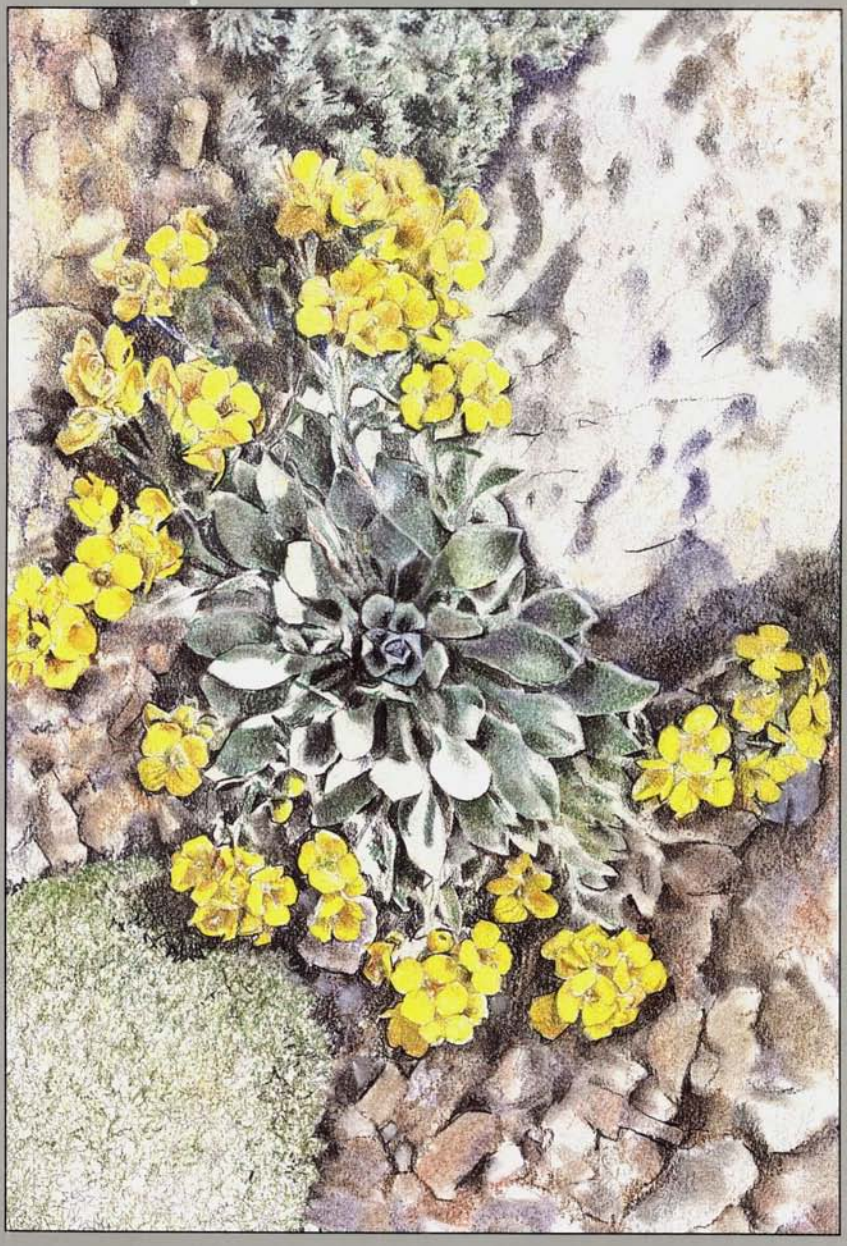

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Cover: *Physaria alpina*

Painting by Carolyn Crawford, of Arvada, Colorado.
A photograph by Panayoti Kelaidis served as her model.

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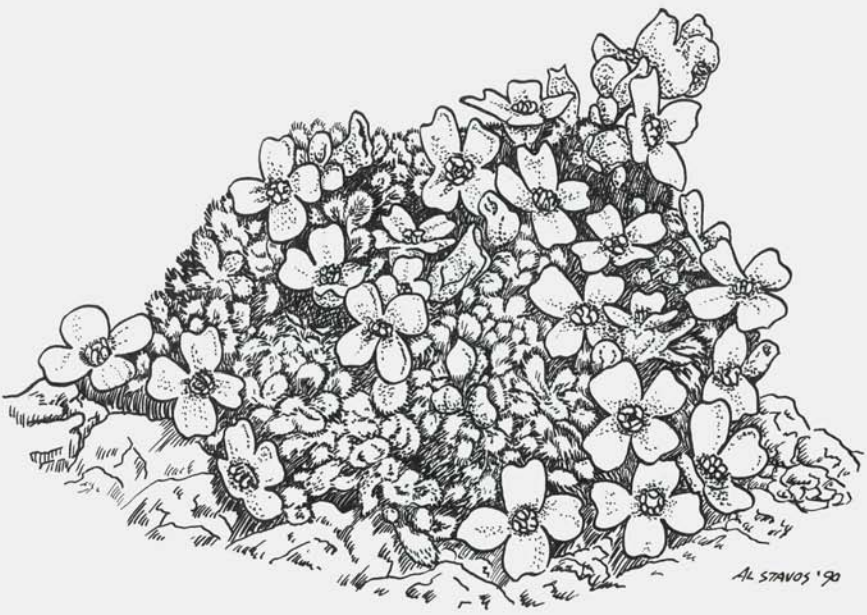
Features

Departments



Draba polytricha

Drabas for an Alpine Spring

by Jeanie Vesall

Native Minnesotans revel in the length and severity of our winters. As gardeners, we stoically suffer, contenting ourselves with seed lists and study weekends. An unseasonal February thaw finds many of us roaming the edges of our snowy gardens attempting to alleviate a raging case of "cabin fever." For Minnesota gardeners spring's arrival will always be a miracle.

My husband David and I first shared our interest in alpine wild flowers on our honeymoon, backpacking in Glacier National Park. Exquisite flowers were everywhere on the heels of the retreating snow. No Minnesota spring was ever like this. Years later we learned that there were special gardeners who had tamed some of these plants. We made our decision: we would be rock gardeners.

We planted our first rock garden with the colorful, predictable phloxes and dianthus. Yet touring the gardens of local experts we found that large mats of color were not the centerpieces. Instead, we were fascinated by the tightly fitted limestone crevice beds crowded with miniature cushions. Plants such as lewisias, saxifrages, and drabas were new to us. These were the plants we wanted to grow.

But pleasing alpines among the boulders of our garden proved to be a challenge. The scale was wrong and the soil too fat. In our early enthusiasm, we carefully collected plant souvenirs from the mountains, only to have them immediately succumb. One particular plant did survive, a small, white-flowered draba from the Bighorn Mountains. Surely this genus must be particularly adaptable. Was this more than beginners' luck? We decided to try more species of this group.

Now, in late March or early April the tiny, crowded buds on the draba cushions bring the first hint of spring. As the bright yellow and white blossoms open, bees from our hive visit often. And, if the weather is just right, *Saxifraga oppositifolia* is in full flower at the same time, creating perfect color harmony on a miniature

scale. These first flowers in our rock garden rate a boastful call from David to a rival gardener.

In the wild, drabas are an evolutionarily successful genus of over 250 species mostly found in the mountains and boreal regions of the Northern Hemisphere. Particularly well represented in western North America, Europe, and Turkey, drabas favor rocky and gravelly areas without much competition from other plants. While some gardeners, including Ingwersen, may dismiss many drabas as of "only botanical interest," we enjoy the subtle differences in foliage and flower. Unlike so many rock plants, the genus has a purity unadulterated by the meddling of horticulturalists. Even natural hybrids are uncommon. I like an alpine plant that still retains its wild form.

After several years of growing drabas, we would rate them among the most dependable of all alpine cushion plants. These small, brilliantly flowered buns are easy to grow and are able to survive a wide variety of conditions, making them a good choice for a beginning rock gardener. Unlike some high alpine plants, many drabas display the same beautiful form and flower in the garden as they do in their natural habitat. The best place to showcase these tiny plants is a trough, raised bed, or rocky crevice. Most draba species develop a deep taproot and appreciate the protected root run of a crevice. The cushions are supported by the surrounding rock and thick gravel mulch and quickly assume their tight alpine habit.

For the same reasons, some drabas do well in our tufa bed. Our raised bed constructed of close-fitting Mississippi River limestone is equally successful. This bed is built up over a mound of limestone gravels of several sizes, coarse sand, peat moss, and assorted rocks. As the tiny plants are positioned in the crevices, we remove some of the basic soil mixture and refill around the plant with an unmeasured concoction of mostly limestone and granitic grit, and much smaller proportions of our sugar-fine acid sand, oak leaf mold, and a dash of bonemeal. The bonemeal, which we used most consistently last year, seemed to improve flowering provided it was at the very bottom of the planting hole, out of reach of our resident raccoons. The raised bed faces south but receives some midday shade.

We water the raised bed thoroughly once a week and more often if the weather is hot and windy. During the hottest part of the summer, we mist the garden in the morning in addition to regular watering. Sharp drainage assures the plants a longer, healthier life, and the cushions assume a characteristic mounding form. In our large, boulder-strewn scree bed, planting in pockets of soil with a good dose of grit in the individually prepared holes also encourages condensed growth.

Most of the drabas remain disease- free with any of these growing conditions. Weekly fungicide spraying during the heat and humidity of our summers keeps the tightest, fuzziest plants healthy. As in the wild, drabas like their own space in the garden. We have had some losses when the foliage of other plants touches the cushions. And ants

tunneling below the cushions need to be dealt with quickly.

Our first selections of drabas were limited to the offerings from various mail-order nurseries, but we quickly built a collection of plants from the numerous species listed in seed exchanges. The whole genus is highly variable in the wild, and species overlap and intergrade. Therefore, gardeners should try the same species from several different sources and select the seedlings with the best characteristics.

Drabas are not difficult from seed. Germination, even of older seed, is rapid, with no cold treatment needed. David starts the seeds in our basement under lights. As with all our alpine seedlings, he transplants them when very tiny (first true leaves) to a gritty mix. Because I have an abundance of seedlings, I can plant drabas throughout the crevice bed, giving it the look of an alpine bunnery. Garden-grown drabas occasionally set lots of seed. Collecting it is good insurance against the loss of some of the shorter-lived species. Self-sown seedlings occur, too. Even sowing seed directly into a crevice or piece of tufa will often produce plants.

Cuttings are also an effective method of propagation. The trickiest part is removing a bit of the cushion with a razor while leaving fingers intact. I have rooted cuttings taken in late summer in clay pots filled with coarse sand and protected with a plastic cup in the coldframe. In midsummer last year, I succeeded by placing the whole pot of cuttings in a sealed zip-locking bag under the basement lights, a much cooler place than out-of-doors. Either seeds or cuttings is the method of choice for bringing plants home from the wild.

Catalog and seedlist writers, having exhausted all the possible descriptions of yellow, fuzzy cushions, leave the beginner with a blurred picture of which drabas to choose. Botanical taxonomy doesn't make this choice any easier. The tiny size of the plants and the numerous similarities between the species can lead to questionable identification or none at all. Thus, one of our favorites from the Wallowas, a choice cushion of wooly, gray rosettes, is still known to us simply as *Draba* sp. It was a nice gift from the Vanderpoels of Barrington, Illinois. By trying many species we have, however, discovered that there are drabas for every gardener. Some are easy and good-looking, others impossibly difficult to grow and extremely choice.

While some might say it is not the best of the North American drabas, *D. incerta* is easy and one of our favorites. Our plants came from seed gathered during a memorable trek to Mt. Townsend on the Olympic Peninsula with the Lowrys, Phil Pearson, and Steve Doonan. The gray-green cushions are looser and more open than some, but the large, light yellow flowers are produced in abundance. *Draba paysonii* var. *treleasii,* from the same trip, is now, after two summers in the crevice bed, a minute fuzzball of twelve rosettes. Tom Vanderpoel, another aficionado of the genus, rates *D. paysonii* (see photo, p. 100) as the finest North American draba. He saw it in perfection on Clay Butte in the Beartooth Mountains of Wyoming. Flowering along with *Saxifraga oppositifolia*

on a steep scree, the ancient 4" cushions were covered with huge, fragrant, yellow flowers. Why is it that the gem of any alpine genus is so rarely vigorous?

Draba oligosperma occurs throughout much of the West, from the Cascades to the Sierra Nevada and the Rockies. It is common but extremely variable in form. Often compared to *D. incerta*, the best specimens of *D. oligosperma* have smaller, more rigid leaves gathered into ball-like clusters. This species will expand into a firm mat given lean soil and sun. The flowers are typically a rich, brassy yellow. Definitely easier than *D. paysonii*, and needing no microscope to be admired, *D. oligosperma* is a premier North American draba.

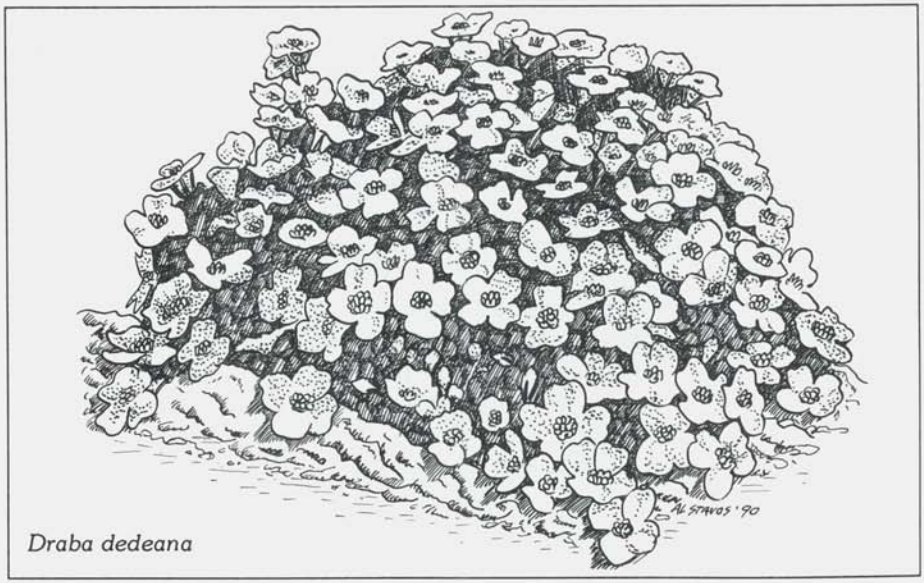
Draba ventosa occurs at high altitudes in the Rockies and a few locations farther west. The picture in Rickett shows large, yellow flowers peeking out from a cluster of rounded leaves cloaked in silver down. A plant we purchased under that name last year has green, bristle-covered, pointed leaves, leaving us to wonder about its authenticity. The true plant is definitely worth acquiring.

Cavorting with *Kelseya uniflora* on the limestone cliffs of Idaho, *D. oreibata* is a promising white flowered species. It has recently shown up on seedlists. Another little white draba from the Bighorns, which piqued our interest from the first time we saw it, remains our special pet. Just don't ask me what it is. I have sat with the taxonomic keys and hand lens, waiting to be enlightened. Last year this draba set enough seed to share a few with the experts.

Another common draba of the American West, *D. densifolia* (see photo, p. 99) is one of a large group of drabas whose leaves are edged, rather than covered, with stiff hairs or bristles. This feature allows the green of the foliage to show through and contrast pleasingly with the color of the flowers. The narrow, lanceolate foliage is a bright grass-green whorled into dense rosettes. Planted in a crevice, this plant slowly forms a rounded, prickly bun. The name of this species has suffered considerable confusion. It has often been misspelled as *D. densiflora*. Even Hortus III has used this non-name. There is no plant named *Draba densiflora*.

The mountains of Europe have numerous species of drabas that make excellent garden plants. In our garden the European species bloom earlier in the spring than the North American ones, and the yellow of their flowers is somewhat tinged with green. *Draba aizoides* (see photo, p. 100) and *D. lasiocarpa* (*D. aizoon*) form large, loose rosettes. All the drabas in this group have yellow to gold flowers displayed in terminal racemes.

The mountains of Spain are home to two of the best species. *Draba hispanica* (see photo, p. 99) forms a tight tuft of rosettes, and the pale yellow flowers contrast with the excellent, dark green leaves. And thank goodness for the other species from Spain, *D. dedeana* (see photo, p. 98). It is the best white flowered draba and should be in every rock gardener's draba collection. The tiny, frizzy-edged leaves have knit the cushion to a piece of tufa, and each



Draba dedeana

spring the foliage is obscured by the brilliant white flowers. We always take a few cuttings and save the seeds, waiting for the ominous day it flowers itself to death. *Draba dedeana* crossed with *D. bruniifolia* produced *D.* x *salomonii* (see photo, p. 98). It has larger, more numerous, white flowers and extremely tight foliage.

If one chose to grow only North American drabas, the collection would be pleasingly diverse. However, some drabas from the Caucasus Mountains and alpine regions of Turkey are especially different in form. Minute balls of scale-like leaves make *D. bryoides* var. *imbricata* (see photo, p. 143) very distinctive. Its golden flowers are said to top hair-like stems. In our garden we joke that we're growing it for the foliage, as it doesn't bloom. Our specimen of *D. rigida* forms a dense mat of small, mid-green leaves that follows the contour of the tufa underneath. We have seen a form in other gardens that grows into a tight dome. Every spring numerous wiry stems carry tiny heads of yellow that almost detract from the impeccable foliage (see photo, p. 143).

Native to crevices of igneous rock in the mountains of Turkey, *D. cappadocica* (see photo, p. 98) and *D. rosularis* (see photo, p. 98) are settled into pockets of granitic grit in our crevice bed. Because of their heavily felted rosettes and foliage, tight as those of high alpine androsaces, some experts recommend these two species for an alpine house. We are surprised that these plush, gray domes have withstood our heat and humidity and delighted us with their large flowers.

We purchased *D. longisiliqua* (see photo, p. 97) just last year, but it already has become one of our favorites. The true plant is native to the northern Caucasus. Tucked into the crevice bed, it steadily produced the most beautiful, gray velvet, button-shaped rosettes all last summer. We

are anxious to see it in flower this spring.

Among all these miniatures, *D. bruniifolia* and its subspecies *olympica* (see photo, p. 99), and *D. sibirica* (*D. repens*) are large enough to hold up to the phloxes in the color garden. The not-so-subtle combination of hot pink and bright yellow always wows garden visitors. *Draba bruniifolia* will form relatively large, mounding cushions with generous quantities of deep yellow to yellow-orange flowers. It is native to the alpine regions of the Mediterranean. *Draba sibirica* is somewhat unusual because its soft green, leafy runners root down easily along the surface of the gravel. It is a native of the alpine steppe of Greenland to eastern Asia. Both of these plants require a sunny, gritty scree to prevent them from becoming scraggly.

Lest one think all drabas are easy, there are two readily available to torment the gardener. The infamous *D. mollissima* (see photo, p. 97) has never graced our garden. This is one of the classic alpines known to scare any beginner. I know of only one or two people who have kept it going outdoors. They must be blessed. During our torrid summers it would have to live in our air-conditioned basement. Confinement as a lowly houseplant wouldn't be fair to such a fine alpine. Country cousin to *D. mollissima*, *D. polytricha* favors us each spring with its petite, moonlight yellow flowers resting on cushions of silvery white down (see photo, p. 98). Twice resurrected from near death in the tufa, it recovered in the cold-frame. Now our $3.50 plant is the size of a half dollar. It is worth the trouble.

Drabas will reward any gardener with their bright flowers and superb foliage cushions and will give beginning rock gardeners a chance of success with high alpine plants. Happily at home in our gardens, they will always remind us of springtime in the mountains.

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Jeanie Vesall is an active member of the Minnesota Chapter of ARGS and the former editor of *Minnesota Rock Plant Notes*. She and her husband, David, have been rock gardening since 1985 in White Bear Lake, Minnesota. Their garden features a large woodland, showy scree beds and crevice gardens filled with choice high alpines, many of which they grow from seed under lights. Jeanie is also a passionate birder.

Illustrations for this article by Al Stavos.

Germination in Crucifers

by Norman Deno

In most species of Brassicaceae the seed requires dry storage, typically for six months at 70°F. After storage the seed germinates rapidly on exposure to moisture at 70°F. The radicle, roots, cotyledons, and leaves all develop in rapid succession. This may be all that most gardeners want or need to know. Many species of plants show profound photo effects in seed germination, but so far such effects have not been found in the crucifers.

In the studies now being done on germination, D is used to signify a plant that requires dry storage, and 70 refers to the fact that the seed germinates at 70°F. Most crucifer seed is thus termed D-70. Seed of the D-70 type often germinates at 40° without dry storage, perhaps an adaptation to alpine environments, but germination is slower and more erratic. From a horticultural point of view it is still much more effective and time-efficient to give the seed dry storage and then to sow at 70°.

The effect of dry storage on germination is vividly shown by the data in Table 1. Not only does fresh seed fail to germinate at 70°, but in most species placing fresh seed in moist media for three months at 70° leads to varying degrees of irreparable damage. This point is strongly emphasized because the horticultural literature is full of statements inferring that fresh seed is better than stored seed. If fresh seed of *Draba aizoon* or *D. densifolia* is placed in moisture at 70° for three months, it will never germinate no matter what further treatment is given. In *Aethionema grandiflorum* treated this way germination takes place, but the rate is much slower, and germination stretches out over six months. In *Draba dedeana* germination ultimately takes place after shifting the temperature to 40°.

The damage caused by placing fresh seed in moist media at 70° is an important consideration in the establishment of large colonies in the garden. In climates with summer rainfall, and with species like the *Draba* that ripen seed in early summer, fresh

Table 1. Damage to D-70 Seed when Sown Fresh

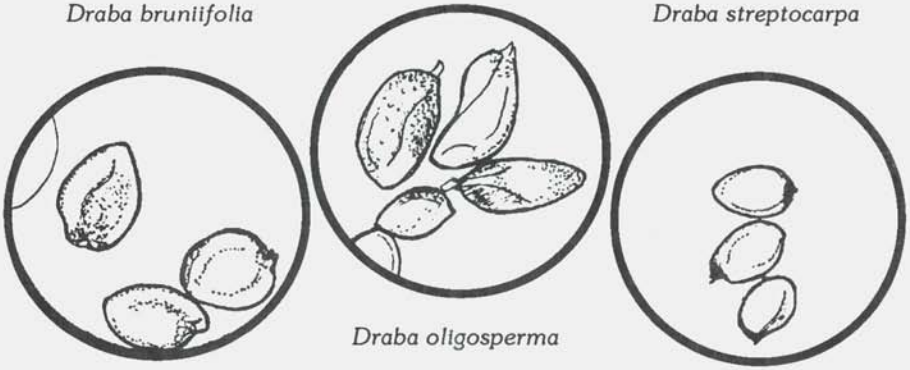
Species of *Draba*	% Germination at 70°			% Seed Coats Failing to Germinate[a]
	Fresh Seed		Dry-stored Seed	
	1 month	3 months	1 month	
D. aizoon	0	0	100	46
D. compacta	0	1	100	4
D. dedeana	0	0	100	62
D. densifolia	0	0	100	18
D. lasiocarpa	2	2	100	0
D. parnassica	0	0	100	0
D. sauteri	0	0	100	0

[a] In the first three columns, the percent germination is calculated on the basis that the total number of seeds is the number that germinated under the optimum conditions (third column). The last column is 100 minus the percent germination as calculated in the traditional way, which is to count the number of normal size seed coats as the number of seeds.

seed broadcast in the garden at the time of ripening or allowed to self-sow would encounter summer moisture. Damage then occurs, so that often few seedlings appear despite good seed production. The remedy is to collect and store the seed dry for six months and then sow.

Minimum dry storage time has been much studied with agricultural crops, since nearly all of these are of the D-70 type. Times range from three weeks for barley to eighteen months for *Rumex crispus*. In the present studies seed was stored dry for six months, but shorter times may well be sufficient, and the time can be expected to vary with species.

About half of the seed tested was received from seed exchanges or collectors and had been stored for several months when received. All of these species showed induction times in the range of two to seven days, i.e., the seed began to germinate after this time period. Rates all followed zero order kinetics out to 80% to 90% completions with rates in the range of 5% to 40% per day. Zero order kinetics is the simplest of all rate laws and means that a constant percentage of the original total number of seeds germinate each day, so that the rate can be expressed as percent per day. For instance, if there were 100 seeds to start and the rate of germination were 20%, the first day after the induction period 20 seeds would germinate. On the second day an additional 20 would germinate, the next day 20 more, until on the fifth day germination would be complete. The following crucifer species were in this group:



Alyssoides utriculata; Alyssum (Aurinia) saxatile; Arabis bellidifolia, A. blepharophylla, A. petraea, and *A. purpurea; Aubrieta deltoides; Cochlearia alpina; Draba acaulis, D. altaica, D. athoa, D. bruniifolia* ssp. *armenicum, D. b.* var. *olympica, D. compacta, D. dedeana* var. *mawaii, D. d.* var. *zapateri* (probably mislabelled), *D. gracilis, D. incerta, D. montana, D. rigida, D. rosularis, D.* species from Ladakh, *D.* species from Tibet, and *D. sauteri; Erysimum kotschyanum; Hutchinsia alpina; Lesquerella condensata, L. pinetorum, L. purshii,* and *L. rubicundula; Parrya menziesii, P. schugniana; Petrocallis pyrenaica; Stanleya pinnata;* and *Thlaspi bulbosum, T. montanum, T. rotundifolium,* and *T. stylosum.*

The other half of the seed tested was from my own plantings and was collected as soon as ripe. This allowed a complete set of experiments to be conducted. These consisted of alternating three month cycles at 70° and 40°, starting some at 70° and some at 40°; using fresh seed in some experiments and seed stored dry for six months in others; and storing some of the seed at 70° and some at 40°. These combinations generate six different procedures. These experiments produce far more data than would interest most gardeners so results will be presented concisely here. The notation 70(50%) -40(0%)-70(25%) means that at 70° 50% of seeds germinated in the first

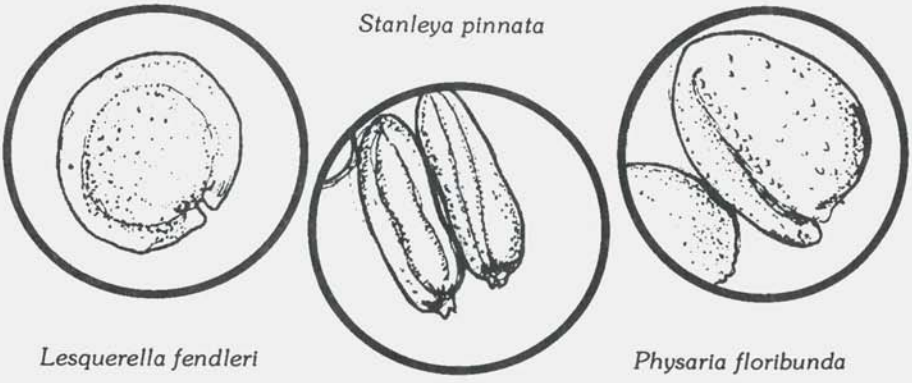


Table 2. Germination Rates for Seed of D-70 Species with Dry Storage for Six Months

Species	% Germination[a] at 70°	Induction time (days)		Germ. Rate (%/day)	
		70°	40°	70°	40°
Arabis albida	75%	2	15-30	50	3
Draba aizoon	50%	4	b	12	b
Draba dedeana	50%	5	3	3	2
Draba densifolia	100%	5	5	10	10
Draba lasiocarpa	95%	1	c	8	c
Draba parnassica	95%	4	c	30	c
Draba sauteri	95%	4	c	30	c

[a] The number of viable seeds is assumed to be the number that germinate under the optimum conditions.

[b] After three cycles of alternating 70° with 40° for three months at a time, 20% germinated.

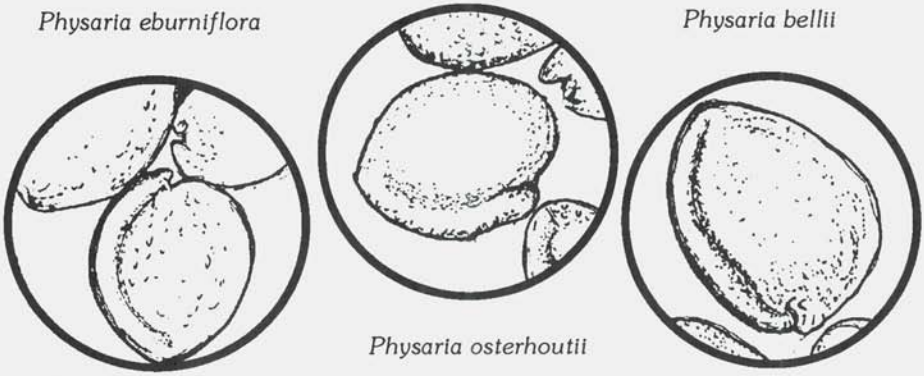
[c] Germination was immediate, but numbers of seed were too small for calculating induction time or percentages accurately.

three months, at 40° none germinated in the following three months, and returned again to 70° 25% germinated in the next three months. Induction times, the time between starting the cycle and the first emergence of a radicle from a seed coat, are given in days. Results are presented in Table 2.

Some species gave behaviors that are best discussed individually. These are described below.

Aethionema grandiflorum. All six procedures gave at least 38% germination although germination occasionally extended over three cycles. The optimum procedure is D-40, that is, dry store at 70° and then place the seed in moist media at 40°. This gave 92% germination with induction time of seven days and germination rate of 5% per day. If dry-stored seed is started at 70° instead of 40°, rates are faster, induction time two days, rate 10% per day, but the percentage of germination is lower and germination extends over three cycles: 70(67%)-40(0%)-70(6%). Seed stored dry at 40° gave similar results, but percentage germination was lower. Fresh seed gave 70(45%)-40(1%)-70(54%) or, when started at the lower temperature, 40(23%)-70(15%). The latter experiment would probably have given a higher total germination if the experiment had been continued.

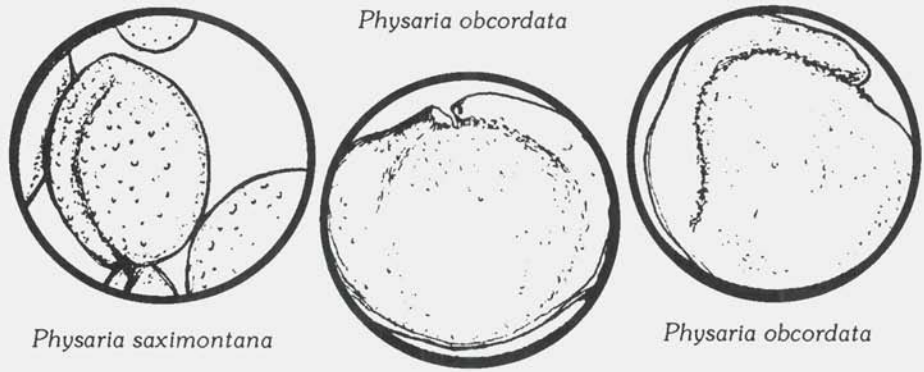
Cardamine heptaphylla and *C. pentaphylla*. Samples from a commercial source failed to germinate. One failure in itself is not significant, but taken with the results on the closely related *Dentaria laciniata*, it is likely that the spring-blooming, woodland crucifers will not tolerate dry storage.



Dentaria laciniata. Large quantities of seed were available, and extensive studies are in progress. All seed stored dry at 70° or 40° immediately rotted on contacting moisture, showing that dry storage cannot be tolerated, i.e., the seed had already died before sowing. Fresh seed started at 70° ultimately rotted after a year. The one successful procedure to date was fresh seed started at 40°, but germination did not start until the *sixth* cycle: 40(0%)-70(0%)-40(0%)-70(0%)-40(0%)-70(12%). Despite this lengthy time the seedlings were strong and developed healthy cotyledons within a week of germination.

Draba acaulis. Two samples of wild-collected seed from Josef Halda gave 40(0%)-70(80%), whereas direct exposure to 70° gave no germination. It is easy to see why most gardeners will kill this seed. Dry storage, followed by three months with moisture at 40°, then a shift in temperature to 70° should yield good germination. A sample of seed from the 1987 ARGS seed exchange gave D-70 germination in contrast to the Halda seed, indicating that a different species may be involved.

Draba argyrea and *D. lemmonii.* Seed collected by Waid Vanderpoel was received October 18, 1986. It failed to germinate in fourteen days at 70° and so was placed outdoors for two months and then returned to 70° on January 1, 1987. Germination started in ten days and was complete in a month. Unfortunately, this was just before procedures became standardized, but it does indi-



cate that germination is D-40-70 and not D-70.

Draba polytricha. Seed received on January 5, 1987, failed to germinate in fifty days at 70° and was placed outdoors on March 1, 1987. Germination began in late March, indicating that it is a 40° germinator.

Erysimum perofskianum. Both fresh seed and dry-stored seed germinated within a month at 40° or 70°. There was evidence of some deterioration on dry storage at 70°, as the percent germination was reduced from 85% to 60%.

Aethionema oppositifolium. All six procedures gave 100% germination on the third day at 70° and the ninth day at 40°.

Hesperis matronalis. The D-70 treatment gave optimum germination as shown by dry-stored 70(20%)-40(0%)-70(0%) and fresh 70(0%)-40(0%)-70(17%). Seed stored at 40° gave only 2% to 5% germination in all three procedures. Further studies are in progress.

Lunaria annua. Fresh seed germinates only at 40° as shown by 70(1%)-40(95%) and 40(56%)-70(0%)-40(0%)-70(0%). After dry storage at 70° there is more germination at 70°, but germination at 40° is still greater as shown by 70(62%) versus 40(93%)-70(1%). Dry storage at 40° was similar.

Nasturtium officinale. Just a reminder that this is watercress and not the garden annual. Fresh seed germinated at either 70° or 40° and was complete in a month. Dry-stored seed behaved identically. It is interesting that the seed of such an aquatic plant tolerates dry storage so well.

Ptilotrichum macrocarpum. Fresh seed germinated quickly at 40° (95% on ninth day), but 70° germination was only 70% and was prolonged over six weeks. The opposite was true for seed dry-stored at 40° where placing in moisture at 70° gave 100% (induction time five days, 9% per day), whereas at 40% germination occurred over one to two months. This is one of the few cases in the study of over 3000 species where dry storage at 40° was clearly advantageous over 70°.

The crucifers provide a number of dwarf evergreen plants for the rock garden. The genus *Draba* is particularly treasured, because the plants bloom in late March and they attract hordes of honeybees and butterflies. *Draba parnassica* is perhaps best of the many dwarf yellows. *Draba argyrea* and *Draba lemmonii* are extremely dwarf and have persisted for several years but unfortunately do not colonize nor flower very well. *Draba dedeana* is the only good white *Draba*, and it is spectacular in its dwarf, floriferous true form. Many straggly, tiny-flowered, white *Draba* are received under the name *Draba dedeana,* and it is a mystery how such confusion arose. There is also confusion regarding *Arabis blepharophylla,* and seed is not often true to name.

Norman Deno gardens with his wife, Ginny, on a steep hill in State College, Pennsylvania where woodlanders, high alpines, and dryland plants are made at home in various ecologically designed areas. A lifetime of training and practice in physical chemistry is reflected in his experiments with germination .

Illustrations by Homer Hill.

Pot that Draba!

by Lee Morris Raden

A very small proportion of the members of the American Rock Garden Society garden in pots. While many of us have been exposed to the art in Great Britain, it is something that just hasn't "taken" in North America. There are certainly many frustrations with growing plants in pots. Some type of structure is needed, either an alpine house, a cold frame, or very cold, sunny porch. The joys of observing plants in pots overcome all objections. Only in pot gardening can one observe exactly what is happening to a rare specimen.

The drabas are superb plants for growing in containers. They have a long period of bloom in the spring, a long growing period from late spring through very late fall, and then many species go dormant from approximately November through early February and March. While drabas are relatively long-lived, they need special treatment just like any plant growing in an artificial environment. Watering is the secret, and when the plants are young (one or two years old), plastic pots will meet their needs very nicely. As the plants mature, from approximately three to ten years, clay is the only pot that will answer the needs of these large buns. The problem with growing mature specimens in plastic pots is that you can't really control the degree of moisture to dormant roots. The very difficult drabas, including such species as *Draba cappadocica* (see photo, p. 98), *D. longisiliqua* (see photo, p. 97), *D. mollissima* (see photo, p. 97), *D. polytricha* (see photo, p. 98), *D. rigida* (see photo, p. 143), and *D. bryoides* (see photo, p. 143), are quite brown with only minute green rosettes when they are dormant. In this dormant period the plants are still transpiring, and therefore minute quantities of water must be in the root system at all times. A growing compost that is too damp will result in the bun in your hand and the decaying root system in the pot.

I hate soil recipes, because some people feel that the recipe is cast in bronze. The potting soil must merely

serve these needs: 1) be a support mechanism for the plant; 2) allow oxygen to circulate through the root system; 3) act as a vehicle for nutrients; 4) be friable enough for the delicate draba roots to penetrate to great width and depth. I meet these criteria for the older specimens with a combination of Turface® (calcined clay), spent mushroom soil, a ground granite that has a particle size of approximately 1/8", and pebbles. If your mix is working, when you water the moisture is sucked through the compost and the excess pours out the bottom of the pot. The actual mix with which you will be successful depends as much on your watering style and the environment in which you grow the plants as on the specific characteristics of the mix.

Specimens are generally transplanted every two years into the next larger size pot. This is done in the month of March when the plants are in very active growth. Some of my oldest specimens are now ten years old and are in 12" pots. Unfortunately, these larger, older specimens are showing the signs of age. Just as in nature, portions of the bun tend to die. This leaves unsightly holes in the bun. When this happens, it's time to take cuttings. In March and April these root easily, and so the cycle goes on.

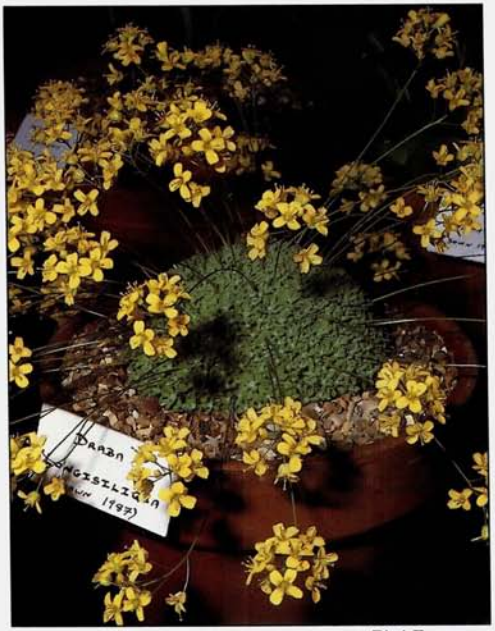
The hardest species to maintain are *Draba cappadocica* from Turkey, *D. longisiliqua* from the Caucasus, *D. mollissima*, and *D. bryoides* var. *imbricata*, and its relative, *D. rigida*. These are very susceptible to damage from moisture on the foliage at any time other than March and April when they first come into bloom. They must be carefully watered around the rim of the pot to insure a healthy plant.

Draba ussuriensis makes tight, large rosettes resembling sempervivums. It's an interesting plant from northeast Asia. *Draba dedeana* (see photo, p. 98) from the Pyrenees is simply marvelous in a pot, as are *Draba crassifolia* from Scandinavia and *Draba rosularis* from Turkey (see photo, p. 98). Lastly, *D. ventosa* from the Rocky Mountains, while relatively new to me, makes a splendid pot item.

Why not try some of these drabas in pots? Give them the conditions they need, and enjoy your plants from a new viewpoint.

[Editor's note: *Draba rigida* and *Draba bryoides* are closely related plants of the Upper Euphrates, northern Anatolia, and the Caucasus of northern Armenia and Georgia. The *Flora of Turkey* recognizes both plants as varieties of *D. rigida*. *Draba rigida* var. *rigida* has spreading leaves 3-6 mm long; *D. r.* var. *bryoides* has leaves inflexed and up to 2 mm long. The *Flora of the USSR* treats both as *Draba bryoides* and describes two varieties, *squarrosa* and *imbricata*, the former having looser tufts, the latter unusually compact. Whether *Draba rigida* is included as var. *bryoides* or under var. *squarrosa* is unclear.]

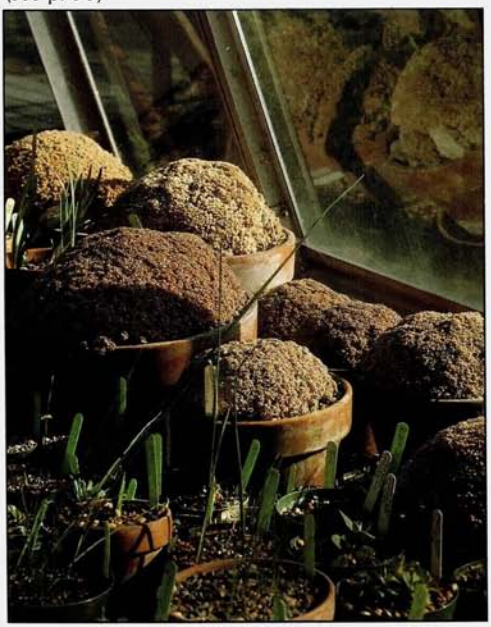
Lee Morris Raden is a long-time exhibitor and prize winner at the Philadelphia Flower Show. He is an inspiring promoter of the joys of pot culture and has spoken to practically every chapter of ARGS on this subject in recent years. Lee has served the ARGS as president for the past four years.



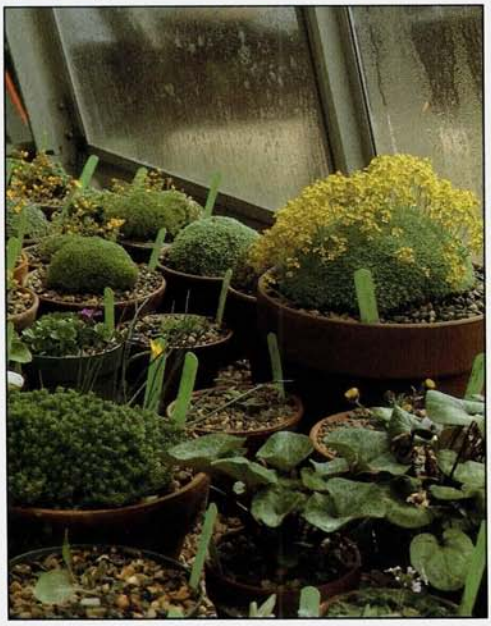
Draba longisiliqua Phil Pearson
(see pp. 87, 95)

Draba mollissima Joel Spingarn
(see pp. 88, 95, 104)

Drabas in dormancy
(see p. 95) Lee M. Raden



Same drabas one month later
(see p. 95) Lee M. Raden



Draba dedeana Joel Spingarn
(see pp. 86, 89, 94, 96, 105)

Draba cappadocica P. Kelaidis
(see pp. 87, 95, 104)

Draba polytricha Dick Bartlett
(see pp. 88, 95, 104)

Draba x *salomonii* Dick Bartlett
(see pp. 87, 105)

Draba reptans William Jennings
(see p. 106)

Draba rosularis Dick Bartlett
(see pp. 87, 96, 104)

Draba grayana Loraine Yeatts
On Mt. Evans, Colorado

Draba graminea. At The Needles, Sandy Snyder
San Juan Mts., Colorado

Draba densifolia in fruit Robert Price

Draba densifolia in flower Phil Pearson
(see pp. 86, 104)

Draba hispanica Joel Spingarn
(see pp. 86, 104)

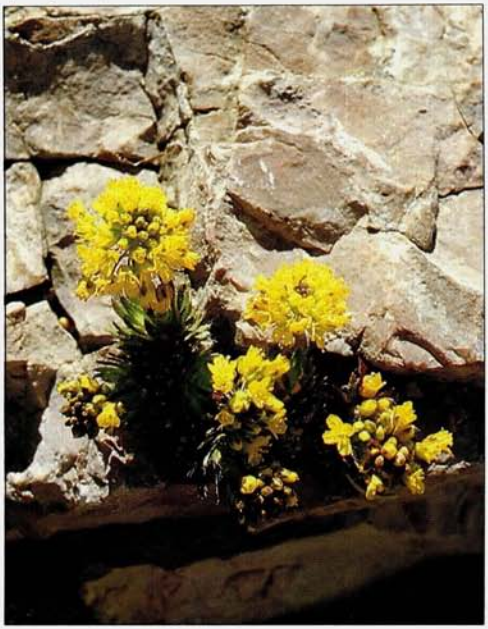
Draba bruniifolia ssp. *olympica* Dick Bartlett
(see pp. 88, 103)

Draba paysonii Phil Pearson
(see p. 85)

Draba crassa Robert Price
On North Star Peak, Colorado

Draba asprella
(see p. 106) Dick Bartlett

Draba aizoides
(see p. 86) Dick Bartlett



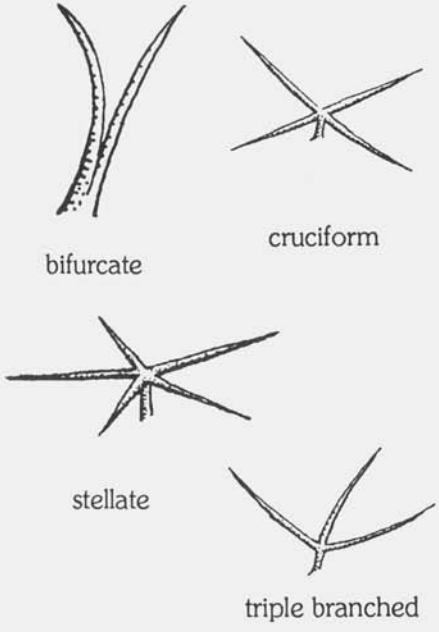
Discovering Drabas with the Hand Lens

by Dick Bartlett

Why in the world would anyone want in his garden an inconspicuous green plant so small you could cover it with a teacup? This plant blooms so early here in Denver that the blossoms may well be blanketed with snow. The little yellow flowers of the genus *Draba*, often found in the tundra areas of the Northern Hemisphere, are not for everyone. Every gardener has his favorite subjects, and I believe they reflect upon his personality. The drabas draw my sympathies as obscure creatures and underdogs. They are hardly flashy plants. My enjoyment of them comes from the discovery of the intricate detail of their hairs and from the challenge of identification. I am often found prostrate on the ground with my lens in hand, getting to know these humble plants at close range.

My wife and I come to rock gardening from the study of wildflowers, and for years I must admit we scratched our heads in ponderous confusion over the identifications of the various drabas we saw. It was sufficient to exclaim "Ah, a draba!" and let it go at that. One problem we encountered early in our attempts to distinguish the species is dealing with comparative differences described in the botanical keys. One species might be described as having *longer* petals, while another has *a few more* clasping leaves. Well, how much more is longer, or how many more leaves are needed to make the difference? But when I finally decided to use a hand lens to look at these plants — Wow! What a discovery. Why had I resisted so long?

Draba hairs are extremely beautiful. Through a lens they remind me of glass and of the glass artist I saw at the county fair as a boy. The artist would touch the hot glass on the side of a cat figurine's face with his tool and zap! With a quick motion the cat would have a new whisker. The different kinds of hairs in *Draba* are usually clear like glass, but may also be translucent or milky in appearance. Draba hairs are quite variable and distinct from species to species. In



combination with other aspects of the plant they make for easy identification of an otherwise confusing group of plants. But, as with other discoveries, these hairs bring with them a few problems to be solved on the way to enlightenment. The first of these is the amusing subject of botanical terminology. Pubescence is a deliberately vague term referring to the general hairiness of a plant. Trichome is the term for any type of individual plant hair. I don't use this latter term very much—just read "hair" whenever you come across it.

Going from the simplest case to the more complex, we have the unbranched simple hairs; bifurcate, or once-branched ones; three-armed ones; cruciform, shaped like a cross; stellate, with five or more branches from a center point like a star; and dendritic, or branched like a tree. Actually, branched is a general term used with both regularly and irregularly branched forms. But the hairs can get much more complex. Some multibranched hairs are very complicated and difficult to see even with a hand lens. Most of the forked or branched hairs have a central stalk and can be called pedicellate. Sometimes the hairs are pick-shaped, the handle of the pick being the pedicel, and the iron part of the pick being the arms of the hair, which are held flush to the leaf surface.

The problems of terminology become humorous when you realize that the authorities themselves don't use terms in a uniform fashion. For example, one may write forked, meaning branched like an antler, and another may use forked to mean bifurcate, or split into two branches. And then there are terms like hirsute, hirtellous, pilose, hispid, strigose, villous, and malpighiaceous. Did that lose you? Shucks! Well, all these terms are not necessary for the beginner. However, the word ciliate is very important and refers to the positioning of hairs along the edge of a plant part, as in an eyelash. The margins of leaves and seed capsules are the first place to look for hairs in drabas. My favorite kinds of hair are the pedicellate ones with multiple branches held parallel to the leaf. Sometimes they resemble thousands of spiders crawling all over the leaf.

Hairs may be found in many different places on the plant. There are three main areas to check for hairs on drabas, and they are the silique, the leaf, and the flower stem. The silique is the seed capsule, or fruit, of the draba. It is usually an oval, flattened pod with the remnant

of a style at its tip. Hairs may be found all over the pod, just along the margins, or at the apex. Some species have hairs only on the bottom surface of the leaf, some on both top and bottom. In some cases two species may be distinguished by the kind and frequency of hair on the stems. Other characteristics that will aid in identification are shape and length of these same three morphological structures. The shape of the siliques is the single most important character for identification of species in the entire crucifer family. To a lesser degree this is true within the genus *Draba*. Some fruits are almost round, while others are an elongated oval shape. The length of the style may be important. The leaves vary a great deal. They may be ovate to needle-like, sometimes soft, other times very stiff, and often the leaves are carried on short stems and form rosettes. Various botanical keys and source materials will give the length or width of these anatomical parts. I have not yet had to get into measurements to identify the species. Being the lazy sort that I am, I have put information about the most frequently used characteristics for identifying drabas in a chart format for easy recording and ready reference. As an example for comparison of species, I have chosen *Draba bruniifolia* and *D. lasiocarpa* (*D. aizoon*). In the chart *tri* refers to three-armed branching.

Draba bruniifolia
(Solid carpet of yellow in bloom.)

	Fruit	Leaf	Stem
Shape	Oval, little or no point	Long, medium wide, blunt-ended, stiff needle	Length: short, ¾-1"
Hairs	Single, short, frequent and even all over	None on top, tri on bottom, alternate tri and single on edge	Furry stems, short, simple hairs

Draba lasiocarpa
(D. aizoon)
(Single rosettes; self-sows.)

	Fruit	Leaf	Stem
Shape	Ovate with some point	Stiff and triangular	Yellow
Hairs	Ciliate, 2-4 per edge	None on top, very few on bottom, sparse on the edges	Long, sparse, simple

The genus *Draba* has been divided by botanists into three sections. The most important for us rock gardeners is the section Aizopsis.

Leaf of *Draba bruniifolia*

Long, single hairs on margins alternating with tiny three-armed hairs.

This group contains the most familiar and the showiest of the drabas. The section is generally distinguished by these characteristics: The species have well-defined rosettes with stiff leaves; the leaf margins have long, stiff hairs and a prickly or bristly feel to them. There are two common leaf shapes in Aizopsis, one short and triangular, the other longer and needle-like. Both types of leaf are stiff to the touch. *Draba bruniifolia, D. rigida, D. hispanica* (see photo, p. 99), and *D. imbricata* are a few of the most commonly grown species found in this section. For the first-time user of the hand lens I recommend looking at *D. bruniifolia.* The leaf is oblanceolate with a tapering point and tends towards a needle-like shape. But what is most interesting is the long, single hairs on the margins alternating with tiny three-armed hairs in between (see drawing above). *Draba rigida* (see photo, p. 143) has minute leaves in very tight rosettes, and the whole plant is hard (rigid) to the touch. It has small, short, simple hairs along the leaf margins. In contrast *D. densifolia* (see photo, p. 99) usually has quite large leaves, and the simple hairs on its margins are less frequent and longer. *Draba athoa* var. *leiocarpa,* also in this section, has only four or five hairs at the leaf apex.

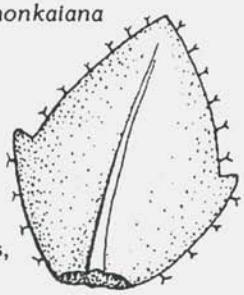
Section Chrysodraba is differentiated by its soft, wooly foliage. Under a hand lens you will see the tangled mass of curved and intertwined hairs that gives the leaves their softness. It is often difficult to separate individual hairs on these leaves in order to discover what type of hairs they are.

There are several choice, compact drabas in this section excellent for the rock garden. Four species quickly come to mind: *D. polytricha, D. rosularis, D. cappadocica,* and *D. mollissima.* These small but pretty Chrysodrabas tend to be a bit more difficult to grow and are not so spreading as many of the common Aizopsis. *Draba mollissima* (see photo, p. 97) is the most difficult to grow here in Denver; it has the densest foliage of the four. *Draba rosularis* (see photo, p. 98) is also tricky to grow. *Draba cappadocica* needs a prominent location in the garden, because it forms a wonderfully domed bun (see photo, p. 98). *Draba polytricha* is typical of the sectionwith its wooly hairs and has been the one I have had the most success growing (see photo, p. 98; drawing, p. 106). Although *D. rosularis* and *D. cappadocica* have dense mats of long hairs as with *D. polytricha,* each is quite distinct in its pubescence. *Draba*

rosularis has a mixture of twice-branched hairs and uneven, multiple-branched hairs, while *D. cappadocica* hairs are much more uniformly cruciform. Despite the difficulty in seeing the individual hairs it is most enjoyable to look under a lens at the unmistakable sheen of each plant's leaf as the sunlight bounces off the hairs.

Members of the third section, Leucodraba, usually have white flowers, as you might guess from the Latin. It would be nice if all white-flowered drabas could be lumped into this section, but there are a few exceptions. Section Aizopsis has at least one white-flowered species that I know of, and there are more in the Chrysodraba. Besides, Leucodraba has some pale sulfur-colored drabas to confuse the issue. So once again, the solution to the problem is to use the lens. This section contains many of the weedy and lanky species—ones not desirable in the rock garden. *Draba tibetica,* an Asian species, is a good example, although it might be suitable in the perennial border. *Draba cana,* an uncommon Rocky Mountain native of the alpine to subalpine zones, also belongs here. *Draba simonkaiana, D.* x *salomonii* (see photo, p. 98), and *D. dedeana* are the best white-flowered species for the rock garden. *Draba simonkaiana* is peculiar in having a single serration on each side of the leaf, reminiscent of common *Aubrieta.* Its hairs are twice-forked and on stalks (see drawing, p. 105). *Draba dedeana* is my favorite of this section and forms a nice bun (see photo, p. 98). Its leaf hairs are uninteresting in that they are medium-sized, single hairs,

Leaf of *Draba simonkaiana*



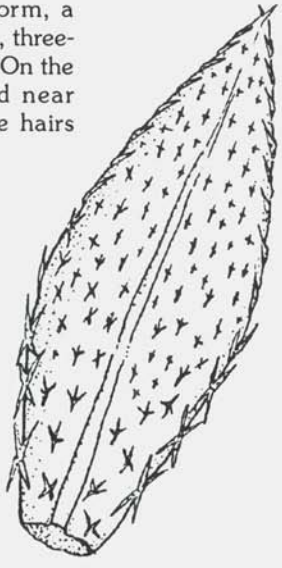
Twice forked hairs, single serration.

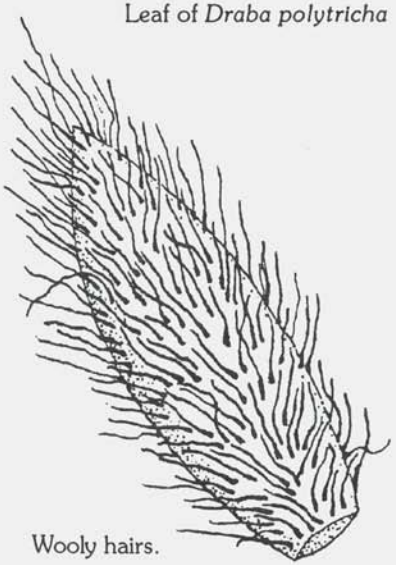
moderately sparse along the leaf margins. However, the leaves are quite small, forming minute rosettes which give the plant an excellent texture. In general the white drabas bloom a couple of weeks later in the spring than the yellow ones, extending the draba season nicely.

Draba sibirica (*D. repens*) is a very different sort of draba. It sometimes is sold as *D. sibirica* and other times as *D. repens,* but as far as I'm concerned, at this time, the names

Leaf of *Draba sibirica*

Hairs cruciform, a few scattered, three-armed hairs. On the margins and near the apex the hairs are simple.





Leaf of *Draba polytricha*

Wooly hairs.

are synonymous. Don't get this plant confused with *D. reptans* (see photo, p. 98), which is an annual Rocky Mountain native of low foothills elevations. *Draba sibirica* is quite prostrate compared to most drabas. Its yellow flowers are rather sparse, and its foliage is less dense than many, so there is no hint of a rosette. If the plant is in partial shade, it can become extremely leggy and unattractive. Grown in full sun on a slope, it becomes a tight carpet and is handsome. The leaves are entire in shape and not stiff. The majority of the hairs are cruciform, especially the larger ones on the lower half of the leaf margins (see drawing, p. 105). A few three-armed hairs can be found scattered about. On the margins and near the apex the hairs are simple.

My all-time favorite draba is *D. asprella*, a native of mountain regions of Arizona (see photo, p. 100). It is the draba which most nearly resembles a drumstick primula (*Primula denticulata*). The flower head is a nearly complete ball of yellow in bloom, and it sits upon a two-inch, red, furry stem. There may be as many as three of these heads, each at a different stage of blooming, borne on one plant. The comical thing is that each yellow head is practically as large as the basal rosettes of the plant. It's a real clown. The leaves are relatively large for the genus, with a dozen leaves or more per rosette and seldom much more than six rosettes per plant. Judging from the hairy leaves, I would guess this species belongs in the Chrysodraba section. I can't really be sure. A strange thing happened—it didn't come up the year after it bloomed. Apparently it is a biennial here, and not knowing this I failed to collect seed or observe the hairs with a lens.

We have native drabas in Colorado also. *Draba oligosperma* I have had in my garden several times, and it is a very choice, low plant. It has rather petite rosettes, which give it good texture, but the flowers are not long-lasting. The fruits are large and elliptic and close together, giving the plant still another texture when in fruit. Both the fruits and the leaves have short-stalked or sessile, stellate hairs. *Draba aurea* I have never grown, but it is a very widespread and abundant draba in Colorado. *Draba aurea* and *D. streptocarpa* are somewhat similar, but the former has a tendency to have dentate leaves and cruciform and stellate, dense hairs. In *Draba streptocarpa*, the twisted-pod draba, the cruciform and stellate hairs are absent. This species is found in the subalpine as well as on the tundra, and it will accept a touch more shade

than most. I have grown this one with satisfaction in my garden. Take note: six or more of the western drabas, including *D. aurea*, have twisted pods. Use your lens and look for the rather long, not-too-dense, single hairs on all surfaces of the leaf of *D. streptocarpa* to be certain of its identity. Also, the fruits of this species have the same sort of hairs as are found on the leaf, but they are shorter and found only on the margins. *Draba fladnizensis* is a white-flowered species found in the Rockies. Although I have not seen it in the wild, I have it in my garden. It is not a favorite, because in bloom it is a touch lanky. It is also found in the Alps and may be circumpolar. The leaves are mostly oblanceolate, and the basal rosette is nice enough. I guess what bothers me is that the raceme is too loose. I cut off the fruits of this species after bloom. The hairs are simple or forked and long.

For those of you unaccustomed to using hand lenses I'll mention my hand lens technique. The first problem is handling a tiny piece of leaf, sometimes less than an eighth of an inch in size. I have a good pair of sharp-pointed scissors to snip off a leaf or two. In some cases if the plant can spare it, I may cut off a whole rosette. Always view the specimen over a large, clean surface, so that if you drop it, it is not gone forever. In some cases a pair of tweezers will help. I have tried placing the specimen on the sticky side of a piece of clear postal tape so that there is something larger to hold on to. The clear tape allows you to look through to see both sides of the leaf. Also, when you are done you can fold over the tape to preserve your fleck of leaf. The difficulty with this procedure is that you can spend more time handling the tape than looking at the leaf. I use miniature zipping bags to store my specimens away, always being careful to insert a label in the bag. These 2" x 2" bags can usually be obtained in a craft store.

The draba hairs are on the plant not only for beauty's sake and to help us identify the species; they have a function. It is thought the hairs protect the pores through which the plant breathes. The hairs disperse the sun's rays, especially in the high alpine plants, which receive a greater light intensity. In this way evaporation is slowed, and the plant does not lose moisture as rapidly. The glass-like hairs create for the leaf its own personal greenhouse. Plants other than drabas have hairs, too, and I hope you will occasionally break out the hand lens to look at them also.

With the days now lengthening and warming, soon the first plants will begin to bloom, and along with the crocus come the drabas hidden away in the nooks and crannies of our rock gardens. And another year marches on as we pick our way through the draba hairs.

Dick Bartlett gardens in Lakewood, Colorado. He and his wife, Ann, have several large rock gardens and are active members of ARGS. Dick is also a photographer and artist by hobby and did the drawings for this article.

Rosette of *D. bryoides* var. *imbricata*

Erysimum capitatum ssp. *capitatum*

Color Forms of Rocky Mountain Erysimums

by Robert Price

At upper elevations in the Rocky Mountains of Colorado and adjacent New Mexico one finds a number of local populations of the western wallflower (*Erysimum capitatum*) with showy red-violet to lavender flowers. Most populations of western wallflower in the Rocky Mountains, regardless of elevation, are yellow-flowered, and there are no other evident differences between plants of the two color forms at high elevation. The red-violet populations are found most commonly in the San Juan Mountains in southwestern Colorado and in the Sawatch Mountains in central Colorado, although an isolated red-violet population occurs in the Front Range in the Alpine Garden trail area on Mount Evans.

The red-violet form usually occurs in the high subalpine and alpine zones but around Ouray can occur as low as 8000' in the montane zone, where the plants are accordingly taller, one to few-stemmed, and probably biennial. Yellow and red-violet populations are scattered in both the San Juan and Sawatch Ranges, and there are no consistent differences in geology or habitat type between the color forms. Perhaps the classical locality for the red-violet form is atop Red Mountain Pass between Ouray and Silverton, but yellow populations are found nearby on the Silverton side of the pass and a few miles to the south at the next mountain pass.

In my experience all high elevation populations in Colorado are entirely of either one color form or the other with the exception of the area of Cumberland Pass in Gunnison County, where one finds local hybrid populations involving the two color forms and their intermediates. The genetics of flower color is evidently complex, since in the intermediate populations one gets a diversity of color forms, including creamy white as well as shades of yellow, orange, and red. The hybrid populations seem to be very local and transient in this area, while most other populations remain either red-violet or yellow (in the subalpine zone below).

Classification of *Erysimum* has become notoriously difficult due both to the real biological complexities of the plants and to the often conflicting concepts of scientists who have attempted to divide them into purportedly distinct species. There have been quite a number of scientific names applied to the various elevational forms of western wallflower in Colorado, as is immediately evident from the treatment in Harrington's *Manual of the Plants of Colorado*. One source of confusion has been that the name *Erysimum asperum*, which properly applies to the species on the Great Plains with stiffly spreading fruits and very prominent ribs on the fruit angles, has sometimes also been applied to the western wallflower as well. In Colorado one sees an abrupt transition between *E. asperum* on the edge of the plains and *E. capitatum* (with ascending fruits with less prominent ribs) from the lower foothills westwards.

In Colorado, upper elevation forms have often been referred to *Erysimum nivale* (which was based on the high altitude yellow form) or *E. amoenum* (which was based on the red-violet form from southwestern Colorado) and sometimes to *E. wheeleri* (which was based on a separate burnt-orange-flowered race at more moderate elevations in the mountains of eastern Arizona). If the higher elevation plants are treated at the varietal level, the name *E. capitatum* var. *amoenum* is correct and has been applied to both color forms, given their lack of other differences. Within the very widespread and extraordinarily diverse species *E. capitatum* there are gradual transitions between lower and upper elevation forms, however, in virtually every mountain range in the western US and much of Mexico. The species shows great variation in plant size, degree of branching, leaf shape, number of branches on and density of the characteristic leaf hairs, and details of fruit and seed form, as well as flower color, but the characters occur in almost any possible combination among local races. I am treating all of the Rocky Mountain and Great Basin forms of the western wallflower as informally named races and color forms of *E. capitatum* ssp. *capitatum*. (See photos, p. 142.)

The red-violet color form as well as other variants of the western wallflower would seem to be particularly good subjects for rock garden cultivation under semi-arid conditions, as their flowers are among the largest and showiest in the mustard family. While yellow-flowered species are most common in the genus as a whole, red-flowered species are found in the arctic, in mountains of Europe and Asia, and on the Canary Islands. Some members of the shrubby, Canary Island species group are now in cultivation, as are a great diversity of color forms of the garden wallflower (*E. cheiri*). Also of considerable potential interest as a garden plant is a bright brick-red-flowered species, *E. ghiesbreghtii*, native to the higher mountains of Guatemala and Costa Rica and not yet available from seed.

Robert Price is a taxonomist at Indiana University. He specializes in studies of *Erysimum* and *Draba*. He is now working on a evolutionary study of the entire crucifer family.

Illustration by Rob Proctor.

Physarias: April's Garden Gold

by Panayoti Kelaidis

Some plants endear themselves to your heart the first time you see them. I'll never forget my first close encounter with the golden suns of *Adonis amurensis* one blustery January day in Paul and Mary Maslin's garden, or the spidery starfish of *Asplenium trichomanes* on a tiny cliff near Ithaca, New York. I've managed to capture the shock of recognition I experienced with these and many other lovely plants by obtaining seed or starts and growing them in my garden to refresh myself year after year with their beauty.

Physarias have never thrust themselves dramatically onto my consciousness. These are universal plants throughout the Rocky Mountain and Intermountain West, after all. Perhaps if they had a slightly more glamorous passport—the Balkans or the Hindu Kush—or had the decency to be rare, but instead they insist on lighting up screes and roadsides by the acre, gradually transforming their neat little rosettes with grape-like clusters of outlandishly swollen fruit.

One comes to appreciate physarias gradually, over the course of time. As I began to cultivate first one, and then more and more species, I noticed that their rosettes are not nearly as uniform as they appear to those hiking quickly past them in the hills. Some are large and lax, while others have highly congested, overlapping leaves. Some are powdery white, while others are flannelly gray. The leaf margins can be smooth or wildly toothed and indented. They bloom over a very long season, and their flower color can vary from deep egg-yolk yellow that verges on orange through various primrose shades to nearly white. They can start blooming as early as February some years with one species extending well into May, and many species have been known to re-bloom in the fall.

As so often happens with rock gardeners, I have become possessed of the collecting bug that won't let one rest until a full complement of species within a given genus is obtained. When that genus occurs

Physaria bellii

over a large range and is virtually unheard of in seed catalogs or nurseries, there is a formidable task at hand. Fortunately, Colorado lies near the epicenter of the genus *Physaria*, and I have come across most physaria species in travels through the Rockies. In the following account, I discuss only species that I have grown or seen in habitat. There are several species and numerous varieties I have yet to know and grow.

Botanists distinguish species in this genus by characters of their seeds and microscopic hairs. For the purposes of rock gardeners, there are many distinctive characteristics of leaves and flowers that can help tell one species from the other.

Physaria vitulifera
(photo, p. 117)

The first species many of us encounter is *Physaria vitulifera*, the common species of the Colorado Front Range. It occurs in vast numbers from the base of the mountains near Denver up through the foothills to subalpine elevations near the Continental Divide. It can be found on virtually any steep, hot, south-facing slope among ponderosa pine and sparse grasses from 5000' to 9000' across the east face of the Rockies. This typically forms single rosettes with sinuous indentations on the leaves and medium-sized clusters of pale yellow flowers that start to bloom in April on the plains extending to the end of June at the highest elevations. Like all the other twinpods, its bladder-like seed capsules are as interesting as the flowers. In this species they tend to be rounded and have a bluish cast.

Physaria bellii (photo, p. 119)

The only other species to occur near Denver is *Physaria bellii*, which differs to the eyes of rock gardeners in its rounder leaves, more profuse flowers, and showy fruits that are often stained with red and purple tints. It is restricted to the black shales and gray limestone of the Niobrara formation along the base of the Front Range near Denver to the Wyoming border. Although it has been proposed for endangered species status, it has taken so enthusiastically to growing on roadcuts along its narrow range that one could argue that highway engineers have been its salvation.

Physaria didymocarpa
(photo, p. 120)

The most widespread species occurs in a number of varieties throughout most of the northern intermountain region, Wyoming, Montana and southern Canada. Any plant with this large range in nature is sure to encompass wide variability. The only form I have thus far grown comes from central Montana and is one of the showiest of all physarias. It forms a compact rosette barely five inches across, with only a few yellow flowers on each stem. These blooms can be over half an inch across —among the largest in the genus. The form I have grown is a stunning pale lemon yellow color, softer in tone than any other species. Its northern and montane origin suggests a greater tolerance for garden conditions than other physarias.

Physaria condensata (photo, p. 118)

In recent decades a number of

Physaria sp.

physarias have been described from the vast stretches of Wyoming's deserts. Possibly the showiest of these is *P. condensata,* which occurs on barren badlands in the southwestern portions of that state. This species forms compact rosettes with narrow, smooth-margined leaves that somehow suggest a miniature *Saxifraga longifolia*. The flowers are small, but produced in such abandon in early spring that they create a vibrant spot of color for over a month. The gray-blue capsules are also smaller than in other species, although there are great numbers on any given plant. This has been a long-lived and fine addition to troughs and small rock gardens, although one must be careful to provide excellent drainage, since it is a desert plant in nature.

Physaria saximontana

(photo, p. 118)

Closely allied to the last species, this slightly larger plant occurs a short distance to the north and east of *P. condensata*. It also has small, congested rosettes powdered with white, but is a bit more lax than the last species and has larger, soft yellow flowers. The leaves also lack teeth. The capsules are tinged with blue-purple. It often grows on reddish limestone, making a vivid contrast in foliage and bloom. It frequently grows with *Astragalus aretioides,* an aristocratic companion plant.

Physaria alpina

(photo, p. 118, cover)

It is hard to believe that any plant so distinctive, so showy, and so abundant over a vast area in central Colorado could have been first described by Reed Rollins as late as 1981. This species is restricted to alpine screes in the Mosquito and Collegiate Ranges of central Colorado. Here it forms neat, narrow-leaved rosettes from three to five or more inches across. The flowers are large for the genus and of a rich yellow deepening to orange in some individuals. On Mount Bross it paints astonishing canvases of orange mingling with the deep purple of *Oxytropis podocarpa* under the

ancient bristlecone pines. On Weston Pass it grows and blooms with *Eritrichium nanum*. Either combination would be the envy of any gardener.

Physaria newberryi (photo, p. 118)

Largely restricted to steep, pink limestone of the Wasatch formation in southwestern Utah and Nevada, Newberry's bladderpod has highly variable foliage and the typical mid-yellow blossoms of the genus. In this species, the seed pods assume star status. They are among the largest in the genus, and they develop a remarkable, prismatic shape that suggests a cubist painting. These pods are stained a deep blue-purple when approaching maturity.

Physaria acutifolia
(synonym, P. australis)

This is an abundant species occuring over much of Utah, Wyoming, and Colorado. It forms a beautiful rosette, very much reminiscent of some rosulate succulent such as *Echeveria*. The rosette can be up to eight inches across and is completely obscured in early spring by vivid, lemon-yellow flowers. There are numerous varieties of this species delineated in Welsh's recent *A Utah Flora*, including var. *purpurea*, which is tantalizingly described as having "flowers yellow or purple externally."

Physaria chambersii

Rather similar to the previous species, *P. chambersii* occurs to the south over the complicated terrain of Utah and Nevada's canyonlands. There are several subspecies that vary in subtle characters of their seeds and geographic distribution. Typically, *P. chambersii* has smooth, round rosettes and ascending stems with pale yellow flowers. This species finds abundant scree habitat in the steep canyon country where it occurs, although plants may sometimes be found in stable soils under piñon pines.

Physaria floribunda

The most distinctive foliage plant of the genus is restricted to higher elevations in western Colorado. *Physaria floribunda* has leaves that are deeply cut and incised, making an almost lacy pattern on the ground. The flowers and seed pods are not remarkable in themselves, but the evergreen rosettes with filagree margins are particularly attractive.

Physaria eburniflora (photo, p. 120)

A very distinctive physaria is restricted to the Ferris Mountains of central Wyoming. Out of bloom it superficially resembles a number of miniature species endemic to Wyoming, but in bloom the ivory-colored flowers distinguish it from any other. In cultivation, the rosettes can reach four inches in width on a rich scree, but in a trough it stays two or three inches across and blooms in March and early April.

This by no means exhausts the theme of physarias in the West. In the Black Hills of South Dakota and Wyoming one of the largest species occurs. *Physaria brassicoides* makes large, lax rosettes unique to the genus. I have yet to grow this in the garden, but have no doubt that it would be amenable and distinctive. *Physaria dornii* is also large, with slightly irregular rosettes, and a highly

restricted range in nature. Perhaps the most intriguing prospect in the genus is another very local plant from central Idaho, *Physaria geyeri* var. *purpurea*. The name summons up images of a ruby red-flowered physaria, although several accounts suggest that the *purpurea* alludes more to the sepals and backs of the petals. The prospect of a purple physaria is simply too appealing to dismiss out of hand. I have just obtained *Physaria alpestris* seed from Washington. This is the most northwesterly species and a true alpine to boot. The most recently described physaria was discovered in the Piceance Basin of northwestern Colorado, *Physaria obcordata*. This is a strange species indeed, blooming on semi-erect stems weeks after other species are already in seed. Who knows what strange permutations of color and foliage might still exist unknown, ungrown, in the vast corrugations of the Colorado Plateau and Great Basin.

Western American alpines and steppe plants have attracted lively debate in recent years. There is no question that most Western Americans require as much sun, air circulation and drainage as possible in most gardens. Physarias are no exception. Few plants will germinate more promptly, or grow more quickly than these rosulate mustards. If they are given the quick drainage of scree, crevice, or trough, you can expect most to bloom the second year. If the spot is warm enough, plants can persist for several years. Self-sown seedlings seem to live even longer.

Many gardeners would probably be content with one or two variations on the theme of physaria. For lovers of rosettes, this genus promises to be a fine new contribution to sunny scree and trough gardens. Although the foliage is almost always a powdery white, the genus runs virtually the gamut of shape and outline conceivable in the rosette form. The starfish symmetry of physarias is never more attractive than during warm spells in winter when they are as fresh and appealing as in the summer months.

Although an individual plant optimally lives only four or five years, they are so easily raised from seed, even self-sowing when happy, that there is no excuse for missing out on this distinctive genus of North American rock plants.

Panayoti Kelaidis is curator of the rock alpine garden at Denver Botanic Gardens. He has lived and gardened in Colorado all his life and is a strong advocate for native plants and plants from climates similar to the semi-arid Southwest.

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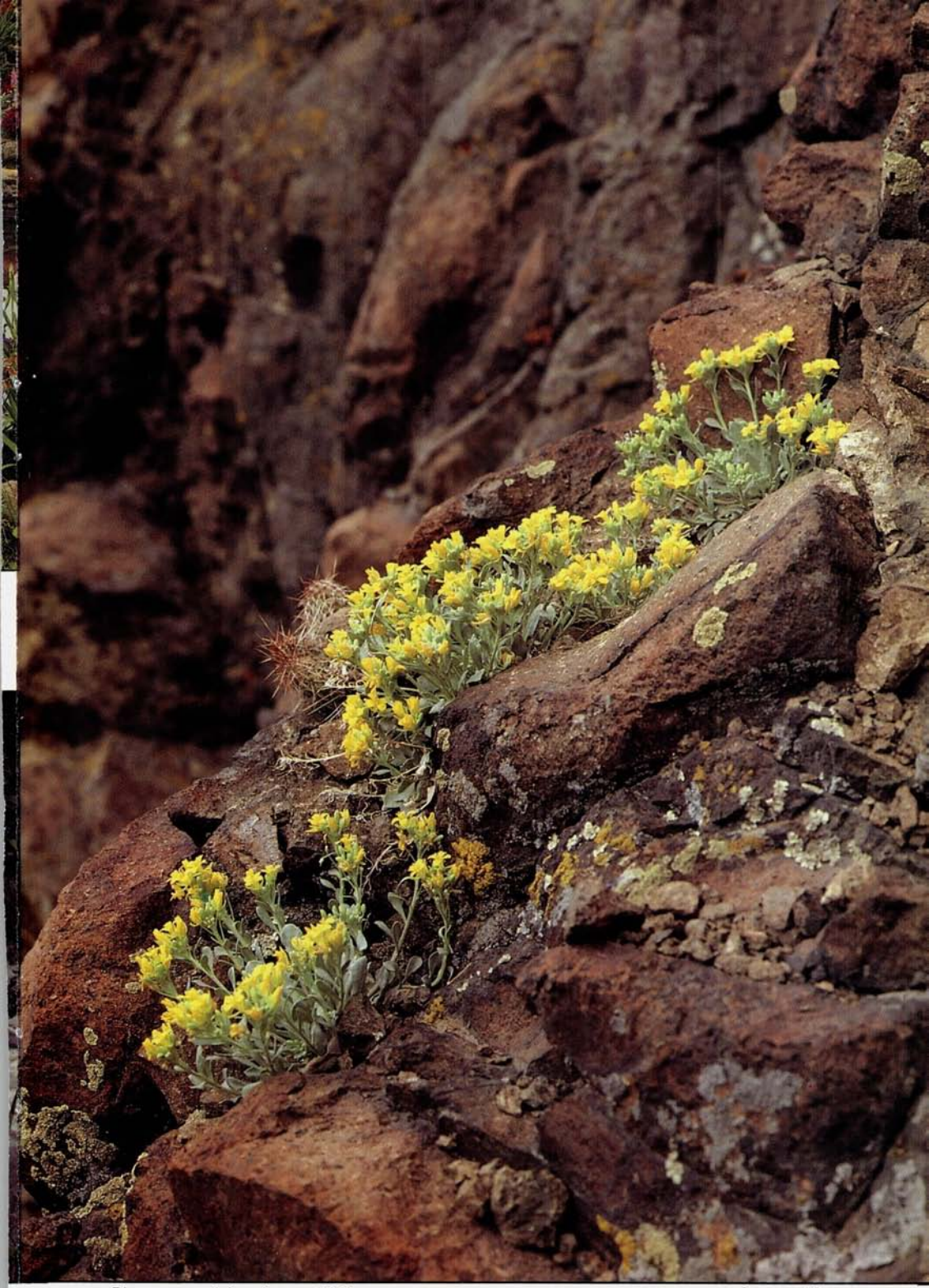
Drawings by Lisa Moran.



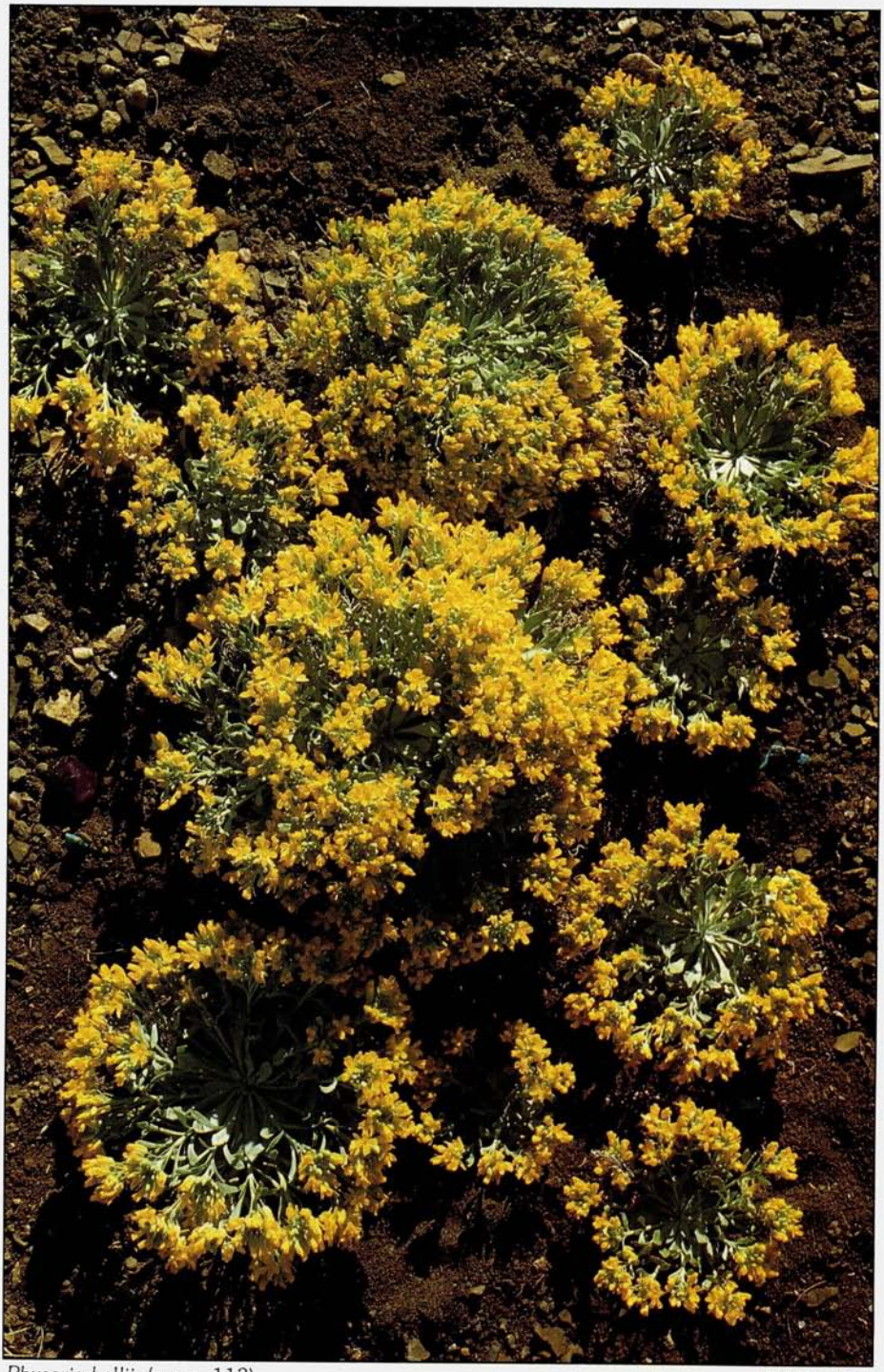
Physaria vitulifera (see p. 113) Loraine Yeatts

Physaria saximontana G. Kelaidis
in fruit, fasciated (see p. 114)

Physaria alpina P. Kelaidis
(see p. 114)

Physaria condensata P. Kelaidis
(see p. 113)

Physaria newberryi P. Kelaidis
in fruit (see p. 115)

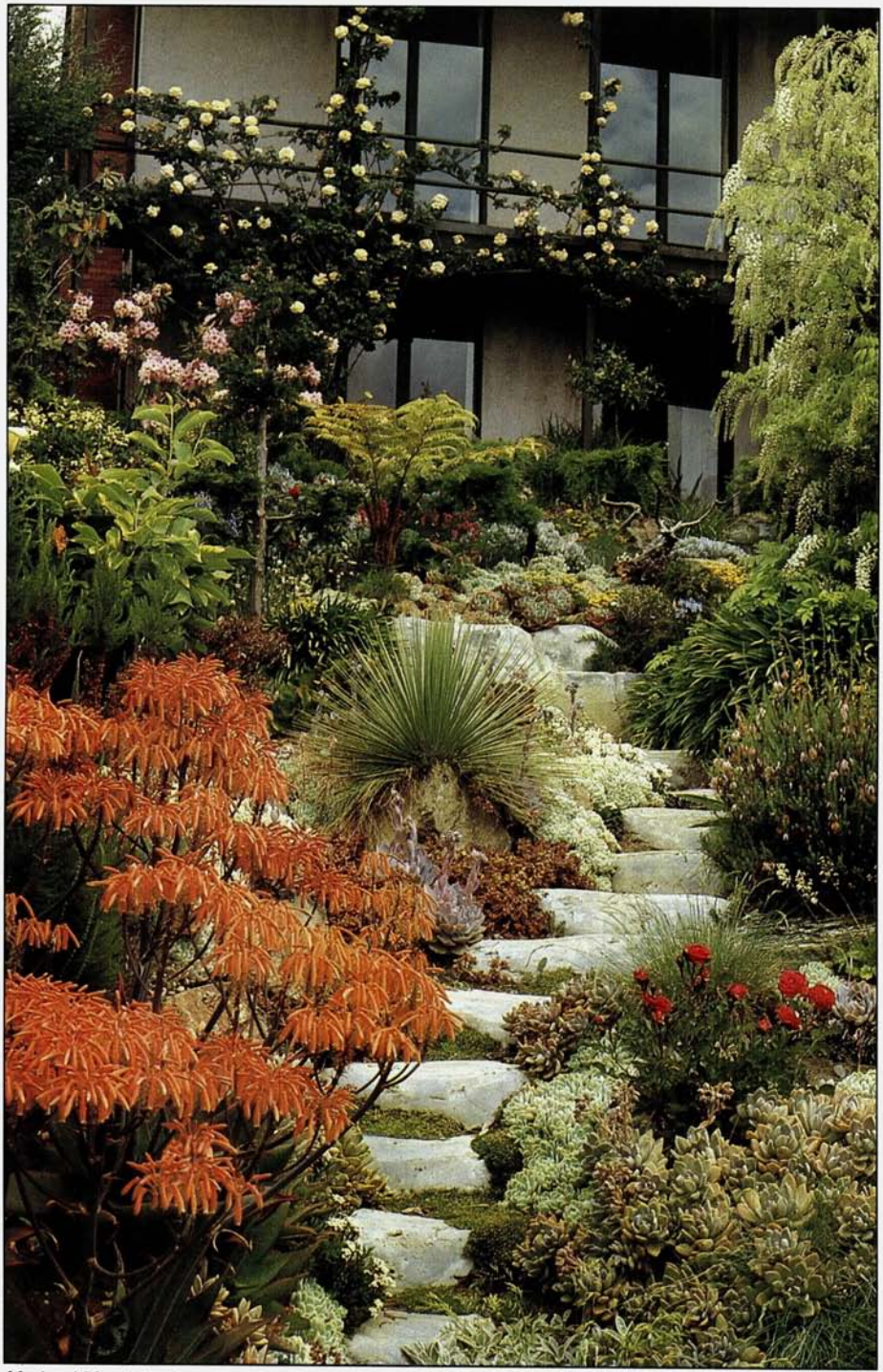


Physaria bellii (see p. 113)

Bill Whelan

Physaria eburniflora (see p. 115) G. Kelaidis

Physaria didymocarpa (see p. 113) P. Kelaidis

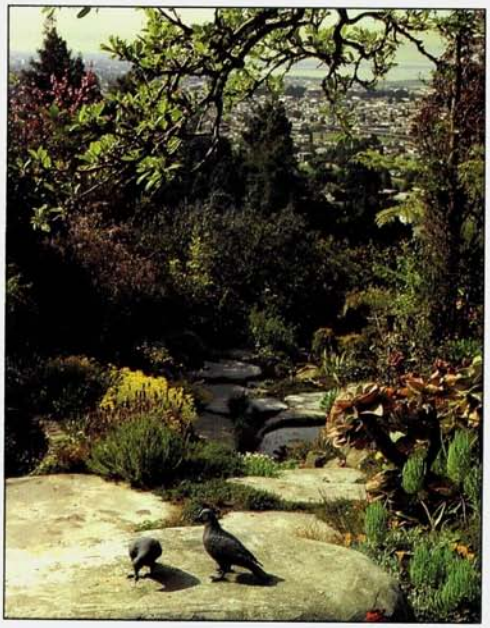


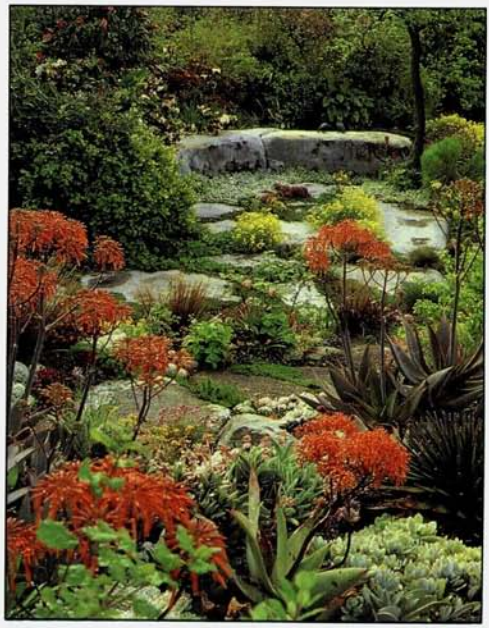
Harland Hand Garden

Harland Hand

Hand Garden (see p. 125)
Dark pools, light concrete, masses of gray foliage.

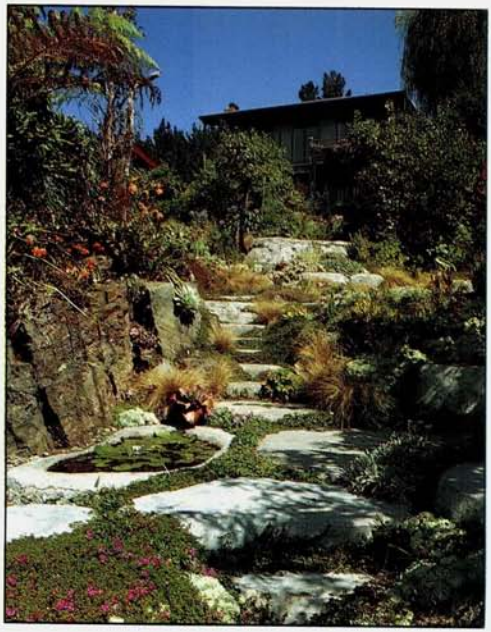
Photos by Pamela Harper





Harland Hand Garden (see p. 125)
Change of elevation, bright contrast of light and dark colors.

Photos by Pamela Harper

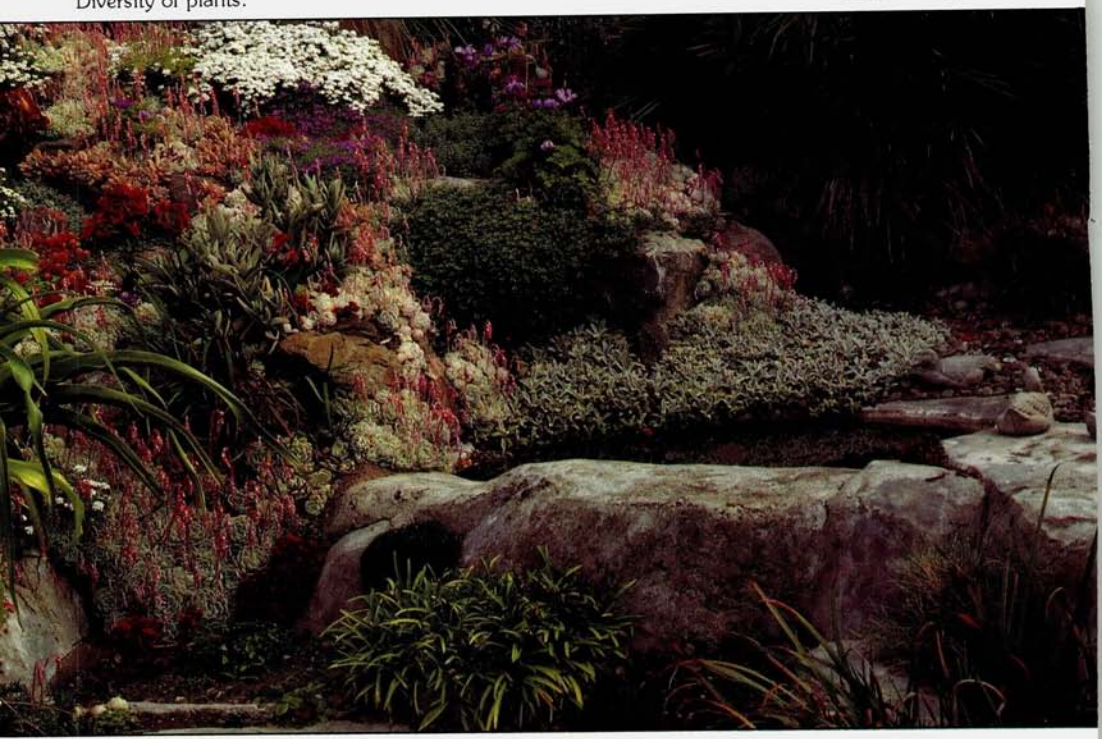


Iris Garden designed by Harland Hand (see p. 125)
Diversity of plants, use of berms.

Pamela Harper

Harland Hand garden (see p. 125)
Diversity of plants.

Pamela Harper



The California Garden

by Harland Hand

I have never seen another area in the world as full of nature's original, varied garden inspirations as California. Because of latitude, a great range of elevations, nearness to the cold currents of the Pacific Ocean, and mountain barriers, every corner brings a new environmental adventure. Mountain, glacier, alpine, lowland, flatland, meadow, forest, marsh, swamp, lake, ocean, valley, desert and, for rock gardeners, every kind of rock outcropping—new, old, volcanic, sedimentary—there are myriad natural places to reap garden ideas. Nature rarely repeats herself in this "State of Diversity."

When even a slight change of elevation can add new plant habitats, it is hard to imagine how many diverse habitats are encompassed by a variation in elevation from more than 200' below sea level to nearly 15,000' above. Add the cold air coming off the chilling Pacific Ocean currents and there come temperature ranges and precipitation variations that lead to layers upon layers of entwined habitats. Try to imagine this physical diversity, then consider that each different habitat has its own special community of plant species. Also, in addition to these plants evolved to fill specific habitats, California has species persisting from before the glacial period plus new ones from after glaciation all mixed in various combinations—a close search finds few places similar to each other. Diversity *is* California.

Diversity can also be the California garden. Probably the most interesting way to introduce diversity is to lift various elements that involve variation from the surrounding landscape, then modify them for the design of individual gardens. It is also a useful way to nestle a garden into its landscape. Of great interest to me is employing color patterns, rocks, growing media, changes of elevation, and especially shapes and proportions from the surrounding landscape into the design of a garden. Also by doing this, it would follow naturally that we can create truly American-California style gardens.

Creating Elevation Changes

In the garden, well proportioned mounds of piled earth and rocks can recreate the visual effect of the varied elevations that most distinguish the California landscape. Bringing in a large quantity of soil for mounds, or doing an extensive re-contouring of a hillside to create such an effect can be the best investment a rock gardener can make. If the mounds contrast in both height and size and the slopes vary from gentle to very steep, the garden will take on a particularly dramatic quality. The greater the contrast of mound shape and size, the greater the number of microclimates, the greater the variety of plants, the greater the interest, the greater the drama of the garden scene—what more can one ask?

Developing varied habitats for special and challenging plants is much of what rock gardening is about. Mounding is a successful device for producing varied habitats to accommodate a variety of plants, each desiring its favorite conditions. Driest at the top, wettest at the bottom, sun from the south, shade from the north, every niche in the mound is a different microclimate, a good home for some plant with special demands...just what the rock plant collector ordered, and for the artistic gardener...great satisfaction in having a vast variety of plants to give richness and subtlety to the masterpiece.

To build mounds, I use our adobe clay topsoil because it shrinks the least as it settles. High humus soils break down so completely that they are here today and gone tomorrow. Adobe is heavy and sticky, so it adheres tightly to the rocks, thus holding both securely in place. Where I need special soils for special plants, I simply scoop out a shelf, sloping it slightly outward for water to drain away (a hole can become a soggy container for water). I replace the adobe with scree, humus, acid soil, or whatever my particular plant may require. I do not object to making whole mounds of scree or other soils. The shelf method does allow for the greatest flexibility in a garden's design scheme.

Bringing Plant Diversity to the Garden

If a garden is to capture the feel of California, as in the California wilderness, the gardener should be free to use a profusion of plant varieties. Such diversity creates interest, and if organized artistically, produces an endlessly fascinating combination of serenity and excitement.

Nearly every plant lover has a passion for growing more and more varieties. I try whatever interests me, and undoubtedly over the years I have lost more varieties of plants than now grow in my garden. Because I try a lot of high risk plants and do not want to see them lost, I attempt to propagate a new plant both to share with more skillful gardeners and to produce enough specimens so I can experiment with various growing conditions. First on my list of experiments is duplicating the plant's natural habitat. Often that does not work, so I have learned to try the plant in several different microclimates within my garden; many times a plant will thrive in conditions quite different than what I had expected

I often go to the wilderness for clues as to how to group new plants and how to grow them. Consequently

pictures of a plant in its wilderness habitat are very important to me. However, nothing takes the place of the real natural wilderness; it can never be duplicated and, for many reasons, must be preserved wherever possible. "If any doubt never destroy" is my motto. Restoration of a wilderness should be tried; nature will eventually take over to create a new wilderness, but it will not ever be the way it was. However, as with every garden, let us be challenged.

Natives or More?

I grow a mixture of plants from all over the world, those that combine best include those from climates similar to California's "Mediterranean climate." Australia, South Africa, southern Europe, etc., all have beautiful native plants that thrive when planted beside our natives. However, I do not know of any device more likely to create a "California Style Garden" than using native California plants exclusively.

Growing any combination of California native plants requires thought and special efforts. A high percentage of native species require drought for at least part of the year, usually in summer, making them nearly impossible to grow in gardens with abundant summer rain. In the San Francisco Bay Area we have dry summers, so most gardeners water regularly. However, it is possible to water only the restricted areas of the garden where we group plants requiring summer water, and then to distribute drought tolerant species wherever else it pleases us. Where there is summer rain or in a whole garden that is extensively watered, some summer drought plants can be placed in the driest areas, such as on the top of a mound. A plant will then have its crown dry (a usual requirement) and be able to send its roots where it pleases. This often works —at least for a while.

It is seldom easy to combine California native plants with favorite plants from other parts of the world. Many attractive California natives require extraordinary growing conditions. Our native *Darlingtonia* and many alpines flourish only in soils with spring water constantly filtering through, a very difficult condition to duplicate. Desert plants, serpentine endemics, and coastal rock plants are other examples that can defy the ingenuity of the most adventuresome gardener. Rotting away, slow death, or vigorous growth followed by a quick demise are some of the discouraging results. Yet I would not want to inhibit any gardener from trying different and difficult plants, or from trying new methods of growing some desired plant, because the majority of successful gardening techniques have been discovered by amateur gardeners.

The California Look

Despite the diversity of plants and microclimate, the California landscape has a distinctive regional appearance. Besides the obvious changes of elevation that dominate nearly every landscape, I see two other qualities that are responsible for that look.

First, let us consider California light: It is brilliant and clearly focused. The moisture and temperature of the air, the latitude, the cold Pacific

Ocean, and the high mountains are probably the elements that produce our extraordinary California light. This brilliant, clear light produces a picture sharply focused. It pervades the scene with startling contrasts; sharp black shadows contrast with dazzlingly bright highlights, presenting a land of strong dark and light color contrast more intense than any other place in the world. This light is a photographer's dream, and photographers revel in it, as thousands of "made in California" movies attest. A camera can modify clear light, but it can not make a clear picture from fuzzy light. This light also controls how colors work in a garden.

In California light, colors go together in unexpected ways. Colors, especially bright colors, can be combined in ways that would not be pleasing under another kind of light—puzzling to people whose tastes are based on the misty pastels of English gardens. In California, the play of dark and light contrast gives colors a jewel-like quality that is both exuberant and subtle, providing us with a range of successful color combinations not to be exceeded anywhere. Colors of somber drama, of pastel quiet, of pageant brilliance, of comic gaudiness, of cottage informality, of estate formality, all possible and all wonderfully workable in this one area of the world.

California Contrast

Second, California's color contrasts: Nearly everywhere the landscape is dominated by strong dark and light color contrast—color contrasts that make almost any photograph of California readily identifiable. These strong contrasts produced by the intense, clear California light are the key to California color. In mid-morning light, a Monterey Cypress will have black shadows with pale green highlights. Across the countryside, the pale gold-

en grass of undulating hills contrasts with the nearly black live oaks drifting over them. White snow-capped mountain ranges rise out of dark mysterious foothills, deep green pine trees pale the light grey of Sierra granite, dark conifers sharpen the brilliance of the Pacific Ocean behind them and the light blue sky above. These contrasts dominate nearly every California landscape. They create a wonderfully dramatic environment.

Observing this dark and light color contrast can be an advantage, because it inspires a color plan that can be used in any garden anywhere but one that is especially successful in California. The plan involves combining three color categories: light (pale colors); middle-tone (in-between colors); and dark colors. I look at a black-and-white photograph of my garden, and I can readily locate the areas of each category. Middle-tone is the middle ground between dark and light, and most plants fall into this category, because most foliage is middle-tone green. Pale pinks, yellow, cream, white and lavender are among the light colors. Maroon-red, dark blue, purple and black are some dark colors.

To organize garden color, I make light-colored shapes by grouping plants with light foliage or pale flowers together; I create dark shapes using the same kind of grouping but with dark-colored plants. The trick is to place these strong dark or light shapes rhythmically through the middle-tone areas. The more the dark and light contrast dominates (black against white being the most contrasting in the garden), the more brilliant and jewel-like the remaining colors become and the better all colors seem to go together. Even colors otherwise perceived as muddy seem to come to life. I find that "dark, light, middle-tone color organization" works especially well in rock gardens, because massing tiny plants into groups with close color relationships in tone and intensity tends to emphasize and harmonize their most subtle differences. Visitors will take a second look.

Such dark and light color contrast is not always easy to establish. Pale-colored flowers come and go through the year, so a more permanent pattern of pale foliage (gray, variegated, etc.) is a must. I use any light-colored foliage that interests me; the list is long. Lamb's ears (*Stachys byzantina*) is one of my mainstays because it flourishes in nearly every situation. However it does attract our ravenous California gophers—the most frustrating animal ever to invade a garden. Items other than plants that register as light colors are concrete (no color added), light-colored sculptures of birds and animals, along with benches, pottery, etc. I find such things wonderfully useful in making interesting color patterns.

Middle-tone shapes are seldom a problem since most plant colors fall in this category. They usually form the mass of a garden's colors, especially in areas of the world with abundant and evenly distributed annual rainfall.

Dark colors are rarest, especially among rock garden plants. I cherish those that I find. A succulent that with a little effort can be kept under 12", the dramatic, maroon-black *Aeonium arboreum* 'Zwartkop' is one of my favorite dark-colored

plants. I use drifts of it across some areas of the garden. Black *Ophiopogon planiscapus* 'Nigrescens' is another; however, it is slow-growing and sometimes reverts to green. Some conifers, such as Hinoki cypress (*Chamaecyparis obtusa*) and its dwarf forms and Mugo pines, register darker than most plants. They work especially well when placed next to a light shape. Where I can not use dark-colored plants, I often incorporate dark rocks or statuary painted black. Ponds of dark water, because they also reflect the sky and colors around them, give a special punch when used as part of the dark color pattern of the garden. In my garden are nineteen ponds. Their dark waters do wonders by reflecting colors and echoing San Francisco Bay below.

The Invasion

The beauty of the California landscape, its diversity, and the agreeableness of the climate in so many areas attract throngs of individuals who find a niche somewhere across the state. Thus there is a real danger of becoming over-populated, not only by *Homo sapiens* but by their accompanying species. *En masse* they invade the special habitats that abound in this "State of Diversity," so much that this could become the "State of Divestiture." When from my windows I view across the land, and I see the dark and light color contrast of our extraordinary natural scene being replaced by so many new buildings, I am troubled. But I remember that I am one of the invading species that change the landscape: I invaded this place, I built a house, I made a garden, I imported species, I made changes. All changes demand constant re-evaluation in order to make the best of everything, not just the best for now but "the best in the long run"—what that is, is endlessly arguable. We live closer and closer to a dangerous edge of both natural, and manmade destruction and there is no panacea.

A gardener's sensitivity to the extraordinary quality of the California landscape can go a long way toward preserving at least the feel of the natural wilderness. Gardens can reflect the contrast of color, of elevations, and, of course, include combinations of native plants. Through artistic design, an appreciation of this often enchanting state can be displayed in gardens that belong here, gardens that touch the landscape with their own contributing enchantment. Through our planning and sensitivity gardens can reflect a deepened sense of our wildernesses for the generations to come.

Harland Hand is an artist who has turned his talent to the creation of gardens. His own garden in El Cerrito, California is both a fabulous collection of plants and a remarkable designed environment. Harland also designs and builds gardens for others.

How I Began to Garden and Began Again

by Marjory Harris

> "I should see the garden far better," said Alice to herself, "if I could get to the top of that hill: and here's a path that leads straight to it—at least, no, it doesn't do *that*— " (after going a few yards along the path, and turning several sharp corners), "but I suppose it will at last. But how curiously it twists!"
>
> *Through the Looking Glass*, Chapter 2, by Lewis Carroll

Do you remember how Alice went through the looking glass and found a garden of live flowers up a hill? Well, the same thing happened to me, in a way.

In 1979, I was with a friend who sold real estate, on the way to visit a mutual friend. The real estate friend said she wanted to stop briefly at a house that had just been listed for sale. I nodded apathetically, having given up hope of ever being able to afford a house in San Francisco. We drove uphill on Los Palmos Drive. The winding road and colorful stucco houses reminded me vaguely of the towns that dot the Mediterranean. Although I didn't notice any palms, I couldn't miss seeing the huge Tasmanian blue gums (*Eucalyptus globulus*) which loomed over the house for sale. They formed a double row along the steep dirt trail that ran along the side of the property, a city "street" quaintly named Lulu Alley.

I fled through the ugliest kitchen I had ever seen to the back door, then down the back stairs to the "garden." There was a little concrete pad out back, between the house and a retaining wall that supported a near-vertical escarpment, the remainder of the lot. I gazed skyward at the towering blue gums and inhaled their aromatic vapors with pleasure. I trod through their slippery droppings to a redwood gate in the retaining wall, ascended a short flight of steps, and set upon a steep cobblestone path that wound upward through a thicket of giant milkweeds and coarse junipers.

At the top of this treacherous path was the first of three redwood struc-

tures, with brick pavements and flat flower beds. The second one was walled with ivy-covered lattice, forming a kind of secret bower. The third immediately enchanted me: a structure 59' wide that spanned two levels. A flight of wooden steps deposited me on a large herringbone-brick terrace surrounded by weedy flower beds. Enclosed by redwood fences on three sides and lattice on the side facing the house, three stories below, it was a world of its own.

My real estate friend stood at one end of the terrace, shaking her head as in "My God, what a mess!" I stood at the other end, by the burned foundation of a toolshed, in ecstasy. I turned to my friend and said, "I'm going to buy this place," and started downhill.

It was an odd-shaped lot less than 25' across the front at the street, but 59' wide at the top. The garden ran for 80' from the back of the house to the back fence, but rose around 30' from the concrete retaining-wall to the top terrace. It had lots of possibilities. It also had lots of trees—40—and lots of bushes and weeds.

A month later, as I filled six garbage bags with wet blue gum debris, all the while fighting off wild blackberry vines that reached through the lattice to tear at my clothes, I began to wonder if I was crazy to think I could reform this derelict. With the ignorance of the novice gardener, I assumed the only way to turn the jungle into a garden was to clear it all out and begin from bare ground.

I hired a young man who worked like a dog for days, removing the dead trees, coarse shrubs, blackberry brambles, ivy, and things he claimed were weeds. I insisted he leave the wild rose and montbretia, both of which I later had to tear out, as they took over all available space. He said, "This is a lot of land here," as in "She's crazy to think she can manage this herself." He warned me about watering the ground once it was stripped of herbage. I asked what he meant; he replied cryptically, "Weeds."

One day while he and his friend were hacking with mattocks at the weeds cemented in the clay soil, I prepared to plant my first outdoor plant—a bougainvillea. I was dolled up in a caftan and long dangling earrings that kept getting caught in the caftan every time I bent over. Using a crummy shovel purchased at a discount place, I started scraping at the clay. After much labor and tripping repeatedly on my ankle-length garment, I made a hole big enough to drop in the bougainvillea. A week later I moved it to another location, ignoring the advice in my gardening book about the touchiness of bougainvillea roots. It soon succumbed.

Later I adopted a more suitable (if less attractive) gardening costume: English rubber gardening boots, a T-shirt and jeans with a loose tent dress over all. The dress makes a useful apron for weeds; dirt shakes off; pants thus last longer. I also began to keep notes on what I planted, with a big red "C" for bad results ("Croaked").

On weekends I visited nurseries and filled the trunk with plants. I soon abandoned my plan to grow easy, low-maintenance plants; I had to have flowers—violets from my childhood playing in the woods, foxglove

and poppies from my sojourn in England, and anything else that would fit in the trunk and was expected to survive in San Francisco.

Ten dead trees had been removed, but the remaining 30 needed pruning. I called Ted Kipping, Tree Shaper, who lived in the neighborhood and whose advertisement I liked. Ted showed up around ten o'clock at night and examined the trees with a flashlight. He said, standing on the terrace and looking downhill, "This would be a terrific place for a rock garden," and asked if I was interested in rock gardens. I remembered the slope beside the house I grew up in, which had some rocks in it and a few plants, and said, "Yeah." He encouraged me to go to the Santa Cruz arboretum on an ARGS Western Chapter outing.

At Santa Cruz a tall, distinguished-looking man approached me and asked in a resonant and cultured voice, "What kind of car do you have?" I told him. He then said, "Would you take a painting to El Cerrito for me?" By then I felt I had humored this character enough, so I said, "Excuse me if I sound rude, but why the hell should I?" He answered that he would show me his garden. It turned out I was talking with Harland Hand, whose article on the color garden in the Spring 1978 issue of *Pacific Horticulture* was on my night table. I read it often between trips to nurseries to buy more flowering plants.

The next day I went to El Cerrito with the painting of twenty-two zebras by a pond of water hyacinth in a pink desert (which I was tempted to keep, so much did I like it). After seeing Harland's garden, I was deeply depressed. I wondered how I could ever approximate the beauty of space and color he had created on his steep slope with its view of San Francisco and the Bay. Of course, if I had had some of the elixir from Alice's magic bottle, I may have been able to see, nine years later, Harland laboring on my steep slope, installing a new garden.

But I'm getting ahead of myself. In the years that followed, I got involved with horticultural societies, seed lists, study weekends, and other *indicia* of plant mania. "Rock plants" (whatever <u>that</u> means) particularly interested me, as I could fit so many of them in a small space. And so many of the small plants from the world's seaside cliffs and mountain ranges do well in the cloud forest climate of San Francisco's fog belt. But the little delicacies I acquired soon disappeared under the hail of antiseptic leaves and capsules from the giant blue gums of Lulu Alley, or they succumbed to the cold and dampness of the cloud forest floor.

I nagged the street department until they got fed up with my pestering and took out the trees—a feat which inspired my neighbors with awe about my supposed clout at City Hall. Once the blue gums were gone, I built a scree. First I dug a pit three feet deep—no mean feat in clay soil—and around five feet wide. My plan was to fill the pit with gravel, then place stones atop the gravel to create a pleasingly contoured slope. This turned out to be an arduous task that spanned two years. In the meantime, neighborhood cats flocked to the area and fertilized it, saving me

the expense of buying leaf mold. The scree was surrounded by small plants that did not need to grow in gravel, and this area soon became the "jewel box" of the garden.

Over the years I learned that clay soil is a graveyard for plants here unless and until it's thoroughly worked with compost; that large damp and shady stretches are ideal to grow weeds that will soon overpower the rarities I grew from seed or acquired from nurseries or friends; and that weeds grow all year in San Francisco. And I learned that no matter how hard I toiled, my garden still didn't look right and never would without divine intervention.

Such intervention came, as it often does, in a most unusual form, the savings and loan crisis. In early 1988, a colleague asked me to work on a huge federal lawsuit involving a failed savings and loan institution. Because of six-to-seven-day work weeks and a drought, I couldn't do much gardening, but the extra money I was making inspired me to ask Harland Hand to develop a design for reconstruction of my garden. My intention was to keep the design in a drawer like a secret treasure and daydream about someday redoing the garden. But the idea burgeoned into action; before I could get cold feet, I announced to Harland that we would begin the reconstruction in June.

We chose the theme of a village ruin. Harland would recycle the old brick and cobblestones from the paths and terrace to suggest the remains of a village near an ancient, imagined castle. Although the plan looked schematic, I felt confident if anyone could conquer my steep slope, it was Harland, whose own garden descends a hill. Later he said mine was the steepest garden and one of the most difficult he, and maybe anyone else, had ever done.

Although I was dissatisfied with the results of nine years of labor, tearing up the garden—and particularly the terrace, with its mossy herringbone brick—was a heartache. Harland did agree to leave my nine-year-old double wisteria (I said very firmly, "It has to stay."). He insisted that my lovely weeping *Myoporum parviflorum* had to go, as it would be right in the workers' way.

For several weekends I dug and potted up as many plants as I could, assisted by two German girls. I lost at least a thousand plants, but managed to save a good part of my *Aquilegia* collection, many *Dianthus* and thyme cultivars, and various sempervivums, bulbs, lilies, and groundcovers. The scree plants, with their three-foot-long roots, could not survive transplanting.

I hired a foreman and a crew of Laotian refugees. A few days before May 31, 1988, when the crew was to begin tearing out the redwood structures and brick paving, Harland called to say I should plan on spending fifty percent more than we had discussed—"Just to be on the safe side." I thought I would hyperventilate. As it turned out, the garden cost twice as much as the new, "safe side" amount.

May 31 arrived, and although I could hardly breathe from anxiety over the estimated cost, we began. I was the general contractor. Two days later I had to fire the Laotians, and I started scrounging around for labor-

ers who understood English. The foreman came up with some recovering drug addicts, eager to learn a trade and earn some money, and I located some students needing summer jobs.

A man I called about diamond-cutting the concrete wall offered to do cut-and-fill with a bobcat tractor. It would save months of hand-terracing the clay soil, but it would be expensive. And terrifying. I would look out the window at the bobcat, perched at a treacherous angle, mauling the earth. I would look down at my checkbook and agonize over rising costs, relapsing addicts, and the red dust from the bone-dry clay soil swirling through my house and office.

Over the next several months, at least thirty-five tons of Sonoma fieldstone were delivered, some of the stones transported from the curb to the site by bobcat, others by hand, board, and wire sling. Tons of cement, gravel and sand were stored wherever we could find flat spaces. Redwood debris and clay soil were periodically carted to the dump. A used cement mixer droned, when it wasn't down for repairs. Several times a week I journeyed to lumber yards or contracting supply houses to buy tools, gloves, wire, whatever Harland and the foreman said was needed. And always more cement.

The federal case had me away from my home office a number of days a week. I would come home at night, put on my English rubber gardening boots, and make my way up through the steep mounds of dirt to see what had been accomplished in my absence and to water the remains of my former rare plant collection in their weed-choked pots. I would call Harland, by then home in El Cerrito recuperating from his labors, and query the latest cement and cobble outcroppings. The little walls did not appear on the plan, which I would unfurl and study, trying to imagine how the schematic outlines would end up looking "in the flesh."

Harland would walk around the dirt mounds each morning, rapt in thought, studying the earth and deciding where to free-form the churning cement. I would sit at my desk and wring my hands as I studied the endless river of bills and compared it to the trickling stream of my accounts receivable. In July one little mound outside my office was finished and Harland said I could plant it. It was my only garden for a long time, and I would look out my office window at the small mound, planted with ferns, Asian violets, *Digitalis* species, *Streptocarpus*, and Corsican mint, and feel hopeful.

Harland finished the rock and cement work by the end of August, but there was much carpentry work remaining. The fences had to be rebuilt and a pergola for the wisteria erected at the highest level. None of the crew, including Harland, had ever built such a structure, so it had the air of an experiment. The finished product, when viewed from the front gate, three stories below, made me dizzy. But Harland was always saying how great artists and designers understand that beauty is imperfect and irregular—or something like that.

As summer drew to a close, I thought there was hope of getting the garden planted before the rains

began. We were in a severe drought and no one could predict when, or for how long, we would have rain. But I was propelled by fear of the weeds that would turn the ground green after the merest spritzing, so during lulls in the federal case, I planted. By the end of October, I had planted almost all the transplants, which had estivated in pots, plus several hundred accessions from near and distant rare plant nurseries, and my new seedlings. Where I didn't plant, I sprinkled seed.

During my two-month planting spree, the irrigation people trampled the earth, mangling minute gentians and other just-planted treasures, invisible to them, as they laid tubing for the misting system. Electricians were here for days, hooking up three-way switches for the lights and waterfall. Neighbors stood on the sidewalk, gaping as they gazed up at the waterfall tower and the dizzying pergola. I wondered if it would ever be finished.

Winter came, and for the first time in my gardening career, I was able to weed during our rainy season. There was always some dry patch of concrete I could stand on without fear of compacting the wet soil. I no longer had to lie down on a near vertical slope to get to the weeds in the rockery—they were now elevated on mounds accessible from the stairways that wind through the garden.

Now, as I climb the thirty feet upward from the concrete retaining-wall yard to the wisteria pergola, I pass ponds, benches, bogs, scree, and little "rooms" with concrete and brick benches, and hundreds upon hundreds of flowering plants. Sometimes I sit in my secret garden, at one end of what was the terrace, and imagine that the concrete cherub who sits at the side of the rectangular pond, dangling his feet in the water, might take flight, out towards San Bruno Mountain and the San Francisco Bay. But why would a cherub want to leave an enchanted garden of live flowers, ablaze with all the colors of the rainbow, a little Wonderland up a hill? I know I don't.

Marjory Harris gardens in San Francisco and collects and propagates rare plants from seed. She is a former editor of the newsletter of the Western Chapter and currently serves on the nominating committee of ARGS.
Photos by the author.

Troughs

Alpines in the Fog Belt

by Wallace Wood

A portable trough, containing a miniature garden, was constructed and has grown to a certain maturity in San Francisco's Golden Gate Park, within California's moist temperate zone, the coastal fog belt. This trough demonstrates the ease with which very small plants can enter into almost anyone's life. It serves to stimulate interest in alpine plants in a metropolitan area.

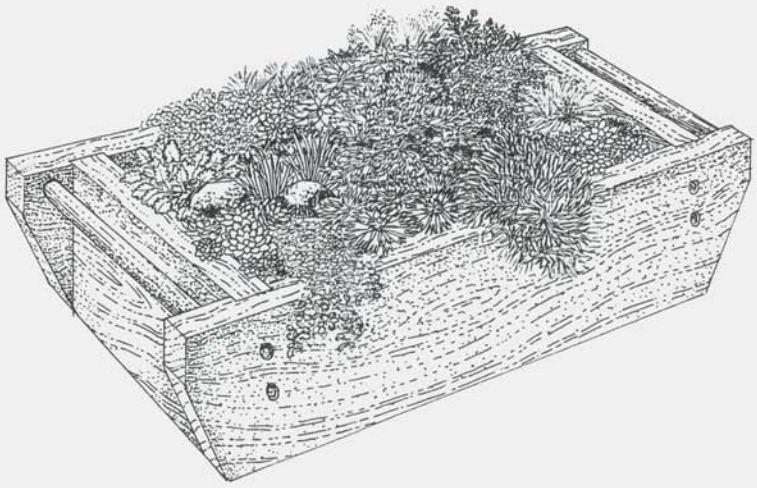
Dense, thick fog frequently hugs the California coast, from south of San Francisco to several hundred miles north. Although it can occur at any season, it is usual during the growing season when plants and people who are within a few miles from the ocean are really living in a cloud.

Typically at Strybing Arboretum and Botanical Gardens the summer temperature is in the upper 50s (F°); the wind is blowing, everything is drenched in moist fog and the sun hasn't been seen in a month. There are however, throughout the year, many exceptional, fine, clear days with occasional temperatures in the 90s and winter lows in the 20s. Rainfall is about 21", snowfall rare, and the fog drip considerable. In this environment many alpines thrive.

For the past five years at plant sales and for exhibition, we have used a wooden container of two-inch-thick lumber (soaked in a copper napthenate solution), which has an interior of 11" by 14" and is about 7" deep. At each end, 1" wooden dowels serve as handles. For our purposes, the shape and size of this trough seem close to ideal. The original planting consisted of 23 plants, and over the years this has been reduced to 15.

The plants in the trough, which come from distant geographical locations and diverse environments, require a minimum of care. In fact, such a garden may be one of the easiest, requiring only a few minutes a week of care. Fingers, forks, and small scissors are the major tools required.

Around the plants and covering the top surface of the trough is a layer of granitic gravel. The soil is an all purpose mix of easily obtainable materials. It consists of equal parts of milled sphagnum peat, gravel, and coarse sand with the addition of about 10% compost. The principal disadvantages of this mix are that it attracts mosses and liverworts, especially in small containers, and that it is difficult to re-wet should it dry out. A more recent soil mix is best described in two parts: (I) 50% ground fir bark, 20% milled sphagnum peat, 15% fine sand, 15% red lava gravel. (II) 50% coarse sand, 50% gravel (or red lava gravel). Nutritional supplements can be added as needed. For general use, equal parts of I and II are used. The proportion can be greatly varied to meet specific plant requirements. In the last few years, the trough has received a



couple of doses of liquid fertilizer annually.

Plants now in the trough include: *Acorus gramineus* var. *pusillus*, *Azorella trifurcata* (*Bolax*), *Antennaria dioica* 'Nyewood's Variety', *Androsace lanuginosa, Armeria juniperifolia* 'Bevan's Variety', *Chamaecyparis pisifera* 'Plumosa Nana Aurea', *Erodium chamaedryoides* 'Roseum', Bishop's Form, *Jasminum parkeri*, *Limonium minutum, Pieris japonica* 'Pygmaea', *Raoulia australis, Rhodohypoxis baurii* 'Tetra Red', *Saxifraga paniculata* 'Brevifolia', *Scleranthus biflorus,* and *Silene acaulis* var. *pedunculata*.

Some of the many other plants which have been used in our miniature gardens include: *Gentiana acaulis, G. freyniana, G. saxosa, G. verna, Stachys densiflora, Raoulia lutescens, Scleranthus uniflorus,* and *Viola yakusimana*. There has been much demand for *Colobanthus acicularis*, an emerald-green cushion plant from New Zealand. Dwarf conifers are frequently used in both sun and shade gardens. Plants that have been used in miniature gardens for the shade include dwarf hostas, *Cyclamen coum, Ophiopogon japonica* 'Compacta' and *Astilbe glaberrima* 'Saxatilis'.

There are many interesting plants waiting to be tried. R. E. Heath's book *Rock Plants for Small Gardens* is essentially a list of plants that do well in containers.

To be admired, appreciated and enjoyed, miniature gardens should be located close to the eye. Flower detail, variations of foliage, color, texture, and the many small details only can be really seen at what would be a comfortable reading distance. It is satisfying to watch from close range the tiny plants respond to the changing seasons, to see the leaves develop, and to observe the minute buds swell and burst into flower. Grow alpine-type plants to perfection, have fun doing it, and the knowledge gained can contribute to the future.

Illustration by Mimi Osborne.

Journal Articles

by Brian O. Mulligan

"A Survey of *Dionysia* in Cultivation." Dr. C. Grey-Wilson. *The Plantsman*. Vol. 10(2): 65-84. 1988.

This includes a key to and descriptions of 20 species, with a color plate showing two of them, and drawings of four others. There is much information about their habits and distribution from the author's personal experience.

"An Account of the Genus *Phyllodoce*." Barry N. Starling. *The Plantsman*. Vol. 10(2): 88-100. 1988.

This discusses all the species and hybrids, with full-page drawings of four.

"*Trillium*: Part 2—Western North America." R. J. Mitchell. *The Plantsman*. Vol. 11(2): 67-79. 1989.

Eight species are described and discussed; one is illustrated by a full-page drawing. There is no key to the species, but a useful bibliography.

"*Cassiopes*." Barry N. Starling. *The Plantsman*. Vol. 11(2): 106-116. 1989.

Thirteen species are mentioned, but some only briefly since they are not at present in cultivation. Eight hybrids are shortly described, which is helpful in separating and identifying them. Two species and one hybrid are illustrated by drawings.

The Plantsman is published quarterly in London by Home and Law Publishing Ltd., in association with the Royal Horticultural Society. The annual subscription is now £13.50 sterling (approximately $22.00 at the current rate of exchange). It frequently contains articles of interest and value to growers of rock garden plants. Back issues of *The Plantsman* can be obtained from the Royal Horticultural Society's office, Vincent Square, London SW1P 2PE, United Kingdom. Price £4.00 each, or about $6.60 at present rate.

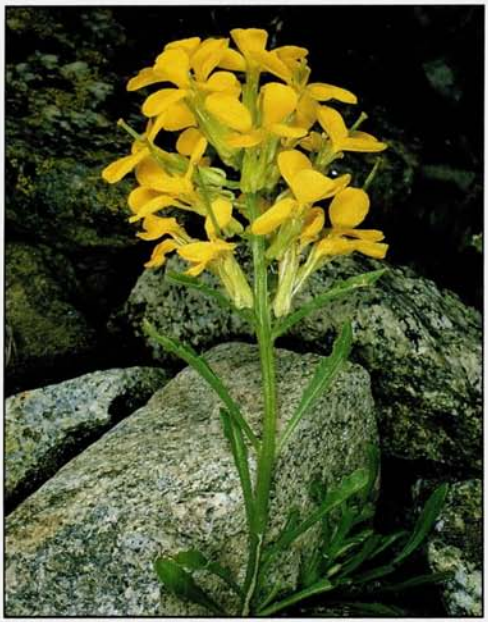
"Taxonomy of the Tufted Alpine or Subalpine Polemoniums (Polemoniaceae)." Verne Grant. *Botanical Gazette* Vol. 150(2): 158-169. 1989.

This article contains a key to seven species of *Polemonium* and three subspecies of *P. pulcherrimum*. It is illustrated by drawings of plants, their flowers, and leaves, and has distribution maps and a bibliography. This is a most helpful aid in distinguishing these attractive but often confused western mountain plants. Professor Grant deserves our thanks.

Erysimum capitatum ssp. *capitatum*, high alpine, pink form, formerly known as *Erysimum amoenum*. On Mt. Evans, Colorado. (see p. 109) Dick Bartlett

Erysimum capitatum ssp. *capitatum*, orange form, formerly known as *E. wheeleri*. (see p. 109) Dick Bartlett

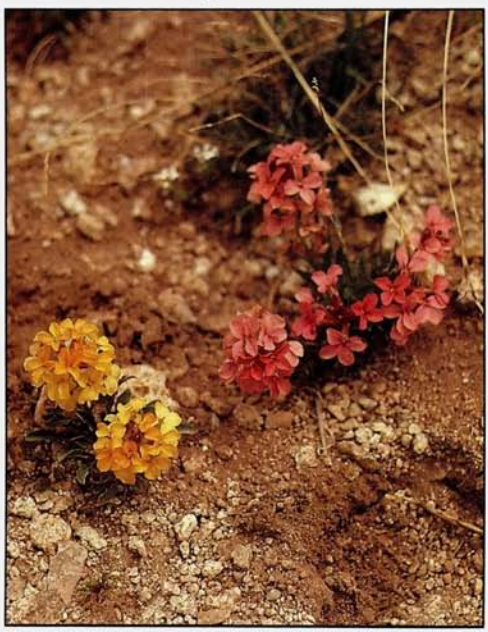
Erysimum capitatum ssp. *capitatum*. On Mt. Evans, Colorado. (see p. 109) Dick Bartlett



Erysimum capitatum ssp. *capitatum*. On Mt. Evans, Colorado. (see p. 110) Sandy Snyder

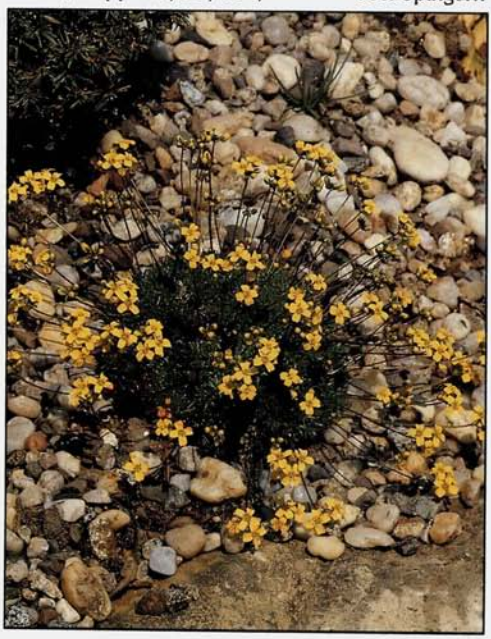
Erysimum capitatum ssp. *capitatum*. Miniature form, on Mt. Patterson, California. Robert Price

Erysimum capitatum ssp. *capitatum*. On Cumberland Pass, Colorado. (see p. 110) Robert Price



Stanleya pinnata (see p. 91) Loraine Yeatts

Draba rigida
(see pp. 87, 95, 104) Joel Spingarn



Draba bryoides ssp.
imbricata (see p. 87, 95) P. Kelaidis

Aethionema 'Warley Rose' P. Kelaidis

Aethionema grandiflorum P. Kelaidis
(see pp. 89, 92)

Aethionema oppositifolium, in bud and in flower (see pp. 94, 145) G. Kelaidis

Plant Portrait

Aethionema oppositifolium

by Anita Kistler

The first true rock garden plant given to me, about twenty years ago, was a leggy, sprawling, grayish-foliaged plant. It certainly was not the most attractive plant that I had ever seen. I was not too interested in it, so I passed it on to my husband to grow in HIS rock garden. The plant thrived and began to show its good points. It developed into a mat 1" high of little, round, thickish, gray-green leaves, closely packed together. You can bet it was not long before I had teased out a rooted cutting to go into HER rock garden.

Aethionema oppositifolium belongs to the crucifer family. Sometimes the name of this little gem has been given as *Eunomia,* but the recently published *Flora of Turkey* uses *Aethionema*. It is a desirable plant year-round, even looking nice through the drab days of winter. Then, in very early spring, there develop tight little clusters of purple balls at the ends of each branchlet that soon burst into lovely, pinkish-purple blooms with the warming sun of late March. My bloom-date calender shows that the flowers open between March 19 and April 4, depending on the year. My garden is in West Chester, Pennsylvania.

This *Aethionema* slowly increases in size—never, ever is it invasive—it just has a slow, gradual increase. The foliage stays about 1" high and the blossoms nestle right on top. Some years it is so floriferous that the foliage is almost hidden from view. It makes both a great rock plant and a trough plant, but growing it as a pot plant does not do it justice.

HER rock garden was built on shaley soil on an existing slight slope to the east and south, so the drainage is fantastically sharp. The entire garden is mulched with red shale stone chips. These contrast beautifully with the grayish-green, tight foliage, and the pinkish-purple flowers sitting just above the foliage in clusters.

After the third year, the center of the *Aethionema* begins to get leggy and brown out, so I immediately make cuttings to start additional plants in diverse locations. Nothing is too much trouble to keep this choice mat happy and growing well.

I sent a cutting of *Aethionema* to Ithaca, New York, to Nina Lambert. Her first reaction was: "An *Aethionema* will not survive our winters." It survived. The plant's origin is Turkey, but it has proven hardy in Ithaca and also in Massachusetts for Joan Means. It is a most satisfactory plant to grow and enjoy.

Books

A Proper Garden: On Perennials in the Border. Elisabeth Sheldon. Stackpole Books: Harrisburg, Pennsylvania. 1989. 224 pp., line drawings, 4 color plates. $19.95 US, $26.95 Canada.

by Geoffrey Charlesworth

This book opens with the immediacy of an autobiographic novel and keeps up its informal, personal voice all the way through. Although the author is not at all a rock gardener, there is a chapter on rock plants which any of us would find useful and stimulating, even though they are treated as border plants. There are also chapters on individual genera that have something to say about alpines—campanulas, geraniums, dianthus, veronicas, anemones.

The author has suffered with all North American gardeners through the love-hate relationship with English garden writers who inspire us with their urge to grow plants yet disappoint us with inappropriate advice. Any gardener living outside of New England or New York may experience similar emotions when reading this book, but the inspiration will outweigh the disappointment. North America is too large a growing area to find one gardener who can write with authority and depth about the methods, the perils, and the rewards of gardening here, but too few have made the attempt. We must be grateful to Elisabeth Sheldon for this lively book. Gardeners everywhere will recognize their own tribulations and triumphs even if the details differ.

For me, but perhaps not for you, the least convincing chapter is "Flower Arrangements in the Border." Planting perennials to flower at the same time in adjacent positions has always seemed to me a rather questionable preoccupation. The vagaries of Nature usually contrive to keep peak blooming times slightly out of phase, making it a matter of luck whether a planned effect really comes off. In any case the value of these effects demands that the observer look at a garden with the eye of a camera, conveniently excluding unwanted colors and other details that would nullify the fancied composition. I realize I am probably in a minority of one and that no purpose is served by railing against such a popular point of view; therefore enjoy this chapter by all means if you subscribe to this use of plants. You will appreciate that the author values tasteful color associations, and is fond of gray and silver leaved plants, and is not afraid of magenta and bright red although she repeats the belief that they are "hard to place." As I read of her successes I think the ghosts of Jekyll, Farrer, and Sackville-West, which seem to stand by the elbow of every perennial gardener, would approve.

Some of the statements about hardiness in her garden in the Finger Lakes

area of New York are puzzling. In my zone 4 to 5 garden, *Lavandula lanata* is hardy. Also, *Salvia argentea* is perennial if the flowering stems are cut off before it goes to seed. But then gardens quite close to each other have differing hardiness experiences.

I like the chapters called "Facing Facts" and "More Facts," which expose the negative aspects of several plants. The idea is to put you on your guard against nurseries that sell dangerous plants by overpraising the plants and underwarning the customer. The chapters which describe and recommend plants are full of personal observations and opinions, more valuable than detached, uninvolved descriptions. Sheldon quotes approvingly Farrer's description of *Pulsatilla vernalis,* but her own image of the emerging *P. vulgaris* is more evocative: "like a nest of gray rabbits." The language is friendly and informative without being dry. This book will be enjoyed and appreciated most by a reader who has started gardening with perennials, is perhaps dabbling with rock garden plants, needs a little push to start growing plants from seed, loves plants, and likes to garden. As the subtitle only promises perennials in the border, it is not surprising that there are gaps that an alpine grower would like to see filled. Perhaps Elizabeth Sheldon will move up to rock gardening and treat us to another book soon. Meanwhile this book is one to pick up and read any time, wherever you garden.

Obituaries

Roy Elliott VMH (1916—1989)

by Michael Upward

To say that with the passing of Roy Elliott the Alpine Garden Society has virtually lost a limb, might, on the face of it appear to be an exaggerated statement. On reflection and with the passing of some months since his death, it is not such an outrageous comment.

During nearly 30 years as Editor, Roy brought international acclaim to the *Quarterly Bulletin of the Alpine Garden Society* through the high standard which he set for himself and the Society. His was therefore a difficult act to follow. The Society is fortunate in having persuaded Christopher Grey-Wilson to take over, and we are thus hopeful of a continued high quality.

What of Roy the man? He joined the Alpine Garden Society after the war. He had been away from home for six years and had returned to Birmingham as an industrialist to the family firm of Haines, Ford & Elliott, which specialized mainly in anodizing. He had originally intended to train as a lawyer. He was soon on the Alpine Garden Society's Committee and then became Public-

ity Officer. When ill-health necessitated the resignation of Charles Mountfort as editor, Roy took over. Behind that simple statement lies evidence of how small the world is, for Charles Mountfort had been a master at Uppingham School, which Roy had attended, and Roy had obviously obtained an initial introduction to the world of alpines from Charles. Somewhere in the *Bulletin* it is recorded how "when we saw Charles Mountfort cross the grass and disappear from view to the hidden area where he was reputed to 'mess about with plants,' we knew we were safe. Algebra could be put aside and our more nefarious activities could be safely resumed, for our Housemaster was 'down with his alpines' and was unlikely to be seen again for some time."

It has been said elsewhere that Roy did not tolerate fools gladly, and many the sharp letter has winged its way through alpine channels to rebuke an officer or member for some foolish comment or action. Those of us responsible for one or other of the many tasks necessary to ensure the *Quarterly Bulletin* was despatched had in our time received a sharp telephone call asking "where is my Bulletin?" In the weeks prior to his death, Roy was still sending off tirades about a committee decision, adding a postscript "getting old, but my nuisance value still rates high!"

He had a wicked sense of humor, often directed at those whose antics had irritated him, so much is lost to protect those who remain. It did enable him to overcome the physical difficulties that plagued him in recent years and prevented him from being as mobile as he would wish. We shall miss him enormously in the Alpine Garden Society.

Jane Kerr Platt (1908—1989)

by Margaret Mason

Northwestern gardeners were saddened by the death in November 1989, of Jane Kerr Platt, one of the most gifted horticulturalists in this part of the world. Her garden of two acres was sensitively designed and painstakingly developed over 30 years in the West Hills of Portland, Oregon. It contains plants at their finest, including a large and famous collection of rare trees, shrubs, and alpines in perfect condition and beautifully grown in a lovely hillside setting. She and her knowledgeable husband, John, who claims he was just the groundskeeper, devoted themselves to constant effort. The Platt garden was a mecca for plant people from all over the world. It was featured in the November 1989 issue of *Horticulture*. A glance at the illustrations reveals its quality.

Jane was a valued, long-time member of the American Rock Garden Society, a past board member of the Berry Botanic Garden, where she was chair of the Alpine Plant Committee. She was also a member of the Hardy Plant Society and the Portland Garden Club. The citation for Jane when she won the Mrs. Oakleigh Thorne Medal of the Garden Club of America in 1984 describes her garden perfectly: "For the establishment of an exquisite garden

incorporating rare and difficult botanic material into a design of incredible harmony, beauty, and distinction."

We shall always treasure our memories of Jane, with her bright humor and unerring eye, and of her garden. She is sadly missed.

Errata

#@!☆@#☆@!!!

Bulletin of the American Rock Garden Society 48(1), Winter 1990.

The drawing on page 6 is of *Fritillaria recurva,* not *Fritillaria lanceolata.*

The photograph of *Spraguea umbellata* on page 42 was taken by Ted Kipping, not by John Andrews.

The photograph on page 44 labeled *Fritillaria planiflora* should read *F. pluriflora.*

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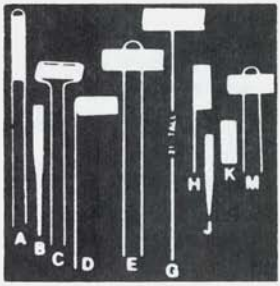

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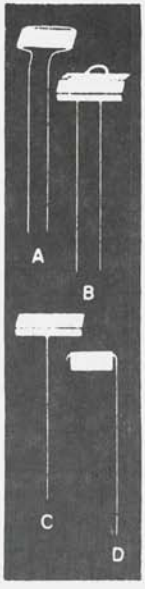

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