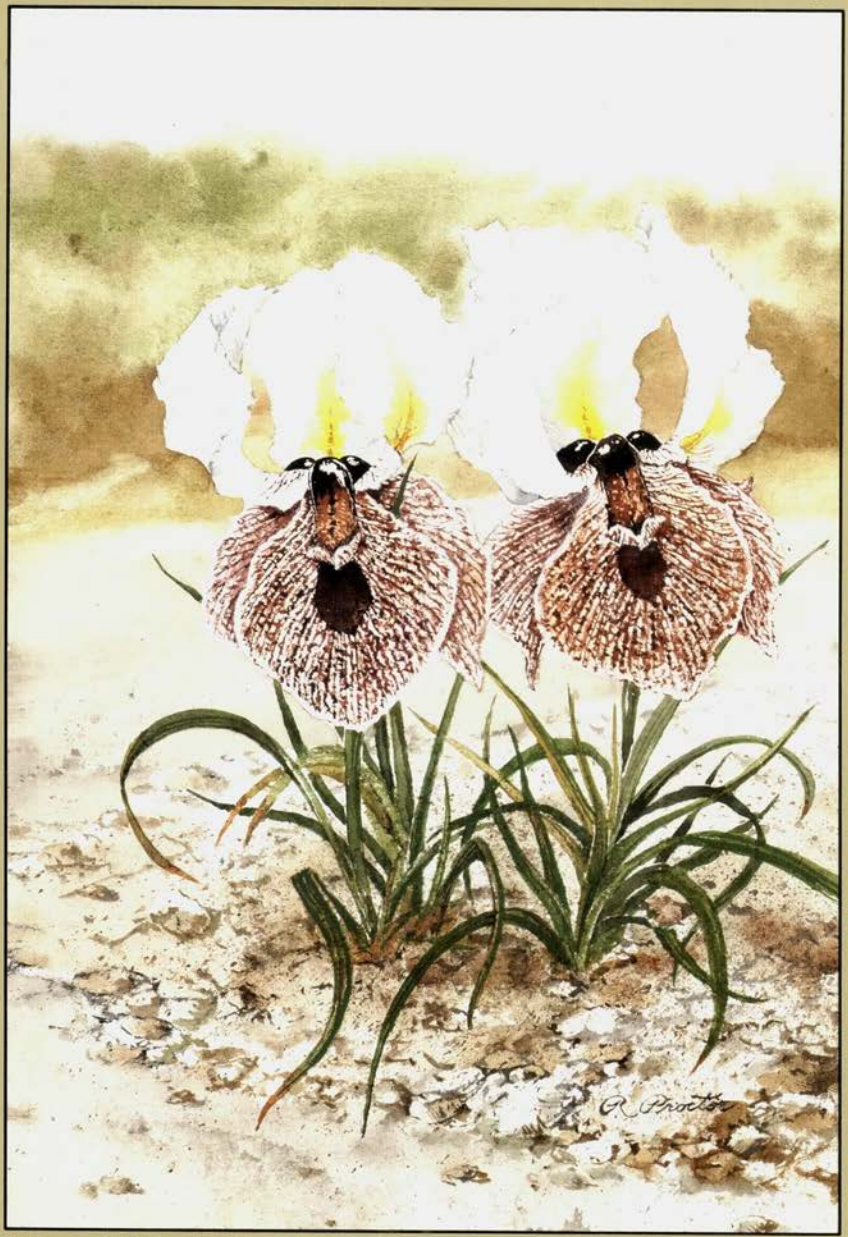
Bulletin of the
American Rock Garden Society



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Cover: *Iris iberica* ssp. *elegantissima*

by Rob Proctor of Denver, Colorado

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Paths for the Ordinary Gardener

by Geoffrey Charlesworth

You start to make a garden. The plot is roughly a rectangle. You are impatient to start planting and want immediate results even if only a few annuals or a dozen bulbs. You decide your garden will be made in sections, a little at a time. So you prepare a strip on the long side of the rectangle. It could be a rock garden, a scree, a perennial border or just a bed. Of course, you love this bare patch of receptive ground, and your imagination boils with the possibilities of the Planting: what you will put in? what it will look like? All the anticipatory joys for which gardening is noted. As the plants start to grow and even before you have any notion that you are doing the right thing or that the picture you have in your mind will materialize, you want to enlarge the garden ready for the next phase.

Your strip is generously wide, and you have a substantial garden going; as you walk around the strip, you can just reach the center of it by raising your heels, or by kneeling and stretching, or by standing on a rock placed in the middle. You can't make the bed any longer and don't want the bed to be any wider because of a phobia about treading on soil in sneakers or using funny muscles kneeling and stretching. So to get more garden, the time has come to start a fresh piece, a separate strip or even a new shape. When you create this new garden, you have created a path. Suppose your effort is to be a strip parallel to the first one and the same width. Automatically there will be a path dividing the enlarged garden in two. You have only to make two decisions: how wide is the path to be? what is the path to be made of? The moment the second strip is started the first question is already answered.

Happy to be digging, you postpone these decisions or rather refuse to worry about them and put your energies into making a third strip parallel to the other two. As you do this you are encouraged to see the plants in the first strip growing happily, and the second strip also doing well, its smaller plants settling in. As you get to the middle of the third strip you notice a dandelion insolently flowering in the middle of the first strip. What do you do? You could walk along the "paths" or you could cross the garden. It's your garden so you can tread on the soil—even on the plants if you slip. But do you want to,

and would you want your spouse or best friend or visitor to do the same? Absolutely not. You take the path and pull the dandelion and walk back.

It doesn't take long to realize that it is not fun to work in a garden in which paths frustrate your efforts to reach nearby points by compelling you to walk long distances. It is labor-intensive and, though good for your health, not very good for your spirits, by the time your knees and thighs reach their extremes of endurance. There are many reasons for wanting to get to point A from point B besides the compulsion to pull a dandelion (which after all could wait an hour or so). You could have left your favorite claw or trowel there, or you might want to carry a heavy bucket or a large shrub along this tiresome route. You can suffer an inconvenient design for months without complaining because: 1. You think you need the exercise. 2. You consider the design artistic and therefore inviolate. 3. You can't admit making an error. 4. Someone you love or someone you paid designed it. Complaints spell trouble in either case. 5. Besides health, art, pride, and respect, we have other absurd reasons for not changing the way we live. This obstinacy ensures that we shall put up with endless inconvenience to "save face" or whatever you call it when only one person is involved.

Rich people and patient people design their gardens before making them. They make little drawings on paper showing where the beds and the paths are going to be. This always seems to me to have an air of finality about it which is contrary to the spirit of a *developing* garden. It may work well if you garden on a grand scale and need cinder tracks for the horses, a generous driveway and parking lot for visiting dignitaries, and enough room in the garden for a horticultural seminar. It is also reasonable to see a design on paper from someone you pay, and to expect the design to materialize in due course. But if you design the garden yourself, there needs to be latitude for a certain amount of whimsy, with freedom to dream in Winter, knowing full well you will rethink the following Spring. If you find yourself jumping over four feet of bed after you have built it because you can't face going the whole way round one more time, then correct the mistake. Make a shortcut even if it means moving a few plants.

Every kind of path has good points and bad points, and you have to decide what you can live with. Consider some of the materials you can choose from:

1. Grass. If you start a garden in a field or carve it out of a lawn, the grass is already there. Grass is pretty. The color goes well with plants. Grass is living and organic, and you can shape it to any outline you like. Unless you live in desert country, lawns are usual, and the gardening tradition we belong to claims it looks right. But there are disadvantages: Grass grows vertically, so you have to cut it. This takes time but also implies tools—scissors, shears, edgers, lawn mowers. All of these bring problems of fatigue, noise, smell, and ecological guilt. Grass also grows horizontally and will invade the garden. You have to weed it out of the beds and at least once a year make the edge neat. Grass stays wet after rain, after evening dew has fallen, and before the dew has dried in the morning. I often wonder if Tennyson's Maud who came into the garden after the 'black bat night has flown' got her feet wet on grass paths. Grass dies in drought, and it will have to be watered unless you don't mind brown. Grass wears out with constant use like installed carpeting that cannot

be moved around to hide the blemishes near the entrances. Grass harbors weeds, so you will have to live with dandelions, sorrel, and chickweed unless you waste endless hours weeding or remember to apply the right poisons at the right time. Poorly drained grass can mean mud. Grass is a tyrant; if you leave the garden even for a week in summer the first thing you have to do when you return is get the grass paths looking tidy—otherwise nothing looks right. Grass paths look marvellous at their best, tacky otherwise.

2. You could try organic paths of wood chips, shredded bark, hay bales, shredded leaves, or sawdust. Something of the sort is needed in the woodland garden, since grass grows poorly and artificial materials look wrong. All of these cost money. All of them are subject to animal interference. It takes about two weeks for the worms to occupy a new path and a few more days before the surface is disturbed by a skunk or a raccoon looking for a meal. If you have laid newspaper or mathematics journals under the wood chips hoping to suppress the weeds, you will be horrified to see discolored strips and sheets of paper all over your woodland one morning. If you used plastic sheets or bags, the results are even more revolting, as there is no way that the plastic can be coaxed back under the wood chips. You either have to wrench it out completely and discard it, or live with black or white plastic triangles sticking out of the brown mulch. Because of its smooth, almost oily texture, plastic has also the disadvantage of making a woodland stroll hazardous. Whatever you use, it is fatal to be stingy with the material. Weeds will grow through eventually, but a skimpy layer to begin with encourages them to grow with gusto, since the wood chips or whatever you use improves the soil for the weeds themselves. Be wary of hay, too. This may seem like a good beginning for a woodland path, but it is only a temporary weed suppressant. Within a few weeks, the seeds in the hay will sprout to give you a selection of meadow weeds quite alien to your woodland and just as pernicious as the weeds that belong there. These organic paths can be used in the garden, too. They need weeding or spraying to keep them clean. I prefer to weed, because I like to leave violets, dianthus, hellebores, primulas, crocus, nigella, columbines, and so on in the paths. You can still walk, but it sometimes needs a little care to pick your way along a crowded path without stepping on something nice, even if expendable.

Individual surfaces have individual faults. Hay is especially bad because of the weed seeds and should only be thought of as temporary. Wood chips are coarse and need time to settle down to a walkable surface; they also can leave splinters in careless hands. Sawdust has a raw objectionable color for the first couple of months and packs into solid mat. This is good until a weed comes through—as it will—but when you pull the weed, large chunks of sawdust are disturbed. But these are all trivial criticisms. Once a path of organic material is established, it looks great.

3. Then there are the earth-like materials: sand, gravel, cinders. These are hard to walk along until they are well-used or perhaps rolled. Your feet slip and sink, and knees feel as though you are climbing a mountain, especially when you are carrying a can of water. If you wheel a cart through sand or invite sixty people for a picnic, the disturbed surface looks untidy, and you may have to rake. Pity the poor monks in Japan, constantly raking the Universe back into the fragile sandscape! You have to do a little of that if you use sand. Also,

the color nearly always clashes with your own soil. Very few people live in a gravel pit, so whatever you use comes from a different geological environment and looks foreign. The weed situation is easier to manage though, and since seeds germinate so readily in sand, you will certainly get *Dianthus* and *Viola* self-sowing. You might get precious seedlings from androsaces, drabas, and so on. The coarser the stone, the harder it is to retrieve these blessings.

4. Taking artificiality one step further, you could make a path with pavement blocks of bluestone, slate, sandstone, bricks, cobblestones, woodblocks, or ceramic. Sinking these in sand can be a fascinating game. If they are laid without much care they look untidy rather than informal and are a constant irritant to the mind's aesthetic eye. Crazy paving is meant to be informal, but it has to be done with care to avoid looking badly made. Everything unnatural you introduce into a garden must be tidy as well as tasteful. You would think an urn lying around casually, or a plaque hung on a wall, or a stone fish sitting on a sawn-off tree would look romantic and picturesque. But unless the site is chosen well, the positioning is done with care, and the object is worth looking at, the eye stubbornly sees an object out of place, a piece of rubbish rather than a beautiful focal point as intended. Pleasing results are difficult to achieve. So it is with paths that have the permanence of pavement, especially if the arrangement is made final by the use of concrete. The advantage of paving materials is the comfort of walking on a smooth surface. Also, artificiality implies formality, and this is may be exactly what you want to achieve.

5. Somewhere between these path types is the hybrid, stepping stone kind of path which uses rocks, wood blocks, or the equivalent to either economize on materials, provide an interesting pattern, or deliberately leave planting space between the blocks. One step beyond would be a rough "natural" path where the rocks make no pretense at being flat, and the idea is to imitate a mountain walk or a moraine. These routes through a garden are for the young and agile or for the gardener who knows all the bumps and hollows so well that walking without stumbling is second nature. But however beautiful your concept of nature, and however skillful your reconstruction, you should warn guests of the hazards and give them time to pick their way gracefully through what is essentially an obstacle course. Once large rocks are part of path-making, weeding also becomes an important chore. You may have to resort to weed killer. Cobblestones have all the disadvantages of all types of paths. At university in England I had to cross a courtyard of cobbles to get to the nearest toilet, and I have no love of this hazardous floor covering.

6. Cobbles are also close to the ultimate in artificiality, concrete and asphalt. These are essential for public gardens, and you may wish you had them in your own garden by the time you are old or infirm. But then, we are talking about other gardens in other places at other times. Dirt, too, can make an excellent path for public gardens, as well as private and intimate gardens. Whether it works for you is a function of your soil and drainage and how you manage weeds. But it is probably the most "natural" material for a path and should be your first thought. Every path requires use. It is pointless to bulldoze a path out of rough woodland if you are never going to use it. In two years you won't be able to find it. This also applies to little-used paths in a

garden. Make them where you want to go, not where you think other people ought to go.

7. Finally, there is the non-path. This may be a route across a boulder-strewn rock garden, across a water feature, or through rough woodland. It could include steep steps with precarious footing. Such passageways are very uncomfortable places to walk. They are made to please the gardener who worships Nature above Art and Art above Comfort; they are not designed for the timid or aged. Visitors scarcely know where they are supposed to be, whether they are walking on precious plants or spoiling lichened rocks. It isn't always clear whether the next rock is safe or whether the next step will land you in a bog up to your ankles. It goes without saying that every rock used as a stepping stone must be firm and stable. But there are also worries about slippery surfaces in wet weather, smooth, rounded shapes that give no purchase, and rocks too high to negotiate as steps. Gardens for scrambling should have warnings, preferably on bronze signs, and the owner should carry a lot of insurance.

In every garden there are paths that are meant only for the gardener, paths at the back of a wide border, stepping stones that go nowhere, "deer tracks," slightly secret routes that reach otherwise inaccessible places. These should be recognized by visitors. Never tread where your host wouldn't, but also be sensitive to those places where your host would walk, but where you may not. These secondary paths, along with the main paths, divide the garden into small planted areas, beds, or sections of beds. This subdivision is an excellent psychological aid to organizing work in the middle of summer when weeds proliferate and the garden looks as though it will never be tidy again. The paths themselves will have to be weeded, and as you crawl around a bed on your hands and knees removing unwanted columbines along with the sow thistle and jewelweed, you can attend to the weeding, mulching, seed collecting, cutting back, and rearranging of plants in the beds that is the essence of dirt gardening. By the end of two or three hours, you have completed a whole section of the garden that won't need more than a flick of the wrist for the rest of the season. Your fun will be spoiled though if you can't reach every inch of each subsection of your garden from the hands and knees position on the paths. Maybe you are a sitter or a croucher, or perhaps you only bend at the hips. The mechanics may vary, but the principle remains the same: all parts of the garden must be reachable. If you have to stand on the garden to do a particularly difficult maneuver such as staking or digging up a large plant, then you will probably have to scratch the soil you trod on and neaten up the mess you made. But for ordinary weeding you don't really want to tread the soil too often, and reachability is desirable. Every gardener has different techniques, and I have seen a large perennial border without mulch and with no access to plants by paths secret or otherwise but rather simply walked on nonchalantly by the owner. There was a hard crust on the soil with weeds struggling through, and the same patch needed almost weekly attention. But the border itself was magnificent, so who is to judge our idiosyncrasies?

Geoffrey Charlesworth gardens near Sandisfield, Massachussetts. He is an enthusiastic grower from seed and a dedicated writer of garden literature, including *The Opinionated Gardener*. Rumor has it that a second volume is to follow soon.

Vita

Zenon Schreiber

Paramus, New Jersey

Born in Arth, Switzerland in 1904; died 1989.

Schooled in Chur, in the east of Switzerland, about 15 miles from the Austrian border surrounded by at least 16 mountain peaks over 6500'.

Diploma of the Canton of St. Gall for Horticulture and Landscape Design in 1924; commendation for his personal herbarium of plants collected on frequent mountain walks.

3-year apprenticeship in Geneva; certificate in arboriculture and fruit culture.

1927, granted commission to design and construct 'Mar-Y-Murtra', a semi-tropical garden near Blanes, Costa Brava, Spain.

1931, arrived in United States from Switzerland. Associated with Marcel LePiniec, 1931-36 at Mayfair Nursery.

Herald Tribune Award.

1932, largely designed and constructed the LePiniec rock garden that won the Sweepstakes Cup for the best garden in the New York Flower Show.

1936, formed his own business and entered into direct competition with LePiniec at the large exhibitions of that era, as well as for clients.

1936-1946, the leading professional competitor in rock garden exhibits at the famous International Flower Shows sponsored by the New York Horticultural Society, and also at shows sponsored by the American Rock Garden Society. Received 10 first prizes and 11 gold medals, as well as the ARGS medal, the Stout Medal, the Pratt Medal, the First Totty Medal, the NY Horticultural Society Medal, and the Massachusetts Horticultural Society Medal.

1968, presented with the American Rock Garden Society Award of Merit at Allwood, the 50-acre estate of Mr. Leonard Buck, in Far Hills, New Jersey.

The citation read as follows: "It is particularly fitting that, after a memorable day at Allwood, we pay tribute to the man who has played an important role in the development of that garden. In 1942, Mr. Buck had the inspiration and vision to see great possibilities for a rock garden and associated landscape at Allwood, and he had the wisdom to entrust the major planning and supervision to Zenon Schreiber. Over the years since then, Mr. Schreiber has brought the garden to the peak of perfection we see today, and this is but one of his many outstanding achievements."

Distinguished clients: Rockefeller family, for Pocantico Hills estate in Westchester County, New York; Governor's mansion in Albany, New York; Nelson Rockefeller's Washington, D.C. estate; Laurance Rockefeller at his Woodstock, Vermont estate. President Eisenhower, at Camp David, Maryland. Many ARGS members, whose names Zenon preferred to keep confidential, with the exception of Harold Epstein, President Emeritus of the ARGS.

Zenon Schreiber, Landscape Architect

by Paul Halladin

The 1930s were very difficult for almost everyone. This was the period of the greatest financial depression of US history, a time of mass unemployment and extreme hardship. Only a tiny minority could afford to build gardens. Competition was intense for the few potential clients. Obtaining awards was often the only way for a landscape architect to attract clients.

The artistry and quality of Zenon Schreiber's displays were of such a high caliber that most of his exhibit gardens not only won prizes but were purchased at the shows by distinguished clients for installation at their estates.

Zenon had very special talents. Few architects of his stature involved themselves so intimately with actual construction. No component of any project would ever escape his scrutiny and actual touch, from soil to stone, plants, shrubs, and trees; all were personally chosen and precisely placed by him. He had an artist's ability to visualize in his mind exactly how everything should fit into a given area in such a way that it looked as if it had always been there. He was a multi-talented individual, equally comfortable in any of the many skills of the gardening world. He was a superb propagator. He was highly skilled in forcing plants to bloom out of season for exhibitions. He pruned both trees and shrubs with a technique that came close to that of the best of the Japanese. He could and did perform the work of the master stone mason, concrete mason, or bricklayer, even up to the time he was 80 years old! He had the ability to direct completely unskilled workers in performing the most complex garden tasks, such as precisely placing stones weighing tons with a combination of metal rollers, planks, levers, fulcrums, tripods, ropes, chains, and pulleys. He was always ready to suggest an easier or better way to perform any task. He was a perfectionist who put his heart and soul into his work. He refused to take shortcuts. In this imperfect world, these traits can earn one the reputation of being difficult. Zenon was at his best for clients who recognized his creative and artistic abilities and were able to step back and allow him to create beauty in their gardens. It speaks for itself that some of his clients retained him for 40 years.

Zenon was far too much the individu-

alist to tolerate partners. His standards were so high that it would have been nearly impossible to find an assistant or partner to produce the type of work that he demanded. Therefore, he never started any project that he could not personally handle from start to finish. The majority of his projects involved long-term garden development on large properties. He was quite firm in refusing virtually all proposals involving typical suburban properties of one acre or less. On the rare occasion that he did accept such a commission, it usually involved either very difficult terrain or a challenging problem. The majority of his gardens were either some form of woodland garden or a combination of woodland with rather subtle rock garden work interwoven. He particularly enjoyed the challenge of constructing pools and waterfalls. During the time that I knew him, he worked with just one helper, a long-time employee who could do all the routine work, such as site preparation, soil mixing, grading, weeding, and concrete mixing, relatively unsupervised. When additional help was required, it was usually supplied by the resident garden staff employed by his clients. He rarely worked on any one project for more than four or five consecutive weeks, dividing construction into appropriately timed phases, working on several projects from early spring until either snow or deep frost intervened. The work site would be tidied up after each phase; work might be resumed later the same year, weather permitting. Zenon was always quite busy, even well past the age of 75. He did not care for the muggy August of the East and often visited his favorite Swiss mountain areas at this time.

His own property in Paramus, New Jersey, encompassed about seven acres, in part heavily wooded. Zenon personally propagated many plants difficult to obtain from commercial sources in the sizes he required. He did not have an alpine house and mainly used cold frames for propagation. Some nursery plants were grown in open ground. He also maintained a collection of mature, well-cared-for trees and shrubs that were kept root-pruned for eventual sale to clients. All plants were reserved for special projects and were to be planted by him personally.

He was a great believer in compost, which he made largely of well-decomposed oak leaves and twigs. He had one of the largest compost heaps that I have ever seen. At least part of his success with plants was due to his insistence on using only soil prepared by his helper according to his own formulas. For his personal use, he grew the most delicious tomatoes and string beans. He produced apples from a very old apple tree that he kept trained horizontally and no more than knee high. His favorite perennial was *Shortia galacifolia*, the favorite shrub, *Rhododendron* 'Boule de Neige'. His favorite tree was *Pinus sylvestris*.

As far as is known, only two of Zenon's gardens are now open to the public. The first is the Leonard J. Buck Garden in Far Hills, New Jersey, donated to the Somerset County Park Commission by Mrs. Helen Buck in 1976. Begun in the late 1930s, the garden consists of a series of alpine and woodland gardens situated in a 33-acre wooded stream valley. There are several very large rock outcroppings with varying exposures and microclimates. Wooded trails lined with beautiful native wildflowers and ferns connect the various rock formations. At the base of the valley walls, azaleas and rhododendrons produce a riot of color in May and early June.

Zenon's style called for masses of plants in large sweeps, since he believed this looked more natural and was most effective in creating visual impact. In the Buck Garden, Zenon used *Aquilegia*

canadensis, often seen in nature on outcrops or cliffs, against dark stone (photo, p. 124). Also in front of the stone are masses of varieties of phlox. This section of the Buck Garden was planted from 1943-1946. Another area of this garden only 18' long and 5.5' high, on a rock face in front of the much larger outcropping called "Big Rock," was described by Mr. Buck in the *Bulletin of the American Rock Garden Society* 10:43. This was a "garden within a garden." Zenon wished to sharply define this low section in order to counterbalance the high rock behind. He split off and cleared away small fragments of rock at the front of the lower ledge. Here a single plant of *Euonymous fortunei* 'Kewensis', an extremely hardy, small-leaved, trailing evergreen suitable as a groundcover or a clinging climber, was planted in the early 1940s to cover the unattractive, newly broken rock. In the years that followed this plant covered the rock face in a luxuriant, graceful contour, setting the tone for the entire area (photo, p. 124, taken in 1978). Excessive growth and stray branches have been regularly pruned to maintain the effect.

The other Zenon garden now open to the public is the Bobbie and Hugh Kaul Wildflower Garden, now part of the Birmingham Botanical Gardens. It was a book containing a description and pictures of the Buck Garden, *The Treasury of American Gardens,* that in 1969 inspired the Birmingham Botanical Society to commission Zenon to convert a 3-acre sandstone quarry into a combination woodland and rock garden. This involved clearing loose rocks and gravel from the bedrock and constructing a large rock garden at one end. A partially wooded adjoining area was developed into a series of interconnecting woodland paths. Construction and planting took 14 years. The primary purpose of this garden is to display the native flora of Alabama in an attractive setting.

Zenon On Paths and Steps

It is only with the greatest reluctance that anyone should ever attempt to write about paths and steps in the garden. This is a veritable minefield of strong and conflicting opinions. All gardens are different, and all owners of gardens have developed systems of paths and steps uniquely their own. The following presents comments made by Zenon Schreiber on the subject from 1972-1984, as well as my own observations of his work.

At our initial meeting, Zenon asked for an hour to walk around our property alone and in silence. He returned looking rather grim and asked if he could speak frankly. Could I be easily offended? Assured of my relatively thick skin, he launched right in: "Mr. Halladin, you have a serious problem in your garden! You have no place to sit, absolutely no privacy, walking about is difficult and even hazardous, and you have nothing to look at except for the worst kind of weeds." And so started a controversial business relationship that was to last for many years.

Terraces

Zenon refused to construct a terrace for me, claiming it was relatively easy to do and a waste of his time. However, he did indicate where the terrace was to be located, its shape, and the materials to be used. This was the first component in his requirements: A place to sit. If one expects to have guests and visitors to the garden during the summer, it is only natural to assume that they will prefer to sit outside in a place where at least part of the garden can be seen. To provide easy access for the garden owner, the terrace should be sited fairly close to the house and should be large enough to accommodate four to six comfortable chairs and a few low tables.

The major paths of the garden should begin and end at this terrace. At least one garden area should be visible from the terrace. The terrace should have a certain degree of privacy, being screened from the street and from the view of neighbors by trees and shrubs if there is enough space or by walls or fencing.

Paths

Zenon had very strong opinions about every facet of landscaping and in particular about paths and steps. As he stated, these are the important connecting links that lead to and tie the different parts of the garden together and allow visitors to view the garden in a favorable and comfortable manner. Paths and steps also facilitate access for the gardener to perform the multitude of tasks required.

Zenon did not like to rush into any garden decision, and most certainly not for anything as vital to the success of a garden as its paths, without making observations during one entire year. Notes should be taken where shadows are cast by trees and buildings, wind directions, water flow on the grounds during and after drenching rainstorms, and places on the grounds that remain either wet or have standing water long after a rainstorm. The amateur can gain much information by wandering about during the height of a rainstorm. It is informative to see how many rivulets form across a path and what has to be done to control such water flows. Of course, those of us with good detective skills can observe the damage done by water by observing gouged out areas and build-ups of mulch, twigs, and leaves in little piles. Paths should remain reasonably clear of standing water, even during a deluge. Debris should not be pushed onto the path by water flow. The primary task of any good path is to keep the feet reasonably dry and free of mud. Its next most important function is to provide access for garden maintenance. The third consideration is a purely visual one and the most difficult one to attain. It is to show the garden to best advantage by leading the visitor to the best vantage points. Although these are rather simple stipulations, considerable skill and a great deal of careful thought and planning may be necessary to achieve successful results.

There is logic to placing any good path. This can be observed in nature as well as in public gardens, and it can certainly be reproduced on one's own property. There will always be a natural flow or direction that the first-time visitor will take on any property. Most visitors, if left on their own, will head for a vantage point to get an overall view. From there they will go to any prominent feature or unusual planting. They will invariably avoid obstacles such as slopes, wet areas, and planted areas. The amateur designer can observe this natural flow and construct paths accordingly. A professional, trained or experienced, can generally estimate how visitors will walk around a property and plan paths accordingly. The professional may also choose to alter the natural flow somewhat by constructing new obstacles, changing the grade, or creating points of interest that channel visitors in a different direction.

Since Zenon worked largely with informal woodland gardens and rock gardens, he was opposed to straight paths and straight flights of steps. In such informal gardens, the straight path injects a note of formality that is visually out of harmony. He also did not care for sharp turns in a path. His paths were gently curving or sinuous and generally formed a larger pattern of an ellipse or oblong, beginning and ending at the terrace.

No path should ever dead-end. The path that terminates abruptly creates a sense of boundary or sharp definition and a termination of the garden itself, whereas the paths that have no discernible ending create an illusion that the garden is larger. Paths might lead to another path, but all eventually circle back to the terrace.

Zenon preferred relatively level paths, because they are more comfortable, especially for the less agile. A level path induces the guest to tarry and enjoy the garden. A steep path becomes an obstacle to surmount on the way up; on the way down, one is impelled forward at a fast pace. Additionally, the steeper the path, the more difficult it is to control water flow. This may not be a serious problem on a hard-surface path, but on a soft surface it will certainly result in repairs after every heavy rainstorm. Our gardening efforts should be devoted largely to our plant material, and not to repairing paths over and over. The properly built path will reward the owner with hours of extra time to devote to his plants.

Zenon relished saying in a loud voice:"NO PATH IS EVER WIDE ENOUGH!" Paths are the stepchildren of so many gardens, doomed to problems from the beginning because they haven't been paid the proper amount of attention or taken seriously. They are forever taking second place to plants. Plants do grow, and if they are planted near the path, soon the path is in danger of disappearing. It is the plants that have to be pruned back. Even plants that are true dwarfs can in time expand to obliterate a path. There are only a few solutions if you do not wish to prune the plant, and each solution creates more problems. Change the course of the path, but this might involve a change of grade or moving large stones, or other equally desirable plants, plus more time and labor than one can afford. So out come the pruning shears, but there is also a point of no return: if too much is hacked off any plant, it may no longer look attractive. Transplant the encroaching plant, but this, too, can be physically difficult, or the plant may not take well to being moved.

The best solution is to start out with a wide path. Zenon's definition of wide was an absolute minimum of 4', preferably 5'. Larger properties can have paths 6' and even 7' in width. The wide path permits one of the more elegant sights in the gardening world, the spilling over onto the path of low-growing plants, creating a sort of billowing effect and softening of the strong line of the edge of the path. It also permits the host to walk alongside his guest and to point out and discuss interesting plants. Another advantage of the wide path is its ability to function as a bed for self-sown plants. The only place in my garden that *Dicentra cucullaria* established itself was in the path at the base of a rock formation where it received early spring sunlight. Likewise, *Mazus reptans* grew only in a damp place in the path near the pool. Fortunately, the paths were wide enough that we could walk around such minor obstructions.

There are two basic path surfaces, hard and soft. Hard surfaces include poured concrete, concrete blocks, stone blocks, stones, bricks, and macadam. Soft surfaces include grass paths, various types of gravel over soil, wood chips, bark, and plain hard-packed soil. Each type of surface has inherent advantages as well as problems. For most of us, cost is an important consideration. Hard surfaces are more expen-

sive than soft ones, although in the long run they require less maintenance and cause fewer problems. Of soft surfaces, the grass path is the most difficult to integrate into either a rock garden or a woodland garden, especially if it has to absorb the punishment of considerable traffic. It also demands a weekly mowing and will inevitably expand into the garden at the edges. The wood chip or bark piece path will eventually disintegrate and have to be periodically renewed. It is also not as tidy in appearance as a gravel path and therefore is suited primarily to large woodland gardens. Zenon preferred gravel paths for rock garden areas but recommended a rather fine crushed stone, mostly 1/4" to 3/8" diameter rather than the rounded, smooth river gravel or larger crushed stones. This was purely a physical comfort consideration, as guests with thin-soled shoes would find it easier to walk on a fine crushed stone surface. Such gravel, especially for larger paths, is far too expensive when purchased by the bag. In bulk, delivered by the cubic yard, it is probably the least expensive, semi-permanent surface for garden paths. Zenon, very cognizant of color, felt that white, beige, and yellow gravels detracted from the appearance of gardens. He preferred any dark color of crushed stone.

Blessed are those whose property is on a gentle slope and whose soil is primarily a deep, sandy, well-drained loam! They do not have to worry about path foundations. The rest of us, if we wish to avoid excessive maintenance and repairs, must prepare dry wells, with drainage outlets if necessary, at all the places that remain excessively wet near or on paths. It may even be necessary to excavate a path to a depth of as much as 2-4', to provide a deep bed of trap rock (very coarse crushed stone), and then to fill completely with layers of coarse sand and 3/4" gravel mixed with some loam, all before surfacing the path with fine gravel. Various soil conditions, grades, and standing or running water near paths must be dealt with in special ways; here it is merely stated that a path can only perform well if it has a proper foundation.

Steps

Steps are the part of a path that negotiates a change of grade. Zenon stated loud and clear: "STEPS ARE NEVER WIDE ENOUGH!" Steps were one of Zenon's favorite topics. He declared them seldom satisfactory. It seems that this subject takes the back seat for most gardeners. Yet, so much depends on the access steps provide in any garden that has differing grade levels. The less agile, as well as those of us who suffer from arthritis, are particularly aware of the hazards of steps. It can be difficult and even painful to mount steep, narrow, or awkward steps.

The first problem is width. Steps should be as wide as the path, at least 4', preferably 5'. Many of us have steps that seemed wide enough when constructed. Encroaching shrubbery, just as in the path, can impinge on steps and either narrow their passage or block them entirely. Steps should be wide enough to allow two persons to either walk together or to pass one another.

The dimensions of each step, the height and the depth of the tread, are a second consideration. Zenon stated that under no conditions should a step be over 6" high, that the normal garden step should be 5" high, or, if space permits, the optimum is 4" high. The tread should be at least 12", or about the length of a shoe, and a 14" tread is more comfortable. Zenon's strongest criticism was reserved for steps with treads so narrow that one had to ascend sideways or on tiptoe, an ordeal for the infirm. Steps should also be as uniform as possible, each step in a flight with the same dimensions.

A third problem with steps is their tendency to wobble when stepped on. This

problem can be very difficult to overcome because of the nature of the materials used. In visiting many gardens, it is inevitable that sooner or later a wobbly step will be encountered. The owner of a garden is seldom bothered by such steps and generally copes by knowing just where the loose steps are and how to put his foot down on such a step and balance himself against the wobble. The visitor, however, is caught by complete surprise, unless the "thoughtful" host is present and has shouted "Watch out for that fifth step! I forgot to fix it before your visit—ever so sorry!" Unsteady steps are the product of incompatibility between the material of the step and the material upon which it rests. Most garden steps are either wood or stone and rest on a base of soil. Tremendous pressures are brought to bear on the front edge of any step whenever anyone descends. As the toe of the foot touches the edge of the step and the other foot moves forward to the lower step, the heel of the first foot rises, and the full weight of the body is brought to bear on the few square inches near the toe, which in turn bears down on an area very close to the edge of the step. This pressure, repeated many times, acts as a sort of lever that inevitably loosens most garden steps.

Zenon speaks again:"NO STEP IS ANY BETTER THAN ITS FOUNDATION." The cure for a wobbly step is to remove it, remove all loose soil underneath , then fill the excavation with 3/4" crushed stone, tamp into place, top with a mix of coarse sand and loam, tamp into place, then return the step to its position. The step is then gently pushed back and forth from the sides to seat it properly. The tread should be level from side to side and back to front; this is best checked with a spirit level. Test the step by standing on it, feet spaced about 20" apart. Then shift your weight slowly from one foot to the other. Any slight tendency to wobble at this stage can best be corrected by the use of a small stone wedge, usually pieces of split slate 1/4"-1/2" thick and tapering to a thin edge, and at least 3" wide and 4-6" long. Such a wedge can be gently tapped into place, between the step and the underlying material. To avoid cracking the wedge, a short piece of wood is held against the wedge, so the hammer touches only the wood. Generally this method provides a solid footing for many years. If not, then as a last resort, excavate the area under the step again. Place a rather stiff mix of coarse sand, gravel, and cement in the excavation. Reposition the step as soon as possible, before the concrete hardens. The combined weight of the step and the large amount of concrete underneath prevent further wobbling. The foregoing applies to stone steps but could also be applied to railroad tie steps. Hammer large 5-6" galvanized nails into the part of the step resting on the concrete leaving about 3" of each nail protruding. Then place the step into the concrete mix nails down, before the concrete hardens. It is important to then stand on the step to assure that it is firmly seated on the concrete. In all cases, a spirit level should be used, and all shifting and leveling performed prior to the hardening of the concrete.

Railroad tie steps may also be made secure by using stakes fashioned from wood that has been pressure-treated with preservatives, one end shaped into a sharp point. The stakes are driven into the ground at each end of the railroad tie, making sure that the flat, wide part of the stake is flush up against the end of the railroad tie. The stake is driven in to a point at which it will no longer be visible, at the top of the step. Each stake is then nailed to the railroad tie, using galvanized nails in predrilled holes (this prevents splitting) in the stakes.

Zenon did not particularly care for railroad tie steps, because they were too obviously a man-made intrusion into a natural environment. He tolerated them when

alternatives such as natural stone or black locust logs were too costly to obtain. Locust logs, bark attached, are ideal for woodland garden steps. They are reputed to last for 20 years. Long ago they were readily obtainable, but today the only way to find them is to contact companies in the tree removal business and offer to purchase the logs on a when-and-if basis. Locust logs, while attractive, require considerable skill to work with in step construction. Part of the log must be below grade if the log has a diameter greater than 6". Logs with a diameter of 8" or more can be used in building retaining walls.

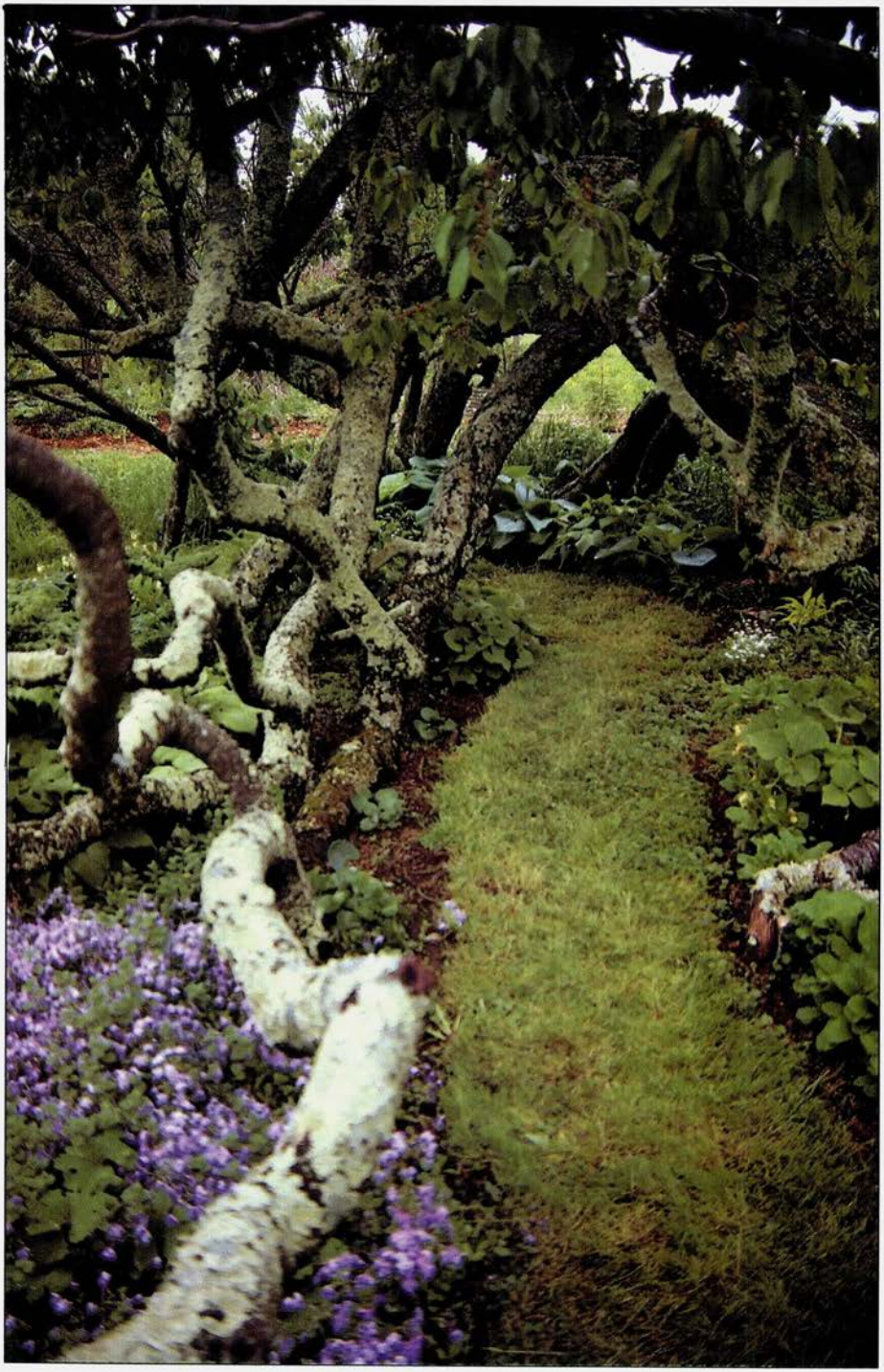
Zenon also warned against the use of railroad ties dipped in preservatives but not pressure-treated. In such ties, the preservatives only penetrate the wood 1/2"-1", leaving the core entirely untreated. They will inevitably attract either carpenter ants or termites and will have to be replaced. The longest-lasting wooden step is a railroad tie pressure-treated with creosote and really intended for use as a railroad tie.

Many gardeners feel that steps are purely functional and not worth a second thought. However, Zenon used steps to his advantage as a part of the garden design. His steps were usually in a curved flight intentionally created to bring the visitor to a special focal point. He attempted to break up all long flights of steps with landing areas. These were situated one for each three or five steps in a flight. The landing would be large enough to accommodate at least three persons and would be strategically located at the best spot to view a particularly fine horticultural specimen or grouping. As an example, at one such landing Zenon planted *Campanula poscharskyana*, an attractive, vigorous spreader, at the base of a very large stone where it could not invade the surrounding area. Just to one side he planted a large grouping of *Adiantum pedatum*. During the blooming time of the campanula, the only time the sun shone directly on the blossoms was in the very late afternoon. As one ascended the stairs and stood on the landing, the eye would be caught by the sight of the rays of the sun illuminating the bells of the campanula, turning them into amethystine jewels. The same beam of sunlight was reflected by the dancing, lacy green fronds of the maidenhair fern. All the components of great art were present—color, form, texture, and movement. This was but one of several seasonal splendors to behold on a single landing. The steps became an integral part of a garden designed to subtly guide the viewer to maximum visual enjoyment.

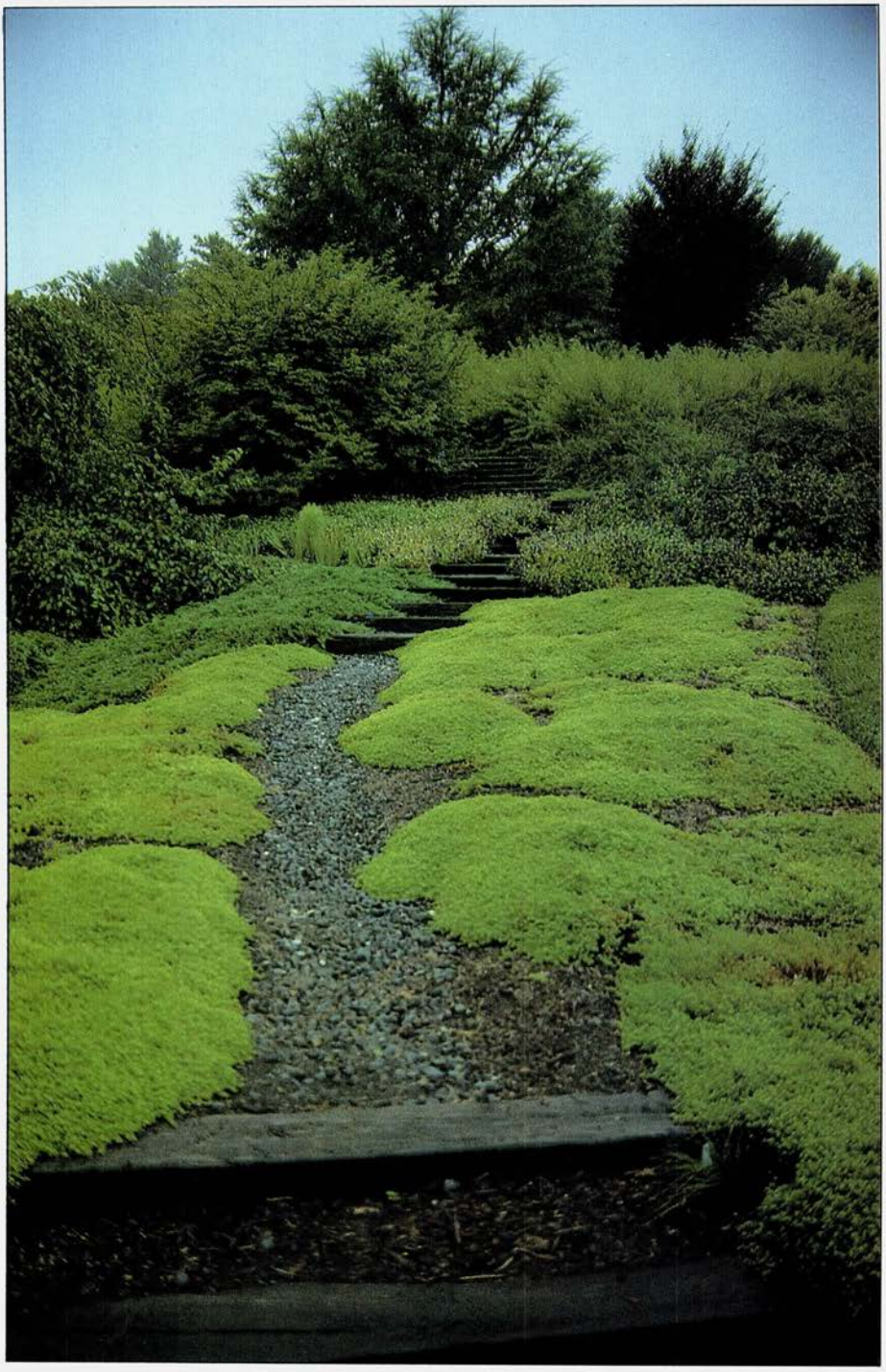
In another role, steps placed within the garden itself give strategic access for weeding, removal of leaves, plant replacement, pruning, and seed collection. For this purpose Zenon preferred natural stones at least 24" in diameter and about 6" thick and as flat as possible on the side facing up. Such stones were usually cemented into place or were so large and heavy that they would not shift. The spirit level was applied even to these stones, and each had to be as level as possible.

Now the average gardener might demure at this point and say, "Why all the fuss? A garden is supposed to be for plants." Yes, that is quite true, but Zenon would point out all the damage done to poorly designed gardens, steps, and paths. Frost will push even large stones out of line, as well as ruin almost any garden in time. One often hears comments that it is too expensive to prepare proper foundations. True enough, but time is also valuable. Keep in mind that remedial work, performed for the second and even third time, is also costly. By all means, let's concentrate all our resources on our plants, by preparing our garden constructions just once.

Paul Halladin gardens in Bellingham, Washington, having lived in London and Lausanne, Switzerland, as well as the Hudson River Valley. He is a long-time member of ARGS.



A turf path in the Cyrus and Rebecca Harvey garden, Connecticut. Nicholas Klise

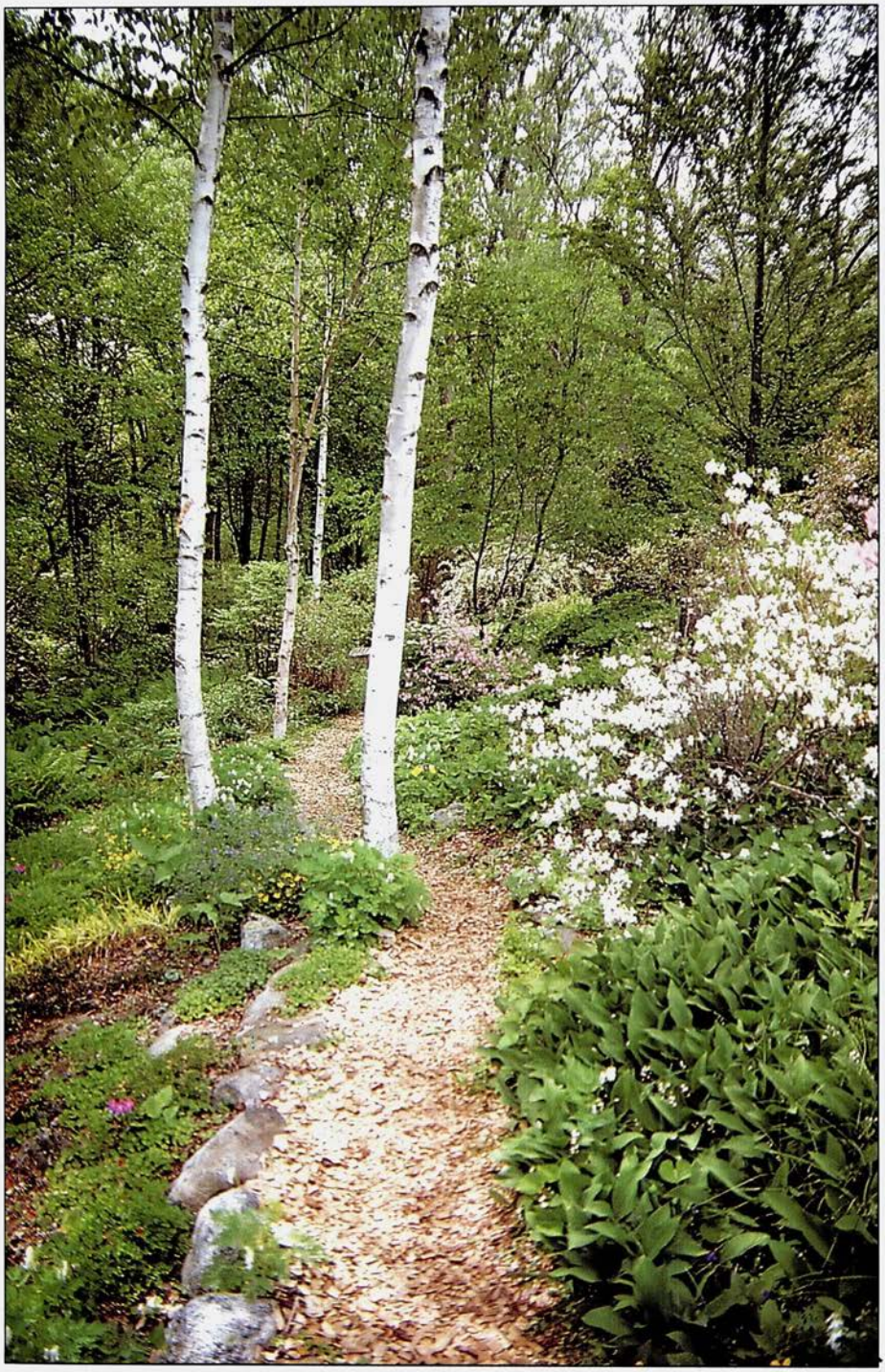


A path through *Sedum* in the garden of William Frederick, Wilmington, Delaware.

A path through the rock garden of John Dietz, Wilmington, Delaware

photos by Nicholas Klise

A path at Garden in the Woods, Framingham, Massachusetts



A wood chip path in the garden of Richard Redfield, Connecticut. Nicholas Klise

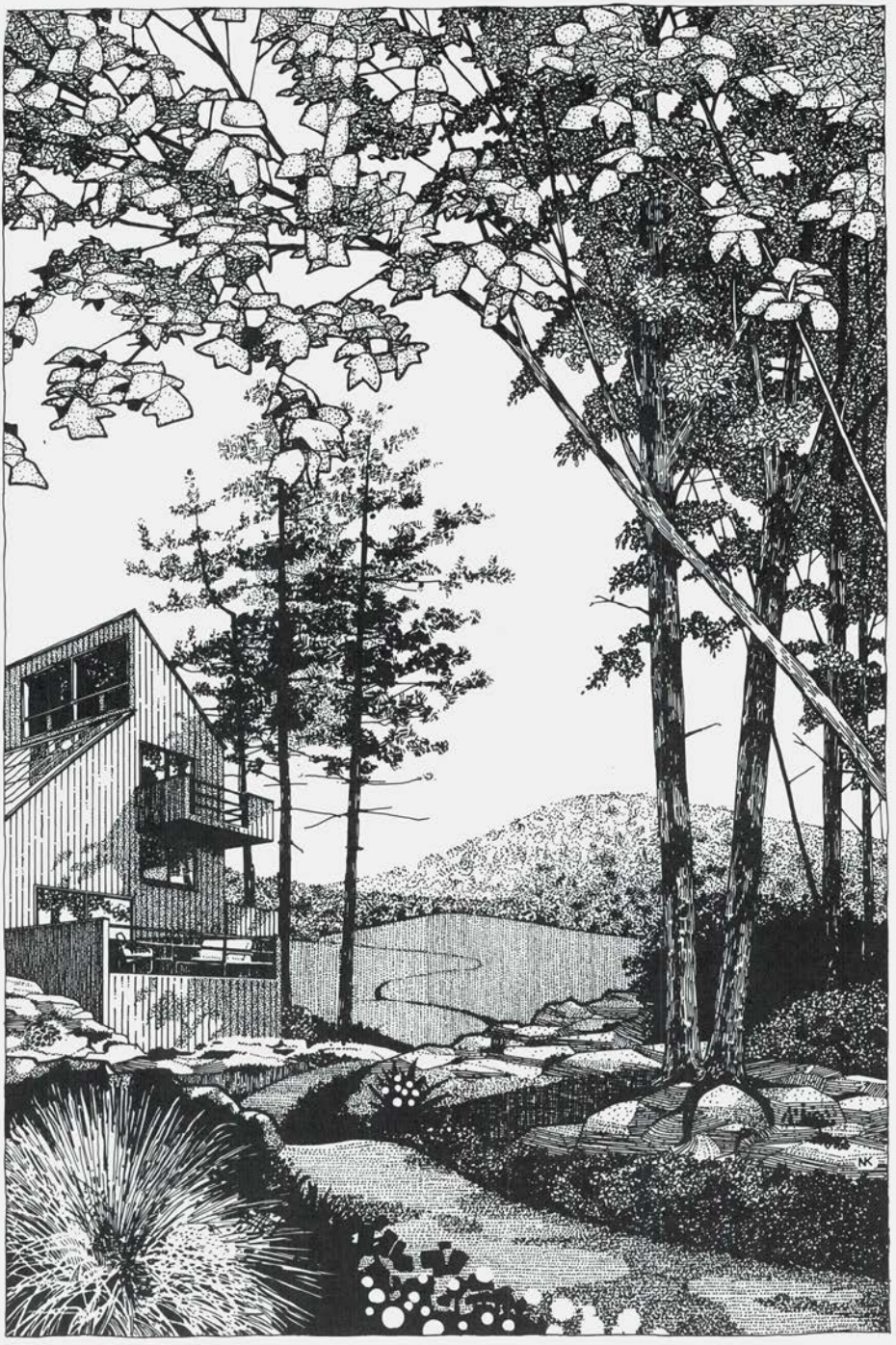
Paths

by Nicholas Klise

Paths in any garden setting have to incorporate two seemingly contradictory attributes. They must be conspicuous and obvious in peripheral vision, and yet they must be harmonious and unobtrusive in direct vision. In other words, when you look directly at it, the path should subtly blend into the garden as a whole. It should be made of materials sympathetic to the entire ensemble and be of a scale appropriate to the spaces of the garden. It should not be noteworthy in and of itself; its presence should not even impose itself on our consciousness. But it must have another very important attribute: a path must be so obvious that it leads without our having to think where to walk. A first-time visitor to a garden—even a child—will know instinctively where to walk and where not to walk. A visitor will know where the path is without even looking at it! This is an amazing dichotomy.

The purpose of a path in a garden is for the movement of people. Consequently, a path, the manifestation of this movement, is a line. Its linear quality is, undoubtedly, its most important design consideration. This line will impose itself on the overall garden plan but, interestingly, does not detract from the three-dimensional composition of the garden. Rather it enhances the perception of sculptural space by facilitating our movement through it. The line of the path can be rendered many different ways. It can be sharp and crisp like the chiseled edge of green turf abutting a flower border, or it can be soft and amorphous, like the leaf-littered, mossy track through a woods—or it may have any quality in between. But regardless of how it is rendered, a path is a line that leads us and tells us where to walk with the clarity of a written sign—and we don't have to look at it to read it.

The most expedient way to establish this line is to walk through the proposed garden site. But beware: in many garden situations and especially in rock gardens the surface of the path should be lower than the existing grade of the garden. You cannot really rely on your perception of existing conditions to help in the design of a garden, since the grade, as well as many other qualities of the garden, will change in its construction. This is only one of many



reasons I can't imagine making a garden without a plan on paper. The paths must be walked over and over in your mind before construction, and the only way to do this is by looking at a scale plan on paper.

A utilitarian walkway, like the path between the car and the kitchen door, must be a straight line, because anything else would be exasperating. If, on the other hand, a path is to lead us through a pleasure ground, as the Victorians called it, that path should be circuitous. After all, here we want to walk slowly, lingering and looking at all there is to see. A small plot of land can be made to seem much larger if paths are artfully snaked through it in S-shaped curves.

Although essentially linear, a path does also have width. Generally, the smaller the garden, the narrower the path. A path as narrow as 18" can accommodate only a solitary person, with any companions lined up behind. This arrangement is appropriate in certain garden environments, like rock gardens, where the scale of the plants is small, and contact with them must be intimate. Also, a narrow path through a wild area will appropriately recall hikes on a wilderness trail. In a large, formal landscape, a path or walkway can be very wide, so long as its width is much less than its perceived length. If you want to walk by the side of a companion, the path must be at least 4' wide to accommodate the unsynchronized movements of two bodies. Six feet would be even more luxurious, but wide paths are more difficult to install and maintain.

A third dimension to a garden path is the vertical height required for the human body. Not only should plants be controlled in such a way as not to impinge on the net width by brushing the arms and legs of pedestrians, but, more importantly, plants and plant parts must be eliminated to a height of 7', so that the garden visitor is not slapped in the face or bumped on the head. Where trees and shrubs are part of the native flora and are usually incorporated into the garden scheme, this is a major consideration. Nothing seems quite so impolite as being beckoned down a garden path and then knocked dizzy by a low branch. Do not assume that garden visitors will find it charming to have to duck the spruce boughs or remember to bow before an oak branch. In any climate with high rainfall, consider also the amount of space plants consume when fully wet and bent with additional weight. Surely you will want the paths passable even after a heavy rain. In my garden, along narrow paths through wildflowers or ferns where the wet weight of plants forces then to hang over the path, I cut them back with a scythe so that I can walk the paths after a rain without getting my legs wet. At no time should the plants in a garden reach out and touch the visitor.

Generally, paths should be low. They should follow the line of least resistance through valleys and along water courses. They should look as if they have been worn into the land by years of usage. To create this effect in a rock garden or a woodland garden, I actually excavate the path. In a preexisting woodland, where I want the path to eventually become mossy, I salvage the valuable leaf mold for garden use and leave the clay substrate exposed, as it is a perfect medium for the growth of moss. Since the first task in constructing a rock garden is the shaping of the subsoil, I dig out paths first and use the excavated soil to create mounds and raised areas between the paths. The path itself should be slightly concave. Where the surface of the path is of the same material as the mulch on the garden, this slight depression is necessary to differen-

tiate the path from the garden proper.

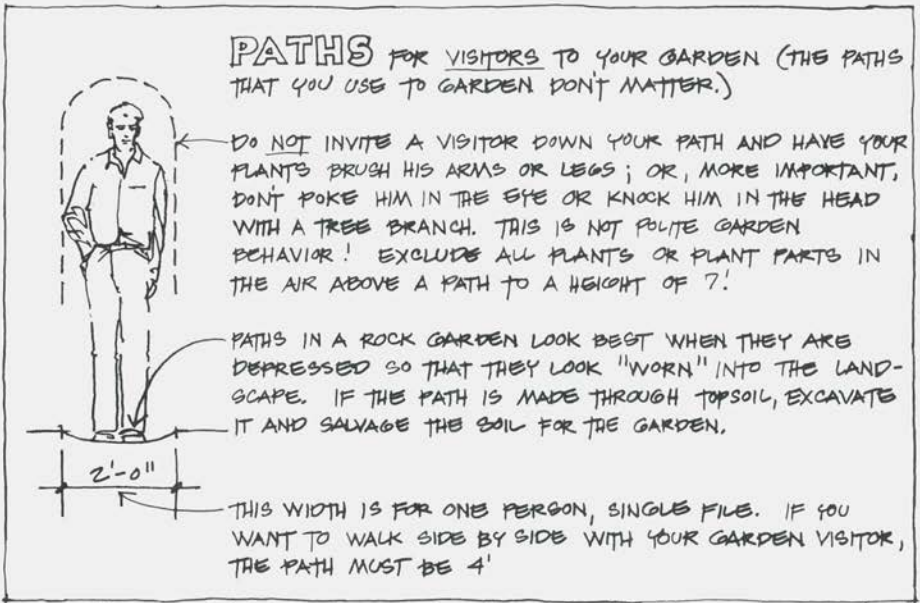
Usually, I think it best to surface the path with a material that is different from the mulch of planted areas, so that there is no question about the difference between the two. Of course, the materials must be compatible. The easiest way to achieve compatibility is to choose materials of the same color, but different texture, such as brown stone chips with brown wood chips. Don't worry about making the paths too conspicuous; it can hardly be done and would probably not detract from the overall attractiveness of the garden. In fact, most garden makers err by making paths too inconspicuous. Many times garden makers make the worst mistake by not only using only one material for the entire surface of the garden, but also thinking that a path can be delineated by the space between plants. It cannot. The path has to be seen as a line, not as space. Many times I've had the unsettling experience of visiting a garden and finding myself cast adrift on a sea of bark mulch or gravel, not knowing where to go or where to turn. Where am I to walk? How do I get back to shore?

It should be assumed that each path will lead somewhere. If there is actually no place to go and the purpose of the path is to view the garden, make the path circular, so that eventually it returns to the place it started. Or at least make a loop at the end, so that at no time will the pedestrian have to stop and backtrack. Don't ever make a narrow path in a garden come to a dead end. Only wide paths and walkways in a large landscape should terminate without further outlet, usually at some important element, such as a sculpture or a vista.

Paths, like every element of a garden, must be constructed, and the garden maker must think through how they are to be constructed. They don't just happen, and they are certainly not just leftover space. After excavating the path and removing the topsoil, decide how you want to surface the path. There are many options. It is important that the path be firm. There should be no movement of the surfacing material whatsoever when it is walked upon.

In many situations, organic mulch seems to be an easy solution. It locks together to make a firm footing, and it is aesthetically pleasing. But in a private garden it should be applied very sparingly and not allowed to build up over the years into a fat, convex cushion of wood mold, which not only looks ridiculous but is difficult to walk on. The fat, overstuffed wood chip path has become the convention in public gardens and nature centers. Although it has its place and logic in these public situations, it has no rationale in a private garden.

One good reason for applying organic mulch thinly to paths is to be able to watch for the development of moss. If you see moss starting to grow, you immediately stop the application of the organic mulch and start culturing moss, the premier path surface. Visitors to my place are always impressed by the moss paths, which are not only wonderful to walk on, but also beautiful to look at. Moss is not without maintenance, however. To stay green, moss must stay moist, which means that the path must be sprinkled with water every rainless day. It will survive long periods of time, however, by going dormant and brown. More importantly, every leaf and piece of organic litter must be removed. Moss cannot tolerate anything lying on top of it for long periods of time except snow . Since a bamboo rake sometimes tears the moss when used to remove leaves, I use a broom to sweep the surface clear of debris. An extremely useful gardening tool for the maintenance of paths (and the grooming of alpine plants) is a gasoline-powered vacuum/blower. It can



remove leaves and debris without touching the moss or other small plants.

Moss also makes a wonderful seed bed, because seeds find a congenial place for germination in its damp cushions. Therefore, moss paths must be weeded. The remarkable, gardener's godsend, glyphosate herbicide (called by the trade name "Round-up"), can safely be used to weed moss paths, since it does not kill moss.

Glyphosate herbicide is very useful in maintaining walkways and paths, of course, but it can also be used to *create* paths in some situations. In a large wild garden, meadow, or prairie garden, for example, it can be used with mowing to create a very appropriate path. The herbicide is sprayed in a continuous line 15" wide, and, after the ten days required for the effects of the herbicide to become visible, I mow each side of the strip to achieve a path a minimum of 24" wide. I use a scythe to mow, but a string trimmer could be used. This technique creates the look of a wilderness hiking trail that was worn into the landscape by the moccasin-clad feet of noble Native Americans. A wider path can be created through a wild area by simply mowing with machine. To make it more pleasing to the eye, make the mowed path curving and don't make the two sides parallel. In other words, the mowed path should not be the same width all along its length—it should be narrow in places, then become wider at irregular intervals as it curves through the wildflowers.

I have a creek on my property that provides me with excellent materials for surfacing paths: sand and gravel. These materials, which range from the size of a walnut to fine grains, with every size in between, pack into a tight, non-mobile mass that feels good to walk on and also looks good, because it is many shades of brown. It is also attractive because of the varied size of aggregates of the same material. Not everyone is lucky enough to have such a wonderful resource for path construction. The first big problem in choosing materials is color. If purchasing gravel from a quarry, you will be limited by what is avail-

able, and in many cases you might not want any of the colors they have for your garden. Secondly, if you buy gravel for paths, don't make the mistake of getting gravel of a uniform size, because it will roll under your feet. The surfacing material of any path should lock into position and not move under foot. Some quarries produce gravel by crushing stone, resulting in all sized aggregates and dust. They then sift this material through various sized screens to separate various sizes. What you want is the unsorted crushed rock, from stones to dust. Spread this in a 2-4" layer over the firm subsoil you have exposed by excavation. It will eventually pack down on its own, but you can hasten the process by spraying it with water and tamping it down with a weight. At first the surface will seem too loose, but if you have every size aggregate, it will start packing down in a few weeks and will get better and better as it ages. If the surface is firm and kept moist, and if the stone itself is neutral or acid, moss will eventually colonize the path.

If you are lucky enough to have a large wet area or bog, the best path through it would be a boardwalk raised just above its surface. Such a walk opens up a new world of gardening possibilities. A boardwalk need only be 18" wide, so long as you keep the plants cut back to keep the air space above the boardwalk 24" wide. It should include a slight zigzag in its length if more than 12'.

A path material that I like very much in certain garden situations is macadam or asphalt paving. I like it mostly for its black color. It works well in some rock gardens and can be surprisingly beautiful in woodland gardens. Again, with time and favorable conditions, moss will colonize the surface. Asphalt is nothing more than stones or other inorganic aggregates held in a matrix of tar, and so many different effects can be created by embedding stones into the surface.

Paths have to be actively maintained, just as do the planted areas of a garden. Paths can disappear in a year, camouflaged by weeds. Fallen leaves must be removed, since they are slippery when wet and they kill moss. Weeds are most effectively dealt with by using glyphosate herbicide, but in a rock garden this may not be the best procedure. In a rock garden, it is the choice rock plants that many times will seed into the paths. Here the problem is one of salvaging precious plants, not weeding. The seedlings have to be pricked out and potted up. It is because this task is delayed and then never done that many rock garden paths suddenly terminate at a mat of phlox or a fecund arabis. I'm sorry to have to tell you that maintaining a path in a rock garden, like maintaining a rock garden in general, requires the unflagging commitment of an enthusiastic and knowledgeable gardener.

Drawings by the author.

Nicholas Klise is an artist, architect, and designer who gardens a large property in rural Pennsylvania where he creates garden elements in innovative ways.

Plants for the Pathway

by Steve Kelley

The most often heard command when children come visiting our woodland garden is, "Stay on the paths!" It is when youngsters are around that we most appreciate the importance of pathways, which are at those times quickly transformed into mulch-covered, meandering speedways. Why is it that the most well-behaved child feels the urge to use garden paths for running races? Well designed paths not only keep little feet off the perennials but also direct traffic, help to frame vistas, accent choice plants, and provide avenues for maintenance.

In garden design, I dare say most of us concern ourselves first and foremost with plant selection and placement. If the garden is broad enough, however, to require some traffic through it, sooner or later we will have to consider the best way to allow access for feet of all sizes. In designing pathways, we need to consider functional concerns such as location and width, and also more aesthetic matters including choice of surface materials. Most often a pathway is nothing more than a series of stepping stones set in gravel mulch. The stark nature of a stone-and-gravel path can be modified and softened by the use of plants in the path itself. Now I would like to focus on some of the plants that lend themselves to use on paths.

Before heading off in hot pursuit toward the garden center, consider the requirements of the path plant. Actually, such a plant should pass the test you'd give any other plant about to be placed in your garden. It should be attractive in and out of bloom and throughout the seasons. In color, texture, and form it should complement other elements in the garden, working together with them for a harmonious whole. Consider the plant's growth habit. Will it remain in bounds or quickly spread by runners or seed, becoming a maintenance nightmare? The plant should match the soil, moisture, and light requirements of plants nearby. Most importantly, a plant for the pathway must stand up to being walked on. It must be a plant you won't mind the kids trampling. Naturally such a plant will be short, ideally under 2", probably a creeper or a mat-former, and not notable for its floral display.

Into the category "Things I Have Learned over the Years," but likely under *your* heading, "Things I've Known All Along," come the following maxims.

—Plants for a pathway that gets a fair amount of traffic benefit by being planted at the edge of the path and creeping onto the path, rather than being planted in the path proper. That way they have a chance to establish themselves before being traipsed upon.

—Give mat-forming plants that tend toward woodiness a good shearing in early spring to allow new growth to quickly camouflage bare stems.

—Limit the number of varieties of plants used along any one path. It's more pleasing to see a few kinds; a profusion of different plants lends a cluttered look. The focus of attention should be in the garden itself, not underfoot.

The following are plants I've used or would like to use to line our garden paths.

Achillea ageratifolia. Though many achilleas are considered weeds, many species and varieties are notable in the garden. Achilleas generally thrive in full sun in well-drained sandy loam. They spread relatively fast and the flowers are a valued contrast against usually silvery foliage. They are drought resistant and can take infrequent foot traffic. *Achillea ageratifolia* has evergreen, silvery gray foliage of a fine texture, 1" white flowers in summer and early fall and would love to be living in zones 3-10. Divide clumps every two to four years to prevent overcrowding. At 3", it's likely a bit tall to handle foot traffic, but at the edge of the path it would be a nice complement to some of the more rugged plant varieties to follow.

Ajuga reptans. Not particularly drought tolerant due to shallow roots, it will tolerate heavy soil provided with adequate drainage. In full sun to moderate shade it will spread fairly fast. The semi-evergreen, stoloniferous plant is 2-3" tall and surmounted by spikes of blue flowers in late spring to early summer. It thrives in zones 4-9 and is available in a multitude of leaf colors, including bronze, green, white-variegated, cream-variegated, and maroon-variegated. Propagate by splitting the mat or by removing rooted stems any time. Although ajugas are fairly common plants, they are also faithfully long-lived.

Antennaria dioica, common pussytoes. This prostrate, stoloniferous mat-former is a moderate spreader. Its semi-evergreen leaves are gray above, wooly underneath. It grows to 3" and is surmounted by 5" stems with quarter-inch flower heads in mid to late spring. Dry, rocky, infertile soil of moderate alkalinity suits it just fine. Very drought tolerant, it does best in full sun to light shade. Propagation in zones 3-9 is by division in fall or in spring prior to flowering.

Arenaria verna, moss sandwort. The arenarias won't mind sandy, well-drained, loamy soils of moderate alkalinity. Avoid clay or soils that are poorly drained. With shallow root systems, arenarias require even moisture throughout the season in full sun or light shade. In northern regions, spring damping off can be a problem. Moss sandwort will grow in zones 3-10. The narrow, half-inch long, grasslike, light green foliage is evergreen. Tiny, white, star-like flowers in spring are a bonus. It is excellent between stepping stones and as a lawn substitute in inaccessible spots. Propagate by division in spring or fall. As self-seeding is common, deadhead to prevent weediness.

Arenaria montana, mountain sandwort. As above, but this species is

Antennaria

distinguished by grayish-green foliage.

Arenaria 'Aurea'. The foliage is light yellow that can revert to green. It is not as vigorous as its green siblings.

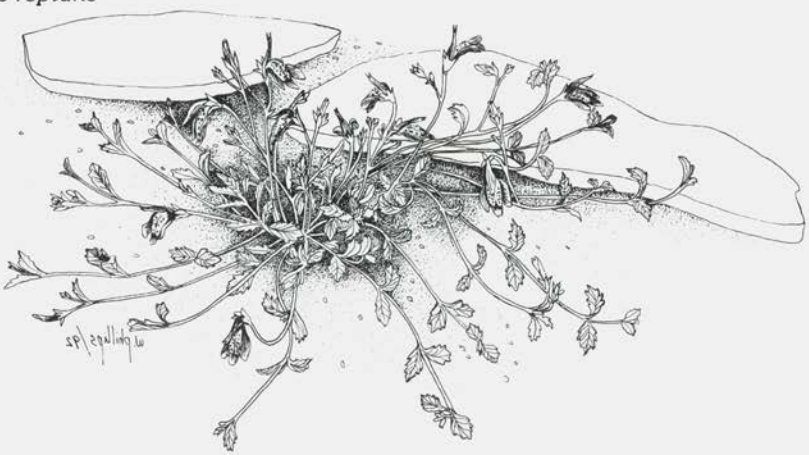
Dianthus deltoides. There is certainly a wide range of plant types in the dianthus clan, but let us here concern ourselves with only *D. deltoides*, the maiden pink. It prefers full sun to light shade in zones 3-7. This herbaceous, mat-forming plant hugs the ground tightly and spreads at a moderate rate. Its narrow, evergreen foliage is half an inch long and is surmounted by small rosy to maroon flowers in spring and early summer. It reblooms lightly in the fall. It is adapted to a wide range of soils as long as good drainage is provided. Maiden pink is not especially drought tolerant, so keep it slightly moist. This dianthus can take moderate foot traffic and should be deadheaded to prevent seeding. Propagate by cuttings or division in spring or fall.

Herniaria glabra, rupturewort. This is a rather nasty name for a dandy little moss-like plant. This plant is hardy in zones 4-10 and really should receive wider use. As a groundcover, it is doing very nicely in the Japanese garden at the Minnesota Landscape Arboretum. Its moderate rate of spread and 2" height make it a good candidate for a path plant as well. It is tolerant of light foot traffic. Its evergreen leaves are half an inch long and bright green. The flowers aren't significant. Rupturewort is tolerant of most well-drained soils and benefits from regular watering. Propagate by division any time.

Mazus reptans. The semi-evergreen *Mazus* prefers a rich, well-drained loam. It is adaptable to quite moist conditions, as long as some drainage is provided, but it is not drought tolerant. In zones 3-9, it is a relatively fast spreader and will tolerate a little traffic. In late spring, small purplish-blue flowers speckled with orange appear above the 2" tall foliage. *Mazus* will tolerate full sun to moderate shade. Propagate by division in early spring.

Potentilla tabernaemontani (formerly *P. verna*). This cutie, whose last name has changed over the years about as many times as Liz Taylor's, is a favorite here. It is hardy down through zone 9. It is a low, mat-forming, herbaceous perennial, 2-3" tall. Its 3/4", semi-evergreen foliage is coarsely toothed. One-half-inch, yellow, buttercup-like flowers appear above the bright green leaves in late spring to early summer and intermittently thereafter. A moderately fast spreader, it may be increased by division in early spring.

Mazus reptans



Mentha requienii, Corsican mint. This diminutive mint doesn't spread by the invasive runners typical of larger mints, so don't think I've flipped my wig in recommending it. Though it is hardy in zones 5-10, we on the tundra are lucky to bring at least a speck of it through every winter. From this it will spread moderately quickly to form a tight little half-inch-tall mat. Leaves are no bigger than half a split pea and are a fresh green color. Corsican mint is excellent used in pathways where it can tolerate limited traffic. When crushed, a most delightful, cool fragrance fills the air. Kids love it. Corsican mint is happy on most soils and can tolerate moisture in full sun to light shade. Divide it anytime.

Sagina subulata, Corsican pearlwort. Hardy in zones 4-10, this mat-forming, moss-like, herbaceous perennial spreads at a moderate rate. Its evergreen, needle-like foliage remains under 2" and is peppered with small, white flowers from June to midsummer. It loves to be planted between stones and in cracks where it will handle moderate foot traffic. *Sagina* thrives in organically rich soil, which is necessary for good growth. It will be pleased in full sun to light shade but suffers through dry spells. *Sagina*

'Aurea', with light yellow leaves, is not as robust as the green form. Division is possible spring or fall.

Sedum. These fleshy, hardy subshrubs number in the hundreds of species, and many are valuable to the gardener, if somewhat common. Sedums perform best in infertile, gravelly, porous soils. Extremely good drainage is preferred. Keep soil on the dry side. Sedums are remarkably drought tolerant and thrive in full sun. The following varieties work nicely in cracks between stepping stones.

Sedum acre. This low, mat-like form, 1"-2" tall, has light green foliage and bright yellow half-inch flowers in spring. It is evergreen and spreads at a moderate rate. *Sedum album* is also a low creeper, with medium green foliage and white flowers in midsummer. Both these sedums are hardy in zones 3-9. Filling cracks between stones is what they are cut out for. Both can be propagated by cuttings or division at any time.

Thymus. The thymes are real workhorses in the pathway. A stand of mixed thyme among cobbles here at the nursery has stood up well for years on minimal maintenance, and it always looks good. Plant two or three varieties of thyme in close proximity and they will soon be mixed. Thymes will live from zone 3 southward in soil of low fertility. They are capable of withstanding drought and in fact love life best under beating sun in hot, dry conditions. Shear plants in early spring to keep them compact. Propagation can be accomplished by cuttings or division in spring or fall.

Thymus citriodorus, lemon thyme. In poor conditions this species will grow to 3" tall. The small, deep green mound of foliage sports quarter-inch lilac flowers in early summer. It has a clean citrus scent.

Thymus herba-barona, caraway thyme. This relatively slow-growing evergreen mat-former sends forth the most delightfully fresh caraway fragrance when crushed. Pink blossoms appear in midsummer. Our favorite pathway thyme.

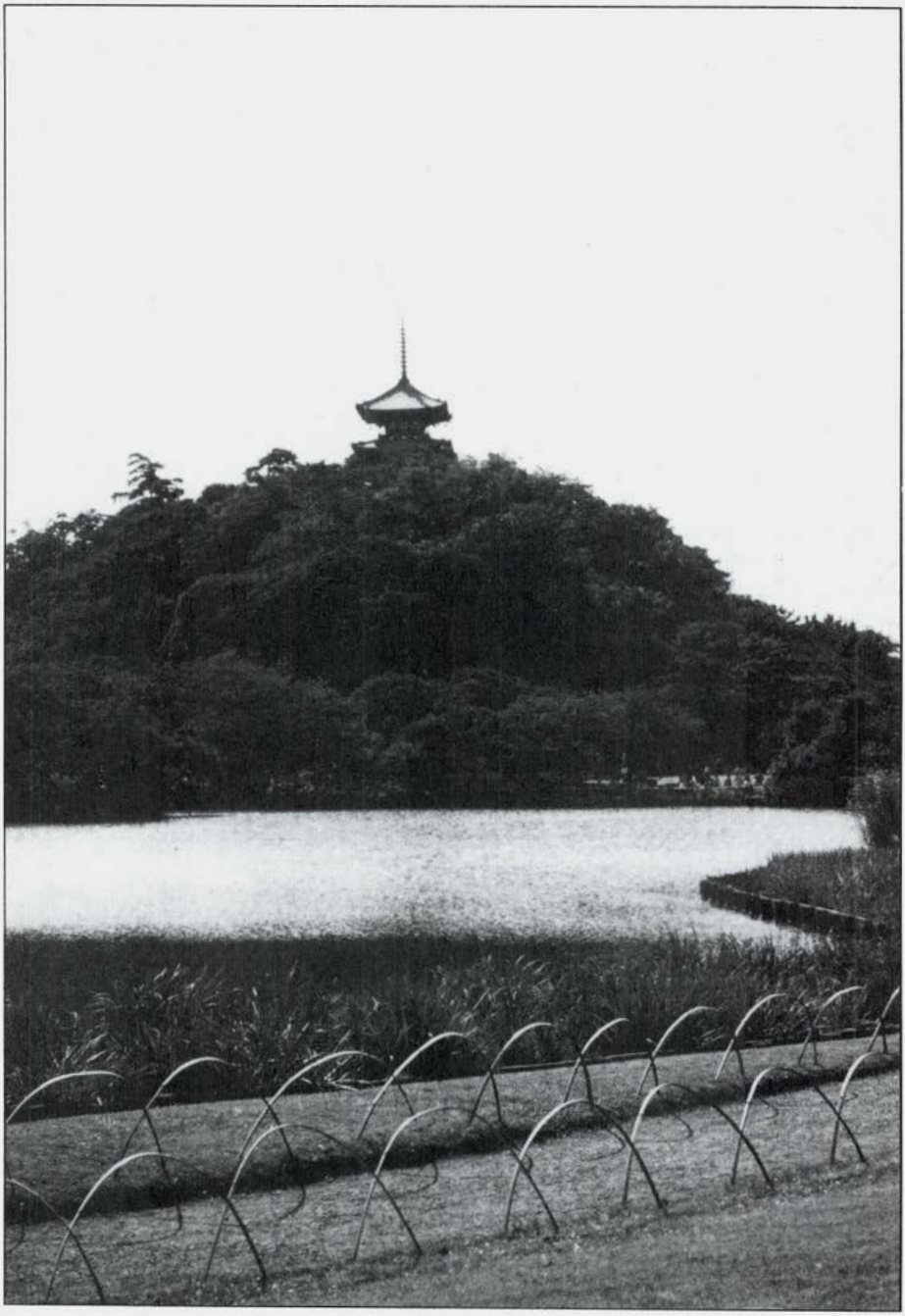
Thymus serpyllum, mother-of-thyme or creeping thyme. This one grows at a somewhat zippier pace than the thymes described above, but if kept on the lean side shouldn't be a problem. Purple flowers in late spring to early summer make quite a show above the dark green, half-inch-tall mat of leaves.

Waldsteinia ternata, barren strawberry. Hardy zones 4-7. The evergreen, palmate foliage is 3" long on plants 3" tall. The leaves are deep, glossy green and turn bronzy in winter. Its habit is low, mat-like, and stoloniferous. Yellow, potentilla-like flowers three-quarters of an inch wide grace the plant in late spring. It is a moderate spreader and would be tolerant of limited foot traffic. In the path, it would perform best giving a bit of height along the edge.

The above suggestions for livening up garden paths aren't guaranteed to keep kids on the paths and out of the garden, but their feet may be slowed down a bit. Now if we could just work on the dogs . . .

Drawings by Wendy Phillips.

Steve Kelley is a third generation member of a family managing a landscaping service and nursery specializing in herbs and woodland wildflowers. The nursery, Kelley and Kelley, is located in Long Lake, Minnesota. He is a member of more plant societies than he actually thinks prudent.



Split bamboo is commonly used as an edging for paths.

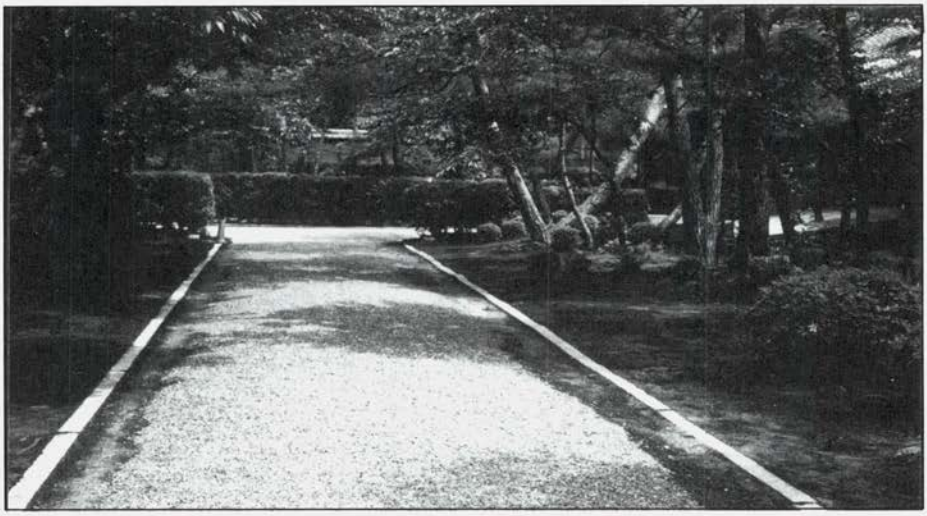
Paths in the Japanese Garden

by John L. Creech

Gardens and their construction are among the enduring arts of Japan, and in this respect the garden is placed in a different sphere from gardens elsewhere. We have been drawn to the mystique of the Japanese garden from the earliest days of the intervention of foreigners because of its reflection of nature and because of the simple manner in which the garden makers of Japan have achieved this end. Favored with an especially rich and diverse flora (over 6,000 higher species) and a long tradition of garden development in which both religious and philosophical concepts play a role, the Japanese garden has endured for more than a thousand years.

Plants, stones, and water are basic to the Japanese garden, and while the garden maker follows time-honored rules concerning their use, individual garden design is carried out with a free hand in the employment of these natural elements. Because of this intimate relationship between the Japanese and their gardens, it is presumptuous for the outsider to attempt to explain the concepts of the Japanese garden other than to deal with the various components in a purely objective fashion. Each of these elements has its own rules of application. For example, the bamboo fence (*yotsume-gaki*) has horizontal rails with prescribed proportions; thus, the Edo style fence requires that the distance between the first and second rails be 2.5:1 from the top while the Kyoto style uses a proportion of 1.5:1. The bamboo rails are always lashed with a black hemp rope (*shuronawa*) in a prescribed fashion (*yotsume musubi*) from which fence makers do not deviate. One can find the same application of traditional rules in all aspects of garden design and construction. About one hundred fifty different trees, shrubs, groundcovers, and herbaceous plants will be encountered in the Japanese garden. Among these will always be *ume, matsu,* and *take* (plum, pine, and bamboo), the three precious plants of the Japanese.

There are so many delightful and curious aspects to the Japanese garden about which I could write, but here I will concentrate on the path. In our society, the pathway, or more commonly, the entrance walk, has the specific purpose of getting the visitor to the front door



Gravel paths used for heavy foot traffic are always well-groomed and straight, designed for ease of walking.

(tradesmen, please use the back entrance). The relationship to the landscape is often incidental, especially where the house faces the road, such as occurs in most subdivision situations. The walk is a straight shot from the road to the front door. Consequently, it would be a considerable task to find enough to say to write an article about the path in this context. But in the Japanese garden, the path is a strong garden element intended to provide the visitor with opportunities to enjoy the landscape art offered. The garden in Japan, both traditional and contemporary, is usually hidden from the passerby. There are many reasons for this, one being privacy. But also there is a desire to whet the visitor's appetite for the experience awaiting inside.

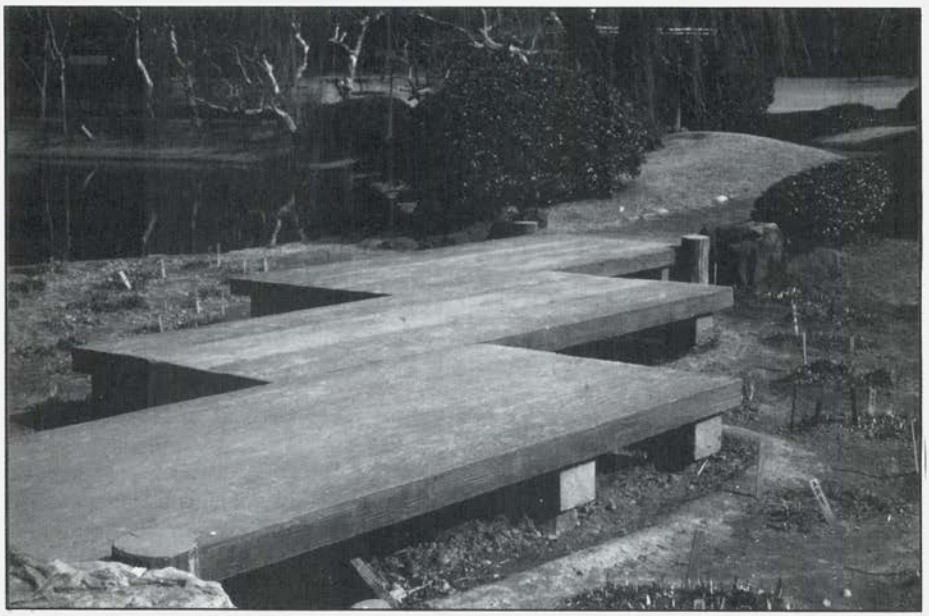
Over the centuries, the path became more important. In earlier times, before 1600 AD, the garden was usually viewed from inside the house, but with the concept of the strolling garden and the tea ceremony, with its prescribed formality, the tea garden (*cha-niwa*) was created. This was essentially a pathway (*roji*) to the tea house, and guests entered through a tea garden along a stone path to the tea house gate. Here was an opportunity to pause and admire this or that plant and proceed quietly to the tea ceremony. The path had now acquired a significant purpose other than a means of access. It allowed for considerable creativity in design and materials, although its character was always a naturalistic one.

Even today, the path carries the same weight as during the Shogunate era, and it is not surprising to find a rough stone path incorporated into the entrance way of an ultramodern Tokyo building. The naturalistic path of uncut stone was used early on, and the concept of straight lines created by the use of cut stone slabs was introduced in the late 16th century by an architect and feudal lord, Kobori Enshu. The use of geometrical patterns in stone paving (*tatami-ishi*) allowed for additional variations in pathways. Combinations of both uncut and cut stone could now be incorporated into the design. But in the

pure tea garden only natural stone paths are permitted.

In major entranceways, throughout modern botanical gardens and parks, and in other places where there is heavy foot traffic, fine gravel, sand, or other compacting material is used. Such walkways may be either in straight lines (photo, p. 114) or informally winding (photo, p. 122). But in the quiet of inner gardens where there is a deliberate attempt to establish a relationship between the individual and the surroundings, the stepping stone path is uniquely Japanese. Such stepping stone paths are found in conjunction with expanses of moss and allow the visitor to avoid walking on the moss itself (photo, p. 119). The paths are laid out so that branching takes the form of a branched tree. In the groupings of the stones, they may be set three and two (photo, p. 118), or four and two, or in some instances as a graceful, broad "V", resembling a flight of geese (ganko) or pairs of stones, like staggered footprints (*chidori*). Where the stone path branches, a larger stone than normal is set and called a "branching-off stone" (*fumiwake-ishi*, photo, p. 122). Even in paths, stones are selected for their individual appearance with great care. When laid in the path, stones are set 4" apart to create a pleasing effect, and it is important that adjacent faces are always parallel. Finally, at the point where the path ends at the entrance to the house, a large raised stone is set for removing shoes, called "the shoe-removing stone" (*kutsunugi-ishi*, photo, p. 119).

Stone slabs are often used in combination with natural stones for walkways to create variation. They take their name, *tanzaku-ishi*, from the strip of paper on which poems are written. Sometimes the *tanzaku-ishi* are placed in off-set pairs or paired with several individual stones (photo, p. 122). A rather charming means of identifying the end of the path, giving a caution, and even signifying "not an entrance" is



Handsome wooden slabs may be used to cross a dry iris paddy.

the use of the barrier stone, *sekimori-ishi,* which is tied with the black hemp rope and placed on the path (photo, p. 120).

Paths in moss areas are generally without guard rails of any kind, but on broad gravel walks passing through zoysia grass, moss, or garden areas, the edges are often delineated with split bamboo arranged in a looping manner (photo, p. 112). In more formal settings, handsome bamboo railing is used to create a strong image.

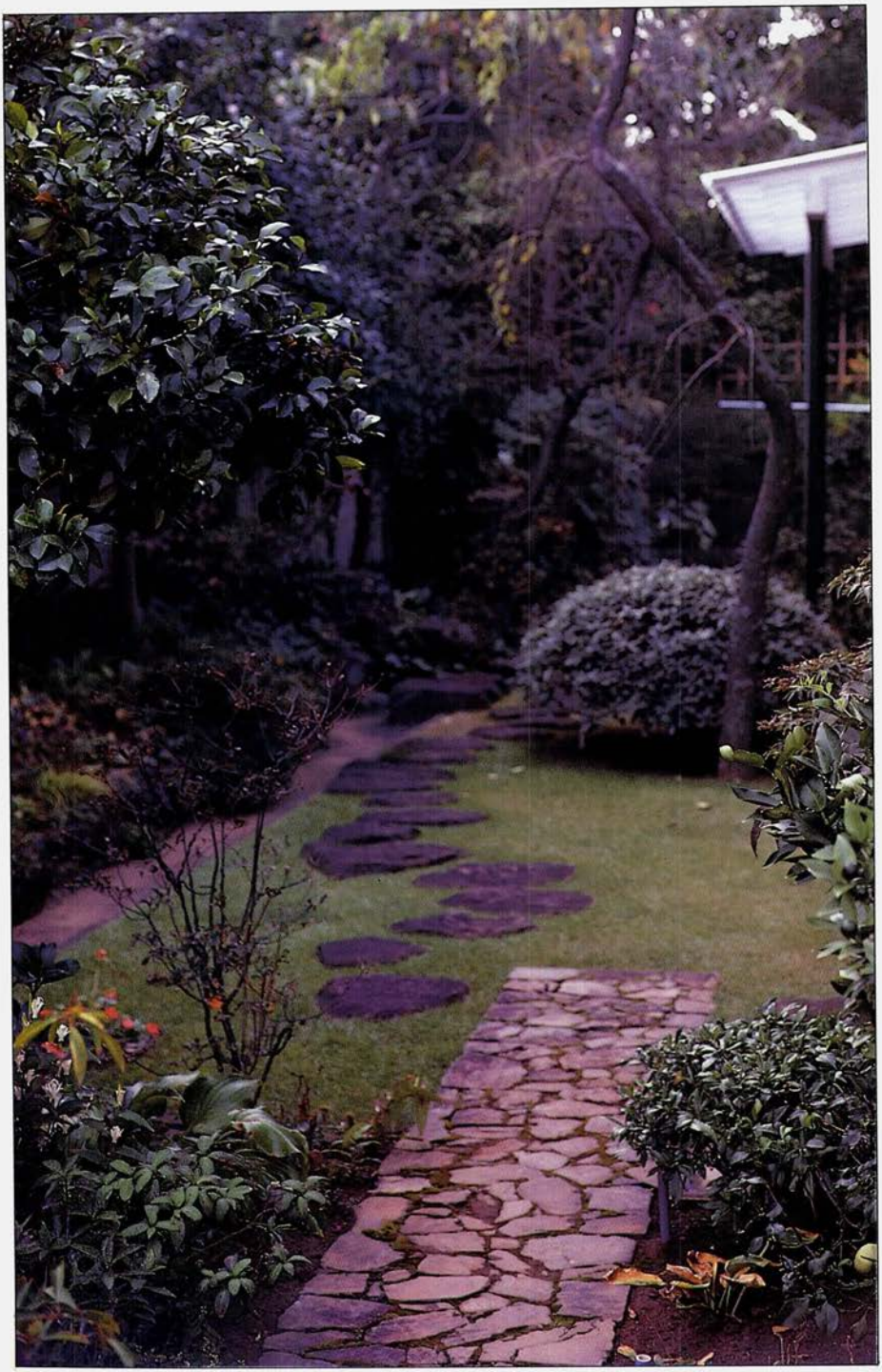
Water is, of course, the third major element in the Japanese garden, either small ponds or streams, the latter usually natural. But in recent years, Japanese architects have introduced circulating artificial water courses with remarkable effects. Paths are often directed across small streams and bodies of water either with stones called "marsh stepping stones" (*sawatobi-ishi*) (photo, p. 117), stone slabs cut with a slight arch (*hashi*, photo, p. 121), or handsome wooden blocks that might be used to cross an iris paddy (photo, p. 115). Where slabs are used, distinct monumental anchor stones (*hashi-basami-ishi*) are placed at either end of the slab for stability (photo, p. 121). If the situation dictates, stone slabs are often used in combination with small stones like those we call river jacks, at an actual or simulated boat landing (*funatsuki-ishi*).

There are many variations of paths in the Japanese garden, and they are applicable to both the traditional Japanese garden and the most modern landscaping in Tokyo. It is remarkable how readily the Japanese concepts of the use of plants, stone, and water can be incorporated into contemporary homes and villas that are being built within the metropolitan localities of Japan. This also applies to the many parks and botanical gardens that are of a Western nature. Because parks with their spaciousness provide a kind of relief from the usual compacted life of the average Japanese and because awareness of the needs of the handicapped in public is now accepted, appropriate accommodations are provided. This includes smooth, gentle walks, rope edging where needed, and distinct pattern shifts in walkways to assist blind visitors (photo, p. 120).

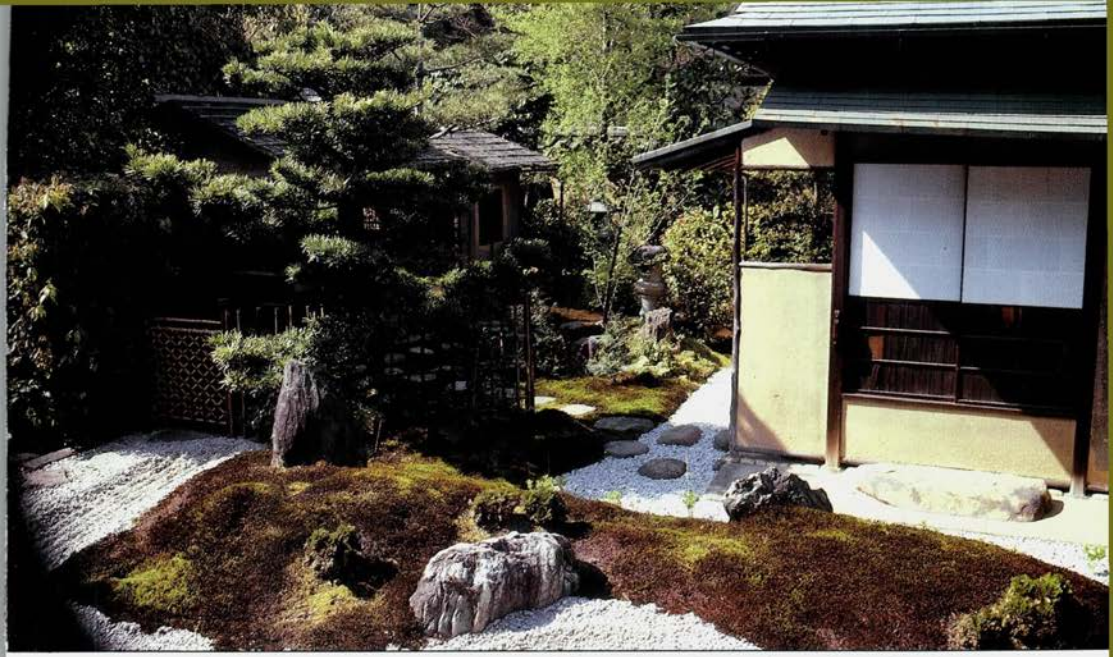
Thus, the path, perhaps in more modern fashion than envisioned in feudal Japan, continues to play a significant role in Japanese society. It is not surprising, therefore, to find dealers in ornamental stone in most localities where plants, lanterns, water basins, and bamboo garden accessories are sold. Even foreigners are attracted to the wares of stone dealers, and at least one participant on my tours to Japan has succumbed and bought a ton-weight stone to be crated and shipped home. My wife and I, too, fell under the spell and purchased two fine lanterns and a water basin, which were shipped by boat to Charleston, South Carolina. When the customs agent inquired how old they were, I surmised several million years, so they were passed duty free. One Japanese dealer who has shipped stone lanterns and similar materials from Japan by ocean freight is the Fukuoka Enzai Company, Shimo Tanushimaru, Tanushimari-machi, Ukiha-gun, Fukuoka, Japan. This dealer has a nice color brochure, and even with no understanding of Japanese, the illustrations are useful.

John Creech gardens in Hendersonville, North Carolina. He is dean of American plant collectors, having introduced hundreds of ornamentals to our gardens, particularly from Japan. His tenure as director of the National Arboretum saw the creation of the Herb Garden, the National Bonsai Collection, and extensive Asian collections.

Stepping stones are used to cross a small stream in a Kyoto garden. John Creech



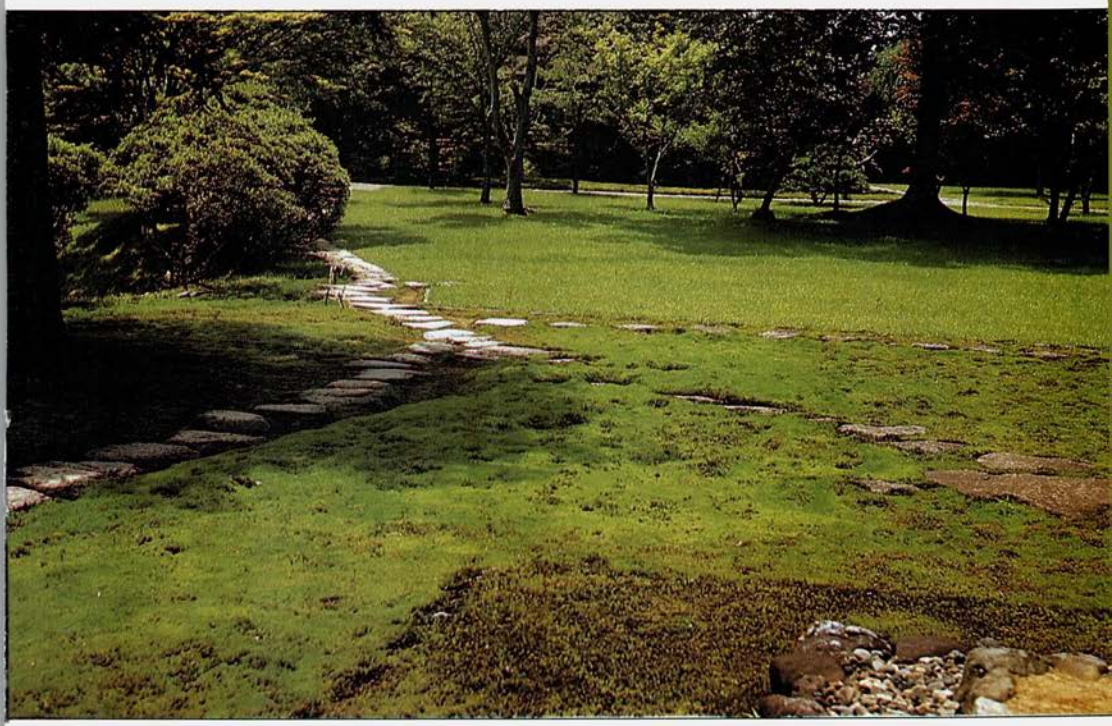
Stones are usually set in groupings of two to three or two to four, distinct from the straight-laid approach walk.



A stone for shoe removal is an essential part of the garden-to-house relationship in the Japanese garden. See article pp. 113-116.

photos by John Creech

Paths in extensive moss areas may take the form of a tree with graceful branching.



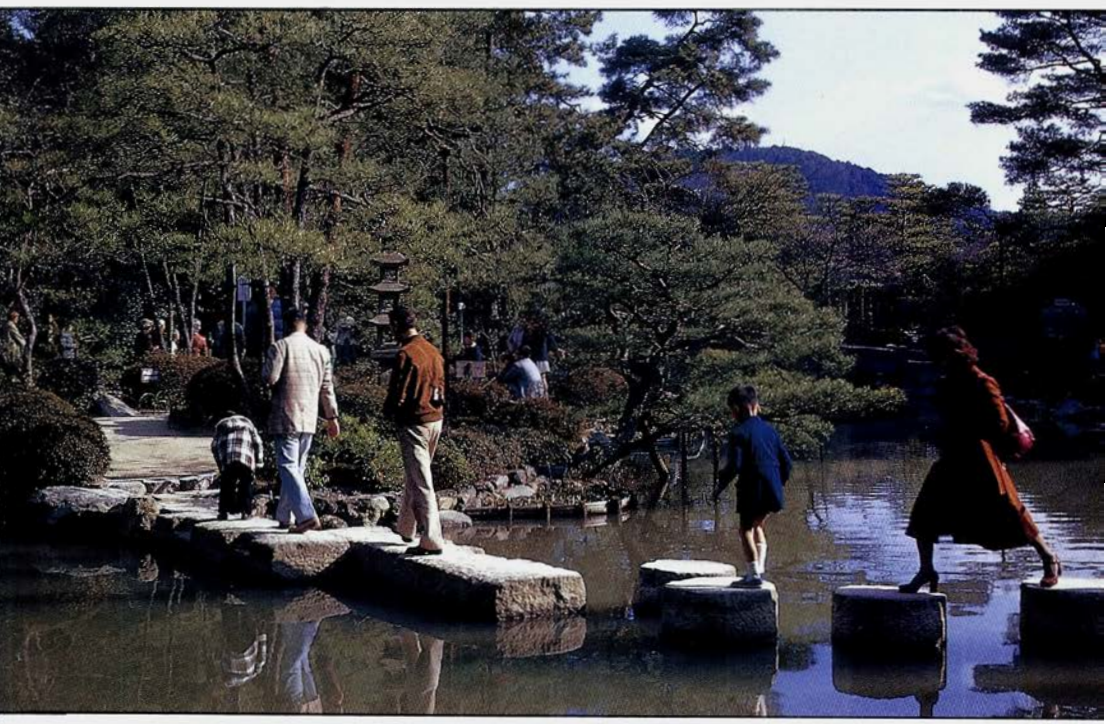
A barrier stone (*sekimori-ishi*) here warns the visitor the water is not safe for drinking.

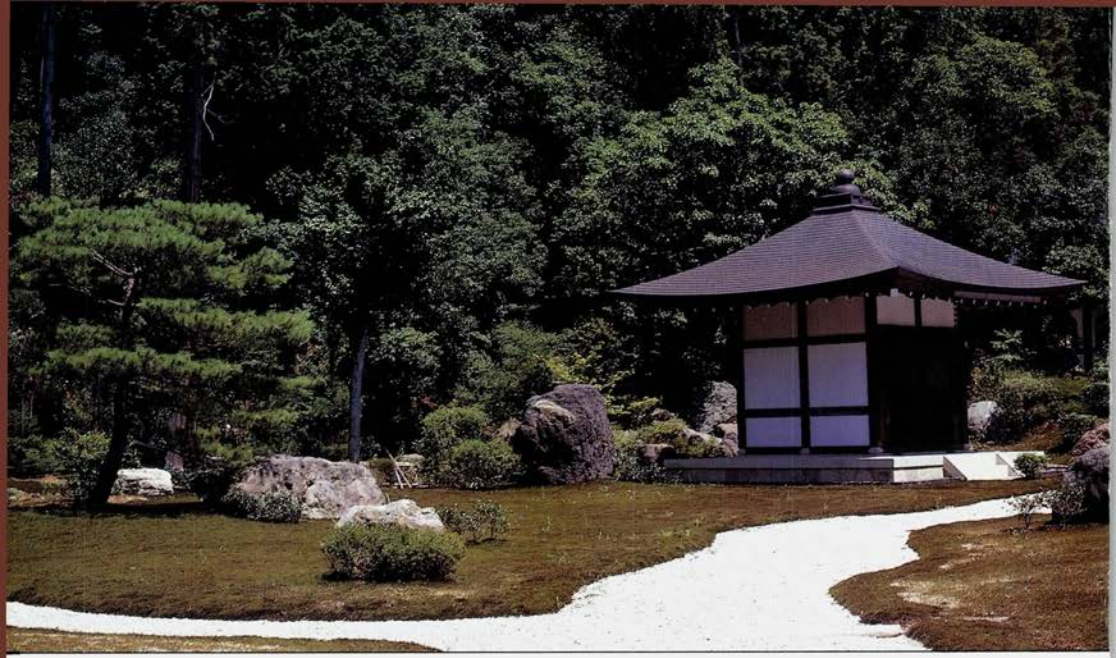
In the Nagoya Botanic Garden, the walks are designed so blind visitors may identify direction and turning points.

A handsome curved slab passes over an artificial water course. Note the two anchor stones at the ends of the bridge.

photos by John Creech

Stone slabs alternating with drum-like stone blocks make a delightful way to cross a small pond.

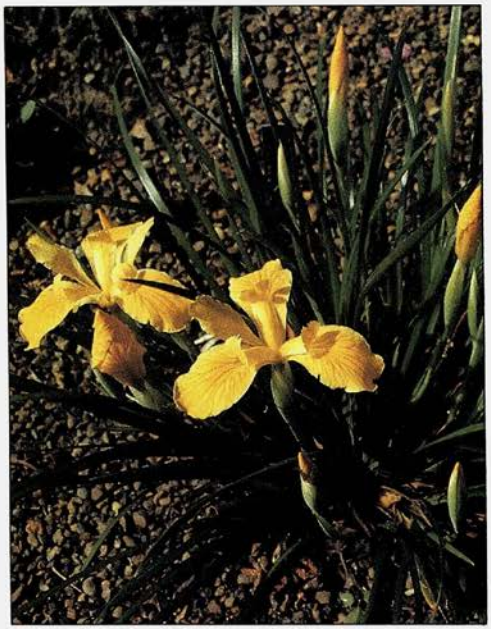




Paths in inner gardens are more likely to be naturalistic in keeping with the surroundings.

photos by John Creech

Paths are highly variable but where the path branches a much larger stone is used. Here both a slab and stones are laid together for variation.

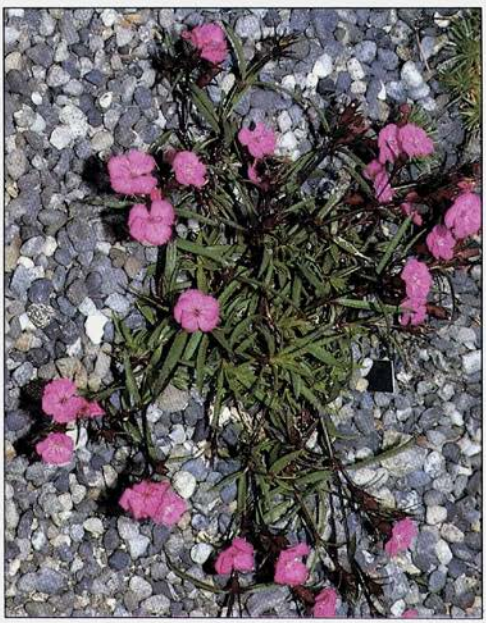


Iris innominata "Floyd's Best" (p. 147)

Erythronium elegans (p. 145)

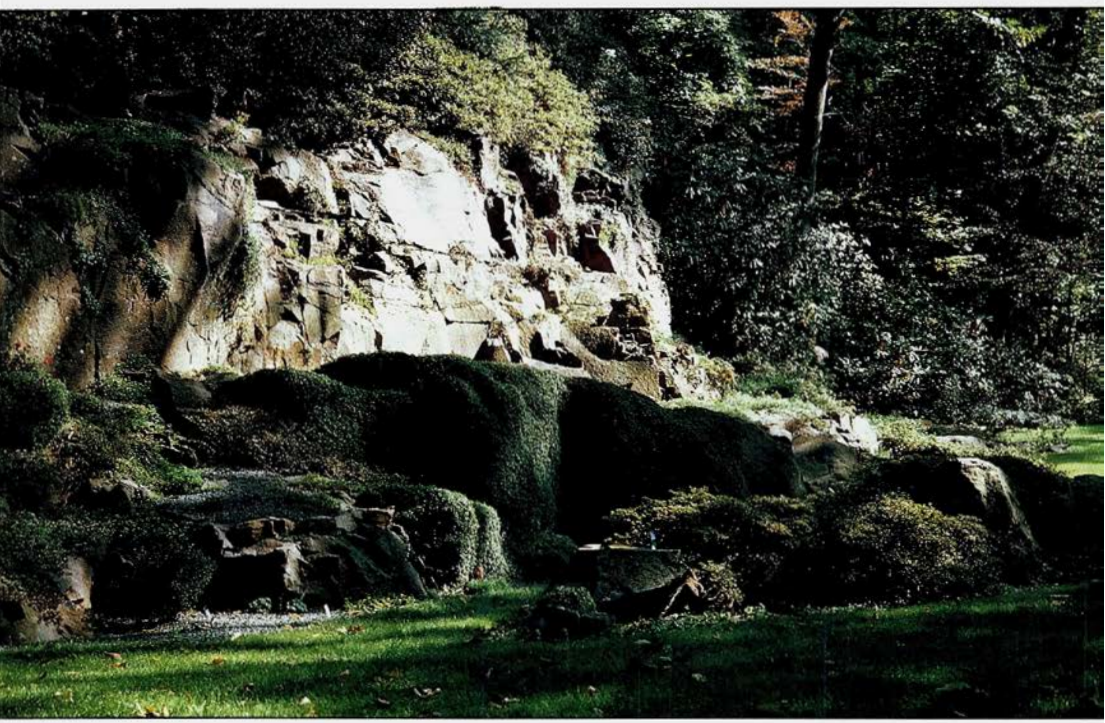
photos by David Hale

Dianthus "Son of Stenopetalus" (p. 147)



Penstemon "Floyd's Fatty" or "Oregon Grape" (p. 146)

Leonard Buck Garden; design by Zenon Schreiber photos by Paul Halladin
Article, pp. 89-91



On Edging

by Liz Rodgers

All gardeners face the dilemma of how to separate their gardens from the rest of the world, how to define their limits and mark their borders. Some people postpone the problem indefinitely by continually expanding the garden farther and farther into its surroundings. For those with less energy and more need for structure and definition, the problem of edging is ever present.

Two aspects of edging reign supreme: compatibility with the garden and compatibility with the gardener. The latter is perhaps the key element in this equation. As elsewhere in life, the human species is apt to make choices based on appearances with little regard for reality. The reality of most edging is drudgery or expense, and periodic infusions of work or money for the rest of the edging's existence. Low maintenence edging falls into the same category as the low-maintenance garden—wishful thinking. So words of advice: Make sure you take an honest look at your own limits and temperament as well as the limits of your edging choice. There is really no point in wasting time, expense, and energy installing an edging only to let it go to rack and ruin through neglect. You will get little sympathy for such behavior—the rest of us used it up long ago!

Once you have faced reality and decided you want to go ahead with edging, analyze the suitability of the particular edging to the garden and the surrounding environment. Pose yourself some questions: How formal does the edging need to be? What are the environments you are separating? Do you want an abrupt or a gradual transition from one to the other? The most common neighbors to gardens are grass, woodland, and driveway. Each presents its own set of problems.

Edging between garden and lawn can be the *coup de grace* for a garden. I find lawn edging strangely akin to household cleanliness, or lack of it. You may not focus on the tumbleweeds of dog hair, the dirty socks under the coffee table, or glasses with dried milk rings in your own house, but you can bet your last *Erysimum* any visitor will and will hastily jump to many conclusions. Alas, so it goes also with gardens. Just as one is apt to refuse an offer of tea in the house described

above, so is a garden visitor apt to glance but briefly at a garden where lawn romps eagerly with plants. Conversely, a perfect edge to a garden, like vacuuming, disguises a multitude of sins—weeds go unnoticed, dead plants go unseen, and even chicken wire becomes acceptable. It's the old "put on a clean shirt if you can't take a shower" trick.

My favorite way to accomplish this miracle in the garden doesn't bankrupt me of money, time, or energy. I call it the "V-to-Raised-Bed" method. Cut an edge angled away from the lawn down 3-5" and then round the front of the garden soil away from the lawn to create an air space between grass and garden at least four inches wide (Illust. 1). Roots won't grow into air, and it takes a surprisingly long time for grass to grow down into the trough and up into the garden. If you've made the air space wide enough, mowers can easily cut along the edge of the lawn without harming plants in the garden that have cascaded down into the trough. Eventually the grass length increases horizontally at the edge, out of reach of the lawn mower, and will need a hand cut. For me this is necessary four or five times between April and October. This can be done quickly and simply by ripping the grass off with your hands, or you can use edging shears. The few stoloniferous bits of grass or clover that have escaped over the edge are easily pulled. If the edge has been made crisp and deep, it should remain intact. Periodic maintenance of this sort shouldn't increase the size of the garden as the edge moves out into the lawn, a hazard that has driven many a prudent gardener away from the more usual vertical-cut edging technique.

Plastic edging, often the preferred choice of edging between lawn and garden doesn't work particularly well with a trough. Such edging is installed vertically into the ground and relies to a great extent on the soil on both sides to keep it in place, especially when it must bear the weight of a lawn tractor on a regular basis. Extraordinarily strong and deep steel edging may hold up, but who can find it or afford it? It is also difficult to install in New England's rocky soil. No matter what the edging, if no buffer space is left between lawn and garden, plants that overflow the edge are either sheared off, or you must mow in waves around them. If the soil of the garden is the least bit raised, a close cut will gouge it, and soil will be spewed across the lawn. Clover and stoloniferous grass will jump eagerly and easily into the

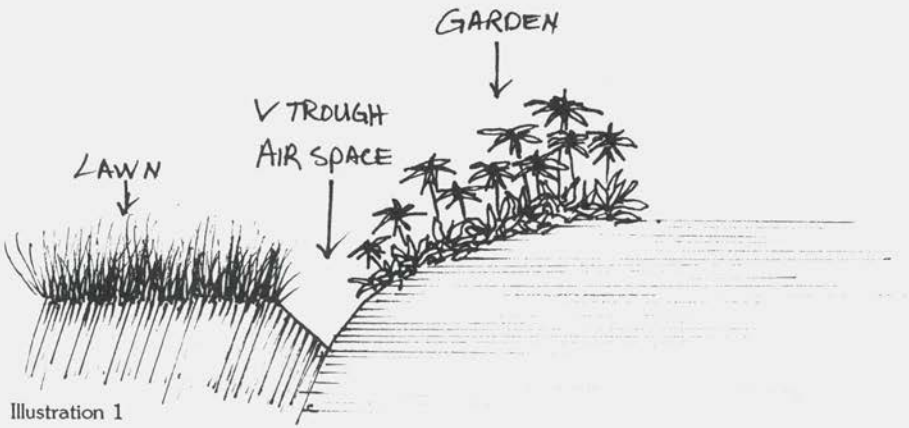


Illustration 1

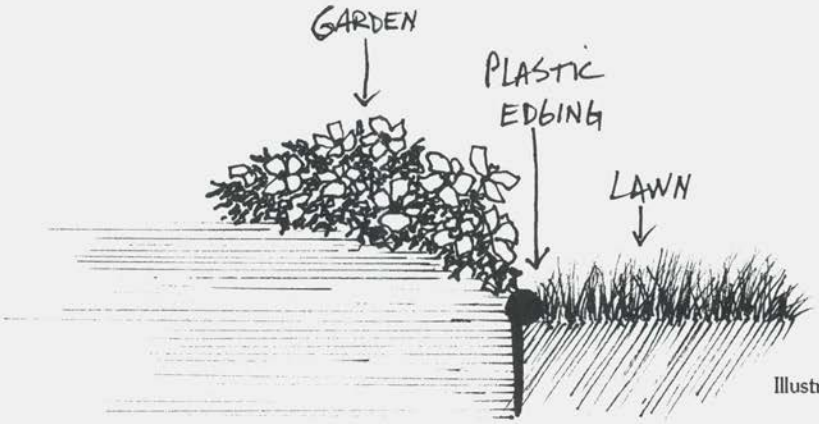


Illustration 2

garden (Illust. 2). That periodic hand trim will be necessary every few weeks.

Where a garden mulched with gravel meets lawn, I prefer plastic edging with a bulge at the top. Unfortunately, with the V-trough method, unless the slope is very gradual, gravel tends to slide down into the trough, leaving landslide-like splotches of bare soil behind. Instead, install the plastic edging with the flat side toward the lawn, keeping the bulge above the height of the gravel surface (Illust. 3). But beware! Make sure your lawn mower is set high enough that it won't shear off the bulge! The inch-plus height and width of the bulge creates enough air space to slow the migration of grass into the gravel. It makes trimming easy, as you can guide the shears along the bulge, almost like resting scissors along the edge of a bowl while cutting hair.

Contained, raised beds create a particular problem with neighboring lawn, as does any vertical barrier: house, wall, tree, clothesline pole, etc. Most lawn mowers just aren't made to trim close to such structures. I'm sure an array of special, costly machines exists just for this purpose. I'm familiar only with the "Weed Eater," which in most hands, mine included, is more aptly named "Plant Decapitator" or "Tree Injurer." A mulch buffer surrounding such structures is kinder. When choosing a mulch, personal preference and availability are usually the determining factors—and not necessarily in that order. I try to use the same material surrounding a raised bed as I've used mulching it. Second choice would be materials that look similar or are made of similar elements: bark mulches with shredded leaves or leaf mold, larger stone or field stone with pea gravel. Of course one still faces the problem of lawn encroaching into the mulch buffer. Is this a place for more edging?

When gardens border woodland, a gradual transition from a gardener-manipulated arrangement to nature's own often solves the problem of edging. If invasive plants are a problem—poison ivy, bittersweet, etc.—a plant-free barrier strip or path is often the answer. If you've been able to eradicate the offending invader from the garden, persevere 3-4' farther and don't let a living thing emerge in that strip. I triumphed over poison ivy by diligently mowing a strip of ground between garden and woods with an old lawn mower, affectionately known as Red Ripper. This method did nothing to

deter the poison ivy population in the woods, which was lavishly lush at the edge of my mown strip. Naive visitors often remarked on its beauty! Red Ripper II now keeps areas too rough for the regular mower free from blackberries and goldenrod. Regular mowing encourages aggressive plants to cast their aspirations elsewhere if it doesn't kill them outright.

Soil compaction might also be enlisted as a barrier. Frequently used paths rarely support plant life. Unfortunately, such denuded paths are usually associated with animal or non-gardener shortcuts in quite the wrong places. I have never heard of anyone deliberately compacting an area for the purpose of edging, but it might be a novel solution.

Where garden meets driveway, the problem of edging often becomes more a problem of protection: either shielding the garden from the drive or the drive from the garden. Life dictates that if a choice plant can seed itself in the direct path of a vehicle, person, or animal, it will. Conversely, if one has carefully nurtured a difficult plant at what appears a safe distance from traffic, be assured that snowplow, novice driver, non-gardener, or UPS carrier will find reason to swerve into it. The only way to effectively deal with this dilemma is to psychologically prepare oneself for the fact that any plant within three feet of a vehicle path is living on borrowed time, and at less than five feet it is in a danger zone.

Once this perilous state is accepted, other measures can be implemented. Obstacles that can damage vehicles or be damaged by vehicles are excellent deterrents, especially if monetary reimbursement can later be accessed. Straightening curves and making sure the drive is adequately wide helps. One can always resort to temporary, drastic measures when needed: keep a baby carriage or stroller complete with a well-swaddled doll handy to wheel into a prominent position. If all measures fail, move the driveway. Better yet, turn it into a garden and park on the street.

Elizabeth Rodgers gardens and edges in Worthington, Massachusetts. She is very active in the Berkshire Chapter of ARGS.

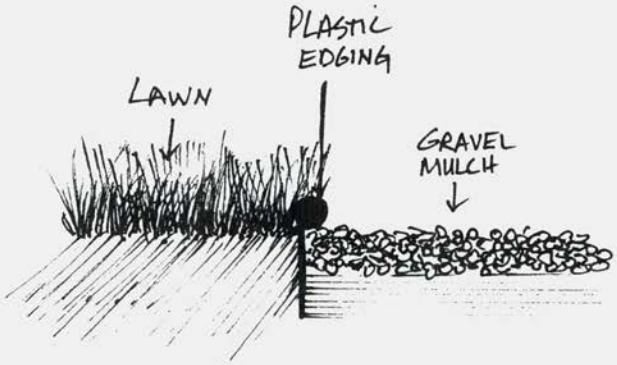


Illustration 3

Plants for the Bog Garden

by Frederick W. Case, Jr.

Climates vary so much in various parts of this country, and the choices of plant material are so vast that deciding what to grow in a bog pond, sphagnum or peat bog garden can be mind-boggling. Certainly, what you can grow will be more limited in the colder northeastern and central states or in Canada. Still there is a rich variety of subjects. Given proper soils, protection, and some luck, many plants generally thought not to be hardy will grow well in the North. My wife, Roberta, and I grow many plants native to the Gulf Coastal Plain or central Alabama here in central Michigan where winter temperatures occasionally get to -20°F. Experiment for plant hardiness; don't always believe the books!

In tables 1-3, I list a few very useful plants for the bog or waterside garden. The lists are not exhaustive, and many good plants have had to be omitted. In Table 4, I list plants dangerous in the bog garden or when they escape into the environment. I have tried to confine the plants discussed in this article to plants of general use, or of special interest. Let's look at some plants from these tables that ought to be usable in a variety of waterside and bog gardens over much of the country.

Terrestrial Native Orchids

In *Alpines of the Americas* (1979), I discussed growing our native ground orchids in the garden and presented suggested methods for bog gardens and raised beds. In the 1987 edition of my *Orchids of the Western Great Lakes Region,* there is an updated chapter on growing these charming and difficult plants. Therefore, here I discuss only a few orchids particularly suited to sphagnum bog gardens. For cultivation of lady's-slippers and other terrestrial orchids, see these other references.

Because many terrestrial orchids are rare, and because many people feel that orchids are too endangered to be cultivated, many people become upset with those who try. I cannot agree, for unless we try, we will not learn. However, I do not think that orchids are for everyone. Unless you are willing to provide exacting soil mixes, monitor soil temperatures and weed a lot, don't try them. *Certainly you ought not to collect them from the wild!* But new techniques in seed germination and

tissue culture soon can produce certain of our desirable orchids in any number without touching wild plants. Some of the first lady's-slippers grown *in vitro* are now advertised in the American Orchid Society *Bulletin*. Transferring these sterile-grown seedlings to outside soils does not always succeed. We must learn techniques that work. If you try these orchids, keep careful records of your methods and results.

For the open, sunny bog garden, the following species, while not yet offered very widely from seed, all succeed best in the type of living sphagnum bog described by Roberta Case in the January, 1992 ARGS Bulletin. They should become available as seedlings or tissue cultures within a year or two now.

White-fringed and orange-fringed orchids, *Platanthera blephariglottis* and *P. ciliaris*, are two fringed orchids well worth growing after *in vitro* seedlings appear on the market. (Plants currently offered commercially are almost certainly not cultivated, but collected from the wild.) The two species are nearly identical structurally. Each consists of a 1-2'-tall plant with two or three lanceolate, fleshy leaves enfolding the stem, and bearing at the top a cylindrical raceme of showy flowers. The blooms consists of three small sepals, two petals and a large lowermost lip, which acts as a landing platform for pollinating insects. The lip is tongue-shaped with eyelash-like fringes along the sides and tip. It bears a very long, hollow, tubular spur. Color in *P. blephariglottis* is sparkling white, in *P. ciliaris* a rich, bright orange (photo, p. 141). Hybrids between the two produce variations cream, buff, or bicolored blooms.

Plants grow in deep sphagnum northward, or in sphagnum or sandy peats on the Coastal Plain. A cluster of fleshy roots penetrates the soil. Each year a bud forms on one root. This bud forms a new offset root system, which will produce next year's plant. The old root system services this year's stem, leaves, and developing seeds but dies at the end of the season. To keep plants blooming, at least partly sunny sites are required. Keep plants free of encroaching vegetation or too much shade, as they develop rot easily. If soils go too sour, develop foul fermentation odors, or become gummy-slippery muck, replace them, or move your plants at once into a newly prepared soil. The showy grass pink, *Calopogon tuberosus* (photo, p. 141), ranges from Newfoundland and Canada south to Cuba. It grows in bogs, swamps, sandy lakeshore prairies, and coastal plain wet woodlands. Flowers, about an inch-and-a-half across, typically are bright lavender-purple. The lip has a yellow, hairy crest and is uppermost. Several flowers appear in succession. Darker forms and pristine albinos occur, all highly desirable garden plants *if grown from propagated, not collected plants.*

Grass pink grows from a fleshy tuber about a half-inch in diameter. Each year a new tuber is produced on the stem above the old one, which deteriorates. If plants are happy, tiny offsets may also appear, increasing the supply of plants. This colorful orchid is both beautiful and relatively easy to cultivate. Furthermore, its seed germinates on aseptic nutrient media *in vitro* easily, so it eventually can be produced *en masse*. We have plants cultivated since 1978 in a pot in our greenhouse, and others for at least five years outdoors.

Rose pogonia, *Pogonia ophioglossoides,* another beauty, has been so successful in our sphagnum bed bog garden that it has become a weed we must thin out! The plant arises from a rambling, fleshy-fibrous root system. It prefers to grow in a very wet , sandy-peat or sphagnum, nutritionally sterile

Table 1: PLANTS FOR AN ALPINE BOG GARDEN

WOODY PLANTS

Andromeda polifolia, varieties, cultivars, and other species
Betula nana
Cassiope spp. and hybrids
Chiogenes hispidula
Gaultheria humifusa
Kalmia species
Ledum glandulosum
Phyllodoce caerulea
Phyllodoce empetriformis
Phyllodoce spp., hybrids, cultivars
Potentilla fruticosa (dwarf alpine forms)
Salix, dwarf spp. and cultivars

HERBS

Caltha howellii
Caltha leptosepala
Dodecatheon jeffreyi and other spp.
Elephantella (Pedicularis) groenlandica (semiparasitic)
Gentiana affinis
Gentiana algida
Gentiana parryi
Gentiana calycosa
Gentiana newberryi
Primula parryi and other species
Ranunculus adoneus, allied spp.
Swertia perennis
Sarracenia purpurea v. *purpurea*
Trollius albiflorus (var. *laxus*)

and acid. A slender stalk bears a single fleshy, oval leaf about halfway up and a leafy bract just below the flower. The bloom, which faces outwards, is rosy pink or rarely white. All segments are alike in color and shape except the lip which is highly crested and spotted with dark purple and yellow. This is a fragrant orchid. Thoreau said the odor resembled that of garter snakes. Where he got that I don't know—to most it has a faint, red raspberry fragrance that is delightful.

Rose pogonia (photo, p. 141) is a rarity among orchids, one that can be propagated by root cuttings. Pieces of cut-up roots in sphagnum develop green buds and eventually produce leaves. In our gardens, the plants prosper and multiply rapidly in full sun. This past season in about 2.5 square feet we had over 100 flowering stems. Roberta has to remove some from the bog garden to make room for other things—certainly not the usual situation with orchids.

Arethusa bulbosa, dragon's mouth orchid (photo, p. 141), is my personal favorite among bog orchids. It grows in deep sphagnum or moist northern peaty turf, usually in full sunlight. The relatively large, showy, lavender-purple blooms with a yellow crested lip are borne on what appears at first to be a naked, 6-10" scape. Close examination, however, reveals a closely appressed, single, grass-like leaf that expands a bit after flowering. Both flower and leaf arise from a tiny corm loosely buried in the substrate. *Arethusa* is native from the mountains of North Carolina to Laborador and Newfoundland, and westward to Minnesota and Manitoba. Very rare southward, it is abundant in Newfoundland and in remote northern bogs. It is difficult to cultivate where any disturbance to the corm occurs. If a situation can be provided where the leaf and corm receive no disturbance and can be protected from rodents, it ought to grow well. This beautiful orchid, not offered commercially at present, recently has been germinated *in vitro* and grown to flowering within 18-24 months. This development opens up the possibility that plants not taken from the wild (where *Arethusa* is often

a protected plant within the US) may soon become available to horticulturists.

For additional information on orchid's needs, please consult the references below. Proceedings from two different symposia on North American terrestrial orchids, (Michigan Orchid Society, 1983, and Brandywine Conservancy, 1989), contain many useful papers on the biology, propagation and cultivation of native orchids.

Ranunculaceae

Marsh marigold, *Caltha palustris* (photo, p. 143) is so familiar to most rock gardeners that I shall dispense with a general description. Yet no bog garden would be complete without some form of the common cowslip. Since this glorious golden buttercup occurs around the world in the North, there is considerable variation in size and flower form. I prefer the ordinary, large, open, single-flowered forms generally, but there are many horticultural doubles in cultivation and available commercially. We have found two unusual forms in the wild. One is a very full, large-petaled double, larger but less floriferous than the double flowered form available commercially. Its big advantage is the rose-like flowers that last late into the season. Another form we have found has the normal ring of about eight petaloid sepals, but the entire central mass of stamens has mutated into a series of miniature flat petaloids, making a delicate raised boss in the flower's center. The effect is that of some of the Japanese peonies.

We have also discovered that relative flowering time is genetically fixed in the cowslip. Given plants in a population bloom early, midseason, or late season, year after year. With careful selection one can extend the bloom in the garden to one month instead of having the entire show over in two weeks. These are rather large plants, not always easy to dig in the wild. Seed, ripe just when showy lady's-slippers bloom in late June, if sown at once germinates rapidly. Plants commence to bloom in the second year. Color variation is limited in our wild plants, but occasional cream rather than bright yellow forms appear.

In the American West grow several alpine species. All are garden worthy. The widespread Rocky Mountain cowslip, *C. leptosepala* (photo, p. 142), is not the easiest to cultivate but worth the effort to try. A relatively small plant, making single growths or small clumps, it typically produces large white flowers. The variety *sulphurea* from east-central Idaho has rich yellow flowers (Dusk and Mosely, 1989) and appears in illustrations to be superior to the ordinary form. I have not seen it. Elklip cowslip emerges in alpine bogs and watercourses very soon after the snow melts. Often a cluster of large, white blooms appears almost on the ground, with little or no vegetative part showing. The plant continues to expand and a few days later may be up to 6" tall. Leaves of this caltha are longer than wide, somewhat halberd-shaped, rather unlike those of most

Table 2: PLANTS FOR SHALLOW PONDS OR WATERSIDE

Acorus calamus & sp.
Asclepias incarnata
Equisetum fluviatile (confine roots in container)
Lysichiton species
Orontium aquaticum
Peltandra virginiana
Polygonum amphibium
Pontederia cordata
Nuphar sp. (large ponds only)
Nymphaea species, esp. *N. tetragona*
Sagittaria species
Symplocarpus foetidus

calthas which are more orbicular or kidney-shaped.

In the Midwest, seed of this mountain species, if fresh, germinates rapidly without stratification. Surprisingly, in a lightly shaded greenhouse, the plants grow well in a sand and peat mix, even though the temperatures may reach 95°F. But when the plants approach flowering size, they become difficult to keep. We have had little success with it outside in our bog or alpine gardens. In climates with cooler summers, or perhaps fewer extremes between hot and cold, it ought to do better.

Caltha biflora is a charming plant that occurs in the Pacific Northwest and along the Canadian coast to southern Alaska. In appearance, if I have had the true plant from nurseries, it much resembles a smaller, more refined *C. palustris,* bearing paired flowers in creamy, soft yellow at the end of the stems. Easy to grow, it deserves to be better known. *Caltha howellii* is yet another winner, formerly classed as a subspecies of *C. biflora*. Less clumpy, but a prolific colonizer, this plant produces cream-colored or soft yellow blooms on 4-8" plants. The leaves are rounded but cut straight, rather than heart-shaped, at their bases. It grows abundantly in boggy places and wet meadows in Mt. Lassen National Park and in parts of the Cascades. Germination, even from immature seed, is rapid and easy if the seed is sown fresh. Like most members of the buttercup alliance, old seed rarely germinates well. Growth is rapid in containers, and we have had better success with this species maintaining itself in our scorching summers than with *C. leptosepala*. It has bloomed in seedling containers. This year it goes into the open rock garden.

Although globeflowers (*Trollius* spp.) are better known horticulturally from the European and Asian species, America has two worthy species. *Trollius albiflorus*, western globeflower, grows abundantly in wet meadows and alpine bogs along the Rocky Mountains. Superficially, the blooms resemble the marsh marigolds. The leaves, which are five-lobed, the lobes bearing teeth, distinguish it from the cowslips. Usually, the plants form tufts or clumps with fewer stems and flowers per clump than in the calthas. At flowering time the plants may be only a few inches tall or up to 10". After pollination, as seeds mature, the flowering stems elongate until they may become 20" or more tall. Flower color ranges from creamy white to a soft, almost translucent yellow. Native from Utah and Colorado north into British Columbia, this buttercup relative is one of the most typical bog plants of the Rocky Mountains.

Although fresh seed germinates fairly well, we have had no success in keeping seedlings going. We have not succeeded with collected plants either. Yet this is such a garden-worthy alpine that we shall keep trying.

Although the two plants are horticulturally distinct in looks and behavior, many botanists have lumped *T. albiflorus* with the eastern *T. laxus*. Spreading globeflower, (*Trollius laxus),* now one of America's rarest native plants, closely resembles its western counterpart in flower. The entire plant is slightly larger in all its parts, and as the specific name suggests it is somewhat less stiffly erect than the western species. Flower color is a butter yellow. After pollination, the scapes, unlike those of *T. albiflorus,* hardly elongate at all. This globeflower formerly grew natively from Connecticut to Michigan and from southern Pennsylvania and New Jersey north to Maine. It has not been seen in Michigan for many years, nor is it now known from Maine or New Hampshire (Fernald, 1950). We do not understand

why the plant has disappeared from so much of its former range. Habitat destruction, as well as changing patterns of land use in forestry practice and pasturing may have contributed to its demise. Its Federal Listing under the threatened and endangered species laws and its apparent shrinking range might suggest that this, like its western co-genitor, is a difficult plant in the garden. Not so! In a sand and peat bed in our garden, where it grows with open, northern exposure, the plant has seeded all about—in fact, we have to weed it out at times. It is a vigorous bloomer and a real asset to our garden. Like most ranunculids, it germinates best from fresh seed sown immediately upon ripening.

Ericaceous Plants for Bog Gardens

Bogs worldwide contain species of *Kalmia, Ledum, Andromeda, Epigaea, Rhododendron, Cassiope, Phyllodoce,* and others. Depending upon the style of bog garden that you choose, any or all of these genera would be appropriate.

The bog laurels, *Kalmia polifolia*, and the western dwarf alpine *Kalmia microphylla* (photo, p. 144), alike in all but size, are wonderful plants in the wild. The glossy, evergreen foliage, and the wonderfully beautiful and complex flower buds hold as much interest as the deep-pink mature blooms. Both species grow readily in our Michigan rock gardens, but the western alpine species has only rarely produced a flower, never a fine display as it does in the wild. It is so worthwhile that we will keep trying. Perhaps a suitable rhododendron fertilizer will induce it to flower. The foot-tall eastern species, rather leggy in cultivation, nevertheless produces beautiful flowers regularly. We have a super fine, pure white form that we found in Newfoundland years ago. It is not easy to grow. An intermediate-sized plant from the Mt. Lassen area, offered by Siskiyou Rare Plant Nursery in the past, grew well for us until destroyed by rabbits. All these kalmias are super rabbit and deer bait!

Another easy *Kalmia,* but rather large for smaller rock gardens, is lambkill, *K. angustifolia.* This plant flowers a bit later, after the new growth has started to mature, so flowers appear below the growing tip, not terminally as in the above species. Color can be a deeper rose-pink. The evergreen leaves are a dull green, not glossy, and are said to be poisonous to grazing stock. Eastern nurseries offer a white-flowered form of this *Kalmia.* Bog kalmias root easily from cuttings; *K. angustifolia* does not.

Rhodora, *Rhododendron canadense* (photo, p. 144), is an extremely hardy, deciduous rhododendron that covers many square miles of heath and bogland in Newfoundland, turning the barren grounds a wonderful lavender-pink in early summer. It deserves to be more widely grown in the northern US where really hardy rhododendrons are scarce. A relatively low shrub, seldom over 30" tall, somewhat upright in habit, and with soft bluish-green leaves, it can be a handsome shrub. Rhodoras differ from other rhododendrons and azaleas in that the petals are separate, not fused into a funnelform flower. Beautiful white forms occur and are available through seed exchanges. Grow rhodora as a background plant in the smaller bog garden, or use it as a featured plant in larger bogs.

The white alpine heathers, *Cassiope* of any species, are wonderful plants indeed, with their lily-of-the-valley-like flowers and evergreen heather foliage. Species occur in the Arctic, the American West, on northeastern US and Canadian mountaintops, in northern Europe, Asia, and in the Himalayan Mountains. Many

outstanding hybrid forms have been bred in Europe and now are available through specialty nurseries.

In the wild, cassiopes give the appearance of being very delicate plants. Unlike the related phyllodoces, cassiopes seldom venture out onto exposed places or open ridges. Instead, they lie buried and protected in ravines and snow flushes—places where the snow lingers late. But this is deceiving, for in the garden, at least in the Midwest, most cassiopes bloom quite well, and endure even poor growing conditions for years. The phyllodoces, on the other hand, almost never bloom; they sulk, winter burn, and die suddenly in our gardens. Only *Phyllodoce caerulea* grows reasonably well and flowers sporadically.

Aroids

Not all members of the jack-in-the-pulpit group (*Arisaema* spp.) could correctly be called bog plants, for many grow in drier woodlands as well. But several of these aroids truly prefer boggy areas. I will confine my comments here to American natives, yet there are many choice exotic species as well.

Stewartson's Jack (*Arisaema stewardsonii*). Although the chief monographer of the American arisaemas lumps this species with *A. triphyllum*, I cannot agree. This plant, in general character like other jacks, does not appear above ground until *A. triphyllum* in the same garden is in full flower and foliage. When it appears, it develops rapidly. It forms tight clumps by means of offset bulbs. Moderately tall (up to 18"), with stems that eventually lean on surrounding vegetation, it has narrowly three-parted leaves. The flowers differ the most. The spathe is distinctly corrugated, the raised ribs being white, while the rest of the spathe is greenish. Almost no dark purple appears on the outside of the spathe, which is sharply downturned towards its tip. The different shape, coloring, and clumping habit make this plant a distinct entity, at least horticulturally. It is a bog plant, either in mucky, peaty deposits along streams, or actually growing in sphagnum bogs from Maine to the mountains of North Carolina. Where I have seen it in the Carolinas, it is a very rare and local plant. I consider it choice.

Not much is clear about the naming of the American swamp jacks, all variations on *Arisaema triphyllum*. Specific epithets such as *pusillum, atrorubens,* and *zebrinum* abound. Huttleston lumps them all into *A. triphyllum*. Regardless of taxonomic status, jacks growing along small mountain streams in the Blue Ridge and in upper Piedmont valleys of the Carolinas seem distinctive. In low, wet ground, humid coves, and stream banks, these jacks are of low stature, with enormous, wide, reflexed hoods bearing brightly contrasting stripes of white and a dark purple so deep as to appear almost black. These are the finest forms we have seen. While they do not *always* grow in bogs, they occasionally do. In Michigan, a slightly different form, with a narrower hood, but with fairly contrastingly striped hoods grows in cedar swamps and bogs, but not in surrounding uplands. Our upland plants show less striping and may have green or only lightly colored, wider hoods. When the dark forms are planted alongside greener upland forms, they keep their color and character, indicating the differences are genetic, not environmental.

Golden Club, *Orontium aquaticum* (photo, p. 143), is an aroid that ranges from Massachusetts south to Florida and Louisiana along the coast, and locally inland from Alabama to the Blue Ridge of North Carolina and even to a

Table 3: USEFUL PLANTS FOR THE GENERAL BOG GARDEN

HERBS

Acorus sp.
Arisaema stewardsonii
Arisaema triphyllum , selected vars.
Darlingtonia californica
(mild climates)
Drosera species
Gentiana andrewsii
Gentiana species
Lobelia cardinalis
Lobelia syphilitica
Lysichition species
Menyanthes trifoliata
Mimulus species
Orontium aquaticum
Parnassia species
Rhexia virginica
Sarracenia, species and hybrids
Symplocarpus foetidus
Trollius laxus, eastern variety
Zephyranthes atamasco

SHRUBS

Andromeda sp. and cultivars
Kalmia angustifolia
Kalmia polifolia
Ledum glandulosa
Ledum groenlandicum
Ledum palustre
Chamaedaphne calyculata, dwarf varieties.
Rhamnus alnifolia

few places in New York. It is a wonderfully effective bog or aquatic plant. The oblong, long-petioled, pointed leaves, up to a foot long on vigorous plants, and about 4-5" wide, originate from a central growing point on the rhizome. Bluish-green or slightly silvery, the leaf surface bears minute papillae. If submerged, these papillae trap air and prevent water from adhering to the leaf's surface, giving the submerged leaf a silvery appearance and the local name "Never-Wet." The beautiful texture and color of the leaves alone make this a desirable bog garden plant. The flower stems produce no spathe, just a slender white stalk ending in a golden-yellow, narrow spadix, hence the name golden club. A mature plant produces an abundance of these clubs.

Grow golden club in shallow water, or in bog soils. It probably will be most dramatic if grown in shallow water, but we have seen whole wonderful glades in the New Jersey Pine Barrens where the sphagnous woodland openings were aglow with these blooms. While this plant grows only very locally in the interior of the country, clearly preferring the milder coastal plain, it is quite winter hardy for us in our shallow (18" deep) ponds.

Skunk cabbages, while native American plants, seem not to be used much at home. Yet they are the pride of the water gardens of the great European estates and public parks. We have two native species, and there is a closely related species from eastern Asia. *Symplocarpus foetidus* is a splendid but much maligned arum that grows abundantly in bogs, swamps, fens, and along streams of eastern North America. With the snow trillium (*Trillium nivale*), it is the first Michigan plant to bloom, often sending its characteristic spathes up in open springs in bitter February weather. The maroon-red, brownish, and yellow-green marbling of the spathe is typical, but occasional variants in pure maroon, green, or pale yellow occur. The spathe protects a knobby spadix of pistils and stamens within. By means of a special metabolism in the spathe, it is able to melt its way upward through deep snow, opening a small area surround-

ing the bloom so that it may be reached by hibernating insects which emerge on the occasional warm, sunny days of late winter. A foul odor (very faint) of rotten garbage and old coffee grounds attracts the bugs. The skunk odor, present in leaves and tissues, is not apparent unless the tissues are bruised. It is not some form of attractant but rather just a consequence of some internal cell chemistry.

Interesting as the flowers are, they are only moderately showy. It is the large, rhubarb-like leaves of very bright, clear green that give the plant its garden usefulness. For, like ferns, this is a plant to use for texture and structure along ponds and streams or as a background to other less vigorous plants in the bog. The brilliant green leaves stay in good condition long into the summer. Leaf spread of this species can be up to 4'. It is not petite. Common as this plant is in our region, it is a difficult and widely sought after plant in Europe. We saw a single, unhappy, and much coddled plant at the Royal Botanic Gardens, Edinburgh, Scotland, although we may have missed others. With its innate, curious beauty and general availability, it is surprising that so few Americans grow it.

Western skunk cabbage (*Lysichiton americanum*), a spectacular plant, is larger in all respects than its eastern relative. The longer, velvety green leaves, occasionally with dark spots, can stand up to 6' tall, although usually they are smaller. The spathe, in rich, clear yellows, may be up to a foot tall, with more of the spadix exposed than in the eastern species. Although it grows mostly in the relatively mild climate of the western coastal regions along the Pacific, it seems fully hardy in our severe climate. This plant is grown very widely in Europe and is held in high esteem. The plantings and naturalizations at Bodnant Gardens in Wales are spectacular. Unless you live in its native region and are a mining engineer, grow it from seed or very young plants; it has enormous roots.

Lysichiton camtschaticum, found in bogs, swamps, and along ponds, is from Japan to Kamtschatka, and closely resembles the western skunk cabbage, except that its spathes are a lovely pure white. Although I have had plants several times, as seedlings, I have not succeeded with it. It appears to be more tender and temperamental than its relatives here. But it is a striking and very dramatic plant. In milder climates, at least, it ought to do well in the bog garden. Hybrids with the western skunk cabbage, in pale creamy tones, were common at Bodnant Gardens.

Wild calla, *Calla palustris* (photo, Vol. 50(1):17), is another aroid that ought to be better known and more often grown. A true calla, this charming plant grows across America in sphagnum bog borders, ponds, moats, and occasionally in woodland ponds, if permanently water-filled. The plant grows from runners that roam through the moss or along shallow pond bottoms, filling the area with heart-shaped clusters of glossy, green leaves with interesting venation. In spring, or occasionally all the summer season, the flowers appear. The spathe is soft, ivory white, turning green or pinkish with age. The spadix is fully exposed, yellowish at first, turning green, then pink, as the berries ripen.

The plant is fully winter hardy—providing it is rooted under water or the creeping rhizome is covered with rotted leaves and soil. If fully exposed to the elements, the rhizome frequently dies. An early writer for the ARGS Bulletin, Nevada Schmidt of Wisconsin, grew the plant in a wooden tub on her porch with great success. It deserves to be better known.

Gentianaceae

Bog bean, *Menyanthes trifoliata* (photo, p. 144), is a gentian relative of circumboreal distribution, and in America its range follows the mountains and glacial pot-hole bogs south to West Virginia in the East and Wyoming in the West. The plant arises from a trailing, thickened rhizome which can grow equally well in open water of ponds or in beds of peat and moss. From this rhizome appear three-parted leaves (like those of cultivated beans) which stand above the water or moss surface. Flower stems up to a foot tall bear racemes of showy, starry, white or pinkish flowers. The outstanding feature of the blooms is a covering on each segment of erect, beardlike projections, giving the flower a frosted look. The beautiful blooms appear very early in the season, and the plant with its floating runners at water's edge contributes to the bog atmosphere all season. Not all collected plants of this species will bloom in our warmer gardens. We recommend that you obtain a selected form, sold by the Wm. Tricker Company, Independence, Ohio, which grows vigorously and flowers well in captivity. It is a fine plant for either bog garden or pond.

True gentians (*Gentiana*) comprise a vast and varied assemblage of plants for many habitats. Many bog dwellers are too large for the smaller backyard rock garden. Still, there are some fine plants in this genus. I comment here only on American species with which I am familiar.

Gentiana andrewsii, the eastern bottle gentian, grows to 24" in some forms and produces polished, opposite leaves. Flowers, from dark purplish-blue to clear sky-blue, occur in the leaf axils of the upper 2-6 pairs of leaves. The plant grows in moist meadows, along streams, and in non-acid swamps. The flower shape strongly resembles the older forms of Christmas tree light bulbs and appears never to fully open. Easy to grow and readily available from the seed exchanges, it is most effective grown in large masses. A program to select dwarfer, clear blue forms for the garden would be a worthwhile project. Similar to the bottle gentian, but much rarer are *G. linearis* and *G. rubricaulis*. Both native to the northern Great Lakes region, they grow in marl fens, brushy wet meadows, and on marshy lake shores

Among western American alpine species, the only two with which I am much familiar are *G. algida* and *G. newberryi*. Both are plants of great merit. *Gentiana algida* (sometimes called *G. romanzoffiana*) is circumboreal in the high arctic and extends southward in the Rocky Mountains into Colorado. It grows abundantly in alpine bog margins and peaty turf, if moist. Clusters of glossy, linear basal leaf rosettes produce, in autumn, huge trumpets of white, variously stained with blackish-purple. Size and form resemble *G. acaulis* varieties. In our midwestern hot and muggy climate, it sulks, and if it blooms, it produces stunted, miserable flowers. BUT, with such a widespread distribution, cultivable forms may occur somewhere!

Gentiana newberryi, another plant much like *G. acaulis*, grows frequently in the Pacific Northwest in subalpine bogs and peaty streamsides. Its trumpet-like flowers, sparingly produced in the Midwest, are of two forms, one whitish with purple streaks and one of soft lavender-blue with darker streaks. With flowers borne on short, wide-leaved tufts, it is a plant of quiet beauty. While not happy in our climate, it persists and does bloom occasionally.

The fringed gentians, (*G. crinita, G. procera*), grow variously in marly fens or wet sands. The Rocky Mountain *G. thermalis* grows both in the sinter surrounding geysers and in wet seepage

Table 4: PLANT PESTS TO AVOID

Azolla sp. rapidly spreading floating fern
Butomus umbellatua attractive rush-like plant with umbels of three-petaled pink flowers, but a serious pest in rivers and lakes
Equisetum scirpoides. Neat dwarf horsetail but a spreader. Seems to poison competition
Lemna sp. All duckweeds clog pond surfaces rapidly.
Lysimachia nummularia. Creeping Jenny invades lawns.
Lythrum salicaria. Invades and destroys native plant habitats by excluding nearly all other plants. Outlawed in Minnesota, Wisconsin, etc.
Nymphoides spp. Floating-heart can escape from ponds into wild habitats. Aggressive weed potential in lakes and streams.
Onoclea sensibilis. Sensitive fern is too aggressive. Spreads by creeping rhizomes and spores. A pest!
Typha sp. Aggressive, spreading; exotic species can escape into native habitats. Hard to control in ponds.
Liverworts, all species. Agressively cover all moist, shaded bog soils. Difficult to eradicate, seem to poison companion plants.

areas. Annual or biennial, the four-petaled, rich violet-blue blooms are very showy and worth growing. Because they resent disturbance, they should be sown where they are to bloom.

Waterlilies

No bog or pond garden could be complete without at least one waterlily, the ultimate in aquatic flowering plants. Commercial waterlily establishments offer a wide range of hardy and tropical species and hybrids, in reds, pinks, yellows, blues and whites. All are lovely. Several fine hardy species occur in North America and in Europe and Asia. *Nymphaea tetragona,* the small northern white waterlily, is a wonderful rarity that is native in mountain lakes and ponds in Idaho and Washington, sporadically across northern Canada from Maine to southern Alaska, and in northern Europe and Asia. A diminutive species, it has oval floating leaves up to about 4" long and 3" wide. Instead of a creeping rhizome like most waterlilies, it has a small, somewhat erect, bulb-like crown that does not run. Flowers, between quarter- and half-dollar-piece size, have four sepals arranged in a tetragon behind one or two sets of pure white petals. It is not as full a flower as some but beautiful nevertheless. I have not detected a fragrance.

The plant grows in peat bog ponds, sluggish boreal rivers, and, in Alaska, in many lakes. It has three special advantages over many waterlilies: It blooms from early afternoon until almost dark (most bloom in the morning). It comes from seed to bloom in a single season. It blooms until hard freeze. Because it is so small, it can be grown in a tiny pond or tub. If crowded, it scales itself down in size and continues to bloom—an ideal plant for the rock garden pool or bog. Unfortunately, the true plant is rarely if at all offered by dealers. We were fortunate enough to obtain viable seed of the Swedish form. It grows wonderfully well for us and has seeded about the pond prolifically. A form from just north of Lake Superior was quite difficult to handle. The best flower quality I have seen was a form from lakes near Anchorage, Alaska.

Amaryllids

Atamasco Lily, *Zephyranthes atamasco* (photo, p 142), is a beautiful flower, a native of the southeastern coastal plain and adjacent Piedmont, and bears wondrous, large, white flowers which resemble a scaled-down *Amaryllis*. Flowers arise from clumps of bulbs and clusters of narrow, strap-like leaves much like those of *Narcissus*. Leaves deteriorate at flowering or just before flowering commences. Rather frequent in parts of Alabama, the plant grows in boggy ground, roadside ditches, and floodplain swamps. It is colonial, occurring in beds of thousands in early spring.

Nothing about the range or plant companions of this species suggests it would be winter-hardy in the North, but it may be. It has wintered without special protection in a wet soil in our bog garden and flowered not once but twice this season. I would advise, however, that anyone attempting this species in the North mulch it heavily with pine, straw, or leaves over the winter. Growing this plant is worth any trouble. We have been told that one should not separate the clusters of bulbs if one wants blooms.

These are a selected few outstanding bog plants suitable to bog and pond or rock gardens. I am sure that the experienced gardener or naturalist could suggest many more. The plants I have listed are feature plants, but they alone will not make for a natural-looking, attractive bog garden. You will need to add textures and mood to the garden. Do it with natural marsh ferns, an occasional larger bog shrub, and a few carefully monitored clumps of sedge or rush. Be careful with these, as they can spread rapidly and choke out your special plants, yet the bog will not look natural without a few of them.

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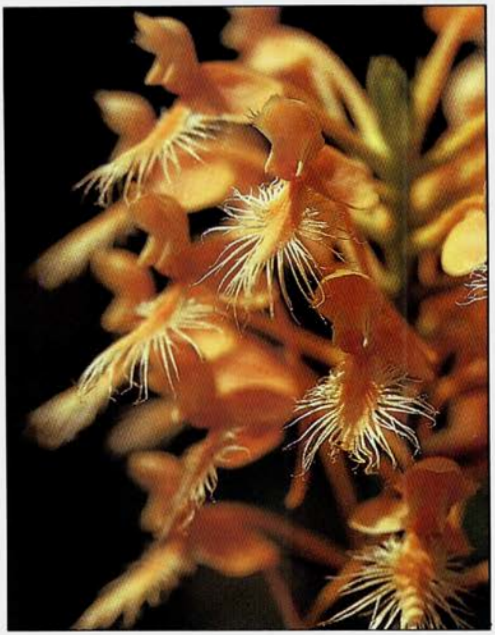
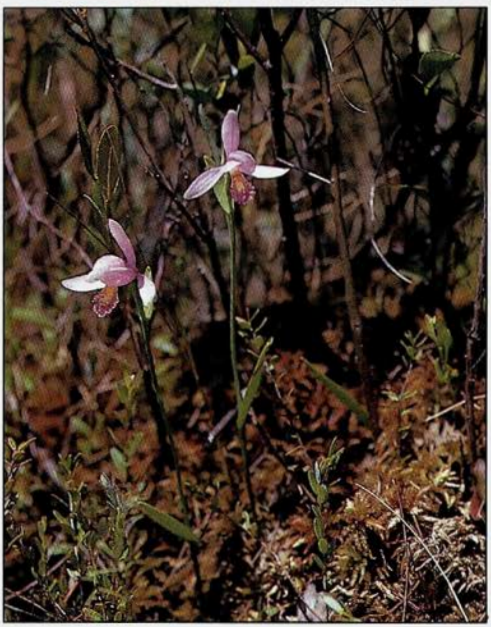
Fred Case gardens near Saginaw, Michigan. He and his wife, Roberta, travel and botanize extensively across North America. His next article on carnivorous plants for bog garden culture will appear in an upcoming issue of the *Bulletin of the ARGS.*

Calopogon tuberosus (p. 130) Fred Case

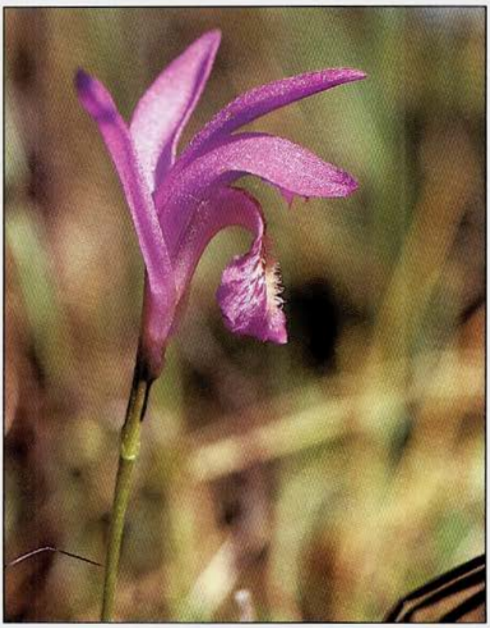


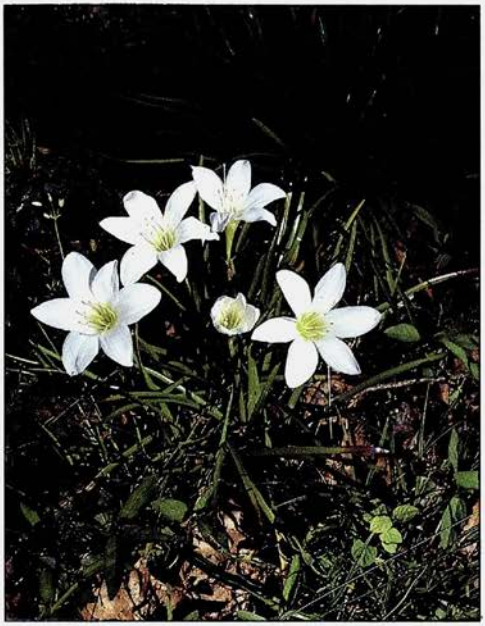
Platanthera ciliaris (p. 130) Fred Case

Pogonia ophioglossoides (p. 130) Fred Case



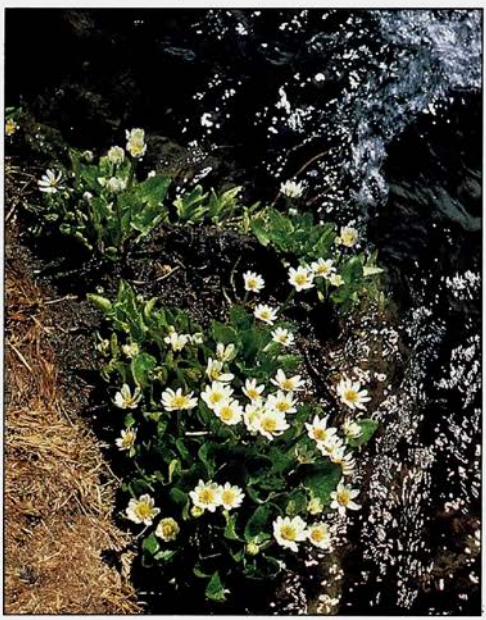
Arethusa bulbosa (p. 131) Hugh Iltis

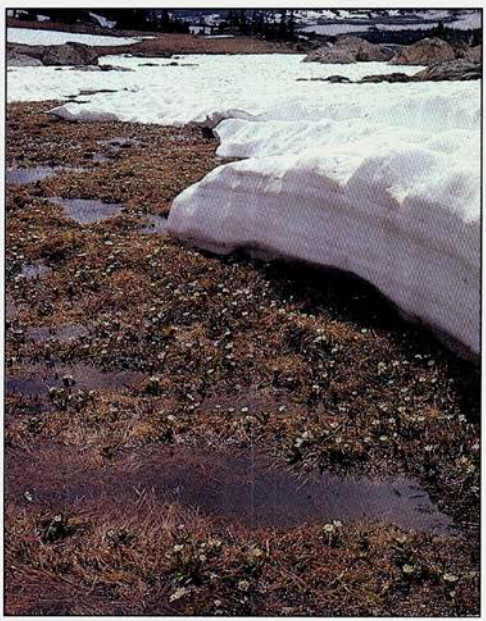




Zephyranthes atamasco, close-up and in habitat (p. 140) Fred Case

Caltha leptosepala, near stream and in snow-melt area (p. 132) left photo, Loraine Yeatts; right, Fred Case





Onontium aquaticum (p. 135)

Caltha palustris (p. 132)

photos by Fred Case

Kalmia microphylla (p. 134) Fred Case

Rhododendron canadense (p. 134) Fred Case

Andromeda glaucophylla, (p. 134) T. S. Cochrane

Menyanthes trifoliata (p. 138) Fred Case

Floyd McMullen Introductions

by David Hale

Floyd launched himself in an arc over our heads, sliding down the rope and landing on his feet near us. We were descending from the summit of Onion Peak, one of the higher mountains in Oregon's coastal range. Fred Nilsen and I had placed the rope to help Floyd, then in his late seventies, to lower himself over this 12' section of vertical drop. Whether Floyd viewed himself as a latter-day Tarzan or thought we did, he decided to go over the cliff as quickly as possible. Then, looking around he said, "Don't tell Kathleen I did that," referring to his wife.

Now, claiming with a laugh to be near death, Floyd finished the difficult descent. We were still at 2500' on an abandoned logging road when Floyd spotted a *Penstemon cardwellii* in the gravel. He immediately declared it to be a dwarf. An argument ensued over the nature versus nurture origin of this dwarf; cuttings were taken; and so was discovered *Penstemon cardwellii* 'Floyd McMullen'. This, as the Siskiyou Rare Plant Nursery catalog points out, is a fine, floriferous plant with full-sized flowers, a good performer, and in fact maintains its dwarf character in cultivation.

In 1989 Floyd McMullen was named the recipient of the Marcel LePiniec Award for his lifetime as a plant explorer and grower of plants. On their one-acre garden where Floyd and Kathleen gardened for 45 years, plants were introduced, and some very special ones occurred spontaneously. Floyd's is a garden of great diversity, with a good collection of trees, shrubs, and alpines. His knowledge about his plants was boundless. Floyd was a great observer of plant variation in nature and made many selections and introductions from our native Oregon.

For a number of years, Floyd encouraged the botany department of Oregon State University to investigate an unusual *Erythronium* on one of the coastal mountain range summits (photo, p. 123). Although he had written several times before, it wasn't until a few years ago that *Erythronium elegans* was recognized and described by appropriate botanical authorities. Floyd was not informed of the publication of this new species until he happened upon it in an article in a plant journal. This species performs well at low altitude in garden loam. This was one of Floyd's many behind-the-scenes discoveries.

Many years ago Floyd had heard rumors that there was an undescribed rhododendron or azalea growing in the foothills east of Roseburg, Oregon. He, with his son Wes, drove to southern Oregon and, with his long-time friend Marcel LePiniec, drove east along the Umpqua River to Horseshoe Bend. There, climbing far up into the hills, Floyd was the fortunate first one to spot the "new" azalea. He examined pressed specimens with his friend Professor Peck, who at first declared it a new species of *Kalmiopsis*, but later a form of *K. leachiana*. This disjunct site is about 130 miles northeast of the Curry County form of that species. In one area, it cascades over cliffs, now shady, forming hanging plants 5-6' long. Early introductions are called "Marcel LePiniec," although this just represents an early introduction of the typical Umpqua form. The Curry County form can tolerate high temperatures and dry conditions in the wild. While also dry in summer, the Umpqua form has in many places been covered over by dense forest with no apparent harm. They both do better for me grown as typical ericaceous shrubs, moist with moderate shade.

Floyd selected another distinctly different penstemon, also in the coastal mountains of Oregon, and brought home cuttings (photo, p. 123). Obviously of *P. cardwellii* parentage, the other progenitor of this selection is presumed to be *P. davidsonii* var. *menziesii* because of the toothed leaves. Unusual characteristics of the plant include the flowers, which are only two-thirds as long as the usual *P. cardwellii,* but perhaps wider, giving a plump appearance. The leaves are also short and wide, quite thick, and dark, glossy green. It is a good garden plant, even with our heavy winter rains and my summer watering. I do grow it in scree conditions, however. The flowers are a deep purple, very grape-like in color. Two names that have been suggested for this selection are "Oregon Grape" or "Floyd's Fatty." It has not yet been registered as a cultivar or offered for commercial sale.

Siskiyou Rare Plant Nursery offers another of Floyd's introductions, *Erinus alpinus* 'Picos de Europa'. Floyd always felt this plant deserved specific status. It grows in the spectacular Picos de Europa Mountains and the western end of the Pyrenees in Spain. It is much lower and daintier than the species itself, and it bears flowers of a softer pink. It should be grown apart from other selections of *Erinus alpinus,* as intermediate forms will appear and the true 'Picos de Europa' will be lost if hybridization is permitted. This plant will die in extremely cold winters when the temperature drops to less than 10°F, but it will self sow. Should you lose it before it has established itself well, be sure to beg or buy another immediately.

Many new plants have appeared spontaneously in the McMullen garden itself. The garden included several specimens of *Acer circinatum*. Under one of these appeared spontaneously over several years a dozen identically growing, small plants, less than 3' tall at 15 years of age. These are compact, and the leaves are tinted a champagne pink through much of the year. It also remains without a cultivar name. I never suggested 'Pink Floyd' after the now defunct rock group, although the thought did occur to me.

Another chance appearance was a tiny, compact version of *Mahonia aquifolium*, the state flower of Oregon. The leaves are 2 cm long and shiny green. The plant doesn't flower but forms an architecturally pleasing shrub reaching 25 cm in six to eight years, with excellent fall color. It does well in the dappled shade of open forest conditions in an acid soil.

Although there were many Pacific Coast irises in his garden, it is the color forms and variations that are the most striking to me. My favorite is the low-growing form of *Iris innominata* with rich, luminous yellow flowers. I call it "Floyd's Best" (photo, p. 123). Floyd's "Second Best" is only about 5 cm taller and of the same glowing yellow color. A selection of *Iris chrysophylla* that Floyd made in the Siskiyou Mountain area of southwest Oregon is very diminutive, only 7 cm high, but still a full-sized 6-cm flower, white with purple markings.

Many sizes and heights of *Doronicum cordatum* occurred in a peaty garden containing primulas, trilliums, and shortias. Although the heights in the wild seem fairly constant, there were plants in the garden from 10 cm to 40 cm tall. Naturally, I begged the 10-cm one, which forms a patch 30 cm across just under my dining room window.

An occurrence in his garden near *Dianthus stenopetalus,* obviously a hybrid with bright carmine flowers on a bun-shaped dome, he called "Son of Stenopetalus" (photo, p. 123). There is a mystery daphne of great age only 15 cm high with glaucous foliage whose parentage and source can only be guessed at. This and others were discovered after the tremendous clean-up of the garden that Kathleen and her son Gene did following Floyd's death in 1989. Many more treasures presumed lost have reappeared.

These are just a few of the rarities that exist in the wonderful garden the McMullens designed. Hopefully, through some of the fine nurseries in Oregon and Washington, these and other plant introductions from Floyd's garden will be made available to all.

David Hale is a plant explorer himself, especially in the mountains of Europe, South America, and Oregon. He gardens in Portland, Oregon, and on the Pacific Coast just west of Portland.

Books

Alpines in the Open Garden. Jack Elliott, 1991. Timber Press: Portland. 6" x 9"; 156 pp.; 20 color photos; 20 black-and-white illustrations. Hardbound. Price, $29.95. ISBN 0-88192-200-5.

The photographs in the bulletins of both the Scottish Rock Garden Club and the Alpine Garden Society feature such a large number of plants in pots that North American rock gardeners sometimes wonder if alpines are grown out-of-doors at all by British amateurs. This book should dispel any doubts. The author shows in photographs and describes an astonishing range of alpines growing in woodland gardens, borders, raised beds--all manner of gardens, that is, except for the hallowed "rock garden."

As in all the best garden books, Jack Elliott speaks entirely from his own experience. His experience is so vast and catholic that any rock gardener is

apt to find insights that will solve various vexing problems.

Americans will be pleased that *Eriogonum, Penstemon, Phlox* and many other of our native plant genera are treated with a familiarity we rarely enjoy in books authored abroad. Why not plant alpines wherever they might fit, look good, and prosper? Of course die-hard alpinists want this book because of Jack Elliott's plantsmanship. But even someone with only a patch of woods or perennial border can find much charm and useful knowledge here.

Errata

#@!☆@#☆@!!!

Bulletin of the American Rock Garden Society 50(1): Winter 1992.
Photo, p. 41, upper right. Winter "phyllodia" present may be from a *S. oreophila* growing nearby, or may be deformed leaves. The photo was taken in August, and Dr. Mellichamp stands by the identification of the big leaves as *S. alabamensis* ssp. *alabamensis*.
Photo, lower right, p. 42 is of *Sarracenia purpurea* "Louis Burk", not *S. flava*. Photo by C. Bramblett .
Photo, upper right, p. 42 is of *Sarracenia flava*, photographed at Blackankle, NC.
Photos, upper right and lower left, p. 61, are callunas, not ericas.

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EDITH EDDLEMAN is bullish on *BULBS*
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GWEN KELAIDIS is batty about *BUNS FOR BERMS*

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Cuttings from a Rock Garden*, by H. Linc Foster & L.L. Foster	$23.00
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Back issues of the ARGS Bulletin are available. Following items are postage paid: Decal—ARGS Dodedcatheon, $1.25; "Seeds-3 methods," $2.50; "Troughs-construction and plants," $3.50; Library Binders, $6.00, $7.00 overseas. This is only a partial listing; most titles listed in the last issue are still available, as are many additional books.

Please mail inquiries and orders to:

Ken Nitschke (517) 835-4325
American Rock Garden Society Bookstore
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