until we get it."

From the references in the Turkish flora I have no doubt that this plant is in fact *Corydalis alpestris* and that it will respond to the same treatment as *Corydalis cashmeriana*. If the tubers survive their period of debriefing in the Ingwersen nursery then there will in fact be a very new bulb, or rather tuber, in cultivation eventually, one that should ultimately give us all some joy.

Callirhoe Involucrata

This is a minor postscript to Timmy Foster's article on *Callirhoe involucrata* in the Bulletin: Volume 35, p. 74.

August 1978 for the first time we saw *C. involucrata* in glowing color in Henry Fuller's garden. (Perhaps the plant is not better known because we all do little garden visiting during the summer.)

Two small transplants, moved to our rock garden, behaved like puppies and died without blooming, but a lurking seed produced *one* healthy seedling the following year — spring of 1979. It grew and grew and grew and bloomed and bloomed and bloomed. There were often fifty blossoms at a time.

We explored the 1977 Seed List to find there were three donors of *Callirhoe involucrata* seed that year. This note is to alert interested readers of the Bulletin that we plan to collect our seeds for the Seed Exchange in order that many of you can grow this gay floriferous charmer. —Dorothea De Vault, Monroe, Connecticut

In Praise of *Daphne arbuscula*

Dr. Alexej B. Borkovec
Silver Spring, Maryland

Dr. Borkovec has offered a proposal to help us familiarize ourselves with unusual but not difficult plants and we are glad to try to put it into effect. The Bulletin will welcome brief articles of one to two pages (double spaced typing) about plants seldom grown in our gardens yet not of difficult culture. The format for such an article should include a description of the plant: its habit, foliage, flowers, and fruit, if any; its native habitat when possible; its culture in your garden; propagation methods, and a short paragraph of comments about its use, special charms, or problems, if any. Pictures, preferably black and white photographs or line drawings, would add considerably to the value of such articles.

The author should, of course, be thoroughly familiar with the plant in question and have grown it for several seasons and should be certain that it is identified by its correct name. You should not worry over much, however, about whether it will grow as easily in other gardens as it does for you. Your name and address at the top of the article will give readers a clue as to where it does *do well and they should be able to take it from there using the hints supplied by your cultural advice.*

Dr. Borkovec's own article on Daphne arbuscula *is an excellent example of the kind of thing we want. — Ed.*

Daphne arbuscula is one of the smallest daphnes in this large genus of ornamental shrubs. My oldest, ten year old plant is 15 cm. tall (6 inches) and 25 cm. wide (10 inches), though much larger and possibly ancient specimens occur in the small region of Czechoslovakia to which this plant is endemic. From a central rootstock rise numerous reddish brown stems bearing toward their ends small, shiny, dark green, leathery, lanceolate leaves that persist for several years. Because new growth starts from the center of the plant, the overall appearance is that of a dark green mound. Lilac, strongly fragrant flowers are in terminal heads that cover the entire bushlet for about two weeks in April. However, smaller clusters of flowers keep appearing for nine or ten weeks thereafter, occasionally until November. Seed capsules form and drop off so soon after flowering that seed is difficult to collect.

In my garden, located in the Maryland suburbs of Washington, D.C., *D. arbuscula* thrives equally well in acid or alkaline soil consisting of crushed stone, loam, and leaf mold (3:1:1), but always exposed to a minimum of six hours of sunlight. *(It is also completely hardy in northwestern Connecticut where it has withstood temperatures of —20°F. with no snow cover or other protection — Ed.)* It dislikes being crowded by other plants and prefers a somewhat elevated open location with a free flow of air. Established plants are exceptionally tolerant of heat, high humidity, and drought as well as winter wetness and subfreezing temperatures. However, heavy wet snow may cause considerable damage by splitting or breaking older branches.

Although propagation from seed is possible and reportedly easy, my only experience is with cuttings. Except for the fresh green wood, 4 to 8 cm. (1½ to

3 inch) long cuttings can be taken with or without a heel in spring, summer, or early fall and kept for five to six weeks in a closed cold frame or, more reliably, in a small box covered with a polyethylene sheet. In such a box, sharp sand is a perfect medium requiring only one initial soaking with water. It should be kept out of the direct sun. Strong, but brittle, fleshy roots form rapidly with or without the use of a rooting compound, but great care must be taken not to damage these when the rooted cuttings are transplanted from the sand to small pots filled with regular soil mixture. The pots should then be gradually introduced to full sun and watered regularly. In three to four weeks, the plants can be transferred to their permanent location where they will flower the next year.

In my garden, *D. arbuscula* is one of the easiest and most satisfying of small shrubs, impervious to insects and diseases. Perhaps its only drawback is the somewhat ordinary color of its flowers. However, since the Czech botanist Halda has described several more exciting color variations, there is a hope of obtaining even better forms of this outstanding plant.

• • • *of Cabbages and Kings* • • •

Here in the Northern Hemisphere the sun has been steadily slipping south as the summer advances and now its rays are less direct, temperatures are gradually sinking and the days draw in. To this cooling and shortening of daylight hours the inhabitants of the plant world respond according to their kind.

Annual plants, having bloomed and set and scattered the seed of future generations, will shrivel to dry husks with the first hard frosts, their brief life span over, but perennial plants, in order to survive the cold months, are preparing for winter dormancy.

Many reduce transpiration by discarding the lush green leaves they produced in spring to take advantage of the long, warm, sunny days of summer for essential photosynthesis. Here in New England, deciduous trees and shrubs flame briefly in mid-October with the phoenix-fire of autumn. The conflagration spreads from the cooler lowland swamps until the hills, too, catch fire and burn scarlet, crimson and gold before the leaves fall like spent embers to the ground below. Herbaceous perennials lose not only their leaves but also their soft top growth, though not as spectacularly. In some it dies away completely leaving only a resting bud at or beneath soil level; in others the leaves and stems retreat to a winter rosette close to the ground where it is out of the wind and can receive some remnant warmth from the earth and, in most seasons, protection of winter snow.

Though evergreens do not reduce the surface from which transpiration takes place, some change the color of their leaves in winter. These may turn darker or redden with anthocyanin, which permits them to absorb more readily the warmth of the sun's weak rays.

Both evergreen plants and those that reduce their above ground tissues must make additional adjustments in order to survive the icy blasts of winter, however. They "harden off", a complicated process entailing physical and chemical changes within the cells. The protoplasm — the essential substance of the cell — develops low structural viscosity to better

withstand the deformation of freezing and the cell walls themselves become more permeable to permit the rapid resorption of water from melting intercellular ice crystals. The free water content of the tissues decreases and there is an increase in the soluble proteins and sugars, which act as an anti-freeze, in the sap. There are, in addition, small increases in osmotic pressures within the cells, which may enable them to more readily absorb moisture from frozen soil. All these techniques increase the plant's ability to withstand dessication as well as frost. It is essential that plant tissue stay moist if the plant is to remain viable. This is one reason a snow cover is so helpful to wintering plants.

But in addition to these ploys that help the plants withstand the winter months, other more long range preparations are going forward. Growth buds, wrapped in protective layers of scales, sometimes waxed, varnished, or wooly to retain moisture in the vital tissues, are being formed in readiness for the next growing season, and food is being stored in roots and overwintering stems and leaves in preparation for the resurgence of spring.

And just so the gardener, too, must look ahead. In addition to cleaning and putting away his tools, battening down the storm windows, renewing the woodpile, and getting the winter woolies out of moth balls, he should prepare for the next season of growth. While the garden is dormant and, with luck, muffled in snow, he should not settle into indolent waiting. Winter is the time to store his mind with information about new plants to try.

In the waning days of autumn the gardener should start collecting beside his easy chair: paper and well sharpened pencils for taking notes, books for reference, and plant lists and catalogs. He should try to track down those books he wants in his library for permanent reference: those in print, from his bookstore or directly from the publishers; those no longer in print, from second-hand bookstores or book finders. He should borrow from his friends, his lending library, or the ARGS-PHS Library Service those books he wishes to examine for possible purchase, or check through, but not necessarily own. (The newly published Brooklyn Botanic Handbook on Rock Gardening, written by ARGS members, contains a list of useful rock-gardening books — order it from your ARGS Store.) In addition to collecting books, he should send to the advertisers in our Bulletin for their catalogs, which frequently make for informative and exciting reading during the non-gardening months, and he should send in orders for those new plants he wishes to try. He should buy Bernard Harkness's *Seed List Handbook* from Your ARGS Store and check in it those seeds we wishes so he'll be ready to send in his order as soon as the lists arrive from the seed exchanges. Those fortunate enough to have a file of back copies of the Bulletin, should get them down from the attic and dust them off. They make wonderful winter and bedside reading and are full of useful first-hand information. And he should always keep that pencil and paper handy for taking notes.

Now that Autumn is here — Prepare for Spring.

Note on Robin Hill Azaleas

Dorothea De Vault of Easton, Connecticut sends in this added note concerning Robin Hill Azaleas:

In the Winter issue of the Bulletin, 1980, George W. Ring in his fine article "Small Rhododendrons and Azaleas for the Mid-South" includes Robert Gartrell's Robin Hill hybrids.

Fortunately no one told us they were good plants for the Mid-South, otherwise

we might never have planted them in our Easton, Connecticut rhododendron garden where they seem to be reliably hardy. George Lee sold us our Robin Hills and was to gather a collection of the best for us but since his death we have failed to acquire more.

We agree with Mr. Ring that 'Nancy of Robin Hill' *is* one of the best. The notes in our garden diary describe others we own: 'White Noon', flowers three and a half inches; 'Glendora', delft rose; 'Watchet', ruffled pink; 'Laura Moreland', dawn pink; 'Lady Louise', empire red; 'Frosty', one of Lee's favorites; 'Mme. Mab Chalon' and 'Antoine', no description but whose adjectives, Mr. Gatrell's or Mr. Lee's, we do not know. However, the diary comments, "Like them *all*."

The flowers are unusually large *but* what pleases us most is their late blooming habit into the first week of June.

I must add a sad note. The population explosion of the Connecticut deer herd has accomplished a decided pruning job on our azaleas, so of late we scarcely see a bloom on our Robin Hill beauties.

HOLIDAYS FOR FLOWER LOVERS
A 1981 PREVIEW

Some of the holidays outlined below combine an interest in sites and flowers while others are primarily for gardeners and botanists. All are suitably accompanied. Full details, with final dates, prices and names of tour leaders, will be available in October. Please do write or telephone and you will receive the information directly it is available.

JORDAN & SYRIA—17 March to 1 April

Although the itinerary of this tour is planned round archaeological sites and crusader castles, it should be emphasised that the wild flowers in spring can present an outstanding spectacle, and that plenty of time is allowed to enjoy and photograph them. Places visited include Amman, Jerash, Petra (where three nights are spent) Madaba, Kerak, Oamascus, Palmyra, Aleppo, Qala't Sema'n, the Krak des Chevaliers and Bosra.

GREECE—The Peloponnese—25 March to 9 April

An equal stress is laid on sites and flowers on this holiday, which covers the countryside of the Morea from Athens as far as Pylos in the south-west corner, and the mountains in between. **A tour of NORTHERN GREECE is also planned, highlighting Olympus and Parnassus, from 29 April to 13 May.**

RURAL TURKEY—15 to 31 May

This original holiday is of equal interest to those who enjoy visiting new places and sites and to flower and country-lovers. The first two days are spent in Istanbul at a hotel on the Bosphorus, then on to Lake Abant, Ankara, Bogaskoy and Akseray from which we explore the Peristrema Valley. Here, in a long, narrow gorge, are to be seen painted rock-cut churches of about the same period of those at Goreme and where, in the opinion of many, the art is of an even higher quality. This wild, scenic country should provide a fine variety of botanical specimens and splendid photographs. The tour ends at Bursa, with its fine mosques and attractive market plus, as a bonus, rare plants on nearby Ulu Dag. **A tour of SOUTHEAST TURKEY is planned for later in the year.**

ZIMBABWE—July/August

A three-week holiday of special interest to mountain flower enthusiasts includes a week in the Eastern Highlands of Inyanga and Vumba, a stay in the Bumi Hills near Kariba and two days at the truly remarkable Zimbabwe ruins at Fort Victoria. We also visit the Victoria Falls, Bulawayo with its fine museum and Salisbury. A recent tour of exploration has shown that hotels are good (some excellent) and the countryside superb.

HOLIDAYS FOR ALPINE GARDENERS—May and June/July

These cover the Spanish Pyrenees, the Swiss Alps and the Dolomites in Italy and, further afield, South Africa in September and treks in Nepal and Kashmir.

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