

Bulletin of the
American Rock Garden Society

VOL 47

FALL 1989

NO. 4



Foreword

For a few weeks this summer, I found it impossible to garden. A tremendous lethargy crept through me and the simple joys of working with plants and the soil ceased for a time. What did remain, though, was the same sense of wonder on seeing the first bloom on a new plant or new seedlings in a seed pot which has been with me for the 30 plus years I've been gardening. During the hiatus of spirit, I reflected on the continuum which make a gardener, from the first brush with nature as a child to the more sobering awareness that gardens and plants (as well as people) need care and nurturing to be at their best.

Time helps. But there's nothing like need to loosen the grip on sloth. Now with the short days of fall upon me, I've begun to pick up the pace, re-covering the greenhouse, collecting seed, planting those innumerable pots which seem to gather at the doorstep of every collector. Just maybe, I'll be ready to move inside when the inevitable winter rains settle in for good.

This is the last issue of the *Bulletin* which I will be editing. I would like to thank those of you who have provided very special help during the past year.

Ted Marston

On the Cover: *Caltha palustris*, from a copperplate by Abraham Munting first published in 1696

Published quarterly by the AMERICAN ROCK GARDEN SOCIETY, a tax-exempt, non-profit organization incorporated under the laws of the state of New Jersey. You are invited to join. Annual dues (*Bulletin* included), to be submitted in U.S. funds and International Money Order, are: General Membership, \$20.00 (includes domestic or foreign, single or joint — two at same address to receive one *Bulletin*, one Seed List); Patron, \$50.00; Life Member (individual only), over 55, \$300; under 55, \$350.

Membership inquiries and dues should be sent to Buffy Parker, 15 Fairmead Rd., Darien, CT. 06820. Address editorial matters pertaining to the *Bulletin* to the Editor, Ted Marston, 13036 Holmes Point Drive, Kirkland, WA 98034. Address advertising matters to Anita Kistler, 1421 Ship Rd., West Chester, PA 19380. Second Class Postage paid in Darien, CT., and additional offices. Postmaster: Send address changes to *Bulletin of the American Rock Garden Society* (ISSN 0003-0864) 15 Fairmead Rd., Darien, CT. 06820.

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Calendar of Coming Events

Eastern Winter Study Weekend (Piedmont Chapter)

Sheraton Imperial Hotel

Research Triangle Park, NC.....Jan. 26-28, 1990

Western Winter Study Weekend (Northwestern Chapter)

Red Lion Inn, Bellevue, WAFeb. 23-25, 1990

Annual Meeting (Western Chapter)

Cal-Neva Lodge, North Lake Tahoe, NVJuly 12-15, 1990

The Rock Garden in Fall

Geoffrey Charlesworth

At the very end of summer through the first half of September the soft orange flowers of *Kniphofia galpinii* light up the garden. They bloom well into Fall lasting with the lilac and white goblets of *Colchicum speciosum* until a really heavy frost spoils the flowers. During September the leaves of the trees surrounding the garden are changing color and no modest rock garden plant can compete effectively against them. Occasional flowers on all kinds of alpines go on and off like Christmas lights in slow motion - a primula here, a delphinium there. A draba has a flurry of a dozen flowers opening on the sunniest of cold October days. But these are anomalies - a free bonus, unplanned and unplannable.

The flowers you can depend on for September and Fall bloom are the aster family. One really has to discount the Garden Center Chrysanthemums (mums) as anything but the Fall equivalent of Garden Center petunias. If you use them, it is to fill a blank spot with strong color. If you are a Savings Bank or a University, you could make a whole bed of them in the space that had tulips in Spring and Marigolds in Summer. There are Chrysanthemums that are good perennials and one or two around the garden is a good idea. For instance *C. rubellum* 'Mary Stokes' (peach X ginger) or *C. r.* 'Clara Curtiss' (raspberry X lilac). The really large 'decorative' Chrysanthemums look out of place anywhere in the open air. There are some useful species too, *C. morifolium*, some of the plants labeled *C. weyrichii* might still be in flower, and *C.*

lactea and *C. nipponicum* are late bloomers.

There are four or five kinds of plant that bloom in the garden in the Fall. First there are the leftovers of late summer. An *Adenophora* or an *Inula*. *Lobelia siphilitica* and *L. cardinalis*, *Zauschneria californica* and a few penstemons might still be in bloom. There are remembrances of things past, not always lovely here but further south they could be in full beauty. Other 'leftovers' are annuals. These are more satisfactory on the whole than perennials if all you want is a splash of color. Annuals are having a last fling in their efforts to make seed and close down for good. *Phlox drummondii* goes on and on for instance. So do *Psilostrophe tagetina*, *Erysimum canitatum wheeleri* and *Machaeranthera bigelowii*. Then there are the flowers of Spring - alyssums, saxifrages and primulas that half open a few almost misformed blooms. These are always reassuring but never spectacular. Also we can count on a few of the seedlings we sowed in February to produce their first flower, and unless they survive the winter it may be their only flower. *Townsendias*, for instance, are often good for a few Fall flowers.

Finally there are the plants which bloom naturally in the Fall. There are enough of these to design a Fall garden with, but few of us have the space to realize such a luxury. Perhaps in North Carolina or Oregon it would be worth the effort. Mostly we are satisfied with a patch of color here, a well-placed clump there or a section of the woodland garden to show off a *Cimicifuga*

simplex or a *Sanguisorba canadensis*. What your Fall plant list depends very much on where you live - how long you can fend off the first killing frost - and the second. Two four inch high alliums *A. thunbergii* and *A. splendens* look good in a raised bed. The late gentians (*Gentiana farreri*, *sino-ornata*, *scabra*, *andrewsii*, *crinita*) are variable in first blooming time and there is a limit to how much frost the flowers will withstand. A large group of heathers, forms of *Calluna vulgaris* are still flowering in October. These are worth grouping into a special bed. Some *Kniphofia* hybrids may want to bloom so late that they are not worth the trouble of growing even if they are hardy plants, but *K. galpinii* has always bloomed for me (Southwestern Massachusetts at 1400 ft., zone 5) through the end of September and it only succumbs to the hardest frost. *Pysostegia virginiana* blooms well into November. *Cyclamen hederifolium*, a glorious standby on Long Island and in Southern Connecticut, tries hard in Massachusetts but is hardly worth the effort. Nor is *Sternbergia lutea*. Nor are the autumn crocus (*C. speciosus*, *ochroleucus* and *sativus*) worthwhile in our part of the country. They are buried by leaves in mid October before they open. By the time you move the leaves to expose the flowers the first hard frost doubles them over. Anyone living south of middle Connecticut should count themselves as blessed to be able to grow a few sweeps of these Fall beauties. *Colchicum speciosum* is a different story. It is easier, earlier, tougher, taller and its color is highly visible among the falling leaves. Even after heavy rain or frost when the heads have wilted and sprawl over each other, there is a starting patch of color to titillate the senses. And of course *Silene schafta* may be lingering on.

But in the Compositae is the genus *Aster* itself. Apart from the ubiquitous *Aster novae-angliae* forms and hybrids and the *Aster 'dumosus'* dwarf hybrids there are *Aster ericoides*, *porteri*, *caeruleus*, *oblongifolius* (*kumleinii*), *linariifolius*, *patens*, *paludosus*, *ptarmicoides*, to name a few of the Fall flowering species. These are all most welcome unless they happen to be your local weeds and unless they clamor for too much space or forget to flower. Running asters are easy to pull up, unfortunately you forget which are the wicked ones until you notice in October a large green mat with hardly a flower to be seen. Other composites in bloom in the Fall include most noticeably and regrettably *Solidago* species but also in areas with late first frosts there are species of *Helianthus* (*salicifolius*) and *Helenium* (*autumnale* forms and hybrids) worth growing. These are all big plants for a border or a prominent clump. Include also *Sedum spectabile*, *Aconites* (*Aconitum*, *Carmichaelii*, *uncinatum*), *Anemone japonica* and *Boltonia asteroides* if you have that kind of room.

The glory of the Fall is the change of color of the leaves; until Columbus Day flowers have to compete with the oranges, reds and yellows of the maples, oaks and sumacs while after the fall of the leaves they must be tall enough to be seen through them or placed well outside the canopy of every tree and shrub. After cleanup and a few frosts, flowers are secondary to evergreens. So, for mid October think about leaf associations - *Euonymus alatus*, and *Rhododendron vaseyi* against the yellows and bronzes of *Chamaecyparis pisifera* or *obtusata* forms. Place a larch where it will shine in November and a *Pinus densiflora oculis-draconis* where you can see the yellow bands on the needles in late

November. Use grasses and artemisias to contribute greys, silvers and subtle browns in contrasting shapes and textures. Some of the flowers will have to be cut off to keep them respectable.

By mid November there have been many light and a few heavy frosts, the first snow flakes have fallen, the first snow to accumulate has melted by noon the same day, heavy rains dispell our obsessive fear of drought and we can believe the rhododendrons will survive the winter. At least if they don't we can't blame lack of rain. Daylight starts noticeably later even after moving the clocks back and if you get up at your habitual six o'clock you have to fill in time indoors until well after sunrise - the sun, late and low, lacks warmth and it could be ten o'clock before gardening outside seems attractive. These are the days to rake leaves, pull brambles and goldenrod at the edges of the woodland, construct a new bed, make a new path, install snow fence. All the jobs that use energy. The hideous paraphernalia of winter is dragged out - gloves caked in March mud, long johns and old sweaters, boots to replace the sneakers which now seem so flimsy. These garments are reassembled from their summer hiding places with reluctance. We wish Winter would delay its arrival but cold knees and frozen toes demand a change of costume. Our macho alter ego puts up a struggle, but cold wins. Once dressed for it, making a raised bed with cinder blocks is an exciting game instead of an ordeal. The gardener looks around for other creative jobs with a godlike feeling of 'I can do anything now I am in Winter underwear (provided I can find the hammer and the staple gun, start the leaf shredder and the chainsaw, and provided I bought in enough black plastic, roofing nails, burlap and

cinder blocks). Some jobs may have to be merely sketched in and left for the merciful snow to obliterate. Some may remain forever unrealized, churning in our minds like guilty thoughts: Like making a larger bog or a below ground irrigation system. Have you ever started on a project after months of premeditation and bullying yourself into the right frame of mind only to find that the hardware store is out of tee joints or angle irons? Even hardware has seasons and if you fail to construct at the proper time what the rest of the U.S. is constructing, you may well never construct it at all.

Fall is letter writing time. We can no longer postpone those bread and butter letters thanking other gardeners for garden tours, longed-for plants and overnight stays. If you postpone until December no-one will believe your excuse that you 'only just got back'. But the real reason for most mail in the Fall is seed. Many packets change hands each year. Plants admired in gardens have to have their seed harvested and sent to the admirer. Seedlists have to be supplied. Widely separated plant friends exchange their own seedlists. It is an easy way to give plants, not a straight forward gift but more like a kit for making a harpsichord instead of the instrument itself. The pleasure will involve work and care and a two year wait for the first flower. Seeds are less a gift than an opportunity. And what do you do with seeds you don't want? If you do nothing you will have a sense of willful waste and uneasy feelings of guilt. If you get seed of a plant you already grow you feel obliged to find another home for it. If seed is choice or if it comes from a famous garden or a dear friend, I sow a little even if I already have the plant. So I usually sow everything I get. My rationalizations are: I want to compare the plant I have with this one; it may be a

new form; I can verify the name. My reasons are: My plant may die, I want more seedlings coming along; somebody will want the seedlings; I just can't dump it.

I sow seed in fifty percent coarse sand, fifty percent peat based soilless mix and a handful of slow release fertilizer; cover with a sprinkling of sand; place in lattice bottom trays; place the trays outside on tables exposed to the weather except for the protection of an inverted tray. Since I have had no systematic failures, I continue with this method though I am certain there are better methods for other people. I cannot claim any success with *Cypripedium*, *Acantholimon*, *Salix*, *Soldanella* or *Rhododendron* amongst others. One thing you need is room for the tables. You need tables because stooping over a coldframe to inspect pots for germination in March and April is back breaking, and because a table is easy to keep clear of snow when you want to add trays in January and February. Also mice like to inspect cold frames and the height of a table is an extra obstacle.

October and November are not too late to turn the compost heap unless it is already unpleasantly wet. My 'compost' is mostly sod, green stuff gets absorbed fairly rapidly so turning a heap is rather like digging a bed once the top layer has been dragged off. By the time you get to the bottom two feet of a four foot high heap that has been sitting for two years, the soil is mellow and crumbly enough to be used to fill a hole in the garden or to plant a tree in the arboretum (meadow).

In November you have to assume that every day in the garden is the last. It could freeze, snow etc. You could be dead before the next work day. So at some point the barn must be cleaned out so that each day all the tools and carts can be stored there in case it really is the last day. When the 'last day'

comes it will snow hard and you will have forgotten what you were doing by the time the snow has gone. Of course the last day concept is an illusion, there are always days in mid winter when something seems possible but it is never the unfinished work of November.

October and November are animal months. In October the chipmunks are still storing food, some of it is from your garden. As you cut down plant remains you may notice the hole of an animal actually living in the garden - even in a raised bed. You can stuff an oily rag into the hole - two attempts is usually enough to discourage a chipmunk, more for a woodchuck. Equally devastating are the footprints of deer in newly planted beds. Whole plants can be wrenched out, chewed on and left high and dry. *Armerias* are very susceptible to this treatment, but nothing is exempt. So there is a constant rescue operation going on through mid November. None of the aromatic deterrents seem to work satisfactorily and I am now covering precious raised beds with spun polyester 'blanket' or polypropylene netting. Beds with good drainage suffer most as the surface is loose sand and stone. Woodland suffers less from clumsy hooves than from careful teeth. From mid November until the ground is frozen hard there are hunters around and the damage seems to decrease. Snow makes the garden even safer so a heavy snowfall has a calming effect on the nerves. There is a lot of anger and anxiety generated by animals but very few gardeners actually shoot them. We seem to live at the edge of success - never really free of unpredictable outside agents that mindlessly arbitrate what will and what will not succeed. Is there some character building in all this that compensates for the tribulations of Fall? Perhaps our pride is

subdued and our vanity disciplined while each small success becomes an occasion for thanksgiving. But how irritating to have to thank a deer for not eating your *Dianthus alpinus*.

Some time in November you have to roll up the hoses and put them away - if you leave it too late you will be stuck with several yards of intractable hard plastic that would rather break than roll. Empty vulnerable water pipes. Don't leave buckets upright to fill with water and freeze solid bulging the bottoms. Bring in the shovels from the compost heap, the sand pile and the woodchip pile. They all freeze solid. Turn on the greenhouse heat. Close the doors and windows at night, open them in the day. It will heat up to 80 degrees in November on a sunny day. Everything is common sense. Everybody knows these things and everybody forgets at some time to do them.

The leaves are down and the sun is about as high in November as it is in February, but what a difference! November grass has a warm ripe look and the lawns are lush. There is no snow to echo the sky, the earth is still earthy and accepts moisture. And November is blessed and cursed with strange and beautiful lights, mists and fogs.

The garden is both clarified and mysteriously transfigured. As we wander through the woodland garden, paths are blurred with leaves; where the landmarks in summer were lilies they are now sharp budded rhododendrons and piles of freshly cut logs waiting to be hauled up to the house. The larches have had their brief fortnight of glory and have shed their bronze needles. Pines, spruces and hemlocks now assert themselves through fascinating variations on the conical theme and rhododendrons attempt variations on the hemisphere. In the raised beds and containers the buns and mats mutely explain survival in a hostile climate. The grey and silver mats of *Artemisia ASSOANA*, *Antennaria dioica*, *Arenaria tetraquetra* and anonymous Hieraciiums show off and Douglasias, Androsaces and Asperulas are at their most loveable. Crucifers form soft, fat, neat pillows after a summer's untidy sprawl. Iberis, Aubrieta and variegated Arabis combining into a gleaming gladness of greens. One or two drabas are brash enough to open a few flowers and we gratefully accept this token that true Spring will follow in four months or less.

This piece completes the seasons in the rock garden year.

The easiest way to tell the difference between young plants and weeds is to pull up everything. If they come up again, they're weeds.

Anonymous

I spend half my time praying for sunshine and half my time praying for rain. Why, oh, why didn't I stay with the certainties of the roulette table instead of gambling on plants?

Henry McLemore

Out of the Seed Pot and into the Garden

Judy Glattstein

Gardeners are a greedy lot. There is always a new plant to be sought out. Use of the singular is perhaps a poor choice as few of us restrict such acquisitiveness to "just one more". A visit to a friend's garden, a visit to anyone's garden, an image flashed on the screen in a darkened lecture hall, description in a nursery catalog, in a book - any of these can trigger the possessive reflex. Not, mind you, that there is a definite place in the garden scheme for this plant. Such covetousness is not the result of a rational scheme - I need something apricot with a spike-like flower less than two feet tall to combine with "X". No indeed, it is more like "Geoffrey, What is that lovely thing?! *Knifophia galpinii*? Thank you." and into my memory banks (somewhat faulty, a notebook really works much better) goes that name. That plant is now a dormant trigger for the Acquire Reflex. Which works as, See It, Grab It.

Now it made perfect sense to me that my trip to Wilmington, Delaware for the 1989 ARGS Annual Meeting should start in Durham, North Carolina. My sense of geography is rather vague and once I've crossed over the Tappan Zee Bridge into New Jersey, everything between here and California tends to get condensed. A lovely few days were spent visiting around - Holbrook Farm and Nursery, We-Du, Montrose Nursery, private gardens, bookstores, craft shops - but I digress. By the time I picked up the rental car and got it loaded, the back seat and back floor were pretty well occupied with plants. (Someone

we will not name back home in Connecticut had been saying snide things like "Sedan? Maybe you can rent a van. Or a tractor trailer.") But we (gardeners) rise above such petty comments. So I drove. North Carolina is not as close to Wilmington as I had thought. So I drove some more. And stopped at Kurt Bluemel's nursery and stuffed in a few more plants. Then at the meeting a great Garden Faire was held. With nurseries selling plants. The front passenger's seat was still clear at this point. So I bought some more. An excellent set of directions to gardens and nurseries had been included with the registration packet, so on Monday I traipsed around to three gardens. And another nursery. It fit, it all fit, nothing on the roof rack, nothing up my sleeve. I could even see out the rear view mirror.

But once I got home, what then? I did not have the foggiest idea where most of these plants were going to go for a permanent location. Some of them are rather small to compete with the weeds that spring up when I am off on these jaunts. After all, rain and warm weather and weeds seem to grow on fast-forward. But this is all taken care of. For one of the most important places in my garden is the propagation area. Here I have the tool shed = keep-your-junk-out-of-my-garage, alpine house = walk-in cold frame, and the propagation beds.

And the propagation beds are an extremely important adjunct to my garden. There are several, in a lightly shaded area behind the tool shed and alpine house. Each bed is eight feet long by four feet wide. This

width means that all parts of the bed can be reached from outside without walking into the bed. They are framed with three railroad ties, two whole ties for the length and two half-ties for the width. Each tie is sunk part way into the ground, raising the surface of each bed approximately five inches. The soil within each bed is the original soil with the addition of compost, peat moss and coarse sand to improve texture and drainage even further. While I do recommend trowels and shovels, the soil in these beds is light enough to dig with your hands. Hard on the fingernails though.

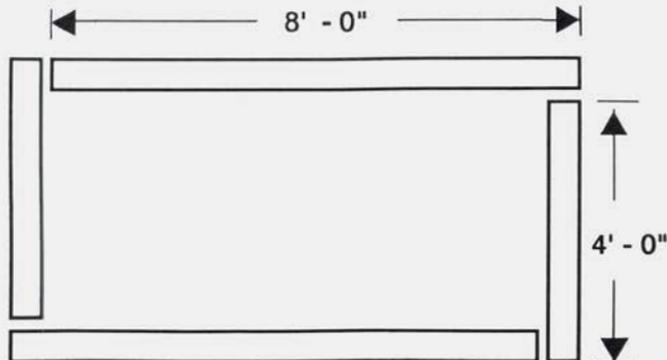
The beds are useful for newly purchased or donated plants which need some thought before placement in the garden. They serve as a growing-on area for seedlings or small plants that need a little more help before planting out. Often when dividing plants there will be a small piece or two that are worth growing on in a holding area for future gifts or trading. I do not like to take bare-root plants which have just arrived from overseas and stuff them directly in the garden. A little more coddling is helpful to far travelers. Soaking the roots for a couple of hours in a dilute fertilizer solution, dipping in dry sand to coat and separate the roots, and planted into a holding bed they fare

much better, i.e. fewer of them die.

I prefer holding beds to pots for several reasons. Firstly, there is no need to look for the proper size pot. The holding beds adjust to everything from trees to rock garden plants to bulbs. Secondly, watering is less of a concern. Pots dry out quickly while the larger soil mass within the holding beds is subject to more gradual fluctuations. Thirdly, winter storage is simpler in that small pots need a coldframe or alpine house to protect the roots from freezing. The holding beds are an easier solution. Fourthly, I do not need to worry about plants becoming root-bound in an undersized pot. If a Japanese maple or rooted azalea cutting stay in the holding bed for a couple of years they are in fine condition when I finally get around to planting them out.

So if you have ever found yourself in my situation, walking around the garden with a pot in your hand, murmuring "Now, now dear, we'll find you a home. Don't worry, you'll get planted." try a holding bed. It makes life much easier. And, oh yes, the *Knifophia galpinii*? I found them at We-Du.

Judy Glatstein, Wilton, CT, writes frequently for the ARGS Bulletin.



A Southern Rock Garden?

Mildred M. Pinnell

A Rock Garden in the South? Many purists may gasp, including those who believe a Rock Garden should only be devoted to growing alpine plants from high, mountainous regions of the world. But denied this opportunity due to hot (average high temperature 88 degrees F.), humid summers and relatively low elevation (998 feet), our broader interpretation of "Rock Garden" includes "gardening among rocks" with choice, unusual dwarf perennials, shrubs, conifers, bulbs, grasses, and succulents. The opening of the Dorothy Chapman Fuqua Conservatory this past March provided the Atlanta Botanical Garden with the opportunity to expand its outdoor gardens. Included in this expansion was a Rock Garden.

Our largest obstacle in establishing a Rock Garden was how to deal with our climate - humidity and relatively high rainfall, including wet, damp winters. Compounding the problem is our sticky, moisture-retentive clay soil - a deadly combination which can quickly cause plants, particularly alpine plants, to rot or "melt" into the ground. To overcome these problems, we paid careful attention to site selection, soil preparation, irrigation, and mulch. The site chosen was an east-facing slope, 120' long, 8' wide at its widest point, and 6' high at its highest point. All of the clay soil was removed to a depth of 3 feet. Large granite boulders were placed in the site and underground irrigation with drip emitters was laid over the entire area of the Rock Garden. The area was then back-filled

with a specified soil mixture of sandy loam, peat, sand, and grit. The mulch used over the entire garden was a coarse, light-colored rock particle, 1/8" to 1/4" in diameter, a waste product of washing river sand in the Atlanta area. There are many active members of the ARGs in the south-eastern United States and we consulted several of them during the planning stages and plant selection process. The only restriction we had for plants was that most should be fairly sun-tolerant, as only about one-quarter of the garden receives about three hours of early morning shade; the remainder is in full sun until late afternoon. Dr. Don Jacobs of Decatur, Georgia provided a wealth of information, as well as a practical example with his own garden. We also visited Sandra Ladendorf and Nancy Goodwin in the Chapel Hill, N.C. area, Alan Bush in Fletcher, N.C. and communicated with Ev Whittemore near Ashville, N.C. All were very generous with their time, plant suggestions, as well as enthusiasm. Our plant selection was based on our observations, recommendations from fellow gardeners, and "dwarf" relatives of plants which had performed well here at ABG (for instance, *Aster* 'Alice Haslem', *Solidago spathulata* 'Nana', and *Helichrysum angustifolium* 'Nana').

The Rock Garden planting was completed in early April. Spring and early summer have been a success as far as plant growth and flowering are concerned. However, it will take several years of continued experimentation and observation

to determine which plants can survive in our area. The woody plants were chosen to provide a framework for the herbaceous perennials, bulbs, and succulents. The *Genistas* (*aetnensis*, *dalmatica*, *delphinensis*, *lydia*, and *tinctoria*) provided color throughout late April and May. Other woody plants which have enjoyed a good spring and summer include *Leiophyllum buxifolium* 'Compactum', *Indigofera*, *Lonicera nitida*, *Cornus florida* 'Pygmy' and the *Salix* (*repens argentea*, *uva-ursi*, and *yezoalpina*). Herbaceous plants which have proven successful include the *Dianthus* (*amurensis*, *gratianopolitanus* 'Karlik', *plumarius* 'Ballade', and 'La Bourbille'); *Erodium* (*chamaedryoides roseum*, *cheilanthifolium*, *petraeum crispum*) - all in bloom for three months; *Nierembergia scoparia albiflora*; *Phlox* (*pilosa amoena*, *procumbens*, *stolonifera* 'Pink Ridge', *subulata* 'Millstream Daphne' and 'Millstream Jupiter'); *Erysimum* 'Bowles' Mauve' (in bloom since February); and the creeping *Veronicas* ('Minuet', 'Sarabande', 'Waterperry', *armena*, *cinerea*, *incana* 'Nana', and *repens*).

A grouping of typical "herbs" has also done quite well. These include *Origanum rotundifolium*, *pulchellum*, and *microphyllum*; *Helichrysum angustifolium* 'Nana'; *Lavandula angustifolia* 'Nana'; *Teucrium subspinosum*; *Thymus* x 'Peter Davis', *camphorata*, and *serpyllum*; and *Marrubium rotundifolium*.

There have been many surprises as well (even with record-setting rains in June), mainly with plants which are typically thought of as 'alpine plants'. These include *Achillea tomentosum* and *ageratifolia*; *Limonium bellidifolium* and *minutum*; *Lithodora diffusa* 'Grace Ward' (of questionable hardiness, but it bloomed for the entire month of March); *Anagallis monellii* 'Pacific Blue'; *Globularia cordifolia*; *Erysimum alpinum*; *Acantholimon glumaceum* (in bloom for three weeks in early spring). The *Phlox mesoleuca* forms, 'Arroyo' and 'Manzana', have proven to be tough plants, with 'Arroyo' in continuous bloom from May through early July. Many of the western *Penstemon* 'Wax Works', *cardwellii* *roseus*, *hallii*, *menziesii*, *pinifolius*, and *crandallii procumbens*.

Funding for the Atlanta Botanical Garden's Rock Garden was provided by Equifax, Inc. Again, our Rock Garden is a large experiment, with only time, trial and error determining the success stories. We are excited by our beginning and anticipate its continued growth and change. As it matures, hopefully the Rock Garden will convert the "non-believers" - those that think a Rock Garden cannot succeed in the South.

Mildred M. Pinnell is Horticulturist,
Atlanta Botanical Garden.

He who plants seed plants life.

USDA Yearbook 1961



New rock garden near the Dorothy Chapman Fuqua Conservatory at the Atlanta Botanical Garden

Photos: Cotten Alston.



Rock Gardening in the South - - an experiment at the Atlanta Botanical Garden

A Trek in Nepal

Audrey Williams

In September of 1987, not long after we returned from a trip to Turkey, we learned that we had the opportunity to go to Nepal to see the high elevation plants in bloom - the luck of the draw! We were warned that it would be wet, as this would be the height of the monsoon. We knew that it would be hot and humid at the 1,450 ft. elevation beginning of our trek, but after several days walk we would be in the rain shadow of Annapurna and that eventually just below our objective Thorong La (a pass at 17,800 ft.) we would be glad to have down jackets.

So it was with some trepidation the my husband Geoff and I set off for Kathmandu, by way of Hong Kong, to join the first Alpine Garden Society expedition to the Marsyandi Valley led by Christopher Grey - Wilson of Kew. We landed in Kathmandu (4,500 ft.) in pouring rain with a few days to explore the city before our fellow travellers flew in from England. Somehow we survived the rain, the traffic and the food which we were terrified would overcome us before the great expedition started.

And an expedition it was! At its greatest our entourage included, besides the 21 of us, the Sirdar, Chuldum, the young Sherpa commander-in-chief of six Sherpas, the head cook and his six cookboys and 56 porters. At Dumre, after a hair-raising six hour bus ride, the porters loaded our baggage, provisions, tents, cooking equipment, dining tent, tables and stools, and kitchen stove; (everything but the kitchen sink) on their backs and the mighty army moved forward -- all of a hundred yards!

Here we had to cross the first of the rushing rivers that barred our way during the trek. With the aid of the Sherpas we waded almost thigh deep in places, through the murky, warm water. It was not unpleasant to be soaking wet as we plodded gently uphill and down towards our first campsite in a school yard; to a world where no wheeled vehicle moved, no aircraft flew, no telephone rang and where there were no toilets, no showers and no electric lights.

Those first three hours remain a kaleidoscope of impressions: sky light reflecting in the watery fields where sariclad women planted fresh green rice plants; disfigured trees, chopped about to provide firewood; a water buffalo, huge and black, pulling a plough through thick black mud; smiling children asking for pens and above all the overwhelming heat and humidity that made me wonder if I would ever reach camp. I was to have the same fear many times in the days that followed.

There were some luxuries -- early morning tea in bed, albeit at 5:30 a.m., followed by warm water to wash in; cooked meals - breakfast, lunch and supper; tents erected and packs carried. It all seemed very civilized at first, but we quickly realized that we needed those luxuries to survive the heat.

It was in the early hours of a misty, moist morning that we started in earnest on the rough jeep-track road to Manang, passing the brilliant green ricefields with iridescent dragonflies hovering above. In some fields, browning cornstalks were still standing.

The terraced fields, curving with the contours of the land, reached high up the mountainsides as far as the eye could see as we headed north, up the broad river valley towards the mist-shrouded peaks of Annapurna which we did not see until several days later, and then only briefly and rarely.

Wherever it was impossible to grow food, usually on steep banks, native and introduced plants took over, growing luxuriantly. As I toiled on in the increasing heat, dripping with perspiration, sloshing through creeks, and inching nervously across flimsy suspension bridges, I was aware of the plants -- the ferns and *Selaginellas*, the orchids and the gingers that I did not have the energy to examine properly. Some things did stand out; the pink fluffy flowers of *Mimosa rubricaulis*, a tall prickly native shrub and the lower growing similarly flowered *M. pudica*, the sensitive plant, a native of tropical America. I remember the beauty of the leaves and pure white flowers of *Begonia picta*. Introduced plants from tropical/semi-tropical regions around the world are well established in Nepal; Bougainvillea from Brazil, Poinsettia from Mexico and from temperate regions, the North American milkweed with attendant butterflies, and even the humble marigold.

But our expedition was not to look at these "tropicals" of Nepal and many of the questions about the plants we saw in those first few grueling days remain unanswered. On about the sixth day, I recall travelling steadily uphill in a deep gorge and feeling almost human again. There were fewer people about, no audience of small children at our lunch stop and we found a tiny *Gesneriad* growing amongst mossy wet rocks, in the shady cliffs beside the trail. *Corallodiscus lanuginosus* looks like a miniature *Haberlea* with long stemmed

violet and white flowers over tiny crinkled leaves. Polunin says that it survives the dry season, withered and seemingly lifeless on dry rocks. I was feeling cooler and much more energetic except of course that the route was more difficult, ascending steeply, and it seemed descending just as sharply and just as far. That night were spent in a "Hotel" at Thal, our third night in such accommodation. For once again there was no flat place that was not under cultivation for us to camp. I think we all agreed that tents were preferable to the Nepal substitutes for the Hilton, even with baby frogs for bedmates. After we left Thal, our Sirdar, Childum, ceased to wear his "wellies" (Wellington boots/rubber boots) and it became obvious that we were entering the rain shadow. Not that it rained any less frequently, but we saw the first pines and eventually the forest took over and we could almost imagine we were walking in the woods near home, except for the monkeys that leaped from branch to branch above us.

Here were familiar woodland plants, even some of the same species as at home. There was *Goodyeara repens*, the rattlesnake plantain, with its beautifully marked leaves and dowdy off-white orchid flowers and *Monotropa hypopitys* that we call Indian pipes in B.C., where its ghostly white flowers gleam in the deepest shade, though here the flowers were pale yellow. A familiar garden plant was *Bergenia ciliata* with clusters of pink flowers, clinging to a rocky hillside, near yet another of the myriad waterfalls. Not far away were the precisely-spaced drooping white bells on arching stems of *Polygonatum multiflorum*.

As the forest became more open the earth more sandy, we saw more familiar plants: *Androsace strigillosa*, its red-backed white flowers on tall stems and *Anaphalis*

triplinervis silvery-leaved and white flowered, very like *Anaphalis margaritacea*, our common pearly everlasting which is native in Nepal too, though we never saw it. Eventually we came into park-like country where the Tibetan holy trees, *Juniperus squamata* and *J. recurva* were scattered among the pines (*Pinus wallichiana*), spruce, *Picea smithiana* and hemlock, *Tsuga dumosa*.

We had seen several species of wild rose but the commonest now was *Rosa sericea*. Its creamy-white four petalled flowers were liberally sprinkled on branches festooned with *Clematis vernayi*. The coppery red to orange and even greenish-yellow hanging bells and feathery seed heads of the *Clematis* made a beautiful contrast with the pale roses.

At the camping place in the village of Pisang, we knew we were into dry country when we found our tents pitched on a carpet of fragrant *Thymus linearis* intermingled with *Astragalus willamsii*'s lavender flowers and silver leaves. In the damper places grew the small *Arisaema flava*, its yellow flowers more showy than many of the Jack-in-the-pulpits we had seen, but not so graceful.

All the *Arisaemas* have bold foliage with an architectural quality that sets off the showy spathe enclosing the spadix of inconspicuous flowers. Both spathe and spadix have tail-like appendages of varying length. These had the purple green or white colouring, the snake-like markings and often foetid smell, which add to the serpentine associations of many common names; serpent's corn for the fruiting heads of *A. tortuosum* and cobra plant for *A. griffithii* with its snake-like markings.

We first saw *Arisaema tortuosum* growing on a wooded hillside above the Hindu temple of Siva at Pashupatinath in the Kath-

mandu Valley. It is a tall plant with large pedate leaves and a glaucous green spathe which bends forward at right angles, shell-like to protect the spadix within. From the spadix, a tapering appendage of deep purple curves outwards and then upwards forming a spire several inches higher than the spathe.

A much smaller and more graceful plant is *Arisaema jacquemontii*, its pale green and white-striped spathe terminating in a green or purple tail-like tip. The spadix in contrast has only a short blunt tip that barely protrudes from the mouth of the spathe tube. The corms of some *Arisaemas* are said to be used as flour when dried and ground up. Beyond Pisang, we saw many more of the choice plants we had come to see. For sometime we had been seeing scattered plants of *Stellera chamaejasme*, an herbaceous Daphne relative with very fragrant flowers, deep red in the bud opening to pure white. The tubular flowers form rounded clusters at the top of leafy stems and fortunately the plant does not seem to be on the menu for the local livestock. I couldn't find anything resembling seed but I hope it will get into the seed lists soon. We did see an occasional yellow-budded form, but this was not as attractive to me.

Once into higher and drier country, we spent more time acclimatizing to the altitude. A two-night stay beside the Sacred Lake, a rather small muddy slough by Canadian standards, allowed us a day to explore the Sabche Khola to where the permanent ice and snow began. A herd of goats around a primitive hut marked the highest human habitation, at least for the summer months. On a wonderful hillside, so incredibly steep as to necessitate frequent stops to inhale enough oxygen, we staggered on through great cushions of *Saxifraga* and *Androsace* sp. in white and

pink, mostly past their best. These were difficult to identify and I fear too difficult for us to grow. The gem of the day for me was *Rhododendron lowndesii* which grew in crevices of wet rock as well as in the short turf. The plants were all of four inches tall with solitary pale yellow flowers spotted dark red within and held well above the bristle - margined leaves.

My attention always seems to be drawn to plants that are not amenable to cultivation - How I wish we could grow the louseworts! We saw *Pedicularis bicornuta*, a robust plant about 20" tall with clustered spikes of butter-yellow convoluted flowers, and *P. longiflorus* var. *tubiformis* which we found in damp meadows, its beak-tipped, long-tubed flowers contrasting with the pale pink and white flowers of a common farinose primrose, *P. tibetica*. I loved the pale cream flowers of *Pedicularis hoffmeisteri* clustered atop short stems, each nodding hood enclosing a curving beak. My favorite was *Pedicularis siphonantha* which has bright pink flowers with white throats, the whole plant about 4" high. The louseworts seem to be shunned by grazing animals and have so far defied efforts to bring them into cultivation. Maybe like another favorite *Scrophulariaceae*, the North American *Castilleja*, they are semi-parasitic.

Another seemingly ungrowable plant of high elevations is *Cremanthodium*. Most of the species have huge nodding yellow daisies and the species intermingle in the highest meadows looking as easy to grow as any old *Helenium* or *Inula*.

Among the choicest composites were the *Leontopodiums*, brothers of the fabled edelweiss of the European Alps, and unmistakable with their clustered fabled flowers surrounded by a ruff of bracts. The smaller of the two species we saw, *L. Ljacotianum*,

has a rather bluish cast, its circle of bracts forming a neat star shape above the tufts of grey woolly leaves. *Leontopodium himalayanum* is larger, its involucre of bracts are rather untidy looking surrounding the white flower cluster which turn golden brown as they age.

I would like to try the dwarf form of *Anaphalis triplinervis* ssp. *monocephala* in the garden. Its solitary pearly everlasting flowers are on stems less than four inches tall, the individual yellow florets surrounded by silvery paper bracts.

The words "woolly", "hairy", "silvery" seem to appear very frequently in describing the plants we saw and some of the most interesting and beautiful can only be described in those terms. *Onosma bracteatum* its drooping bells of deep red-purple almost hidden by long hairy woolly bracts, are very different from another new-to-us Borage family member seen earlier. *Maharanga emodii* reminded me more of *Pulmonaria* than *Onosma* (its old name). The leaves are rather coarse and hairy and the short tubed flowers in drooping clusters, puckered at the mouth, with pink, blue and purple blossoms on the same plant.

Another fantastic woolly plant was *Eriophyton wallichii*, a dwarf member of the mint family. Its few flowers, densely woolly, nestle in whorls around the stem. The upper lip of each pale purple flower resembling a mushroom cap protecting the interior, is sheltered by toothed leaves covered with long silky hairs.

At 17,000 ft., we found only one flower in bloom, a surprisingly coarse crucifer, *Christolea crassifolia* with vicious magenta flowers and coarse unattractive, rough, grey leaves. According to our leader, it has been recorded at elevations of 22,000 ft. A plant remarkable for its showy bracts was *Ajuga*

lupulina. Its small lavender flowers were hardly noticeable; the main attractions were the very large creamy bracts that clothed the stem, forming a showy spike about 8 inches tall.

For the first time in the wild, we saw several plants we grow in the garden. The brilliant yellow flowers of *Potentilla eriocarpa* and *P. cuneata* are never as bright in the garden as they were in a dark, drizzly canyon at 15,000 ft. where they kept company with the most beautiful pure turquoise-flowered *Meconopsis horridula* we have ever seen. Here, loose boulders kept cascading down around us and we beat a hasty retreat. *M. horridula*, as we grow it, is a rather dark blue sometimes almost navy; and we did see some less desirable colours in the wild but at its best, *M. horridula* was superb. There is not much to be said for *Meconopsis bella*; it is small and dainty but of a wishy-washy blue that varied very little.

Cyananthus integer's deep blue flowers carpeted the camp area along with numerous dwarf pea family members but the more commonly grown *C. lobatus* was rarer. *Polygonum affine*'s deep pink, rounded spires were much showier than the pale pink form we grow under the cultivar name 'Donald Lowndes', who collected the

original plant here. Did it change colour in cultivation, washed out by the rain or does it pine for the high mountains?

Primula sikkimensis' drooping pale yellow bells clustered in damp areas often beside cascading streams, though we never saw them as often or in such profusion as we had expected. The dainty white bells of *Primula involucrata* were even scarcer, though we found them growing in crevices of dark rocks running with icy water. We found a couple of isolated specimens of *Primula buryana*, a smaller and rather similar plant to the endemic *P. wigramiana* that we first mistook it for.

Primula wigramiana must be the gem of them all, with pale cream bells nodding just enough to display the pinkish lavender calyces, and a sweet perfume. We saw this primrose in profusion only once and if we had all been of a mind to collect a couple of plants, there would have been few left. It was a sobering thought, and did not make the member of our party who dug up everything is sight, very popular - this, on an expedition designated "not a collecting trip, leave your trowels at home".

Audrey Williams, North Vancouver BC,
and her husband, Geoff, frequently lecture
on plants and plant travel.



Campanula piperi

The Ups and Downs of Moggy Hollow

Ruby Weinberg

An excited Hubert Van Duyne, fine plantsman and owner of Hidden Valley Nursery in Gillette, N.J., telephoned me over 25 years ago. "I want to take you to a most remarkable garden unlike any other you have ever seen." We met at the estate of Leonard J. Buck in Far Hills, climbed down a narrow path surrounded by heavy indigenous woodland, and found ourselves in Moggy Hollow Gorge. Van Duyne was right. All about me was an incredible rock garden.

Buck was a mining engineer of international repute. One of his interests had been the location of mineral deposits by their association with specific flora. He had also been fascinated with the geological formations on his own property. Moggy Hollow is the lowest part of Buck's 50 acre estate. An ancient glacial lake had created the floor of this gorge, and had left behind unusual rock formations. Using dynamite, Buck had exposed loose trap rock. Some of the larger rocks were split to create separate areas. Additional rock from outside was also used to extend rocky ledges. Then Buck prepared carefully adjusted soil mixtures to create habitats for a variety of choice alpines.

Together with Zenon Schreiber, a landscape architect and rock garden authority, they planned a series of alpine plantings where each of about 13 outcrops would serve as the focal point for individual garden areas. Some are in the sun, others in the shade. Moisture loving plants were

colonized in boggy areas. Wildflowers, some native, but many from other parts of the world, were established to enhance the overall interest. With the natural woodland as a backdrop, many ornamental trees, some conifers, rhododendrons and azaleas completed the plantings. The garden is connected with grassy plateaus and paths as well as bridges crossing the stream that feeds two ponds.

Throughout the years, I visited the garden many times, noting the addition of rare primulas, native orchids, and many alpine gems. Once, when I wrote to Buck requesting permission to tour the garden I was amused by his reply. "Do not attempt to imitate this design," he wrote. (I was then a landscape contractor) Could it be that he did not fully realize the unique character of the site? It was beyond duplication!

Leonard Buck devoted 40 years of his life to the garden, collecting alpines from his travels throughout the world. He was undaunted by the fragility of rock gardens in this part of New Jersey where snowless winters, as low as -20 degrees F., sometimes occur; summer droughts, humidity, and severe heat are not infrequent; water supplies are usually inconstant; skilled labor is always a problem. In fact, Buck usually did a good part of the work himself, with only one or two gardeners to assist.

In 1974, Buck died, and the gardens began to decline rapidly. Mercifully, two years after his death, his wife Helen deeded 27 of these acres to the Somerset County

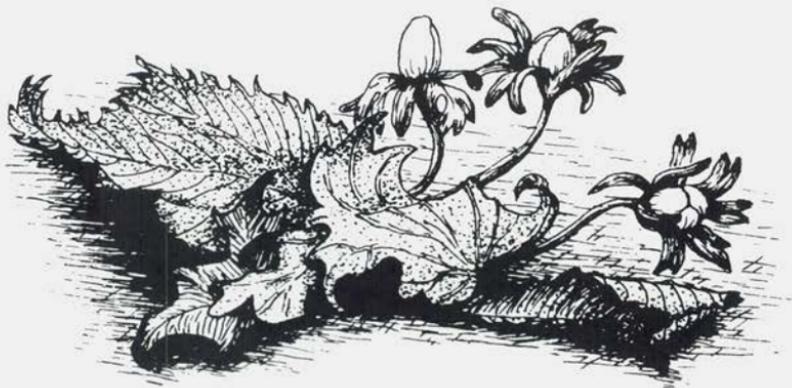
Park commission. Preparations began for opening the gardens to the public while meantime, park workers tried to save, restore, and replant to fill the losses that occurred during the years of neglect.

Three succeeding directors were beginning to make gallant strides in transforming the garden to its former glory. Only recently, in '88, Barry Yinger, (who had been Curator of Asian plantings at the U.S. National Arboretum,) was appointed as the fourth Supervisor of Horticultural Services of the county's park system. In this capacity, he is also the Buck Garden's new director. Yinger is faced with enormous challenges. Throughout this part of N.J., once a rural and agricultural enclave, increased housing development has forced marauding herds of deer to flourish in every open field. Gardens have become their salad bowl. At Moggy Hollow, the deer began munching on azaleas and trees, and as they increased in number, included in their diet parts of rhododendron, evergreens, and rock plants. According to Barry Yinger, only *Epimedium*, *Primula japonica*, and ferns were ignored by the deer. A variety of

sprays proved useless as deterrents. In the summer of '88, Yinger reported that he could not name any choice alpine still thriving in Moggy Hollow, though he has yet to survey spring plantings. A few summer bloomers that have survived are *Sedum sieboldi*, *S. nevii*, *Jeffersonia dubia*, *Cypripedium parviflorum*, *Asarum europaeum*, and, in some places, *Erica* hybrids and species.

Happily, funds have, at long last, been provided for electric fencing which is now being installed. It is hoped, and expected, that the fencing should keep the deer at bay. The Buck Garden has undergone so many severe problems in the past, problems that were at least temporarily solved, that the visitor can now look forward to a promising new era in its history. Leonard Buck provided the idea, the inspiration, and the site. The reestablishment of Moggy Hollow as a home for the most choice of alpiners, is a project with exciting prospects.

Ruby Weinberg, Califon, N.J., has most recently been chairman of the Watnong Chapter of ARGS.



Alpine Regions Are in A Fragile Ecology

Rob Grall

Is love blind? Perhaps, for the rock gardener who is in the midst of the mountains wading through wet high mountain meadows, or scrambling across perilous scree, or striding over the alpine tundra in search of those plants that make the heart race and that satisfy the botanical cravings of the enthusiast and connoisseur alike, love is blinkered. The senses are overwhelmed by the clear blue sky, the snowy, jagged peaks, the clean, crisp, mountain air, and the tapestry of flowing mats of color and broken stone. The mind is busy reeling off Latin names, recording minute variations in form and color, and evaluating the conditions which allow such floral beauty to exist. It is in this silent contemplation that blindness exists. In our evaluation of the conditions which prevail in the alpine environment we do not see ourselves, even though at that very moment, we have become one of the most influential factors in the survival of the alpine floral.

The alpine environment is a place of sublime beauty shaped by the harsh and rigorous hands of freezing and thawing, subject to the whims of ice and snow; all in all, it is in a constant state of flux induced by forces which grind the mountains down, shattering boulders and cliff faces into scree and talus slopes, and then pulverizing the fragments into a thin soil. It is under these conditions that over hundreds and thousands of years alpine plant communities have established a tenuous balance with the severe elements of their environment.

Those factors which are most influential in the development of alpine vegetation are

temperature, wind, water, exposure to sun, and geomorphic processes such as permafrost, frost heaving, needle ice formation, and solifluction. In almost every case where plants have colonized, a fragile equilibrium exists between the alpine flora and the constructive / destructive forces which prevail. In order to comprehend the tenuous nature of this relationship, we have to understand how these environmental factors affect the formation of soil and the lives of the plants.

Low air and soil temperatures characterize the alpine region; the growing season is short and cool with the possibility of frost occurring almost any time. Long periods of biologic inactivity in the soil are the result of low mean annual soil temperatures. Soil fungi and bacteria which decompose organic matter are active for only short periods of time in extremely restricted areas of the soil which results in very little decomposition and the accumulation of acidic humus only where some vegetation has already become established.

Wind is a major erosion factor in an alpine region, and in areas exposed to the tearing action of the wind little soil development can occur. Whatever fine particles of organic and mineral matter are carried by the wind can only be deposited in a sheltered area. Cracks, crevices, and the lee side of boulders provide points of deposition for this material. In areas already covered by vegetation, any slight disturbance will be immediately taken advantage of by the wind. Its tearing and gouging action can

set soil development back hundreds of years. The increased evaporation due to wind action reduces soil moisture, restricting plant growth, and consequently, humus accumulation.

Precipitation in mountain areas can vary from a few inches to several feet with two thirds of this usually being snow. Even if snowfall is heavy, in areas where strong winds prevail the soil is left bare, thus deprived of thermal insulation, moisture, and erosion protection. Accumulations of snow are mostly beneficial to the alpine flora, but where snow melts rapidly, soil washing and sliding occurs. Meltwater erosion is generally insignificant where closed vegetation is present. Trampling of alpine plant cover to the degree that it causes the disappearance of plants may open an area up to rapid meltwater erosion.

Intense solar radiation at high altitudes also restricts the development of vegetative cover in many areas. On southern slopes the sun can raise soil temperatures rapidly. The resulting higher temperatures are conducive to increased biological activity but the temperature extremes restrict plant colonization to those species specially adapted to variable temperatures and intense ultraviolet radiation. Coupled with high winds, the sun accelerates evaporation of soil moisture to such a degree that in order for plants to survive they must be able to tolerate desert-like conditions.

In those areas where soil moisture is present intensive frost action becomes a serious disrupter of soil development by maintaining an unstable substratum. Ice formation in the soil creates a heaving and thrusting of unconsolidated materials and aids in downslope movement. The soil instability associated with frost action plays a dominant role in determining the presence

of vegetation. Large areas are kept bare of plants by the combined action of frost action and soil movement because the movement of rock fragments destroys the root systems or disrupts the growth of the plant. Without plant growth there can be no humus accumulation and no soil development.

Frost action is most marked in wet areas. Alpine bogs, with their characteristic hummocks, are in a constant state of upheaval and development. Frost continually raises the hummocks until they are above snowline where the plant cover is finally torn away and needle ice crumbles the soil which is soon swept away by wind. Then, from bare stone to fine mineral grain build-up, to the advent of plants and humus accumulation, the frost-hummock cycle occurs, a microcosm of the entire alpine soil process.

Solifluction occurs mostly on impermeable or frozen ground. Extremely wet soils which form in poorly drained areas become unstable due to a lack of soil particle cohesion, and then slump downhill. Needle ice is another phenomenon of wet soils at high altitudes where freezing temperatures are common in the summer. Slow temperature drops to below the freezing point favor the development of the ice. It is most commonly seen in hummocks of granulated earth near streams, or in other sites with ample moisture, a fine soil, and little or no plant cover. When formed on inclined slopes needle ice raises dirt and pebbles which roll downslope causing considerable soil movement and instability. The soil lifted by needle ice is porous, dries quickly, and is easily blown away by wind. The heaving action of the ice breaks the stems and roots of invading seedlings. Conversely, needle ice seldom forms where there is good plant cover.

This intimate causal relation between the soil and the vegetation in the alpine region is an interrelationship that is extremely important when considering the developmental process of either one. The high mountain region of the Southern Rockies provides a good example of how the plants of this harsh land have achieved a balance with the conditions that exist. Where bare rock is crumbled and pulverized over a long period of time, blown by the wind to settle in the interstices between the boulders, *Geum rossii*, *Claytonia megarrhiza*, and *Saxifraga caespitosa* find footholds and add their own organic remains to further enriching the soil and capture moisture dripping down the boulder sides. The rudimentary soil of the fell field is dusty and gritty, exposed to wind and sun, prone to rapid drainage and summer drought, and dotted here and there with the low growing cushions and polsters of *Phlox condensata*, *Primula angustifolia*, *Draba crassifolia*, *Silene acaulis*, and *Trifolium nanum*. The shifting rocks of talus and scree slopes offer little in the way of a secure footing as they smother the crowns and tear the roots of vegetation attempting to establish itself. *Dryas octopetala* thrives in these exposed areas, its elaborate root system eventually stabilizing the "soil" and enrichening it with nitrogen, its sprawling woody branches catching dirt and plant debris which eventually becomes humus that serves as a favorable seed bed for grasses which in turn become the center of tuft formation of the talus. The gentle slopes of the alpine meadows which remain relatively free of snow accumulation are dominated by grasses and sedges such as *Kobresia macrocarpa* and *Carex elynoides* whose extensive fibrous root systems ramify the upper soil layers and continue to alter

the parent material beneath. The cold, dark, saturated soils of the alpine bog boil with frost activity, yet are tightly interwoven with the roots of hummock plants such as *Carex scopulorum* and *Koenigia islandica* which have established a delicate equilibrium with the controlling environmental factors. In all these locales, plant species act as humus suppliers and soil stabilizers, contributing to the process of soil development and further floral distribution and growth. Disruption of the balance achieved between plants and the rigorous alpine environment by the presence of people opens the soil to the erosive forces of wind, water, and frost.

When we admire the wide range of plants that compose alpine communities, and we marvel how they have adapted to the restrictive conditions of the mountains and arctic regions, we should consider the fact that they have developed and survived in the absence of people. In his book, *Rock Gardening*, Linc Foster suggests that "the plants we classify as typical rock garden plants... are relegated to these bleak aspects by a constitutional fragility that will not permit them to compete with the stronger vegetation needing better soil." This accurate yet seemingly paradoxical description, considering the conditions under which these plants exist, can be expanded to include the fact that they evolved mainly in the absence of the human presence. Just as better soil and stronger vegetation are atypical in the alpine region, so are we. People are simply an unnatural part of the alpine environment. As we stroll through the alpine meadow or scramble over rocky slopes, we become an additional factor in the struggle for survival, a factor that could tip the scales and adversely affect the very plants we cherish.

Even though the effects of our presence

aren't always immediately obvious, our passage through plant communities alters them in subtle ways. Our footsteps injure plant tissue, and through the loss of leaves or stems, the process of photosynthesis is interrupted or stopped completely. The resulting growth is slower, resulting in smaller plants which produce fewer flowers, and consequently, reproduction is diminished. Those plants most susceptible to damage become less common, and as an area is exposed to so much trampling that all plants are affected, barren areas develop. In an environment where cold temperatures, high winds, and ice prevail, the healing of plant tissue proceeds slowly once damage occurs. Cold preserves the impact caused by people by extending the time required for recovery. If the extent of impact depends on the durability of the environment as well as the time it takes to recover from injury, then the alpine region could possibly be the most fragile environment of all.

The degree of impact caused by the lone rock gardener strolling through the alpine countryside can be minimal or nonexistent. However, the greater the number of people, the more serious the damage. Some plants will not survive being stepped on more than a few times and certain unstable soils begin eroding even with light use by people. Even as few as fifteen or twenty people walking along the same route in a year leave a noticeable path. Others are attracted by an obvious trail, and the effects of human passage in a fragile land are compounded. To make matters worse, visitors to the alpine regions are usually present in the greatest numbers at the peak of the growing season when plants are most vulnerable. In an environmental sense, human responsibility in alpine areas is the same as anywhere else, it is the consequences of our

presence that are more severe. What appear to be harmless changes, and more than likely, they would be inconsequential in a more resilient environment, can actually be lethal to plants which have developed highly specialized ways of adapting to the severity of the alpine region.

In ericaceous meadows of some northwestern mountain regions, trampling by people has precipitated what could become the destruction of vast areas of plants like *Cassiope mertensiana*, *C. tetragona*, *Phylodoce glanduliflora*, *P. impetiformis*, and *Arctostaphylos uva-ursi*. Openings appear in the plant cover after a plant is stepped on just a few times, and the plants are unable to close the hole. An irreversible cycle of erosion is initiated by needle ice which lifts the soil and subjects it to wind and water. As the shallow roots of these ericaceous plants are torn or exposed, the plants die. What at first is a small bare spot of exposed soil becomes larger, and if occurring in abundance, can result in the destruction of the meadow community. It has been estimated that some of these meadows can be ten thousand years old.

I personally do not advocate abstaining from walks above treeline, for I do not believe that is truly the answer. The beauty that exists among the mountain tops and the intellectually stimulating diversity of plant types and forms scattered in isolated groups between the rocks or spreading in sheets of floral splendor through the meadows is for all humanity to enjoy. But, I do believe that people, especially rock gardeners, must accept responsibility for the consequences of their actions regardless of the fact that the motive is love and admiration. Once we are aware of our effect on the alpine environment, we can take steps to eliminate or minimize the adverse impact we create.

Many places in the alpine region are resistant to human impact. Bare rock and snow are the best surfaces on which to travel. Dry meadows are also resistant to impact because the soils are held together by the matlike, fibrous root systems of grasses and sedges. It is still important to remember not to step on any one place too often and to travel singly or in small parties, being careful to spread out so as not to follow the paths of others. Follow gentle slopes wherever possible, and if steep slopes must be traversed, movement should be slow and cautious. Water saturated soils such as wet meadows are best avoided, or at least treated with care, particularly if the ground slopes and is covered with low woody plants which lack the resilience of grasses and sedges. Wherever possible, traveling by trails is preferred over an off-trail route. And, although it may mean wet feet, it is better to cross mudholes and snowbanks directly than to attempt to skirt them and in the process enlarge the trail.

My own concern is the direct result of a still growing awareness of how this world of ours works, and a deep-seated guilt spawned by memories of how I have treated

it in the past. I have great love for the natural beauty which we are all so fortunate to experience and it has only been through ignorance that I believe we all cause it harm. My most recent memory is the result of participating in the annual meeting in Oregon this past summer, and in being one of the many alpine plant admirers that scrambled over the rocks of Mount Hood and through the moist meadows which adorn the volcanic slopes. It was wonderful to be there with all those fine people, revelling in the sights of *Lupinus lepidus*, *Saxifraga tolmeei*, *Eriogonum ovalifolium*, *Calochortus subalpinus*, and numerous other plants I had only seen in books or on slide screens. However, there were times when I believe that in being so captivated by what we were seeing and by where we were, we were oblivious to what we were doing, and in our ignorance, caused harm to that which we cherished. It is my hope that if we can all nurture a growing awareness of our own affect upon the alpine regions we love, and develop that insight into an "alpine ethic", perhaps we will avoid loving our mountain to death.

Rob Grall lives in Warren, CT.



Rhododendron keiskii 'Yaku Fairy'

The Dr. Edgar T. Wherry Award

Dr. Arthur R. Kruckeberg

The presentation of the Dr. Edgar T. Wherry Award to Dr. Arthur R. Kruckeberg seems particularly appropriate when we review the many contributions that Dr. Kruckeberg has made to the study of native American plants and to his dissemination of information about them.

His knowledge of plant taxonomy has earned for him a respected place in the American Society for Plant Taxonomy. His two monographs and related papers on Serpentine Flora have brought him international recognition. Two research grants enabled him to pursue this study in considerable depth. His botanical and horticultural background equipped him well to serve on the Graduate Student Supervisory Committee for more than twenty candidates for advanced degrees at the University of Washington where he is a Professor of Botany and has taken his turn as chairman of that department from 1971 through 1977. He has inculcated in many of his undergraduate students a sincere concern for native plants and their relation to our lives.

Art helped found the Washington Native Plant Society and is currently editor of its newsletter *DOUGLASIA*. His new book on Ecology of the Pacific Northwest will soon be released. His popular 1982 book, *GARDENING WITH NATIVE PLANTS OF THE PACIFIC NORTHWEST*, attests to the keen interest he and his wife, Mareen, have in the cultivation and actual landscape use of native plants. The distribution of

such plants has been greatly aided through the MSK Nursery which Mareen operates. Another plus added to Art's many-faceted reputation was when, in 1966, a western fern was named *Polystichum kruckebergii*.

His professional interest in botany has not prevented Art from assisting the *AMERICAN ROCK GARDEN SOCIETY* in practical ways. He was Director of the Seed Exchange from the fall of 1957 to the spring of 1960. He was Northwestern Chapter Chairman during 1960 - 61. He and his wife graciously give the use of their garden and yard for countless plant sales, picnics and other Northwestern Chapter activities. These services indicate truly generous devotion to our organization.

The University of Washington Arboretum Bulletin has welcomed articles that Dr. Kruckeberg has written. In addition, he has served on its Editorial Board. He has given programs for ARGs groups as well as for other organizations. In these talks he offers his audiences practical scientific concepts of plant taxonomy, physiology, ecology and distribution. His mastery of the English language and his skillful handling of words always increases the pleasure people derive from such presentations.

It is fitting that we should present the Dr. Edgar T. Wherry Award to Dr. Arthur R. Kruckeberg who will add luster to its esteemed value.

Frances Roberson

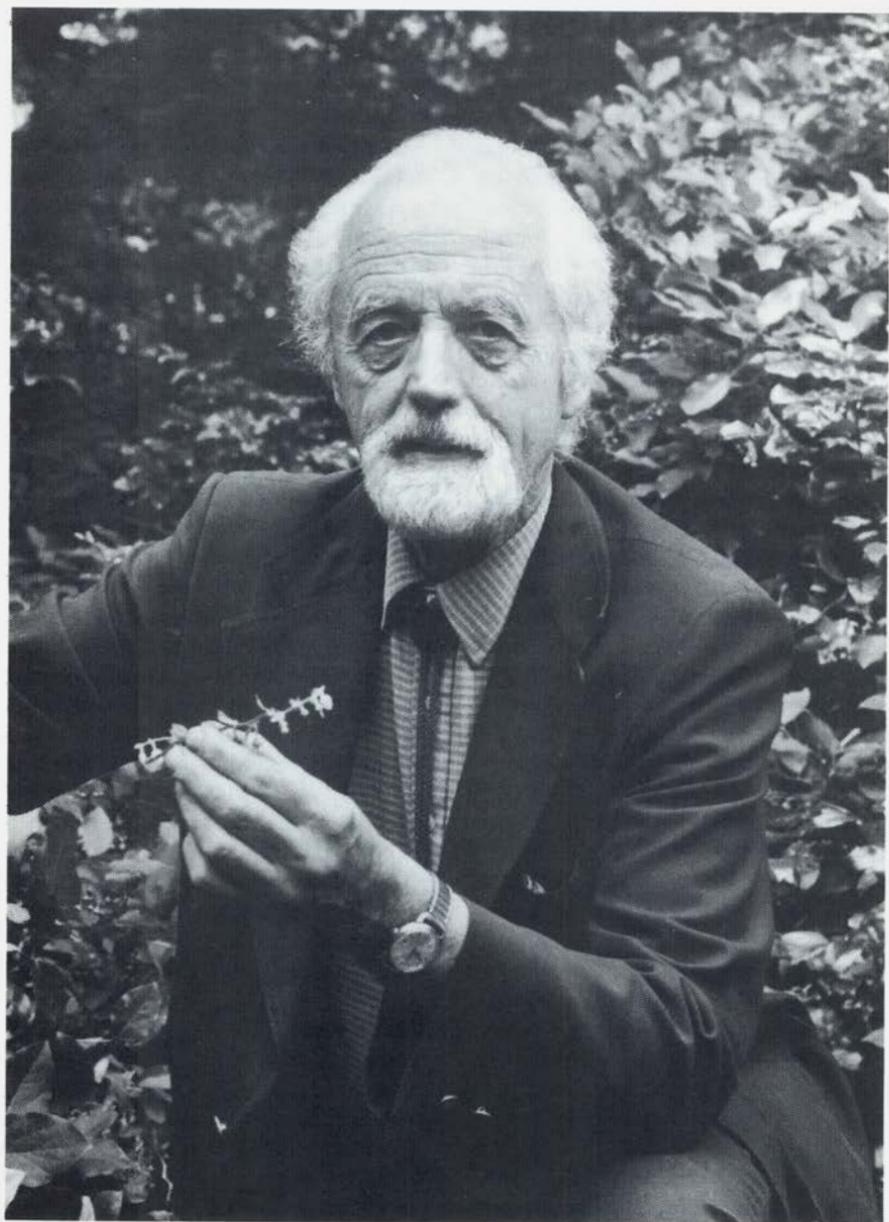


Photo: Joseph Freeman

Marcel LePiniec Award

Floyd McMullen

The American Rock Garden Society has named Floyd McMullen, a founding member of the Columbia-Willamette Chapter, as the recipient of the prestigious Marcel LePiniec Award, for his extraordinary career as a plant explorer and grower. The award has been given annually since 1969; its recipients include many great contributors to the rock garden. This is the first time one of the three national ARGS awards has been bestowed on a member of our chapter.

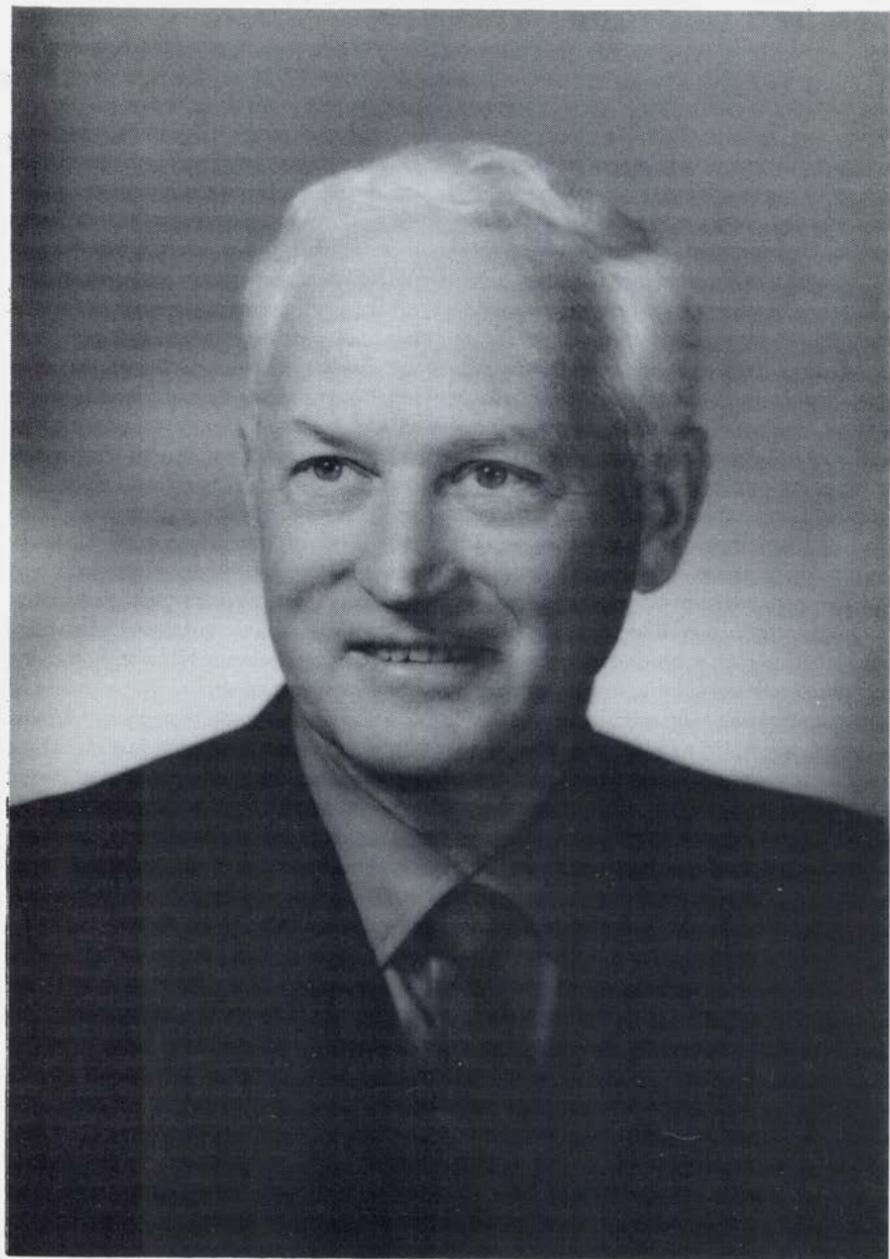
Floyd was born in 1907 in Iowa and moved to Oregon at an early age. He worked for many years for AT&T, retiring as an administrator and long-range planner. He and his wife Kathleen, a pianist and piano teacher, married in 1933 and have two sons. They built their present home, starting in 1940, a wooded acre in the hills west of Portland; there Floyd planned and planted his remarkable woodland alpine garden.

Floyd is a man of the Northwest mountains, enthusiastic and untiring in his search of rare and beautiful forms of alpine plants, and a gracious source of information and advice on the identification, habits, and cultivation of native plants, shrubs, and trees. With his family and friends - - including many distinguished plantspeople - - he has discovered, photographed, and propagated native plant material extensively. His travels have encompassed all the mountain ranges of Oregon as well as the Northern Rockies, Mt. Borah in Idaho, the Kiamath country of Northern California, the Colorado Rockies, and the mountains of southeastern and south central Alaska. His

memory for details of location, habit, and form of alpine plants is encyclopedic and always at the service of others. He has also explored and collected in the mountains of Spain, the Alps, Greece, northern Yugoslavia, Bulgaria, and Romania, and ranges in Austria, Germany, and northern Italy. He made many of these European trips with Dr. David Hale and their wives; this year they went to Turkey.

Some of the exceptional forms of alpine plants that Floyd discovered over the years have been introduced through the nursery trade, or through the seed and cuttings he has generously provided to other gardeners. Among the best known are *Cornus nuttallii* 'Colrigo', *Ribes sanguineum* 'Elk River Red', *Corydalis aquae-gelidae*, *Potentilla villosa*, *Erythronium elegans*, *Kalmiopsis leachiana* 'Umpqua form', a selected form of *Penstemon cardwellii*, *Synthyris reniformis* 'Pink form', and *Daphne genkwa*.

Floyd has planned, built, and freely opened to visitors his extraordinary garden in a Douglas fir woodland. It is reputed to contain the best form of every species within it, all beautifully grown. There are hundreds of species, including *Shortia*, *Hepatica*, *Anemone*, *Primula*, *Penstemon*, dwarf *Mahonia*, the beautiful pink vine maple, *Campanulas* (including *C. piperi*), many conifers, *Stewartias*, *Rhododendrons*, *Kabschia saxifrages*, drifts of *gentians*, *meconopsis*, and many others. It is a very instructive garden, and an inspiration beyond being enviable; it displays under perfect horticultural conditions, the "best of the best," on the ground up to 100 feet high.



Award of Merit

Carl A. Gehenio

When one considers rock gardening in Western Pennsylvania the name Carl Gehenio come to mind immediately. His garden and greenhouse are absolute delights, filled with innumerable gems of the alpine plant world, all grown to perfection in our less than ideal climate.

Carl is one of the people most responsible for the growth and success enjoyed by the Allegheny Chapter of the ARGS. He is a charter member of the chapter and the second president of the chapter, serving a five year term. He devotes considerable time and energy creating special displays for our annual shows that always generate a great deal of interest among visitors, as well as club members. He also, freely and enthusiastically, shares his vast knowledge through talks given at our club meetings and articles written for our bulletin. At the national level Carl is a past member of the Board of Directors of the ARGS.

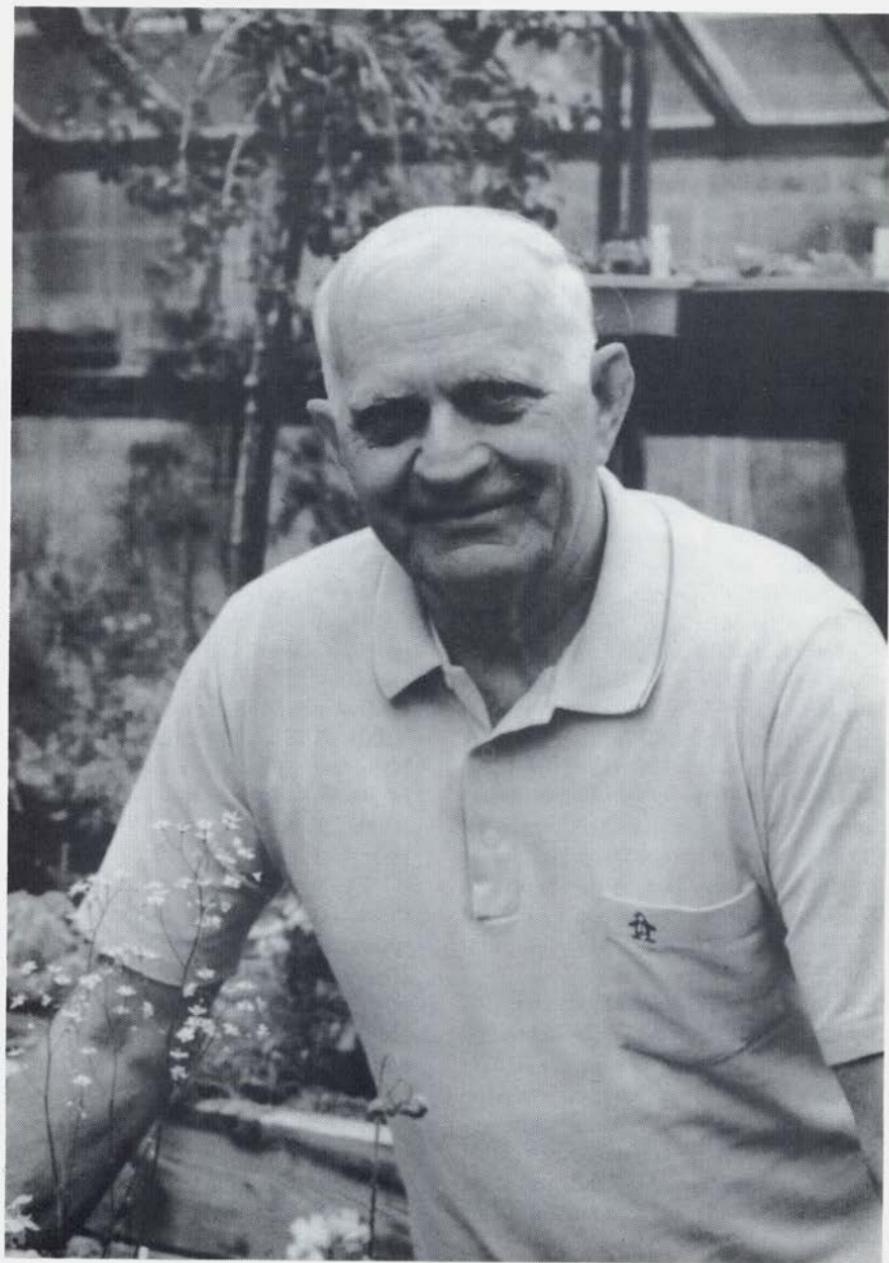
But even more, Carl is truly the consummate gardener. His dedication to

saving wildflowers has seen him 'cheat' the bulldozers on numerous occasions. Two particularly successful rescues resulted in masses of *Trillium grandiflorum* being delivered to Bowman's Hill Wildflower Preserve in eastern Pennsylvania and at least 600 pink ladyslippers being given to the New York Botanical Gardens. He has also been a judge at the Philadelphia flower show several times.

A man with no formal horticulture training, Carl is an intuitively intelligent and inquisitive gardener whose special talent is the ability to propagate and grow 'difficult' plants in our environment. His success with choice, demanding plants, such as *Anchusa caespitosa*, *Lewisia cotyledon*, many primulas, and the heathers is grand testimony to his skill as a gardener.

For diligently promoting rock gardening and the efforts of the Society at the local and national levels the American Rock Garden Society is proud to present to Carl A. Gehenio this Award of Merit.

-A.W. Deurbrouck



Award of Merit

Howard W. Pfeifer

I am very happy to present, on behalf of ARGs, this award of merit to my good friend -- and occasional antagonist -- Howard Pfeifer.

Howard is a rare creature in our midst: a professional botanist, ssp., taxonomist, with a sense of humor. He needs it to sit through the constant denunciations of the ways in which taxonomists make our lives miserable. What's more, Howard is also a botanist who has been quoted as saying he wants "to be thought of as a serious gardener!" and he is, indeed, a serious gardener.

There are several criteria for receiving an Award of Merit. One is service to the Society. Howard became chairman of the Connecticut Chapter almost immediately on joining it, was re-elected for another term and came back years later to serve again. He has been a member of the Board of Directors of the National for several terms where his forthright, direct, outspoken (O.K., blunt!) speech not only enlivened the meetings but, as parliamentarian, kept them on track. Memorizing Robert's Rules of Order is probably a defense he developed at endless faculty meetings.

Howard knows plants -- another criterion for the Award of Merit -- and he has shared his knowledge at talks to chapters all over the U.S. and Canada as well as Great Britain where the Alpine Garden Society has sponsored his tours. We may wonder what the British made of him and his ribald humor but we can be sure he was a fine ambassador.

Some of the talks Howard has given indicate the breadth of his knowledge:

North American Wildflowers
Scientific Names of Plants
Rhododendrons Suitable for
the Rock Garden
Flora of the Pine Barrens
Flora of Newfoundland

Constructing and Planting of Rock Gardens, a new career he embarked on after taking early retirement from the University of Connecticut.

Howard, who happily corrects my pronunciation of botanical names, once gave the show away when he told of asking his taxonomy professor for guidance on pronunciation. "Say it loudly and firmly and you'll be okay." Howard says it all loudly and firmly as he shares his knowledge with us all. (Sometimes surprisingly firmly, like the time I proudly showed him a stand of *Viola pedata* in my garden and his immediate response was "That shows how poor your soil is.")

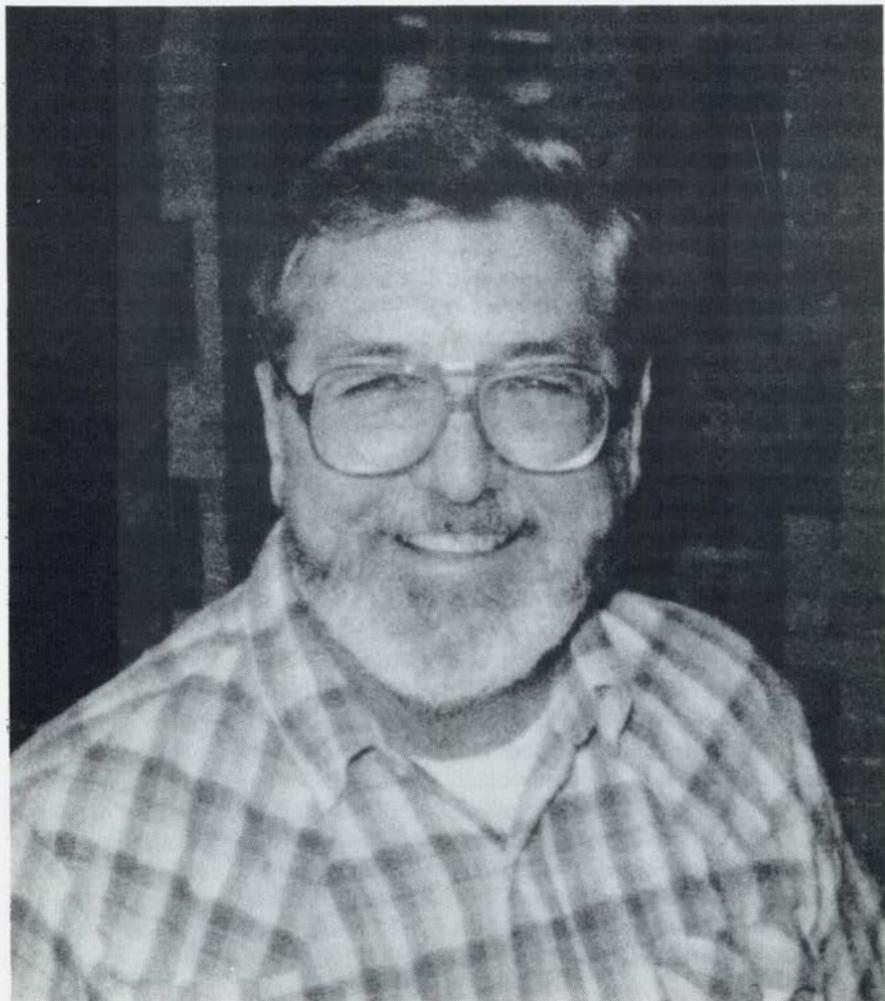
The Award of Merit also recognized those who have made a special study of plants native to the United States. Each year Howard leads groups to the Big Horns and other western areas for botanizing and study. He also works on his own collection of rare and unusual plants, many of which he has propagated and distributed. Among them is a dwarf form of *Smilacina racemosa* v. *crassa* which he discovered on a trip to Newfoundland, from where he also brought back a fine form of the yellow lady slipper -- *Cypripedium calceolus pubescense* --

which he distributed widely. He has also distributed a low form of our native *Aster linariifolius*.

So, for his outstanding plantsmanship, for his contributions to the study of our

native flora, for his devoted service to ARGS, we are pleased to present this Award of Merit to Howard Pfeifer.

Norman Singer



Carlton R. Worth Award

Mabel Gleason Harkness

The Carlton R. Worth Award recognizes the accomplishment of Mabel Gleason Harkness as author of *The Bernard E. Harkness Seedlist Handbook*, as published in its fourth edition by Timber Press.

With entries ranging from the one hundred and fifty-foot *Abies procera* to the minute creeping *Mentha requienii*, the Seedlist Handbook is recognized as an indispensable reference for serious gardeners of all persuasions. Since the publication of the first edition in 1974, sales abroad have been most gratifying, thus establishing a base for communication among rock gardeners world-wide.

After the death of Bernard Harkness in 1980 Mabel continued to fill orders for the third edition through the tiny Bellona post office. No one could be more aware than she of the value of the publication, and also of the size of the task of keeping the Handbook current.

In 1983 Mabel began updating entries, more time-consuming each year with the ever-lengthening lists from the three societies. Working with Bernard's library, she has been diligent in searching out additional references to aid in documenting elusives of the lists. She early began to investigate computerization; again it took persistent pursuing to find what would work for such specialized documentation. Many frustrating dead ends were encountered. A less dedicated and resourceful person would have given up, but not Mabel.

A fortuitous meeting with Deborah D'Angelo brought the assistance of a reference librarian with an exceptionally perceptive eye. A work schedule was set up and rigorously held to in time to accept the contract with Timber Press for publication with distribution at the end of 1986.

A native of Oil City, Pennsylvania, Mabel fondly recalls her introduction to botany: As a small child she walked with her Aunt Carrie around the yard, her aunt giving each plant its name.

Later as a student at the University of Rochester Mabel studied general botany and taxonomy, receiving an AB degree in biology in 1935. During the years 1936 - 38 she did graduate work in the department of botany at the University of Michigan. Her course work included plant anatomy, plant physiology, paleobotany, and the rugged study of the family Gramineae. In 1962 she was awarded an MS degree in Canadian-American history from the University of Rochester.

In the 1940s Mabel worked as a research librarian in the engineering division at Stromberg-Carlson in Rochester. She also edited a technical magazine for the engineering division. She married Benjamin Olney, acoustical engineer, who died in 1963. From 1953 - 66 she served as library director, The Garden Center of Rochester, and as editor of the Garden Center "Bulletin" from 1964 to 1966.

When Bernard and Mabel were married

in 1964 the seed sorting and packaging of the ARGS seed exchange moved to Mabel's work table, a collaborative effort which continued for several years. A common interest in the history of horticulture led to a joint Harkness - Olney research paper on artist John Walton in *Huntia* of October, 1965. With Bernard's retirement and the move to Pre-Emption Road in 1967, the collaboration centered on gardening, with Mabel's special interests a productive vegetable garden, a fruit orchard, and a treasured peony collection.

It is interesting to note that in 1953, the

year Bernard planted the rock garden at 5 Castle Park, Rochester, Mabel was asked to develop a horticultural library at the Rochester Garden Center. It is precisely this combination of the librarian's skills in research and documentation plus extensive botanical knowledge that make Mabel's contribution of the fourth edition of the Harkness Seedlist Handbook so valuable. Another ingredient in this accomplishment should be sited: Mabel's dedication to continuing a publication welcomed by gardeners around the world.

Audrey O'Connor



Ferns on the Fence

Ron Bendixen

When I moved to my current address some fifteen years ago, our back yard certainly looked different than it does today. Way back in the olden days there were still a few spots here and there that actually got a couple of hours of scattered sun. That was before our "umbrella tree" (Norway Maple) was forty feet tall and the seven other trees, in this relatively small backyard, were still seedlings. To complicate matters even more, the yard was surrounded by a six-foot redwood privacy fence done in a basket-weave design. What we have now, fifteen years later, is a back yard that is so intensely shady we have had to turn about 30% of it into patio because we cannot even grow grass in the shadiest areas.

Fortunately, I recognized the potential of this shade-intense area from the very beginning. That was back in 1974 and Bicentennial was a big issue with everyone at the time. People were planning their bicentennial gardens and I'm sure that 95% of them were red, white, and blue. I decided my personal bicentennial theme would be a native American garden. If it wasn't a native American plant, it wasn't welcome in my garden: in other words, I would grow wildflowers. To compliment these wildflowers, what better shade-loving companions than our native American ferns.

That began my love affair with ferns. Somewhere along the line I slackened my rigid requirements and let a few non-native hardy ferns move into my garden. I now have more than seventy varieties of hardy ferns in my Minneapolis garden.

In the early years there was enough space to work with and every spring would find me digging up a new corner of lawn to expand my gardening spaces. The years passed and the field trips and the orders from various wildflower nurseries kept adding new varieties to the garden. While the earlier plantings established themselves and spread from single plants into clumps or colonies, I was faced with the problem most city gardeners face sooner or later - lack of space.

On one early trip to the North Shore of Lake Superior, I noticed that Warren was collecting a small sod of polypod ferns with its associated mosses from a cliff that was literally encrusted with them. This was one plant we had not had a great deal of success with as we were trying to grow it as a border plant. When we returned from our trip, he mounted the entire sod, including the humus and the moss that was completely covering the rhizomes, on a flat board, tied it securely in place with monofilament fishing line, and hung it on the fence. The idea was a spin-off from our house plant collection of staghorn ferns which were comparably mounted.

The result was quite impressive. The ferns were very lush, hanging there several feet above the tops of the border plants. They gave the redwood fence a new perspective; it suddenly became part of the garden rather than a geographic boundary. Most important, the ferns looked much more natural than they did on the ground. This was a variety that we always found growing

on cliffs and out of crevices; in nature they were nearly always on a vertical surface rather than a horizontal one.

This started as an experiment and, as with so many successful experiments, once the initial model was completed, we could immediately see the areas that needed improvements. The first "fern plaque", as we began calling them, had a major flaw that was apparent from the start; it required watering daily and on hot, windy summer days, sometimes twice a day. Even though I am an avid gardener, I don't have the time to give each plant that kind of attention.

The next unit we made was also mounted on a flat board, but this time we placed a flattened mound of long-fibered sphagnum moss on the board and placed the fern rhizomes on top of that before tying it securely to the backing. This improvement meant that we could go for two or three days between waterings - a definite step in the right direction.

The following year we tried a couple of diverse designs. One attempt was to mount an arched piece of hardware cloth convexly over the board and fill the resulting "cage" with long fiber sphagnum, cut openings in the wire for the ferns and plant them. The result was an ugly wire cage that still dried out in about three days. The other design involved adding strips of wood to the bottom and sides of the initial backing board while leaving the top open to catch rain water and the corners open to facilitate drainage. This design gave us small ledges enabling us to use more sphagnum moss and, more importantly, to pack the sphagnum to a uniform depth, thus holding moisture for a longer time. We decided that this was the design concept which we wished to pursue, but even this design could be improved.

The design which we now use for the

dozen fern boxes that adorn our fence consists of a shallow wooden box with sides two to three inches deep and mitered, closed corners. For cosmetic purposes only, we add a facade of finishing molding around the outside and paint the whole unit with redwood stain so it is more in harmony with the fence. After the unit is painted, I drive brass brads (brass doesn't rust) into the front lip of the box about one inch intervals.

When it is time to plant the box, I soak long-fiber sphagnum moss in a bucket of water until it is completely saturated, then I wring out as much of the water as I possibly can, and pack the damp sphagnum into the box. I start packing the moss at the bottom and work my way up. I pack the sphagnum to the depth of the molding as tightly as I can, incorporating the plants into the growing medium as I work my way up.

When I am finished and completely satisfied with the placement of plants, I begin tying the whole unit together with monofilament line. I attach one end to a brass brad, draw the line across the sphagnum surface where the roots are imbedded (sometimes actually weaving through the fronds) and tie the line to a brad on the opposite side. At that point, knot the line securely, cut it, and start all over again. After the box is tied horizontally, I make three or four vertical ties from top to bottom so the sphagnum is secured from all angles. In early attempts, I used to try to tie the entire unit with a single length of line, simply twisting the line around the brad four or five times and then crossing back over with the same line. That proved to be a disaster. In the first place, it is extremely difficult to maintain uniform tension on the line and secondly, when a curious squirrel chews through the line, you will have to restring the entire unit rather than simply

replace one length of line.

Watering is now relatively easy despite the number of boxes we have to take care of. I have two heavy plastic troughs (the type construction workers use for mixing concrete in small batches) and I simply fill these with water and immerse the boxes (face-down because they float) for ten to fifteen minutes. I can get two boxes into each trough, so that conserves time. I use my *Woodsia ilvensis* box as an indicator: when that plant begins to curl around the edges, every one gets watered.

In the autumn, when I am putting my garden to sleep for the winter, I simply remove the boxes from the fence and lay them flat on the ground, facing up, and cover them with leaves as I do the rest of the garden. The biggest thrill of uncovering the gardens in the spring is finding the incredibly lush green of the polypods emerging as I remove the covering of dead leaves.

One thing that has amazed me is that many of the so-called limestone ferns do very well growing in pure sphagnum. We often have had much better results with *Asplenium platyneuron*, *Camptosorus rhizophyllus*, and *Asplenium trichomanes* under this method of cultivation than we do trying to grow them in limestone crevices.

We are still experimenting and our design is still evolving. My favorite box at the moment is one that we have modified by placing small ledges of limestone into a thin veneer of concrete on the back of the box. When the concrete had thoroughly hardened, we packed long-fiber sphagnum between the emerging stone ledges and planted it with *Pellaea glabella* and *Cheilanthes Feei*. These plants are also much happier on the fence than they were in my fern cobble. This particular box is very heavy to move and when it is watered, it goes into the watering

trough face-up, as it doesn't float.

The summer of 1988 was a cruel one, as you may remember. Not only were we setting temperature records and battling one of the worst droughts in memory, but my interests and energies were not being concentrated on my woodland gardens. Three years earlier I had contracted that infectious disease commonly known as Rock Garden Fever, so I spent one of the hottest summers of the century moving boulders from Lake Pepin to my front yard. By the end of summer, the entire bank in front of our house had been terraced and planted. Unfortunately, nothing fared worse than the fern boxes.

By the end of the summer, two of the twelve were still showing signs of life, the others were completely gone. An "autopsy" relieved some of the guilt. Upon examination of the desiccated remains, I discovered that the long-fiber fresh sphagnum moss had broken down and deteriorated to a greater extent than met the eye. It's strange how easily one can lose track of time; most of those boxes had been hanging there through five or six summers with little or no maintenance other than watering.

We'll learn from experience and we all learn that no matter how effective a concept or technique is, it can always be improved. The fact that I lost ten of my twelve fern boxes during the hottest summer in recent memory doesn't mean the idea was not a success. After all, we have had ferns on the fence, in one form or another, for a dozen years.

Replacing these boxes will be my top priority for spring. I will use the same basic technique I have used in the past. I will limit my varieties to the miniature ferns I have worked with in the past: *Woodsia ilvensis*, *Polypodium virginianum*, *Asplenium trichomanes*, *A. platyneuron*, *A.*

pinnatifidum, *Camptosorus rhizophyllus*, *Cheilanthes tomentosa*, *Adiantum pedatum* var. *subpumilum*, *Pellaea giabella*, and others. I will also make a point of checking the condition of the growing medium after the second year. When it starts to appear crumbly, I will dismantle the box and replace it. I will soak the boxes in a mild solution of fish emulsion in late May or early June and perhaps again in early September.

We have discovered that plants grown from spore are more adaptable to these boxes than nursery stock or collected material. Sporelings can be planted directly into the sphagnum when they are about an inch high. The box can then be left under lights in a horizontal position until the plants are sufficiently developed and hardened off to go outside. We have had fantastic success with *pellaeas* and hope to try other varieties in the near future.

There is no reason that this technique

for growing has to be limited to ferns. At various times our ferns have hosted uninvited guests, including *Aquilegia canadensis*, *Corydalis sempervirens*, and a common old gooseberry bush. I think a box of miniature iris would be very attractive, especially when in bloom. We had a couple of boxes of semps and sedums early on when we still had a few sunny spots and they were marvelous. If anyone decides to try this with any other plant materials, I would be interested in hearing about your results and anything you might have done to improve upon my methods. In the meantime, I will continue to grow ferns on the fence.

(The author has provided a video-tape demonstrating the method of constructing and planting these boxes. It is available through the ARGS Slide Library.)

*Reprinted from the March 1989
Newsletter of the Minnesota Chapter.*



A Midwest Dwarf Conifer Bed

Elise Felton

Why plant dwarf conifers? Because they are unusual, evergreen, colorful and interesting during all seasons, while requiring little maintenance. For color, there is nothing more vivid than the new, brilliant growth of the Dwarf Alberta Spruces. Then there is the yellow to the Rheingold Arborvitae which turns a soft copper-brown in the winter, and the blue of the junipers and Colorado Spruces. The leaf textures vary from scalelike to threadlike, from fine to needlelike. The forms vary from the pyramid of the Dwarf Alberta Spruce to the globular and flattened shape of the Dwarf Hinoki False Cypress. The Dwarf Blue Spruce is round with a flat top, while *Juniperus virginiana* really looks like its name "Sky Rocket."

In October of 1981, we planted 24 dwarf conifers in a bed measuring 6 by 18 feet where, during summer, they receive seven hours of sun a day. We situated them on the lake-side of the house under the dining room windows as they are so pleasurable to look down on. On the north side of the bed is our neighbor's grey board fence which doubles as a fine background and protection from the north wind that can blow down Lake Michigan unobstructed for 500 miles.

In planting we added bales of sphagnum peat, 5-10-5, and superphosphate to our sandy loam soil, which drains very well. The smaller plants are planted in front on the southern edge, which is covered. The taller, bulkier ones are in the rear, up against the fence. We have mulched only once with redwood bark, allowing each proportionally

spaced plant to stand out as a specimen.

The only real problem comes from winter winds which drive through a channel between the fence and our house near where the bed is located. If we have enough snow to cover the plants, there are no worries. I refuse to use burlap or plastic cones to prevent browning as I find them unsightly. I do remove *Chamaecyparis lawsoniana*, *Thuja plicata* 'Stoneham Gold,' and *Chamaecyparis thyroides* 'Ericoides' which are in clay pots set into the soil. They go into our garage about the middle of December for the winter. About May 1, I plant them back into the bed, repotting them in a one size larger container, if necessary.

This year I will Wilt Pruf all the plants. Last winter's winds dehydrated and consequently denuded one side of the Alberta Spruce, the two *Juniperus communis* 'Compressa,' and portions of some of the other conifers.

For those unfamiliar with Wilt Pruf, it is an anti-transpirant, slowing down evaporation rates from leaves by as much as 80%. It should be sprayed on in late fall, in January, and early March when the air temperature is above 40 degrees F.

Each fall I send away for three or four more plants. As a result the bed now measures 44 by a curvy 7 feet. It has been extended in an easterly direction, toward the lake, with an iron fence extension to the board fence as background. We now have 54 dwarf conifers.

When the new plants arrive, I pot them up in a light soil having equal parts of peat,

perlite, and compost. I transfer the conifers to the bed carefully, minimizing disturbance to new roots. Usually with new introductions, some established conifers have to be moved around to achieve balance, contrasts of sizes and shapes, textures and colors, and an overall pleasing arrangement. All this is best done, in the Midwest, the first week in October. Ground freezing usually occurs a week before Christmas so the transplants have about 10 weeks to become established.

"Conifer" comes from the Latin meaning "cone bearing." Three main groups prevail: Large - those which grow 3 meters in 10 years and ultimately over 12 meters. Medium - those which grow between 1.5 to 3 meters in 10- years with ultimate heights of up to 12 meters, Dwarf - those which grow less than 1.5 meters in 10 years. In addition, there are prostrate and semi-prostrate forms which in a 10 year growth span can also be measured.

Dwarf conifers have several origins. They are made from cuttings from witches'-brooms, i.e., a mass of abnormal tightly compact twigs on an older tree resulting from the irregular growth on one bud or of a bud mutation. They can come from a nurseryman's seed bed where one seedling in thousands does not respond to the normal growth pattern and remains dwarf. Perhaps a normally vigorous tree grows a weak side branch. The resulting propagations could be prostrate and permanently slow growing plants. In some Spruces a virus disease can cause permanent dwarfing. Dwarf chamaecyparuss and juniperus can be the result of juvenile foliage fixations, meaning that some of these plants have mysteriously retained their juvenile foliage, which is quite different from adult foliage. Lastly, dwarf conifers can originate as alpine or mountain forms which exist despite harsh climate and

destructive winds. These retain their dwarf habit even when grown in our gardens (e.g., *Pinus mugo pumilo*).

I enthusiastically recommend these dwarf plants for attracting interest in all seasons, and especially as foundation plantings under picture windows, allowing a view to the outside and more light inside the house. They are small and slow growing. They are also appropriate plants for raised beds, rock gardens, troughs, and low hedges. they are most suitable for providing interest among low ground covers. Dwarf deciduous shrubs, such as *Berberis thunbergii* 'Crimson Pigmy,' a lovely contrasting red, make fine contrasts as complementary plantings, as do the smaller ornamental grasses.

When selecting, buy from a nursery which knows the source of propagation and the ultimate size of these plants. You should know the scale, proportion, and growth rate of each plant selected. Keeping detailed records about these special plants is a fun project. If you live in areas of the U.S. where there are no dwarf conifers available, do not hesitate to use the phone. There are a number of specialized dwarf plant nurserymen who are very knowledgeable and keen. Almost all of my collection has come by United Parcel Service. The plants I buy are small and young, and therefore not expensive. You, the collector ordering from nurseries, will only receive small plants, The larger ones are already in collections.

I look upon these dwarf conifers as a lifetime investment and eagerly await each fall for creating new artistic arrangements.

Elise Felton lives in Evanston,IL.

FURTHER READING

Conifers, D.M. van Gelderen and J.R.P. van Hoey Smith, Timber Press, 1986.

Dwarf Conifers, Brooklyn Botanic Garden, Volume 21, No. 1, 1980.

Dwarf Conifers, Joseph Hudak, Horticulture, April, 1986.

Gardening with Dwarf Trees and Shrubs, Andreas Bartels, Timber Press, 1986.

Ground Covers for the Midwest, Keith and Giles, University of Illinois Press, 1980.

Incredible Shrinking Trees, Jack Ruttle, National Gardening, December, 1988.

Manual of Cultivated Conifers, Gerd Krussman, Timber Press, 1985.

Manual of Dwarf Conifers, Humphrey J. Welch, Theophrastus, 1979.

Ornamental Conifers, Charles R. Harrison, (edited by Julie Grace), Timber Press, 1983.

DWARF CONIFER SOURCES

Coenosium Gardens
6642 S. Lone Elder road
Aurora, OR 97002

Fort Washington Garden Mart
488 Bethlehem Pike
Fort Washington, PA 10934

Foxborough Nursery
W. David Thompson
Street, MD 21154

Greer Gardens
1280 Goodpasture Island Road
Eugene, OR 97401-1794

Siskiyou Rare Plant Nursery
2825 Cummings Road
Medford, OR 97501

DWARF CONIFER COMPANIONS IN THE MIDWEST

These are complementary plants for a dwarf conifer bed. They provide more contrast in color, texture, form, line and space, which are the primary elements of design.

<i>Arrhenatherum elatius</i> 'Variegatum'	Oat Grass
<i>Arctostaphylos uva-ursi</i>	Bearberry
<i>Berberis thunbergii</i> 'Atropurpurea Nana'	Crimson Pygmy Barberry
<i>Carex morrowii</i> 'Albomarginata'	Japanese Sedge Grass
<i>Cotoneaster apiculatus</i>	Cranberry Cotoneaster
<i>Euonymus japonica</i> 'Aureo-marginata'	Spindle Tree
<i>Festua ovina</i> 'Glaucua'	Blue Fescue
<i>Hakonechloa macra</i> 'Aureola'	No common name
<i>Hypericum yakusimanum</i>	St. John's Wort (annual)
<i>Mentha pulegium</i>	Pennyroyal (annual)
<i>Potentilla fruticosa</i> 'Goldfinger'	Shrubby Cinquefoil
<i>Salix x morrei</i>	Morrei Willow
<i>Salix repens</i>	Creeping Willow
<i>Thymus serpyllum</i>	Lemon Thyme

Elise Felton Dwarf Conifer Collection

Dwarf Conifer	Fall 1985 Size		Fall 1988 Size		Color	Origin	Date Planted
	Height	Width	Height	Width			
<i>Abies balsamea</i> 'Nana'	1/2'	1/2'	3/4'	1'	bright green	Greer	4/83
<i>Chamaecyparis lawsoniana</i> "Elwood Improved"	2'	1'	2-1/2'	1'	silver	•	6/81
<i>C. nootkatensis</i> 'Compacta'	•	•	3/4'	1/2'	blue-green	Siskiyou 4/87	5/88
<i>C. obtusa</i> 'Ericoides'	•	•	1/2'	1/2'	yellow-green	Wildwood Gardens 10/87	5/88
<i>C.o.</i> 'Kosteri'	•	•	1/2'	2/3'	green	Siskiyou 4/87	5/88
<i>C.o.</i> 'Coraliformis'	1'	2'	1-2/3'	2-2/3'	dark green	•	6/81
<i>C.o.</i> 'Mariesii'	1'	1-1/2'	1'	1-1/2'	yellow, white, green	•	6/81
<i>C.o.</i> 'Nana'	1'	1'	2'	2'	dark green	Berd	6/81
<i>C.o.</i> 'Nana'	1/2'	1/2'	3/4'	3/4'	dark green	brought from east '79	4/81
<i>C.o.</i> 'Pygmaea Aurescens'	•	•	1/2'	1/2'	brown-green	Siskiyou 4/87	5/88
<i>C.o.</i> unlabeled - 'Gracilis Compacta?'	1'	2'	2'	2-1/3'	dark green	Chalet Nursery	6/84
<i>C. pisifera</i> 'Filifera Aurea'	2'	4'	5'	5-1/2'	gold	Berd	4/81
<i>C.p.</i> 'Minima Silvernode'	•	•	3/4'	1'	green, splashes & silver to cream	Siskiyou 4/87	5/88
<i>C.p.</i> 'Minima Variegata'	1-1/2'	2-3/4'	2'	3'	green, yellow tips	Greer	6/8
<i>C.p.</i> 'Plumosa Compacta Aurea'	1-1/2'	2-1/4'	2-1/3'	2-1/2'	green to gold	brought from east '79	4/81
<i>C.p.</i> 'Plumosa Compacta Aurea'	1'	1'	1-1/2'	1-1/2'	green to gold	Calf. as a bonsai	8/85
<i>C.p.</i> 'Plumosa Flavescens'	1/2'	1'	4'	3-1/3'	green	GCA plant xchg	6/82
<i>C.p.</i> 'Plumosa Juniperoides Aurea'	2-1/4'	3'	4'	3-1/3'	yellow & green	Greer	6/81

<u>Dwarf Conifer</u>	<u>Fall 1985 Size</u>		<u>Fall 1988 Size</u>		<u>Color</u>	<u>Origin</u>	<u>Date Planted</u>
	<u>Height</u>	<u>Width</u>	<u>Height</u>	<u>Width</u>			
<i>C.p.</i> 'Taukom'	1/2'	1-1/2'	1/2'	3/4'	bright green	Siskiyou	4/81
<i>C.p.</i> unknown sport	1'	1'	1'	1'	blue	Swathmore College from cutting made	8/85 10/74
<i>C. thyoidea</i> 'Ericoides'	1-1/4'	1'	2'	1-1/2'	blue-gray	Greer	6/81
<i>Cryptomeria japonica</i> 'Elegans Nana'	2'	3-1/2'	•	•	blue-gray	brought from east died	'86
<i>C.j.</i> 'Tanyu'	•	•	3/4'	1/2'	green to bronze	Wildwood Gardens 10/87	5/88
<i>Juniperus communis</i> 'Compressa'	•	•	2'	1/3'	gray-green	Greer 9/85	10/87
<i>Juniperus communis</i> 'Compressa'	•	•	2-1/4'	1/3'	gray-green	Greer 9/85	10/87
<i>Juniperus communis</i> 'Compressa'	•	•	1'	1/4'	gray-green	cutting made 11/86	6/88
<i>Juniperus communis</i> 'Repanda'	•	•	1/2'	1'	silver-green	Midwest Gr. Covers 10/87	5/88
<i>J. horizontalis</i> 'Wiltonii'	2/3'	3'	2/3'	5'	blue	Berthold Nursery	5/81
<i>J. x media</i> 'Shimpaku'	2'	3'	3'	3-1/4'	dull green	Greer	5/83
<i>J. procumbens</i> 'Green Mound'	3/4'	4'	1'	6-1/2'	bright green	Chalet Nursery	6/81
<i>J. squamata</i> 'Blue Star' (3 planted together)	3/4'	1-1/2'	1'	2-1/4'	steel blue	Siskiyou	4/81
<i>J. virginiana</i> 'Sky Rocket'	7'	1'	9-1/4'	2'	blue-silver	Berd	4/81
<i>Microbiota decussata</i>	•	•	1/2'	2/3'	blue-green to bronze	Siskiyou 4/8	5/88
<i>Microbiota decussata</i>	•	•	1/4'	1-1/4'	blue-green to bronze	Midwest Gr. Covers 10/87	5/88
<i>Picea abies</i> 'Nidiformis'	1-1/4'	1-1/2'	2-1/4'	2-1/2'	dark green	Berd	4/91
<i>P.a.</i> 'Echiniformis'	3/4'	3/4'	1-1/2'	1-1/4'	gray-blue	Siskiyou	4/81
<i>P. glauca</i> 'Echiniformis'	1'	1-1/4'	2'	2-1/3'	gray-blue	Berd	4/81

Dwarf Conifer	Fall 1985 Size		Fall 1988 Size		Color	Origin	Date Planted
	Height	Width	Height	Width			
<i>P.g.</i> 'Albertina Conica'	4-3/4'	2-1/2'	5'	3-1/2'	bright green	Wibbard Rd. Gard.	4/81
<i>P.g.</i> 'Conica Sanders Blue'	•	•	1-1/4'	3/4'	green-blue	Wayside	4/85
<i>P. mariana</i> 'Nana'	1'	1-1/2'	2'	2-1/4'	gray	Berd	4/81
<i>P. omorika</i> 'Nana'	2'	2'	2-1/4'	3'	grayish-green	Greer	10/84
<i>P. pungens</i> 'Glauca Compata'	1-1/2'	2-1/4'	2-1/3'	3-2/3"	blue-gray	Berd	4/81
<i>P.p.</i> 'R.H. Montgomery'	2'	3'	3'	4-1/4'	blue-silver	Greer	6/81
<i>P. sitchensis</i> 'Tenas'	•	•	1/2'	1/2'	green-silver	Siskiyou 4/87	5/88
<i>P. aristata</i>	•	•	3/4'	1/2'	blue-green	GCA plant xchg	6/82
<i>P. parviflora</i> 'Nana'	2'	3/4'	2-1/2'	3/4'	bright green	Greer	10/84
<i>P. strobus</i> 'Contorta'	2-3/4'	1'	2-2/3'	2'	medium green	Greer	10/84
<i>P.s.</i> 'Umbraculifera'	1-1/2'	2'	•	•	green	Berd	4/81
							died '88
<i>Thuja occidentalis</i> 'Hetz Midget'	1-1/2'	1-1/2'	1-1/2'	2'	dark green	Berd	4/81
<i>T.o.</i> 'Lutea Nana'	1-1/2'	3/4'	2-2/3'	2-1/3'	dull green	Greer	10/85
<i>T.o.</i> 'Rheingold'	2'	1-3/4'	2-1/4'	2-1/2'	orange-gold	brought from East '79	4/81
<i>T.o.</i> 'Rheingold'	3/4'	3/4'	2'	2-1/3'	orange-gold	cutting made 7/81	10/82
<i>T.o.</i> 'Tiny Tim'	1/2'	3/4'	1'	1'	dull green	Greer	10/85
<i>T. plicate</i> 'Stoneham Gold'	2'	1'	3'	1-1/2'	bright green-gold	Greer	10/84
<i>Tsuga canadensis</i> 'Cole's Prostrate'	1/2'	4'	1/2'	2-1/2'	dull green	Don Smith '76	4/81
<i>T.c.</i> 'Jeddeloh'	•	•	1/2'	3/4'	bright green	Siskiyou	5/86
<i>T.c.</i> 'Curly'	•	•	2/3'	2'	dull green	Siskiyou	5/86

Deciduous Trees for the Rock Garden

Robert L. Fincham

A rock garden needs more than an assortment of alpine plants and slow-growing conifers. There are many accessory plants which can add variety, form focal points, and create microclimates for a garden of any size. Deciduous trees make fine accessory plants with many forms, sizes, and colors available to the rock gardener.

Some rock gardeners are blessed with a variety of biomes which create idyllic settings. Many plantspeople, however, possess a section of property with no suitable habitations for alpine and must start from scratch. For example, to develop shady nooks on an open hillside, a person must often plant his own shade trees. Choosing these trees is a major decision. The wrong choice could be disastrous and destroy a promising garden. An individual must consider a variety of factors when choosing any trees for the rock garden. What are the height and spread of the tree at maturity? Would a flowering tree accent the planting? Would the garden benefit from a tree with colorful foliage? Which form would add interest: a rounded crown, narrowly ascending branches, or perhaps a low-growing form with pendulous branches?

Whatever one decides, several readily available trees must be avoided, not only for their large size but for other reasons I will mention in their descriptions.

Unsatisfactory Trees

Acer platanoides (Norway maple) is an extremely dense shade tree that becomes quite tall and broad at maturity. As is typical of many maples, its root system is shallow

and extensive, presenting problems for sub-canopy plantings.

Acer saccharinum (silver maple), one of the fastest growing maples, has several glaring deficiencies. Its rapid growth results in the development of soft, weak wood, which, when added to its proficiency for developing crotches, resulting in a tree that suffers severely in ice storms. The root system is also extremely shallow and wide spreading.

Salix babylonica (weeping willow) is a nicely pendulous form that belongs near streams and in swamps far away from human habitations and gardens. Because the root system is fibrous and shallow, weeping willows often topple during wind storms. The soft wood of this tree makes it very untidy and completely unsuitable for the rock garden.

Juglans nigra (black walnut) is an attractive tree noted for its valuable hardwood. Its foliage creates a pleasing, light shade pattern. The major drawback of this tree is its toxicity. Its roots kill almost any other plant they touch. At one time the hulls of the nuts were boiled and used to poison fish in ponds for the restaurant trade.

Robinia pseudacacia (black locust) is a very large tree with an attractive foliage that forms a light shade pattern. Since it will sucker from its roots and seed itself prolifically, the black locust will eventually take over the entire garden.

Populus nigra 'Italica' (Lombardy poplar) is very common in the landscape and rapidly develops into a tall, attractive,

narrowly ascending tree with foliage that shimmers in the wind. Its major drawback is a short life span that results in the death of many specimens shortly after they attain a large size.

I have discussed only six of the most common trees one should avoid. When purchasing trees from a retail source, a person should research each selection to see that each tree contains none of the negative qualities mentioned.

Any of the following deciduous trees are suitable for the rock garden. This listing reflects my preferences and is by no means comprehensive.

Narrowly Columnar (Fastigate) Forms

Fastigate trees are useful for their aesthetic values rather than their shade production. They grow with a very narrow habit, and all of the branches ascend along the trunk. When planted in the upper portions of a rock garden, they tend to break up horizontal lines. In a more formal setting, they may serve as a natural fence or a privacy screen when planted in a row around portions of the garden.

Acer saccharum 'Monumentale,' is the most fastigate sugar maple available. This tree looks like a utility pole covered with ivy. It is a fairly rapid grower, reaching a mature height of about 20 meters.

Carpinus betulus 'Fastigiata,' the columnar hornbeam, is an ascending form with a light green leaf color and a very dense habit. It tends to be a bit broader than the other trees in this section, but is still quite narrow with a height of about 15 meters at maturity.

Fagus sylvatica 'Dawyck,' the fastigate European beech, has branchlets which are somewhat contorted and leaves of a dark

green color. During the winter, these branchlets create a picturesque pattern. The mature height is about 20 meters. Recently, a gold-leaved form and a purple-leaved form originated at the Trompenburg Arboretum. When they become available in this country, the supply will not be able to meet the demand for many years.

Ginkgo biloba 'Fastigiata,' is a columnar form of a living fossil whose unique, fan-shaped leaves have been found as fossils in ancient rock formations. It is thought to be a link between the conifers and the more primitive tree-ferns and cycads. This conifer has a mature height in excess of 20 meters. Many people are surprised to see what they at first think is a giant geranium.

Quercus robur 'Fastigiata,' the columnar English oak, has a very narrow habit and is a rapid grower in rich, acid soil. Both of my specimens grow up to 2 meters per year. The leaves are a dark, rich green with rounded lobes and often persist on the branches through the winter, though then of a light brown color. At maturity this tree has a height of 25 meters.

Pendulous Growth Habit This group possesses a pleasing shape and provides some summer shade for low-growing plants. These small trees, with branches that curve downward to varying degrees, grow broader than high and generally must be staked to attain any height. In addition to a pleasing shape, they also provide various colors for the garden with their different barks, leaves, and flowers. Pendulous plants are quite attractive next to water at the top of a wall, or directly above a large rock in the rock garden.

Acer palmatum 'Dissectum,' is a group name for a variety of cutleaf Japanese maples. All, except *A. palmatum* 'Seiryu',

have a spreading to pendulous habit. These trees possess a wide variety of leaf colors, which often vary with the seasons and put on an impressive seasonal display. During the winter, the branch structure of the tree provides another type of beauty. Two personal favorites are *A. palmatum* 'Dissectum Everred', a dark red form with silvery pubescent newly opening leaves. These plants are generally as broad as high, attaining heights up to 3 meters. An excellent reference book for this group of plants is *Japanese Maples* by J.D. Vertrees, published by Timber Press.

Prunus serrulata 'Pendula,' the weeping cherry, is a strongly pendulous form which grows very fast and becomes quite attractive in the spring when covered with pink flowers. The branches will reach the ground if not kept pruned. If so desired, the tree may be maintained as a canopy over plants needing light shade. The mature height is 4 to 5 meters. Please note that the grafted form of this tree will develop a large knot at the union and has a tendency to sucker from the trunk. Trees from rooted cuttings will not have these problems.

Betula pendula 'Youngii,' the contorted European beech, has strongly twisted branches and grows wider than high, with an irregular habit. It has dark green foliage and is most outstanding in the winter with its twisted branches. In the future, a purple-leaved variety will be available in this country. This tree makes a nice alternative to *Corylus avellana* 'Contorta' since it does not grow nearly as fast.

Fagus sylvatica 'Pendula,' the common weeping European beech, has been available in this country for many years, and becomes quite large. The branches start horizontally and then drop, as if they can no longer support their own weight. Then one

main branch will lift itself and make another section for more horizontal branches to originate and drop. A purple-leaved form, which is slower growing than the green-leaved form, is also quite attractive but must be staked to a desired height as it does not grow upward at all. A golden form of weeping European beech will soon be available in this country. It develops a leader, from which the branches droop. However it must be protected from the sun since the gold leaves will burn. The variety of leaf colors and growing habits allow this tree to be used in a wide variety of situations.

Flowering Trees

Flowering trees, which are suitable for gardens of a variety of sizes, make up the last group of trees. They provide outstanding color for the rock garden as well as areas of light to moderate shade. Several of these trees also provide outstanding foliage color from spring through fall.

Cornus florida, the eastern flowering dogwood, has several varieties that provide color, form, berries, and light shade for the garden. They eventually attain a height of about 6 meters.

Cornus florida 'Hohman's Gold' does not exhibit a prolific flowering habit but is noted for its outstanding yellow-variegated green leaves. The variegation involves the complete margin of each leaf and often reaches completely to the mid-vein. The autumn coloring of each leaf consists of varying shades of pink and red.

Cornus florida 'Welchii', the tricolor dogwood, exhibits a limited flowering capability, but has the most attractive leaf coloration of any plant on my list. Each green leaf has a white margin and becomes suffused with varying shades of pink during the summer. The fall coloration contains

many shades of red and pink.

Sorbus acuparia, the European mountain ash, possesses a soft-appearing foliage and produces light shade. It attains a height in excess of 10 meters but is not excessively wide. It is best known for its dense clusters of orange berries in the late summer.

Franklinia alatamaha, is an attractive tree for the garden because it produces large, showy, fragrant white flowers during the summer and keeps flowering until frost. It is a small tree growing to 7 meters in height. It is not cold hardy north of Zone VI.

Prunus serrulata 'Kwanzan', is a cherry with deep pink, double blossoms which contrast nicely with the reddish-green, unfolding leaves. It produces light to medium shade while reaching a height of 15 meters. For many rock gardens, several of these trees would create a nice border planting.

Prunus cerasifera 'Pissardii', the thundercloud plum, is prized for its dark purple foliage. In the spring, tiny pink flowers cover the branches and are nicely complimented by the dark purple leaves. The leaves maintain their color throughout the summer season. This tree will reach up to 6

meters in height at maturity.

Crataegus oxyacantha 'Superba', the crimson cloud hawthorn, is a small tree with a fairly narrow habit. It possesses smaller needles than the species and will not impale passersby. The foliage of this plant is uniquely shaped with somewhat dissected, rounded lobes. Each tiny flower is red with a white center and is part of a mass of flowers enshrouding each branch.

One very large group of flowering trees with new varieties being added yearly is a crabapple. Crabapples generally attain a height of about 7 meters and come in flower colors from deep pink to white, both single and double, as well as in a variety of leaf colors. Some varieties are even quite pendulous. This plant group has fine flowering trees for the large rock garden. The fruit is quite small on the newer varieties and gives summer and fall coloration as well as wildlife food. One should research this group before making a purchase since not all varieties are disease resistant and will defoliate each summer if they are affected.

Robert Fincham is from Boring, OR.

There is a fascination and satisfaction about producing plants from seed which gives the grower a feeling of omnipotence at having set in motion a train of events which will have an inevitable conclusion.

T.C. Mansfield
ALPINES IN COLOUR AND CULTIVATION

The Olfactory Consideration

Trevor Cole

People build rock gardens for many reasons; because of a love of the miniature, to keep up with the neighbors, to use up a pile of soil left from top-dressing the lawn ("I did not realize that eight cubic yards was so endless"), or because their garden is so rocky they cannot grow anything else (the "if you can't beat them, join 'em syndrome"). I have yet to hear of anyone who built a rock garden purely for the olfactory consideration.

I have recently been designing a fragrant border for the display gardens at the Central Experimental Farm in Ottawa. While researching the possible plants that could be used for this border - and which are hardy in Ottawa - I was intrigued by the number of perfumed alpinas, and therein lies the inspiration of this article.

To most of us, the fact that many alpinas are scented may come as a surprise. I can only put this down to our reluctance to "eat dirt" as it were. While we are used to bending and stooping to plant, weed, collect seed, take photographs; in all of these operations it is our hands that actually come close to the plant, not our noses. To test a plant for perfume we must bend much further. It is our chin that must come almost to ground level - a difficult feat for many people whose tummies get in the way. We will have to crawl through our plants to enjoy their odours.

We can look upon scent in two ways,

that which is given off by flowers, as a pollinator attractant, and foliage scent, which presumably tastes bad and deters herbivores. In the first case we either need very calm weather, so that the scent lingers or we have to get down on hands and knees to appreciate it. Foliage on the other hand can be rubbed, stroked or crushed underfoot to release its odours which often persist on the skin for a long time.

Floral scent is always ephemeral and subject to the capriciousness of nature. Most flowers have stronger perfume in the morning or evening than at midday. Some of course reserve their scent purely for the evening. Hot, dry weather is also more conducive to the production of perfume. The scent-bearing oils get diluted and washed away in rainy periods. Foliage scents are rarely affected in the same way. They are not usually released until the leaf is bruised.

Before I started digging through books, looking for potential residents in my bed. I could have named only a few rock plants which would have qualified. Some Jonquils and miniature narcissi, *Puschkinia*, Siberian wall flower, some of the *Aquilegia* species, *Dianthus* of course, and *Oenothera caespitosa* all have scented flowers, plus, we must not forget *Lobularia maritima*, the annual sweet alyssum. For foliar fragrance I could only think of thyme and the Corsican mint. A quick look through a few books

soon expanded this listing.

I was surprised how many of the small bulbs turned out to be fragrant. One thinks of bulbs being the harbingers of spring, bursting through the last crusts of snow to greet the new season. This is a time when few insects are awake and thus the need should be minimal. A little thought reminds me that even on cold days in April there are always bees on the *Scilla sibirica*. So much for that theory.

Gertrude Jekyll says of jonquils "The scent of the Jonquill (is) perhaps the best of all, for it is without the rather coarse scent of the Trumpets, and also escapes the penetrating lusciousness of poeticus and Tazetta."¹

Several of the alliums are, according to others, scented, but no one seems to write from first hand knowledge. Certainly - other than a slight garlic trace - I have not been aware of "perfume".

Crocus is another bulb that never brings to mind scent, and I have grown enough of them in pots that I would have expected it to register. According to Louise Beebe Wilder (my prime source on matters olfactory) "*Crocus versicolor* and *C. sativus* are sweet scented and bloom before the Dutch varieties, and *C. biflorus*, called the Scotch crocus, has a delicate honey-scent."²

Snowdrops also have a sweet scent it seems. Personally I won't buy even the double form because you cannot see the extra whorl of petals without picking the flower. I certainly never dreamed of crawling around in the snowmelt smelling them.

We all know of the skunky odour of crown imperial, both from the bulb and the foliage. While this hardly classes as an alpine, the western species *Fritillaria pudica* grows about 10cm tall "with nodding yellow

flowers that are sweet scented"² I wonder if it would survive here. Anyone tried it?

Both the snowflakes, spring and summer, are said to be fragrant. I must admit I have never had great success with *Leucojum*. I had ordered more for planting last fall but they arrived so late, I sent them back.

The early flowering bulbous iris have a perfume... faintly violet-like, but with a dash of tulip. *Iris reticulata* is also sweet, with a still stronger perfume of the violet character', while *I. cristata* has "crab-scented blossoms early in April."² (hopefully this is crab-apple not crab-meat). The miniature bearded iris also have a perfume, but different from that of the bulbous types.

That most prolific alpine *Arabis* is, according to Wilder "very sweet in early spring. *A. albida flore pleno* has spike of double stock-like flowers that smell of Heliotrope".² I have never noticed a scent to *Arabis*, neither has the person in charge of the rock garden here. Reginald Farrer says "Arabis, as a rule is a race neither elegant in appearance nor pleasing in smell... the double form is curiously beautiful and recommendable, giving an unanalysable suggestion of Lily-of-the-valley spires, especially when cut. (The whole plant has a coarse smell if bruised)."³

It would seem that the correct name for the plant that I have known all my life as *Diantus caesius* is now *D. gratinopolitanus*. "Ah well !! A Cheddar pink by any other name with its sheets of blue leafage overshadowed in June by fragrant flights of fringed rose-pink flowers, in numbers as the stars of the sky."³

Most of the pinks are fragrant to some degree, and, when selecting seedlings it is as important to take this into consideration

as it is the colour and form of the flowers. A few of the named forms are also outstanding, "Tiny Rubies" form a dense, slowly-spreading mat of tiny blue-green leaves, about an inch high, with literally hundreds of tiny fully-double deep-pink, very fragrant flowers on 3-inch stems, in May and June."⁴

One tends to associate smell with flowers and leaves rather than with roots (although I must admit peeling Jerusalem artichokes in mid-winter always makes me think of wet soil). This is particularly so with small plants that don't have fleshy roots, but according to Jekyll "I always enjoy digging up, dividing, and replanting *Asarums*, both the common European and the American kinds; their roots have a pleasant and most interesting smell, a good deal like mild pepper and ginger mixed, but more strongly aromatic".¹

Oenothera caespitosa has never been long-lived here. Although *caespitosa* means tufted, all the plants that I have grown have been *procumbens* or *repens* and cascade nicely over a rock face. I wish I could find the secret to successful germination, since I only ever get two or three seedlings from every batch of seed. I would like to plant an entire ledge and have it covered in the 8 cm, pure-white, deliciously fragrant flowers.

Although Wilder gives a list of plants seven pages long, many of these are better suited to the woodland than the rock garden. Many others are so obscure that we can ignore them. When was the last time you saw yellow flowered *Erinus fragrans* in a seed list?

However, I cannot close without a paragraph about the simplest and most frustrating genus, *Primula*, I call it the simplest because some of its members are among the

easiest of all plants, and thrive despite our climate. Others can be the most frustrating of plants to grow, suddenly dying off for no apparent reason (if you can get them to germinate in the first place). Luckily, some of the easy ones are also the best perfumed.

"All the scented flowers of the Primrose tribe are delightful - Primrose, Poly-anthus, Auricula, Cowslip. The actual sweetness is most apparent in the Cowslip; in the Auricula it has a pungency, that accords with the clouded and curiously blended colourings of many of the flowers."¹ *Primula auricula ciliata* "is a magnificent small form, with broad foliage, powerless, glandular, densely hemmed with hairs. The flowers of this type should be sweet-scented" While *P. a. moschata* has "glands emitting a violent odor of musk."³ Scent is indeed a varied thing, even within the same species.

One other plant with scented foliage is also a very good addition to any rock garden. The creeping winter savory, *Satureja montana* 'Prostrata', makes a waterfall of small white flowers in summer and, as a bonus, has aromatic foliage that can be used in cooking. While it is native to the Mediterranean, it survived many winters in Ottawa - although -39.5 degrees finally killed it.

I am sure we are growing many other plants with scented flowers and fragrant leaves if we can only get down to them. Certainly some noses are more sensitive than others (my wife will remark on a fragrance I cannot detect), and, like the closely allied sense of taste, not everyone perceives scent in the same way. Hopefully, these few notes will make you aware of another aspect of your garden and encourage you to grow plants purely for their Olfactory Consideration.

Trevor Cole is from Kinburn, Ont This piece is reprinted from the March, 1988 Journal of the Ontario Rock Garden Society.

References:

1 Jekyll, Gertrude: *Wood and Garden*, 1989, Ayer 1983

2 Wilder, Louise Beebe: *The Fragrant Path*, 1932, reprinted as *The Fragrant Garden*, Dover 1974

3 Farrer, Reginald: *The English Rock Garden*. 1919, Theophrastus 1980

4 Kolaga, Walter: *All About Rock Gardens and Plant*, doubleday 1966

The Genus *Briggsia*

Frances N. Batcheller

One of the rare genera of the Gesneriaceae is *Briggsia*. This was offered this year by the ARGS seed fund.

Most gesneriads are tropical plants, occurring mainly in the rain forests of Central and South America and Southeast Asia. Two of the most popular genera - *Saintpaulia* and *Streptocarpus*-- come from Africa. However, there are alpine members of the family, notably the very hardy European ones, *Ramonda* and *Haberlea*. There are also others from Japan and the Himalayan region. *Briggsia* is one of these.

Briggsia is a genus of several similar species from China, Tibet, Bhutan and Burma. The plants form a basal rosette, 15 cm. to 20 cm. in diameter. The leaves are about 12 cm. long by 5 cm. wide, elliptic or strap-like in shape. The margin is dentate. The flower color is in the yellow to orange range, usually spotted or striped with brown or dull purple. The corolla is about 2 cm.

long, narrow at the base, then inflated with an open throat.

The habitat is on open rock faces on damp shady gorges or on mossy pine trunks in deep forest. The plants are sometimes found at elevations of 14,000 feet. Growth habit is similar to *Ramonda*. The caudex or rhizome may become quite thick and woody on older plants.

I was fortunate enough to obtain seeds of *Briggsia musicola* from the ARGS seed fund this year. I planted the seed immediately in vermiculite, not covering the tiny seeds. I placed the small container in a clear plastic box on the light bench with a 14-hour light cycle. The temperature was maintained at 65 - 68 degrees F. Good germination occurred in about a week.

The alpine gesneriads do not seem to require chilling for germination. Seeds of *Haberlea* and *Ramonda* from the same source are germination under the same

conditions.

As this is my first opportunity to grow *Briggsia*, I cannot predict what success I will have in growing the seedlings on. British publications say *Briggsia* is quite apt to damp off in cultivation. General recommendations are dry winters and damp summers, keeping moist from March to November.

Whether *Briggsia* would be hardy outdoors in New England is a question. It would probably do better in an alpine house. In any case, cool growing conditions are needed and somewhat shady situations.

There is also an inter-generic hybrid, *x Briggsandra calliantha*, between *Briggsia auriantica* and *Opithandra orimuloides*, the Japanese alpine. This was produced in Germany some years ago. The corolla tube is straight, ivory to pale pink in color and striped with purple. It is reported to be easier to grow than *Briggsia*.

I am most grateful to the ARGS seed fund for the opportunity to try growing this rare gesneriad.

Frances N. Batcheller, Durham, NH, is a student of gesneriads of all kinds.

Dwarf Daylilies in the Rock Garden

Karen Mathews

Last spring I had the pleasure of visiting the garden of Betty Dzworoski who is a member of the ARGS and in the Berkshire Chapter. She is a devoted rock gardener. In fact, when Betty needed major surgery last year she scheduled the operation around her gardening, putting it off until a new section of her rock garden was finished. (And I thought that people only joked about things like that!!) This dedication is apparent in her exquisite gardens.

As I toured the garden, completely enthralled by her wonderful sense of design and the artistic arrangement of the plantings, I saw some plants that I couldn't identify.

The wonderful little gems tucked away among the alpine did look somewhat familiar, though. Then it hit me they looked like daylilies. It turned out that the remarkable resemblance was due to the fact that they actually were daylilies.

For a second I wondered if the rock garden connoisseurs would approve of this. But there was no doubt about the fact that they looked great !!! The miniature, dwarf daylilies were in a perfect scale for the rock garden. The liling foliage sprays sprang up like tiny green fountains among the rocks. They looked like they simply belonged there. It provided interesting

foliage contrast and a refreshing splash of color in July and August when few of the traditional rockery plants were in bloom. Even when hemerocallis are not blooming the handsome green leaves against the rocks beautifully complement the other plantings. The small tufts break up the flatness of the standard rock garden arrangement and greatly enhance the overall garden design. Since they don't bloom when the alpinists do, the colors don't compete and the foliage sets off the other rock garden blooms, making them look even better. The plantings of dwarf daylilies in a rock garden is like finding the perfect tie or necklace to go with an outfit, they make everything look better.

As it turned out, Betty had been using miniature daylilies in her rock garden for about ten years now. she is also a member of the American Hemerocallis Society. Her rock garden features daylilies as specimen plants in a wide range of colors and forms that are under 12" tall. Among the miniature daylilies Betty uses is 'Pywackett', a pretty cream with a bright contrasting eye zone. 'Double Cutie' is a double yellow that looks like a little double daffodil. 'Thumbelina' is a glowing golden orange which was still blooming in late August. 'Simple Gifts' is a delicious melon pink and 'Little Raindrop' is a lovely pale yellow. 'Meadow Sprite' is a darling little rosy purple gem and 'Raspberry Pixie' is a raspberry color with a delightful fragrance. Many of the daylilies have the added bonus of being wonderfully fragrant. One of my favorites is 'Little Luke' which is a bright red. There are also several of the 'Siloam' series that feature striking eye zones and halos in Betty's garden.

In addition to the sampling mentioned,

there were many other miniatures and also some slightly taller (12-15") daylilies in the background of the rock garden. Betty also uses taller cultivars equally effectively as striking specimen plants in the borders gardens.

If the aesthetics benefits are not enough, these plants are also very hardy, easy to maintain and will grow almost anywhere. I had to have some for my garden. Luckily for me, Betty sells her surplus daylilies out of her back yard. I went home with 'Popover' a lovely lavender only 8-12 inches tall and 'Bonanza' a yellow one with a red eye zone. They made themselves right at home in my rock garden just as they have in Betty's. Since then I have perused the daylily catalogues for dwarf miniatures and have found that a lot more than I had expected are available that are 12 inches tall or even less. Every major daylily nursery catalogue has at least a few of the gems to offer.

'Eenie Weenie' is a common one that can even be found at many local nurseries; it is 10 inches tall with tiny 1-1/2 inch yellow flowers and reblooms. 'Stella De Oro' is also easy to find. It is 12 inches tall with almost everblooming fragrant yellow bell shaped flowers.

So, if as I had, you have always thought of daylilies as strictly border perennials, you may want to reconsider. If you have some extra room or a difficult spot, or if you're looking for something to give you color in late July try some of these miniature dwarf daylilies. However, I feel that I should give you one last word of caution. Collecting daylilies in every bit as addictive as collecting alpinists.

Karen Mathews lives in Adams, MA.

Book Review

The Genus Cyclamen by Christopher Grey-Wilson is a Kew Magazine monograph published by The Royal Botanic Gardens, Kew in association with Christopher Helm in England and Timber Press in the U.S. This is a long-awaited book which has lived up to its promise. It is a first rate treatment of all aspects of this extraordinary group of plants. Until 1988 when this book was published, the best available material on cyclamen was to be found in three separate sources: a small handbook by D.E. Saunders published by The Alpine Garden Society, *Growing Cyclamen* by Gay Nightingale, and the journal of the Cyclamen Society. Now Mr. Grey-Wilson has covered much of the material in these earlier works and made important advances on them.

Mr. Grey-Wilson begins with a concise history of what has been known about the genus from the time of Theophrastus to the present. He discusses the taxonomic problems endemic to a genus in which there are enormous variations within each species. He presents a clear account of the botanical characteristics beginning with seed germination, and he discusses the distinctions by shape of tubers, leaves and flowers. There is a detailed list of the chromosome counts of each species with suggestions of interspecific compatibility. His chapter on conservation reports the terrible deprivations caused by "systematic exploitation of wild 'bulbs' for the greedy European market", and he emphasized the importance of resisting the purchase of wild-collected material. The section on cultivation was provided by Alisdair Aird and Peter Moore and has excellent advice

for gardeners especially in the difficult matter of watering.

The bulk of the book consists of a fascinating and thorough discussion of each species giving its natural distribution and precise botanical description. The key to the species is an excellent aid for identification. The book includes a discussion of the natural range of the plants, detailed descriptions of them including recognizable forms in cultivation, and, most important, detailed advice on the important differences required in cultivation for each species. The detailed and beautiful illustrations by Mary Grierson and Judith Gauden are a valuable aid in the identification of the species. All of the people directly involved in producing this book understand the genus as well as the problems in growing it. We are in their debt.

I recommend this book without reservation to anyone interested in these plants. It is a joy to read straight through all at once, and after will take an honored position on the reference shelf. It contains material for both amateurs and experts and will long remain the standard work for these plants.

Nancy Goodwin, Hillsborough, NC.

A Manual of Alpine and Rock Garden Plants

Christopher Grey-Wilson (ed.) and 11 contributors.

Inside the jacket of this handsome book is the statement that it is intended primarily

as a beginner's manual. At first glance it is obviously both that and, as well, designed to intrigue the more advanced in the field of rock gardening. There are very well written abbreviated discussions on many related subjects, several sorts of cultivation, soils, propagation. Blessedly there are no directions for laying down a simulated stone quarry. Midsection of the book are 32 color plates illustrating the scope of the plants one may grow, and the fifty b&w line drawings constitute further elucidation as well as aiding the imagination of the novice.

Not surprisingly the body of the work is made up of an A-Z encyclopedia, and its 260 pages bravely attempt the capsular condensation so nearly impossible to achieve satisfactorily. Each of the genera entered has at least one representative detailed to a degree, presumably all of them available in British horticulture. The beginner is warned about the possible introduction of weeds in such as *Oxalis* and *Convolvulus*, and warned too about some of the less than easy species that really require special conditions or some special skill, but the old question of what is suitable is still there. One time years ago someone wrote that it was far easier to define what is NOT appropriate. Wasn't it Farrer himself? Does a three-foot *Aconitum* belong here? Another editorial prerogative is that of nomenclature; there is a fair accounting of outright synonymy as well as of alternate choices of the "currently right name".

Now as to some North American entries; *Douglasia* for example is, we are pleased to note, not submerged in *Androsace*, nor is *Vitalliana* annexed to it. *Cheiranthus* = see *Erysimum*. *Maianthemum* Kew apparently regards as monotypic with the western species spirited away, but what of the

Japanese one? No explanation offered. *Claytonia* has bare mention with nothing on our Spring Beauties so great in the peat beds. It is both understandable and forgivable that within such as *Draba*, *Gentiana* and *Primula* all the honors go the Old World representatives, but *Iris* has no entry, presumably on the strength of rhizomes considered as being "bulbs". Thus no *crinata* nor *innominata*? *Lewisia* gets thorough coverage in a most exemplary concise treatment of 13 species plus various forms and hybrids. *Heuchera* gets a single mention and that not a proper one but an *Elmera*; do the Brits NOT like nor value such foliage through the winter?

Holy-Moly! *Limnanthes douglasii*, a California winter annual made the list! Down into the P's now: *Penstemon* made it with 6 mentions; all of them them the sub-shrubby species, plus to British garden hybrids. Wait a minute; something is surely amiss -- check the index. Believe it or not - NO PHLOXES! That's right, NONE. Farrer had upheld the genus *Phlox* while scarcely paying attention to the majority of other American plants when he declared that "the day that saw the introduction of *Phlox subulata* ought indeed be kept as a horticultural festival." And that is saying nothing of the many other superb species. No phloxes indeed! Not even an apology?

Although this book has a great deal to offer, the beginning American rock gardener could do no better than commencing with Linc and Timmy Foster's book available from the ARGS bookstore, and then perhaps going on to consult British opinion. But NO phloxes? That is hard to forgive. Beginners NEED phloxes; we all do.

B. Roy Davidson, Bellevue, WA.

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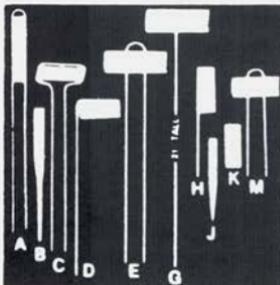
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