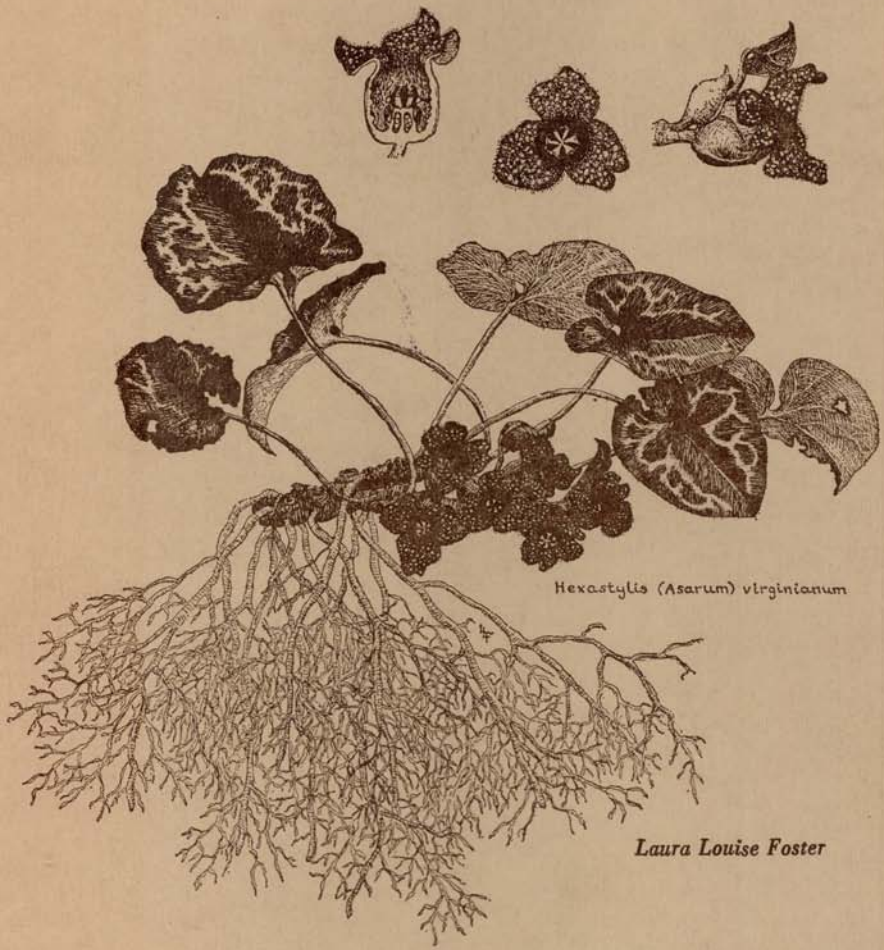

Bulletin of the American Rock Garden Society

Vol. 35 Winter, 1977 No. 1

The Bulletin

Contents Vol. 35 No. 1 Winter 1977

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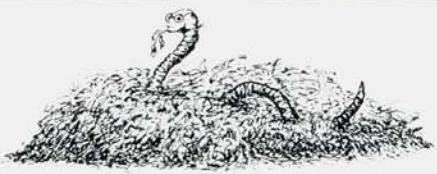


THE COMPOST PILE

THE ANNUAL MID-WINTER STUDY WEEKEND

At the invitation of Mrs. Erastus Corning, II, we met in Albany, N.Y. Despite winter weather of a ferocity rarely experienced by most of us, attendance was high, approaching 200. The program, arranged by Lincoln Foster, focused firmly on a subject of the most central concern, namely the culture of plants in the rock garden. The hotel "was a miracle of rare device, A sunny pleasure dome" in fields "of ice."

A plant show was an innovation that will certainly become a feature of future study weekends. A full report will appear in our spring issue.

On Saturday morning Anita Kistler described her method with seeds. Herewith a brief resume — for dilatory sowers. Her basic mix consists of equal parts garden loam, compost, and builders' sand. For seeds such as cortusa, cyclamen, douglasia, gentiana, hepatica, primula, soldanella, and woodland plants she adds sand and compost (1 loam, 2 compost, 2 sand). For seeds demanding sharp drainage, such as aethionema, dianthus, penstemon, and townsendia, she adds sand (1 loam, 1 compost, 2 sand). Anita does not sterilize her soil, fearing loss of nutrients and loathing the smell in the kitchen. ("That's right," said Howard Pfeifer, "don't sterilize, but pasteurize at 180°F for one half-hour.") Sow in December, January and February. Prick out before June 15, start again about August 20, thus avoiding handling during the summer muggs.

Among a wealth of valuable hints were the following: Soak cyclamen seeds for 24 hours; avoid letting choice dianthus varieties become pot-bound; dodecatheon species are easy, but keep the seedlings in pots for a year to prevent them from shooting out of the ground in the first winter. Do not let the pots dry out for a single day after March 1.

Pots are put out under the protection of shade cloth, which breaks the force of driving rain. Even so, some seeds will move from pot to pot, so separate pots of the same genus.

The following seeds are planted in the open garden, but only in prepared areas where they have a chance of surviving: *Anacyclus depressus*, annual androsaces, *Anemone pulsatilla*, *Antirrhinum asarinum*, acquilegia, draba, eranthis, erinus, gentians, gladiolus, gypsophila, jeffersonia, linaria, mentha, *Papaver alpinum*, *Saxifrage cymbalaria*, thlaspi, trillium.

Later that morning Frank Cabot showed us slides of the choicest of the choice plants, both in the wild and as grown by superb plantsmen, both here and abroad. Frank's talk was moving and filled with a sense of wonder; and if, in fact, there is little chance for most of us ever to see such plants in the wild or grow them in our gardens, we can at least hope that one day — maybe — if we live long enough — A man can dream, can't he?

A clue to Frank's remarkable record as a competitor in plant shows: a misting system in his alpine house, controlled by a hygrometric "leaf". Of this we hope to hear more anon.

In the afternoon members talked about their favorite plants. Marny Flook's choices were: *Arenaria montana*, *Anemone nemorosa*, *Hutchinsia alpina*, *Astilbe chinensis pumila*, *Shortia galacifolia*, and *S. uniflora*, *Cassiope lycopodioides*, *Rhodendron racemosum*, *Gaylussacia brachycera*, and *Soldanella montana*. Bill Brown chose *Edraianthus serpyllifolius*, *Rhododendron radicans*, *Viola pedata*, *Saxifraga* 'Cranbourne', *Lewisia cot. hyb.*, *Gentiana acaulis*, *Douglasia vitaliana praetutiana*, *Haberlea rhodopensis* var. *virginalis*, *Lewisia tweedyi*, and *Cuthbertia graminea*. Ellie Brinckerhoff unfortunately could not attend — she had to protect her house against the elements — but her list consisted of six gentians *(GG acaulis*, *verna*, *asclepiadea*, *septemfida*, *scabra*, 'asiatic hybrids') and *Laurentia tenella*.

Harold Epstein refused to pick a list of favorites, and indeed his vast knowledge and experience would have made the task difficult for him. Of his prizewinning Japanese Garden-on-a-rock we will hear more in our next issue.

After the banquet Dick Redfield, one of our society's very favorite speakers, talked about the history of the garden in Closter, N.J., and of the problems of moving to northeastern Connecticut. He has promised us a version for publication in the *Bulletin*.

The next morning Howard Pfeifer talked of his trip to Newfoundland and of the interesting dwarf vegetation to be found there. The program concluded with Viki Ferreniea's talk entitled "Of Soils, Seedlings, and Surprises".

It would be invidious to attempt to pick out the best performance in such a rich program, so I must be content to say that the final talk was not an anti-climax. Viki talked most knowledgeably about the limitations

of our knowledge; about how a plant would succeed in one position but would fail a foot away; about microclimates and subtle soil differences; about how sometimes, after the event, we could tell why a plant succeeded or failed and how then we must report our discoveries — preferably, I might add, in the pages of the *Bulletin*.

Which brings me to a rather complicated subject. Some of our members, to judge from letters that come in, wish that there was more specific instruction in the *Bulletin* on how to grow our wildlings. This, to judge by correspondence in past issues, has always been the case. There are, no doubt, legitimate grounds for complaint, but it is also true that no one can grow a difficult plant — and most of our choicest plants are difficult — because someone else tells him how to do it. Every garden, and every gardener, is unique. We must always adapt such hints and instructions as we receive, and such observation as we may make of others' practice, to our own situation, which includes our own habits. Above all, we must always experiment; and we must continuously propagate so that we have material for experiment. If we do so, happy and triumphant surprises will drive into oblivion our grief for losses.

Of course books and articles, lectures and conversations, are important, but despite the aid of such sources — and nobody is holding back any secrets — I still can't grow *Viola pedata*.

In some areas precise instruction is directly usable by the gardener. A case in point is Adelaide Minogue's detailed account in this issue of a method of rooting cuttings under lights. Here the environmental factors are under complete control.

A quite different utility is to be found in Dr. Lionel Bacon's piece, also in this issue. Few of his plants are suitable for us. His climate and soil are both radically different from those found in most parts of this continent. But we can all learn from the adventurous high plantsmanship that permits him to grow plants from many parts of the world in a small area. There are screes and moraines, peat beds, bogs, and a pond, and special beds for plants gathered on his travels — these protected by plastic tents in the winter.

Which brings me to Ronald Beckwith's talk which opened our proceedings in Albany. Ron was trained in England but works as an horticulturalist in Massachusetts. He knows both worlds and speaks with authority. Americans often attribute the very high standards of British horticulture, and of rock-gardening in particular, to the moderate British climate. Not so, says Ron. The climate in England is better in some ways, worse in others. What puts the British ahead of us is the spirit of adventure, the constant experimentation, and invention of devices such as the alpine house, and the close observation of microclimates.

Ask not what your plants can do for you, but what you can do for your plants.

Note: The *Index* for Vol. 34 of the *Bulletin* of the ARGS will be combined with the index for Vol. 35 and will appear in Vol. 35, No. 4, Autumn, 1977.

THE WILD GINGERS

H. Lincoln Foster, Falls Village, Conn.

The tribe of the Asarums, the wild gingers, contains upwards of twenty species in the north temperate parts of the world: in Europe, in eastern Asia, and in North America. Wherever found, they are remarkably similar in appearance, forming a low growing herbaceous mat from shallow, ginger flavored, spreading rhizomes. The short branches of these rhizomes give rise at thin tips to a single or a pair of long stemmed leaves, heart shaped, kidney shaped, or occasionally more spear shaped, either deciduous or evergreen. At the base of the leaves, on short peduncles are produced tubby, three-cleft flowers in shades of olive green, brown, and purple.

The leaves of the genus, some of which are marvelously mottled with silver, are elegantly proportioned with a bold clear shape. Closely clumped together they form a ground cover of architectural distinction among the low herbage of the woodland flora.

There is, however, a curious modesty among these gingers that leads them all to conceal their flowers beneath leafy petticoats. Yet it is upon the shape and size of these gnomish blossoms that botanists distinguish one species from another. The structure of these flowers also determines inclusion in the Birthwort Family, the *Aristolochiaceae*. The name Asarum is derived from the Greek "asaron" for some obscure plant, while the family name is composed of two Greek words: "aristos" — best; and "lochia" — delivery, from the purported use of the plant in aiding childbirth.

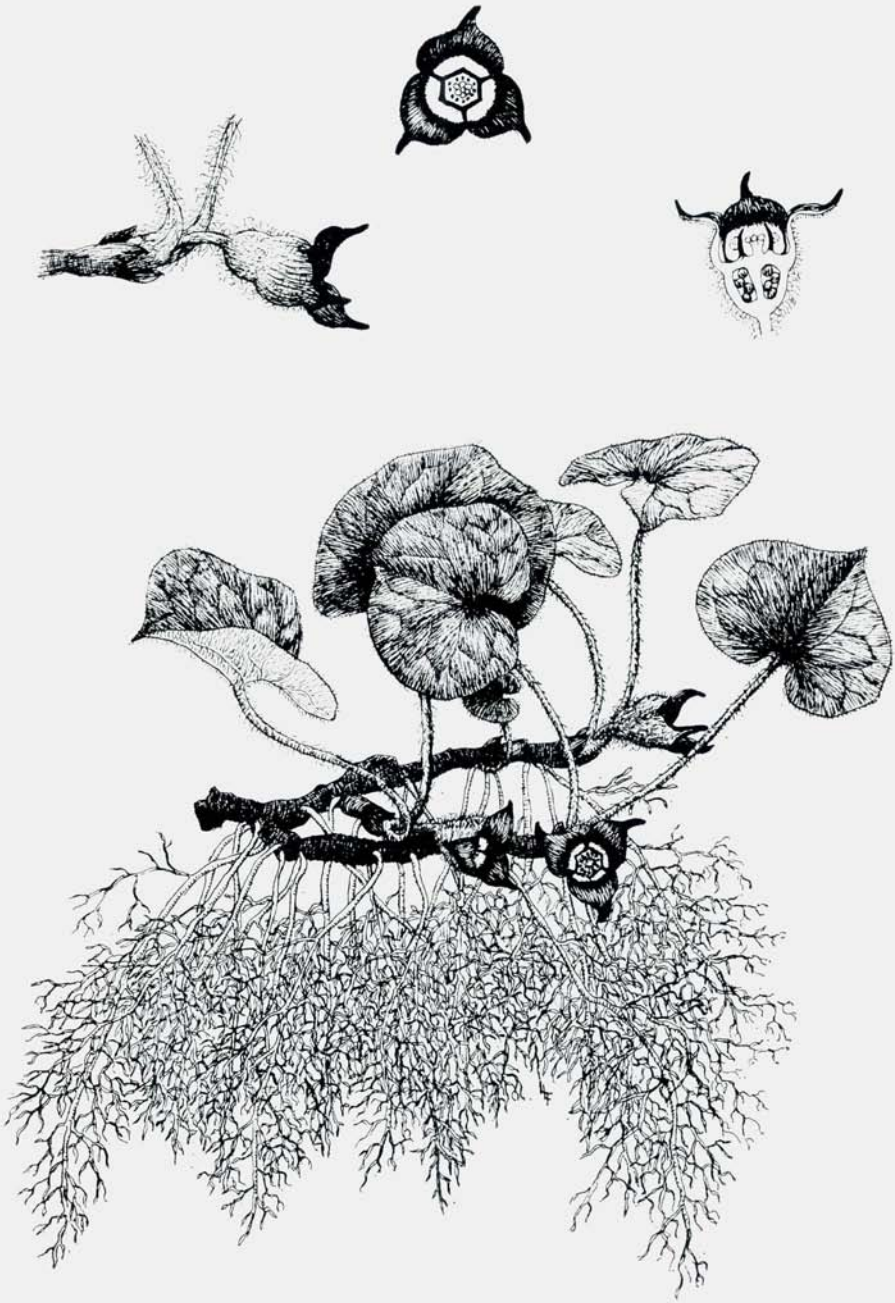
The common name, Wild Ginger, aptly describes the rather pungent flavor of the rhizomes, which have been used, either dried and pulverized or candied, as a substitute for the true ginger root, and also much employed in earlier times to concoct a perfume.

These plants are rarely listed among the choicest natives for inclusion in the woodland garden and, indeed, were rather scornfully dismissed by Farrer: "But for the rock-garden these glossy dwarfs have no charm but their evergreen quaintness, the flowers being not only of no value, but decently concealed beneath the foliage."

One can only wonder to what rhapsodic heights the same author might have risen if the Asarums mounted their blossoms on waving stalks above the foliage. Just visualize a plant with the thick, splashed leaves of *A. shuttleworthii* at the base, brandishing aloft on stout mottled peduncles a full cluster of Asarum flagons; stout, swollen, intricately eared, speckled and brooding in exotic colors.

As they are now structured, and for sound evolutionary reasons to be explored later, these goblin flowers lie flat upon the ground. There is something primitively pleasurable about rummaging at the base of the plant to finger and peer into those tubby blossoms, curiously heavy textured, oddly shaped, secluded, and suggestively serpentine. Fit habitation they are for the devil; secretive, sexual, and seductive.

The American species fall into two divisions: the deciduous eastern *A. canadense*, plus two western species, *A caudatum* and *hartwegii;* and the more southern evergreen complex, by some botanists placed in a separate genus *Hexastyl*is, meaning six-styled, on the authority of that early wayward plantsman, Rafinesque, who based his decision on the quite different arrange-



Asarum canadense

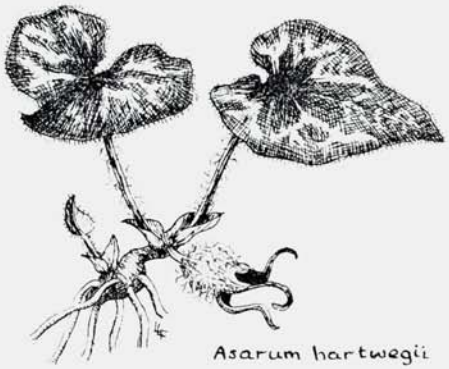
Laura Louise Foster

ment of the sexual parts. Europe provides two evergreen species of Wild Gingers and Asia a group of deciduous ones.

A. canadense, found in rich woodland sites from eastern Canada to Minnesota south to North Carolina, Kentucky and Illinois, begins to unfold the pungent crumpled membranaceous leaves very early in the spring sending forth also in that same chilly season the solitary flowers at the base of a pair of leaf stalks, these opening frequently beneath the carpet of tree leaves deep and fluffy from the fall of the previous autumn. Especially in its early stages the whole plant is downed with soft pubescence. Later the heavy textured leaves spread their long stemmed blades, broadly acuminate at the tip and deeply heartshaped below. The flowers of the typical species are composed of a fleshy three-parted calyx forming a tub-like wrapping about the basal ovary. This flagon, purplish-green and wooly outside is smooth and creamy within. The three-parted lip is enameled on its inner surface with a deep plum-purple glaze that runs in three thin lines from the partings of the calyx into the base of the cup where it forms a hexagonal band around the ring of twelve rich maroon stamens. These spring from the flattened top of the ovary which is embedded in the fleshy base of the flower. The pointed tip of each stout filament extends well above the elongated anther that clings to its outfacing surface. The six pistils, fused into a short thick column, rise within these encircling menhirs.

This secret and dungeon flower, in the chilly spring days, by ability to raise its temperature, lures into its darkened halls early fly-like insects to perform the rites of fertilization as they move from one intoxicating tavern to another to ensure the mingling of genes from a diversity of individual plants.

Though on superficial inspection all specimens of *A. canadense* look identical, botanists have created three varieties, in addition to the typical, based on the shape and carriage of the pointed calyx lobee: *acuminatum*, *reflexum*, and *ambiguum*.



In many ways even more exotic are the blossoms of the western deciduous Asarums: *A. hartwegii* and *A. caudatum*. Here the lobes of the three-parted calyx are elongated into attenuated curlicues and the whole greenish-purple flask is long persistent until the fat thick seeds burst forth from the enclosed ovary. Ants, doubtless attracted by the eventual breakdown of the seed envelopes, may play a role in the distribution of the seeds. There

is no information about this in the literature available, but the fact that various species have sown in my garden at a distance from the original plants rather beyond mere gravitational effects suggests a possible auxiliary agent.

The two westerners have more glossy leaves than their eastern cousin and *A. hartwegii* is especially attractive by having its polished green leaves splashed with ample silvery splotches. One wonders, sometimes, why silvery markings on the leaves, as in the Rex Begonias and other plants, hold such an allure for gardeners. Photosynthesis must be reduced in those areas of the leaves so decorated and should therefore be negatively selective. It is worth pondering.

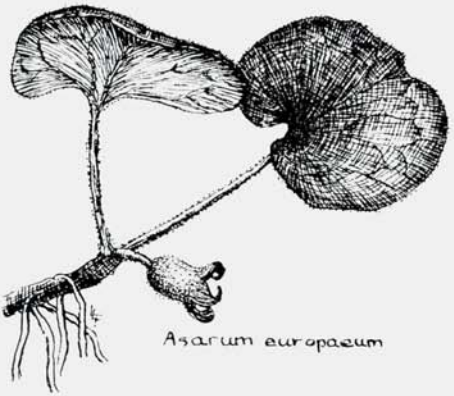
For beauty of foliage the *Hexastylis* species in the southeast United States are preeminent, and there the common name for the Wild Gingers is more often Heart Leaf. The leaves, on long, stout brownish petioles, are broadly heart shaped to rounded spear shaped, thick and leathery. They are a light green beneath with prominent veins and much darker on the upper surface, tinged occasionally with dark red and frequently decorated with an intricate pattern of lighter reticulations and maculations. These leaf variations occur in all the different species, some almost kidney shaped while one, *H. arifolia* has arrow shaped leaves.

Based on the size and shape of the flowers, with special attention to the length of the three calyx lobes, the authors of the *Manual of the Vascular Flora of the Carolinas* recognize eight distinct species, somewhat more than other botanists. With the possible exception of *H. arifolia* it is probably sufficient for horticultural purposes to make two principal separations based on the size of the flowers, remembering that the urnlike blossom is really a calyx with three pointed lobes. In one group we may include *HH. virginica, maniflora, minus,* and *heterophylla.* In these the calyx is 1 to 2.5 centimeters long. In the other group, which includes *HH. shuttleworthii* and *lewisii* the calyx is from 2.5 to 5 centimeters long. Time of bloom may also play some part in this division, *H. shuttleworthii* blooming much later in the season, in June and July in our New England garden, rather than in late April and May as does its look alike *H. virginica.*

The larger flowers of these last two species are especially striking when they are explored after a probing beneath the leathery leaves; fat, thick textured, streaked with green and maroon on their outer surface they last long, late into the season before decaying to release the seeds. Their flaring three parted lips are most marvelously speckled and dotted on their inner surface with subtle colors against the sueded tan to mulberry-purple hide. Deeper in, these jugs are variously ridged with fleshy vermiculations. Amidst them one can visualize strange gnomish rites, secret and seductive. Or as one observer said about a mature plant that had a close packed clutch of blossoms at its base, "It looks like a nestful of baby birds with gaping beaks." A hill country man native to the woods where these gingers flourish is reported to have commented, "A real passel of young sarpints coiled up and ready to bite."

To return briefly to botany and taxonomy for a moment while on the subject of the blossoms of Wild Ginger, the *Hexastylis,* unlike the Asarums, carry their hemispherical stigmas facing outward near the apex of the six styles. These are pointed at the tips, which are more or less

split into two parts. These styles, instead of being united into a single column rising from the center of the top of the ovary as in the *Asarums*, are fused to the sides of the ovary and enclose it. The filaments of the twelve stamens are in turn fastened to the basal portion of this crown of styles, their anthers pressed tightly against it.



With less exciting flowers but decorative leaves are two evergreen *Asarums* of Europe: *AA. europaeum* and *caucasicum* with blunt open heart heart to kidney shaped leaves of lesser substance than those of the American *Hexastylis*. In Asia the species tend to be deciduous and similar to *A. canadense* though one species. *A. sieboldii*, is so variously mottled in the leaves that Japanese fanciers once recorded up to seventy variants. Some of these also have flowers of considerable interest, *A. macranthum* of eastern China and Formosa with rich purple-brown blossoms two inches across with wide, wavy, yellow margined lobes, and *A. caudigerum* with lobes extended into long curly tails of 1 inch or more. Unfortunately neither of these are hardy.

The Wild Gingers are not plants that elicit exclamations from your garden visitors, but are for display to the observant few. A collection of the deciduous and evergreen species along some shaded path in the woodland garden provides occasion for a close examination, with a discerning friend or on your own, of the varied leaf shapes and textures and the discreet display of flowers. This inevitably leads to those friendly disputes about distinctions among species. The final gesture, of course, is to extract a rooted rhizome with attendant leaves and a solitary flower and, as you tuck it into the plastic bag to toss off a remark like, "I find this one particularly pleasant. I believe it's *Asarum*, or if you prefer, *Hexastylis lewisii* but I can't be sure. At any rate I think you'll like the foliage and the flowers are worth scrabbling for."

All the species are readily propagated by division at any time during the period of active growth. They thrive best in duffy soil, well shaded. In fact they are among the few of our woodlanders that will flower well even in dense shade. The various species tend to self sow, but experiment shows that one must wait two years for seed to germinate and another two for seedlings to give good account of themselves. I think the wait is worth it.

THE USE OF FLUORESCENT LIGHTS IN ROOTING CUTTINGS FOR THE ROCK GARDEN

Adelaide E. Minogue, Bentonville, Va.

Many ardent rock gardeners have neither the space nor the means to provide sophisticated equipment such as a greenhouse, an alpine house, or even a cold frame to assist them in rooting their cuttings, but are none the less desirous of propagating at least a few of their choice plants. These plants may be favorite performers in the spring or summer rock garden but unsuited, because of adverse climate or situation, to overwinter reliably in a particular garden. A gardener faced with this problem must resort either to obtaining new plants in the spring, or to taking cuttings in the fall that he may root and carry through the winter. It is also frequently desirable to propagate plants that are perfectly hardy in the situation in order to provide more really good tested plant material for the landscaping. A mass planting of one variety of plant, if space permits, is generally more effective than a spotty arrangement of a number of different kinds of plants haphazardly grouped together. For these reasons, and because propagating in itself is a very interesting process that may be closely observed indoors in the winter time, the use of a spare cool corner of the kitchen or utility room and a set of fluorescent lights may be highly recommended.

1. Lights

We are all aware that green plants need light to develop and grow. Even cuttings that have leaves but no roots are kept alive by light, so that the provision of a reliable source of adequate intensity for a sufficient length of time each day is of major importance. It has been found that fluorescent tubes provide the best possible source within the means of the average gardener. They are cool, which is important, easily obtained, inexpensive to set up and operate, have a reasonably long useful life, and — best of all — they work. A 4-foot 2-tube fixture equipped with two standard cool-white tubes has been found perfectly adequate for propagation and is easily obtained at any hardware store as a standard "shop-light".* This fixture usually comes equipped with a white reflector and chains for suspending it from the ceiling. It should be set up over a sturdy bench or table space of at least two by four feet, which is to be used for the propagation boxes, and suspended or set on legs so that the tubes will be 12 to 16 inches above the table space. The area selected for this arrangement should be well away from any furnace or heat source so that the air temperature may be maintained between 50° and 70°F. The lower range is more desirable as it is important to delay top growth, which warmth encourages, until after roots are well advanced.

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* Eight-foot tubes are more efficient (also more expensive), and if space and interest are great enough, it would be well to consider them. The so-called growth lights of different kinds may have longer life, do have more red in their emission which helps blooming plants, but are much more costly and no better than the standard cool-whites for propagating use.

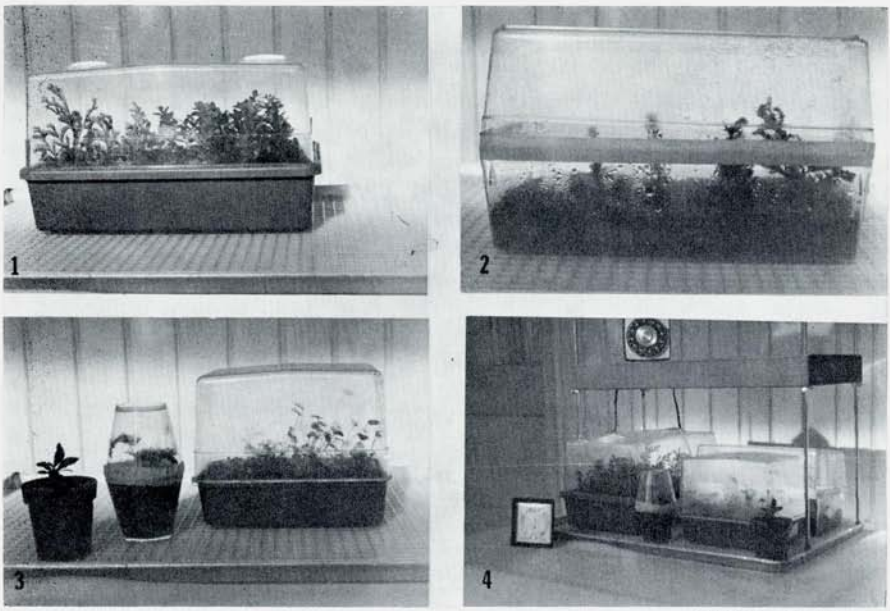
In order to automate this set-up, it is recommended that the lights be plugged into a timer set for a 12 to 14 hour day. This gives sufficient light for encouraging the cuttings to live and grow without forcing, and permits a dark period with attendant temperature drop, which is also of some value. A pair of tubes used at this rate for a six-month period in the winter should last effectively for two seasons. As tubes age the light drops off but the energy consumption does not, so that it is wasteful to keep ordinary commercial tubes in service much past 5000 hours.

2. Trays and heating cable

Shallow waterproof trays to hold cutting boxes should be provided. Two standard 18" x 24" x 1" galvanized drip pans, obtained from auto supply stores, fit nicely under the 4-foot fixture and can easily be fitted with a 12-foot electric soil-heating cable that is provided with a thermostat set at 70°F. This soil temperature has been found ideal for stimulating root growth. In order to avoid hot spots and to provide a more even temperature the cable, after being spread out and anchored in the trays with masking tape, should be covered with clean sand or something similar to a depth of half an inch. Plastic "egg crate", which is the half-inch grid commonly used to diffuse the light from fluorescent fixtures in elevators or other commercial installations, may be cut to fit the trays and makes an excellent base for the cutting boxes. It may usually be obtained from plastic dealers or building supply houses. The sand, stone, or "egg crate" in the trays should be moistened with water (about 1½ quarts per tray) to improve the humidity in the ambient air and to help in distributing the heat evenly over the entire surface area. It will be necessary to replenish the water at frequent intervals as it evaporates rather rapidly when the heating cable is operating. The whole system of the size described will use from two to three kilowatts of power a day.

3. Propagation boxes

There are a number of sizes and types of propagation boxes available from horticultural suppliers; most of them are very easy to use and quite satisfactory. They consist essentially of an opaque plastic container with a rigid clear plastic cover equipped with some ventilation device. For our purpose, using them in conjunction with lights set up as described, the size 9" x 14" x 8" high has been found most practical. Four of these may be accommodated efficiently under a 4-foot fixture, allowing for a bit of waste space at the ends of the tubes where the light is less intense, and rooting will be less effective. If standard propagation boxes are not available, however, it is perfectly possible to provide some home-made substitute such as clear plastic shoe or sweater boxes. Two such boxes will be required to make one propagation box: one to hold the rooting medium, and the other inverted over it to provide the close cover needed. The fact that these boxes contain neither drainage holes nor ventilation arrangement seems to be no drawback. The boxes should be kept tightly closed in any event during the early stages, and after rooting is well advanced and ventilation becomes desirable, the plants may be set into individual containers and placed in a hardening-off environment for further development. It has been found that even a pair of clear plastic tumblers may be employed successfully for one cutting.



Adelaide E. Minogue

Types of propagation boxes: (1) *Commercial type with movable vent,* (2) *Two shoe boxes taped together,* (3) *Plastic tumblers taped together and small commercial type with open vents,* (4) *Complete set-up: various kinds of boxes, timer, and hygrometer.*

4. Rooting medium

The number of materials used and advocated for rooting cuttings is almost as many as the number of gardeners involved. Each ingredient and each mix should help in some measure to provide suitable conditions for the maintenance of the cuttings in good health until roots form, and to encourage growth afterwards. What is needed is a material that is reasonably sterile, to lessen chance of infection by noxious insects or fungi, moisture retentive, to keep the cuttings in a turgid state, and yet well drained. There must be open pore space so that there will be sufficient oxygen in the root zone to encourage active growth.

Many use a clean coarse sand, horticultural vermiculite, perlite, peat, or bits of calcined clay, alone or in combination, with good success. In the light garden arrangement, when some of the containers used may be without drainage, it is found that peat, sand or vermiculite, if sufficiently moistened, tends to pack into a dense wet mass without the pore space. Perlite is so lightweight that it does not provide enough stability to support the larger cuttings and it also tends to dry out rapidly.

The Cornell mix of peat, perlite, and vermiculite, or some variant obtained commercially, is satisfactory for an all-purpose rooting medium, or a home-made mixture may be prepared without much effort. Two parts by volume of peat moss (Canadian or German) mixed with one part horticultural perlite all mixed and screened through 1/4-inch hardware cloth, produce a material of practically ideal physical quality. The peat retains the moisture while the perlite provides the essential aeration, and when it is suitably moistened, it works very well either with or without drainage

in the propagation boxes. In practice it is well to sterilize the mix unless the ingredients are taken from newly opened containers or have been kept in a clean situation. Sterilization of small quantities can be easily carried out by heating in the oven at 200°F for one hour. The mix should be moist and in a shallow pan. This treatment will effectively kill stray weed seeds and most fungus spores. After baking and cooling it is advantageous to add some nutrients that will be available to carry the young plants on until transplating may be accomplished. In this way the plants may be carried through the whole winter in their small quarters, if necessary, without inhibiting their growth appreciably. If the propagating space is limited to one 4-foot fixture this may be of primary importance. It is therefore recommended that a slow-acting source of the three essential nutrients (NPK) be added. A practical formula that provides enough mix to fill one 9" x 14" box follows:

2 quarts Canadian or German peat moss, screened
1 quart horticultural perlite, coarse or fine
2 tablespoons blood meal (11 to 14% organic nitrogen)
1 tablespoon ground dolomitic limestone
1 tablespoon superphosphate

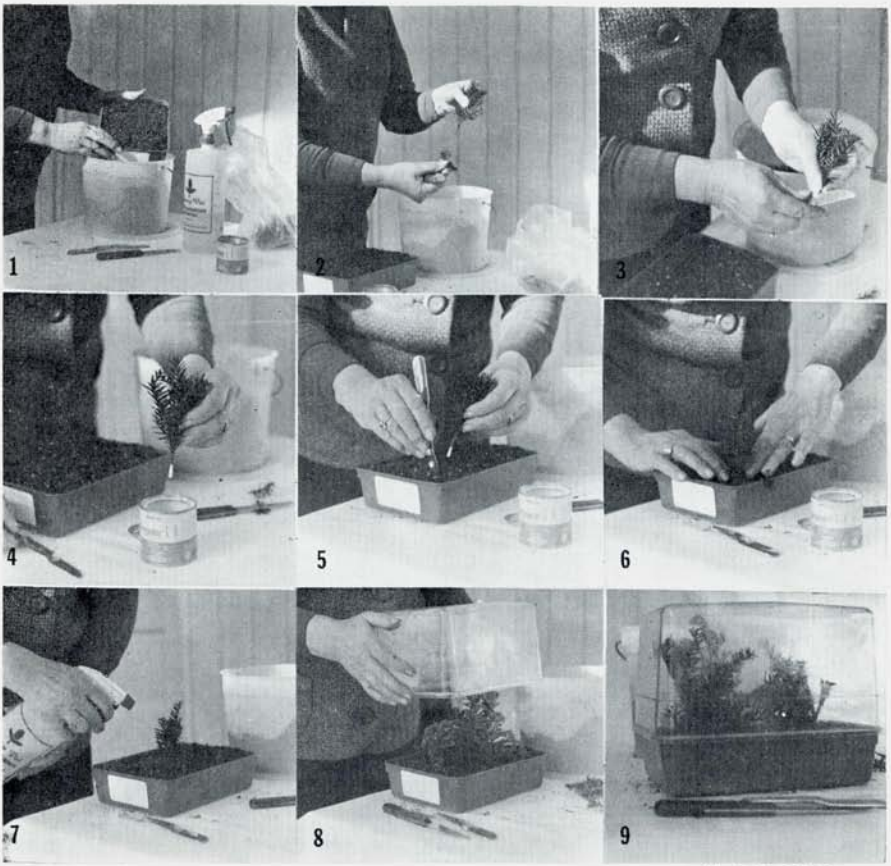
The materials should be mixed dry and then moistened to the proper degree by adding warm water which has been fortified with any one of the available all-purpose water-soluble fertilizers added at no more than about one fourth the recommended strength. This not only provides instantly available nutrients with trace elements, but perhaps as important, a wetting agent that makes moistening the dry material quick and effective. Enough water should be added so that a handful when squeezed will cling together lightly, but no free water should be noticeable. The propagation boxes should be prepared with about a three inch depth of the moistened material, shaken down and leveled off but not pressed down.

5. Cuttings

There are in general two types of cuttings, evergreen and herbaceous, that may be rooted under lights. Their treatment is very similar but the evergreens may take from three to six months to strike, whereas many of the herbaceous sorts may be brought along in as many weeks. Evergreen cuttings may be made in the late fall after the current year's wood has hardened but before it has become dessicated by winter exposure. Such plant material will have ample time to produce plants that will be in condition to set directly into the garden in the spring. The herbaceous cuttings must of course be taken somewhat earlier while the plants are still in active growing condition. Due to space limitations in a light garden, the larger plants probably should not be considered, nor is it any advantage to take large cuttings of even the smaller plants. The system is excellent for propagating choice dwarf conifers, azaleas, box, daphnes and some small rhododendrons, but is not very practical for the large-leaved sorts because of their greater space requirements. The ultimate choice though rests with the interests of the gardener.

5a. Evergreen cuttings

The cuttings should be gathered from stock plants that are in good condition on the day before setting them, so that they may be completely



Adelaide E. Minogue

Steps in preparing and setting an evergreen cutting: (1) *Filling propagation box with rooting medium,* (2) *Stripping leaves from lower inch of stem,* (3) *Cutting bark from one side of stem,* (4) *Dipping stem in hormone powder,* (5) *Inserting cutting,* (6) *Firming mix around stem,* (7) *Misting cutting,* (8) *Covering with transparent top,* (9) *Ready to set under lights.*

immersed in warm water for twenty four hours. This treatment removes soot, dirt, and any insects from the leaves, and allows the cuttings to take up water as necessary. If the cuttings are turgid there will be less danger of flagging during the first days after they are set.

After the plant material has been washed and soaked, the cuttings to be used should be made not more than four inches tall of well shaped material. All the leaves should be stripped from the lower one inch of the stem which is to be inserted in the rooting medium, and the bark cleanly cut from the lower half inch on one side of this stem. This will expose some cambium and provide a larger area for roots to form. The stem is then moistened and dipped into a hormone rooting powder of suitable strength. About 1% indole butyric acid ("Hormodin No. 3") is suitable for dwarf conifers and many woody plants. This powder coating not only provides a stimulus for root formation but also protects the cuttings from fungal attack. Cuttings so treated are then set into the prepared

propagation box by carefully opening up a small space in the rooting medium and dropping the cutting into it. This method should leave the powder intact on the stem as the cutting is inserted. Afterwards the material should be firmed around the stem. As cuttings are set into the box there should be no leaves buried or loose on the surface, and each one should be free-standing without touching another. After the box is filled sufficiently, the cuttings should be misted, covered with the plastic top (taped in place if necessary), and set on the tray under the lights. If the tray is kept moist by adding water from time to time as needed, and the lights are kept on a 12 to 14 hour day with a timer, no further attention should be required for several months. As long as moisture condenses on the covers of the containers, no misting will be required, but if droplets are not in evidence, the covers should be removed, the rooting medium remoistened and the cuttings misted. It is desirable to use lukewarm water for any such treatment.

If clear plastic shoe boxes or something similar are used, eventually the roots may be clearly seen through the bottoms of the containers, but in any case rooting will be found to be well advanced when the dormant buds begin to break into new growth. At this point the new plants may be set into individual pots for further development if space is available. Plastic pots are recommended for this step as they are light-weight, provide good volume of soil for their size, and most important, prevent the evaporative cooling and accelerated drying that is characteristic of porous pots. If additional space is not available, the plants may be left in the boxes with some ventilation provided, but they will develop more rapidly if transplanted. At this stage they should be given more light by increasing the day-length to sixteen hours. The use of the heating cable should be discontinued gradually if warmth is adequate, and careful attention should be paid to watering from this time on. The same soil mix may be used for this potting as for the initial rooting, and lukewarm, very dilute fertilizer solution used for moistening as needed, with special care to avoid overwatering. It is important to maintain high humidity around these new plants by setting the pots directly on the "egg crate" grid, sand, or crushed stone in the tray. These materials should be kept wet, but the pots themselves must never be allowed to come in contact with the water. Alternate methods might include placing the pots into some partially enclosed terrarium, in individual plastic bags left open, or tenting the area with a large piece of sheet plastic left open a bit to allow for some air circulation around the plants. The plants in this way will be gradually hardened-off and acclimated to the outside conditions before the time comes to set them into the outside garden. A relative humidity of close to 50% should be maintained in the air around the plants. A hygrometer set nearby will indicate if extra moisture is needed. If it is, a portable humidifier may be set up, but frequent misting often is all that the plants require. The gardener should always be aware that the fluorescent lights, although a relatively cool source of illumination, do generate some heat and are activated by ballasts which also produce heat, thus lowering the relative humidity.

5b. Herbaceous cuttings

The general method described above is also applicable to the propagation of many of the herbaceous plants. In some cases they must be vegetatively

propagated because they do not produce viable seed or are special cultivars and do not come true from seed. Very small stem or cushion cuttings (depending on the nature of the plant) may be taken in the fall before frost and set into the boxes after treatment with a rooting hormone. It is not desirable to cut slivers from the stems of these green cuttings; rather, the ends should be cleanly cut. In this case the strength of the hormone powder should be about one-tenth of that used for woody plants, or of the order of 0.1% indole butyric acid or equivalent ("Hormodin No. 1" or "Rootone"). Higher concentrations may burn the soft tissues before roots can develop. Many herbaceous plants will root satisfactorily under the lights without the hormone treatment, but the fungicidal properties of the commercial rooting powders are helpful. It is quite likely that not all the cuttings will root in any case, and those that are obviously dying — that is, turning brown or dropping leaves — should be removed to avoid the possible spread of any infection present, and to provide more space for the good ones to develop. It is to be expected, however, that if good clean stock is used and if conditions are kept favorable, a very high percentage of the cuttings will produce plants. Some may take much longer than others, even of the same variety in the same batch; and some kinds of plants naturally root more slowly than others even when optimum conditions are provided. It is easier to have patience if we bear in mind that we can do no more than encourage the very complex growth process by giving favorable environment, close surveillance, and any care that good husbandry suggests. Nature itself must carry through.

HOW TO GROW: *DRYAS OCTOPETALA*

Norman C. Deno, State College, Pa.

Few plants are more characteristic of the circumpolar boreal flora than *Dryas octopetala*. This fact alone would make it treasured by alpine gardeners, but it is also sought after because of its fine large flowers, close mat-like growth, and crenulate deep green evergreen leaves like tiny oak leaves. No wonder that it takes first rank among the plants that every rock or alpine gardener desires to grow. Farrer christened *Dryas octopetala* "the sovereign of alpine shrubs."

Dryas octopetala belongs to the *Rosaceae* as is evident by the circle of countless stamens and the center brush of many pistils. The specific name *octopetala* signifies eight-petalled, a feature which seems to be characteristic. The flowers stand on stems several inches long and average two inches in diameter. Individually they are perfect, but they never bloom with such abandon as to hide the foliage as does *Phlox bifida* or *Arenaria montana*. There is a tendency for the flowering period to be strung out so that they spangle the mats instead of covering them. The main flush of flowers is in May (in Central Pennsylvania), but flowers appear sporadically throughout June to August, particularly after rains.

The beauty of the seed heads has often been described and photographs are often shown of the plant in seed. The seed heads are much like those of a Pulsatilla and lend themselves to easy harvesting. As a result, *Dryas octopetala* seed is always offered in the seed exchange lists. Our experience, however, is that this seed is either sterile or difficult. We made several

(continued on p. 45)

A HAMPSHIRE ROCK GARDEN

Dr. Lionel Bacon, Winchester, England

My wife and I came to live near Winchester in Hampshire (England) twenty-five years ago. We brought a few plants with us from our previous garden, and straightaway set to and built a small rock garden. Over the years this has steadily grown, and we have attempted, by making special provision, to cater for an ever wider range of plants. The latter part of this article is concerned mainly with these "special areas".

Our garden lies upon chalk. The soil is a light calcareous marl, easily worked, rapidly draining, and deficient in humus. It is of course unsuitable for calciphobe plants, and indeed we have come over the years to realise that without modification our soil is inimical even to some plants which will tolerate a slow release of calcium: lime and chalk, we think, have to be viewed very differently by the gardener. So much of our effort is directed towards making special provision for more or less calciphobe plants.

Our other main problem is frost. We are at the lowest point in a hollow about a mile and a half long and half a mile wide; and on clear nights the freezing air lies like a pool across the garden. Not that it is a cold garden by the standards of our friends in northern and eastern England and Scotland. The winters generally are mild and moist, with little snow-cover, and with warm spells in January or February that promote young new growth susceptible to the night frosts which are liable to descend upon us in almost any month of the year. Add to this that we have a particular affection for many of the plants that grow in rocky areas around the Mediterranean, and you will see that frost-protection is the second of our two main types of special provision.

But before coming to our "special areas", let me tell you something of the rock garden generally; for although it is the "specials" that make the heaviest demands upon our time and energy (sometimes, be it admitted, quite disproportionately to their garden value) the greater part of the garden is planted with ordinary good showy colourful easy rock-plants. Ease of cultivation is of course a relative matter, and plants that are "easy" in one garden are not always so in another: a few will thrive on harsh conditions and neglect, but for the majority, even of "easy" plants, certain basic requirements have to be met. We do not have any drainage problems: quite the reverse — our soil needs added humus, both for water-retention and for food. Also when it is dry it tends to cake into a pan which seems acceptable to many plants, but I think for others it is perhaps deficient in aeration. So in all our rockwork construction we have added to our native soil an equal proportion of a mixture of roughly equal parts of peat, leafmould and sand. These same three ingredients, with the addition of a little bone meal, are applied about once a year as a top dressing.

The stone in our rock garden is mainly Purbeck limestone (our nearest and therefore cheapest source), which is yellowish-white when freshly quarried, but weathers to a neutral grey. It comes in blocks and slabs, basically cuboid, and so is fairly easy to use. We have always attempted to lay it in a natural way, aligning the strata; and in recent years (the whole rock-garden is constantly under re-construction) have paid even greater atten-

The front lawn and rock garden in February. *Dr. L. J. Bacon*

tion to this, aligning the stones by compass. The essential unit of construction, repeated many times over, is a bluff or escarpment, made in most cases partly by digging down and partly by building up, planned so that the steeper faces are towards the west and south and the shallower slopes towards the north and east. The aim has been to make each bluff appear to be emerging naturally from the ground (a garden upon rock, not rock upon the garden); and the bluffs are "life-size", not miniature mountain-ranges.

The rock-garden was set in a lawn, and a good deal of this remains between the bluffs; however, the central part was lowered, so that the rock-work and parts of the lawn slope down to a pool. Apart from the obvious provision that this makes for water and waterside plants, it has also facilitated the construction of special beds, such as a wet peat-bed, which will be described later; and also we hope provides a slightly moist microclimate in the summer.

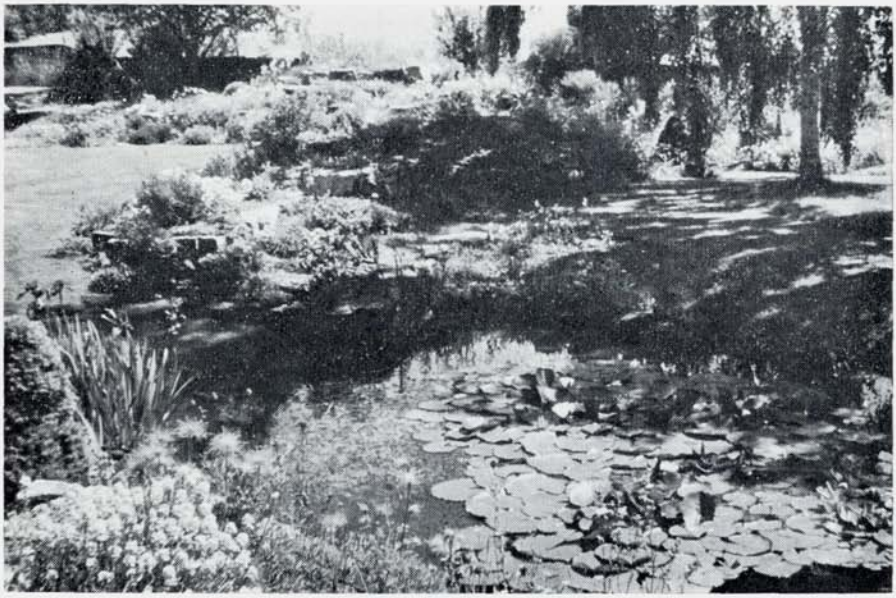
Two large weeping silver birches in the lawn near the pool are a highly valued feature of the garden. They also provide some useful shade — though indeed this is becoming excessive now that the trees are so tall; and of course they create a bit of a problem when their leaves are shed on the garden and into the pool in the autumn. A small hazy copse at the south corner gives local shade, and is an especially attractive feature in the winter, when the hellebores, hepaticas, anemones, snowdrops, etc., delight us in January. The hazel is an excellent tree for this purpose: we shear away all the bottom growth and keep the trunks clean up to six feet or so, and treated in this way the hazels give lightness in the winter and shade in the summer that seems to suit these plants very well — and the hazel catkins are a delight in the winter sunshine.

Much of the garden, however, is in sun, and many, even among our "easy" plants, are I think not very happy in continuous full sun throughout the summer days. We put such plants on the more northerly exposures

so far as possible, and also make use of shrubs to provide shade for other plants. My favourite shrub for this purpose is *Potentilla fruticosa* in its many varieties of leaf and flower colour and of habit. All but the most dwarf and spreading forms can readily be trimmed to provide shade for smaller plants on the north side below them: their deciduous habit is I think an additional advantage, allowing some winter sun on to the plants to which they give summer shade. Another delightful deciduous shrub which we use in the same way is *Ononis fruticosa*, with rose pink flowers among small neat toothed leaves. The cistuses, and some of the taller hebes, are used for a similar purpose; but these are evergreen, giving deep shade in winter as well as summer. *Daphne tangutica*, *Syringa palibiniana*, *Ecsallonia* 'Gwendoline Anley' and *Rhododendron hirsutum* also give useful shade. Dwarf conifers are rarely of a shape that allows them to be used in this way. We are not great conifer enthusiasts, but have a number of them, which I regard as a valuable part of the setting (just as are the rocks) in which the flowering plants are grown: they add much to the architecture of the rock garden, and come into their own particularly in the winter, when there is little flower colour, and especially do they contribute to the scene when frost or a thin covering of snow accentuates the form of the rock garden, giving it a distinctive beauty which no other part of the garden can emulate.

Our taste in plants is catholic: the only requirement is that a plant should, in our eyes, look well when planted in the rock garden. In such a matter, tastes will differ, and indeed our own tastes have changed somewhat over the years. Plants which we have seen in the wild acquire a new status. I suppose that before we saw the stout thirty-inch columns of *Lilium croceum*, with its huge scarlet-orange blossoms, in the mountains of northern Italy we would never have thought of it as a plant suitable for the rock garden: but now it is there and we rejoice in it. Similarly with *Lilium*

The copse in early spring. *Dr. L. J. Bacon*



The pool in June. *Dr. L. J. Bacon*

candidum from northern Greece, and *Asphodelus albus* from southern France. An interesting discovery has been that, even in a small rock garden (ours occupies I suppose about one-eighth of our two-thirds acre plot — work that one out!) quite large plants, such as those I have just mentioned, can look well provided that there are enough of them, carefully placed.

We grow large numbers of bulbs, and particularly rejoice in our "February show" (which in some years comes in March) of crocuses, galanthus and narcissi, followed later by chionodoxas, scillas, romuleas, etc. Most of these grow in the ordinary rock garden, requiring no special treatment. The only problem they present is that their foliage after flowering gets untidy and tends to smother other small plants: I cut it back (usually in two stages) with sheep-shears, and have found no evidence that either the survival or the flowering of these bulbs is affected in subsequent years. We grow a number of forms of *Erica carnea*, and particularly value these from November to March when they add warm colour and act as excellent foils for the spring bulbs. *E.carnea* is of course lime-tolerant: I doubt if it ever occurs in nature on naked chalk, but it seems happy enough on our chalk modified with peat, sand and leafmould.

We grow a limited number of annuals — or rather, we let them grow. Such plants as *Legousia speculum-veneris*, *Omphalodes linifolia*, *Campanula patula*, *Silene armeria*, *Aethionema saxatile*, *Erodium cicutarium* and *Briza maxima* seed themselves around and make a most valuable contribution to the garden. Some of these are perhaps biennials, or even short-lived perennials, but whatever their technical status their continued presence in the rock garden depends upon self-seeding. We aim to recognise their seedlings and spare some of them when we are weeding, though truth to tell lack of time means that our weed-control is not so strict as to create a threat to them!

The rock garden is on the whole heavily planted: if I can put, let us say, *Anemone blanda*, *Colchicum agrippinum*, *Sedum cauticola* and perhaps a bit of one of the forms of *Campanula cochlearifolia* all into one hole I feel I have done well! The biggest problems of course arise with plants like aubrietas, arabis and *Campanula carpatica*, which tend to overlie their neighbours in late summer and leave bare patches, with perhaps a corpse or two, when they are cut back. We are continually experimenting with plant-associations which will overcome this problem. We are particularly fond of that handsome sprawler *Vicia onobrychioides:* it is herbaceous but, starting into growth in late spring, will rapidly cover a square yard with its trailing stems carrying their brilliant blue flowers. It associates well with spring bulbs, for these flower before the vetch sprawls over them, and their leaves do not seem to be any the worse for being smothered. Pink-flowered *Coronilla varia* behaves in much the same way, though with a greater tendency to form spreading underground stems which need to be pulled out hard where they are not wanted; and this again associates well with spring bulbs. But of more interest and value, I think, was an accidental planting of *Lilium pomponium* alongside the coronilla: for two or three years past the lily has cheerfully pushed up through the coronilla, topping the latter with its vermilion flowers. Some, no doubt, will shudder at the thought of mixing pink and vermilion! — It is my personal view that you can combine any colours you like in the rock garden provided that the quantity and range are sufficient, so that no pair of clashing colours is conspicuously dominant over the general colour mass. So now I have put some *Lilium bulbiferum* plants (very easily raised by popping some bulbils into a pan two years ago) under the same coronilla — and perhaps a plant or two of *L. pyrenaicum* will be put there too if my seedlings mature as I hope. Another plant that grows all mixed up with the coronilla is *Convolvulus cantabricus*, and this is *not* a successful combination colour-wise, because the convolvulus flowers are of the same hue (but slightly less saturated) as those of the coronilla, and though attractive in their own right they are lost in the mass. Another very successful (and quite accidental) planting was of *Daphne blagayana* and *Genista anglica*. They started alongside one another, but the gorse has grown to two feet or more across (and eighteen inches high), and now the daphne is growing up through it: daphne's singularly unattractive bare legs are hidden in the gorse, and the terminal leaf-sprays and white bunches of flowers emerge dispersed above the yellow flowers of the genista.

It is in June that the rock garden is at its most colourful, and the main contributors are the phloxes (forms of *Phlox subulata* and *Phlox douglasii* in particular) and the helianthemums. The phloxes are wonderful plants: they do not pose the problem inflicted upon us by aubrieta and arabis of needing to be cut hard back after flowering, leaving wide bare areas. We simply trim them lightly to the shape and size required, and this can be kept more or less constant. Similarly we trim the helianthemums to size after flowering, usually in August: after a few years they tend to get woody, and do not make good new growth after the trimming, so we keep selected forms going by cuttings and scrap the old plants. The mossy saxifrages, whose cultivar names are legion (but I find it adequate to think of four kinds — large and small pink flowered, large and small

Dr. L. J. Bacon

Colchicum agrippinum — a superb summer-flowering plant for the rock garden.

white) perform well on a north slope or under a shrub that gives light shade: they are none the worse for being constantly trimmed back, and their neighbours are very much the better for it. There are some spreaders that I regard as harmless and acceptable: *Oxalis magellanica* is one — obviously one does not let it get into the screes where it might smother smaller precious plants, but most plants seem to be able to compete very satisfactorily with it, and it provides a neat green sward with pretty white flowers as an added bonus. *Linaria striata* gives valuable colour in the late summer with its soft lilac flowers over neat glaucous foliage; but it is a menacing underground spreader, and must be pulled out in hunks where it is not wanted. The survival (or failure to do so) of plants that are overlain by for instance *Linaria striata* is interesting: some plants seem to need abundant air and light for their health, while others emerge when the linaria dies down in the winter fresh and clean and bonny. I suspect that in some cases it is not so much smothering that may do damage as the protection given to slugs and snails, which attack the smaller plants: others, especially perhaps woolly ones, are no doubt more prone to attack by moulds in moist airless conditions.

Plants that flower into the late autumn are especially to be welcomed. I mentioned that the soft pink flowers of *Convolvulus cantabricus* are lost in the *Coronilla varia;* but in late summer, when the coronilla has shot its bolt, we cut it hard back, and the convolvulus blooms on for a time. Another late flowerer is the charming and delicate and very distinct little *Dianthus nardiformis*, which blooms from July until the frosts come. One of our most highly valued plants is *Colchicum agrippinum*, whose fine show of delicately tesselated rose-lilac flowers fills an awkward gap in late August and early September: its leaves too are much more acceptable in the rock garden than those of *C. autumnale*, and though it does not set seed it

multiplies abundantly by division of the corms. *C. autumnale* (together with the more showy species and cultivars) we relegate to the rough grass at the edge of the drive: *Pulsatilla vulgaris* too has been established here, and the grass is not mown until the foliage has died down in the summer.

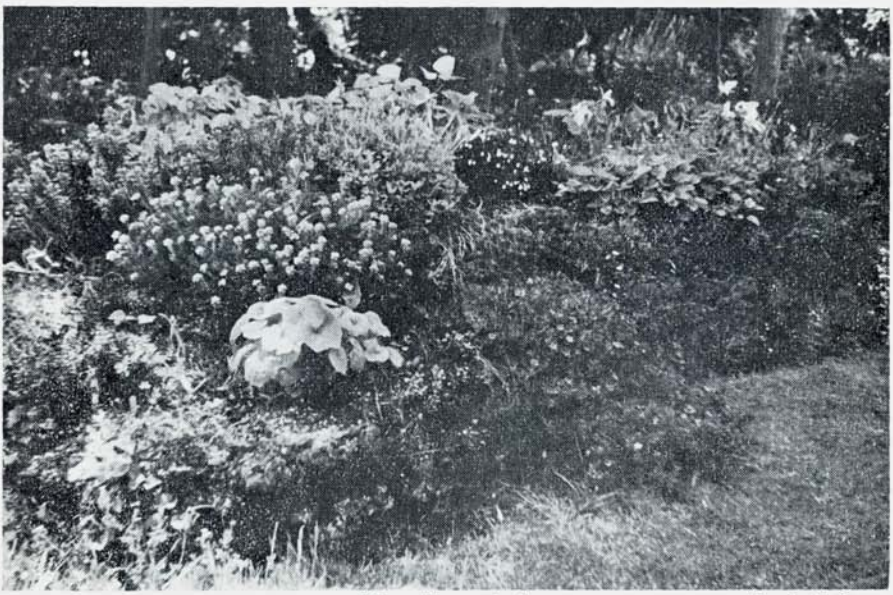
Turning now to our "special areas", these include beds especially designed for calciphobe plants (two peat beds and two lime-free screes), two (the "Spanish bed" and the "Greek bed") with protection against frost, another scree protected against winter wet, several limy screes, a small bog, a wall, two areas which though not claiming to be lime-free are heavily enriched with peat and leafmould, two small banks of tufa, two beds (one limy, the other lime-free) designed for high alpine turf plants, the copse already mentioned, the "Treat-'em-Rough bed", and last but by no means least my wife's alpine house.

I suppose that in any rock garden there are plants which have some garden value but are over-rumbustious at the expense of their neighbours. The "Treat-'em-Rough bed" was made for such plants: they are put in it and left to fight it out, and those that go under die unmourned. The bed is set into the lawn, and the lawn-mower maintains a cordon sanitaire round it. One little oddity in this bed is the peloric form of *Linaria vulgaris*, which our daughter found growing wild on the chalk downs near our home. The little 5-spurred regular flowers with pinched noses are interesting, and that's about the best that can be said for them: it has the invasive habit of the type plant but not its beauty. The peloric form seems to be fixed in this clone of *L.vulgaris:* last year fully peloric flowers (and also some partially peloric flowers with several spurs and lips) appeared transiently among the normal flowers on *L.striata* and *L.anticaria*, possibly induced, I suspect, by minute traces of the weed-killer 2-4-D. Twenty years ago we acquired from a Seed Exchange something called "*Linaria alpina* (red form)". It certainly wasn't *L.alpina;* but ever since then we have had every year showers of annual linarias with foliage generally resembling that of *L.alpina* and flowers of all colours from purple to yellow — many very pretty, some not. I fight a running (and mainly losing) battle to eliminate them, except from the TR bed, where they can go as they please. A spreading centaurea from Spain, thymes, *Campanula rapunculoides*, *Prunella grandiflora* and *Satureia subspicata* are among the crowded and quarrelling population of this bed: between them they keep out most of the weeds. There is also a large plant of *Daphne tangutica*, which lends a certain distinction to the bed: it grew too large for its niche in the main rock garden, and was hoofed out, leaving a seedling behind. I would add that this bed, in spite of its name and its isolation, contains a rock bluff and is designed to accord with the general pattern of the garden. It is alongside the drive, and various plants such as the linarias and a very nice little erodium (perhaps a form of *E.cicutarium)* from Spain seed down into the gravel, where they flourish. We keep this corner of the drive free of weed-killer, and in particular grow in it *Oenothera acaulis (taraxacifolia)* and two yellow ones whose names I have not been able to sort out.

Our earliest attempts to cater for lime-hating plants were made by digging down and cementing off areas which were then filled with peaty lime-free soil. The cement had holes in it for drainage. The first of these areas

was made 25 years ago when we first came here; and one or two plants such as *Erica vagans* (whose calciphobia I suspect is not very severe) still survive in it. But on the whole this method was not very successful. Limy soil washes in from the sides, and probably is brought up by worms through the drainage holes.

Ten years ago we built our first raised peat bed. This was on the north side of the hazel copse: we foresaw that excessive drying out would be a problem, and thought this would be minimised by putting it in shade. It was built some twenty inches high, and, against advice, I used for the walls dried out peat blocks of the sort sold for fuel. I was told they would never moisten, and plants would not root into them: but I regarded them as equivalent to rock, and the longer they remained tough and unbroken the better. In fact it has worked well. Plants *do* root into them, and they have acquired a very effective coating of lichen: there has been remarkably little sinkage in the ten years, and the main damage to the blocks has arisen from the tearing out of large flakes by the blackbirds. The bed has given us great pleasure. Erythroniums and trilliums have flourished, and ericaceous shrubs (dwarf rhododendrons, phyllodoces, cassiopes, bruckenthalia, etc.) have survived and flowered, though not perhaps with the lushness and abandon that one would expect to see in an acid garden. Watering has always been a problem: I use rain water when this is available, but am not too much worried about using limy tap-water, which I would suppose is washed through by the rain. I have been more worried by the thought that moles (which from time to time have invaded the peat-bed) and earthworms would bring calcareous soil up from below, and if I were to re-make the bed I would put layers of polythene and wire netting under it: however, I have never seen any evidence of chlorosis in the plants in this bed. A more serious fault, I think, is that it is too much in the shade: the hazels have grown a lot since the bed was originally made,



The old peat bed. *Dr. L. J. Bacon*

and I think some of the plants would grow and flower better if they were in at least partial sunshine. In particular the Asiatic gentians of the *G.sino-ornata* group did not do well in this bed, though whether from lack of sun or from lack of moisture I am not sure.

So, in 1972, when the present pool was dug, I built a new peat-bed alongside it, and the front part of the bed was built actually in the pool, the lower peat-blocks being in the water. This bed is in good sunshine for most of the year, but the upward seepage of water keeps it moist. Some plants have done well. *Shortia uniflora* and *Schizocodon soldanelloides*, after sitting almost flowerless for seven years in the old peat-bed, immediately flowered well on transference to the new one. Cassiopes have grown better, but I would not say that they have yet flowered better. Other plants that have done well in this moister and sunnier peat bed are *Gentiana saxosa*, *Primula clarkei*, *PP.warshenewskiana*, *nutans* and *viali*, *Cyananthus sherriffiae*, *Crocus banaticus* and *Saxifraga oppositifolia* and *S.aizoides*. The petiolarid primulas are notoriously difficult in the south of England; but *P.gracilipes*, though remaining small, has grown and flowered for the past two years between the peat blocks on the north side of this bed. The Asiatic gentians continue to disappoint us: the first year in the new bed we thought they were going to do well, but they have largely disappeared. A possible explanation is the heavy infestation of this bed last year by crane-fly larvae: also the severe droughts of the last two years have meant that the water-level in the pool could not be maintained, so that upward seepage of moisture into the peat-bed was limited. We shall go on trying.

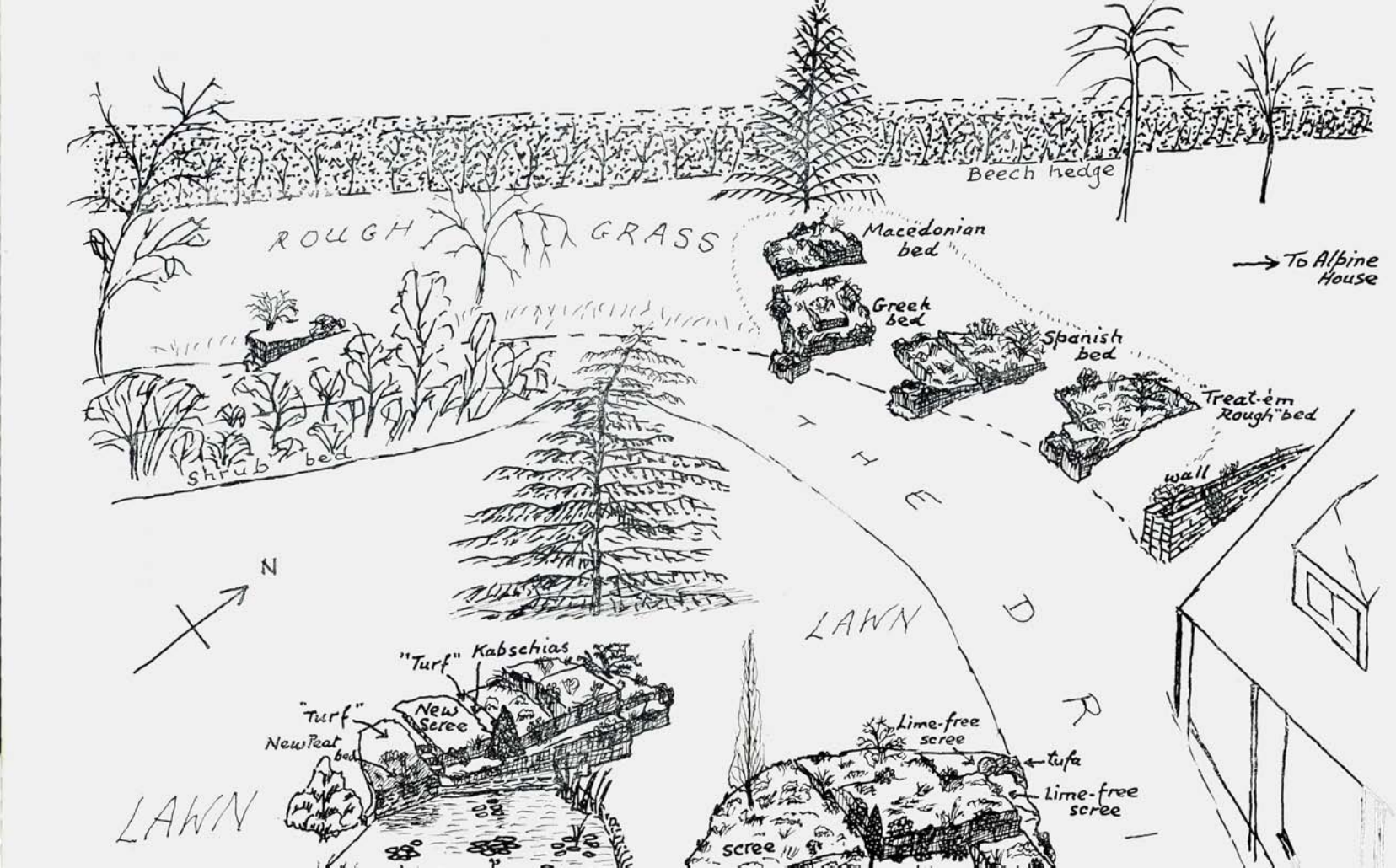
This peat-bed is separated off from the surrounding limy soil by thick polythene sheeting, which seems to have a remarkably long life when it is not exposed to the light. The bed is continued back, away from the pool, into a drier area which was designed for calciphobe turf plants from the European Alps — plants such as *Primula minima*, *P.glutinosa* and *P.hirsuta*, *Androsace carnea*, *Pulsatilla vernalis*, *Gentiana verna*, *Dianthus pavonius*, *Campanula alpina* and many others. These are plants which in the wild tend to grow in high alpine acid turf, very wet in the spring, relatively stoneless, and rich in humus. Some of them, e.g. *Primula hirsuta*, grow also as crevice plants, but tend to be in a very acid humus-rich soil in the crevices, while others, such as *Gentiana verna*, though they may grow on calcareous formations, still tend to be in acid soil overlying the rock. The idea was to try to have them close-planted in such a soil — peat and finely sifted leafmould with some sand but no coarse grit. There were some initial successes: *Primula minima*, transferred from a scree where it had failed to flower for years, immediately flowered well, and so did *P.hirsuta*. But on the whole it has been a failure. It dries out too quickly: I think this a matter of construction. The polythene separation from the adjacent soil means of course no lateral seepage of water, and the base slopes down towards the pool. I think the idea is worth pursuing, and I shall try to reconstruct it, making it deeper and with a stepped base. A similar bed, for a similar purpose (but not aiming to be lime-free) has also been subject to excessive drought.

We have two lime-free screes, which, like the beds just described, are separated off by polythene. They are less subject to drought, partly because they are made more deeply and partly because, as in any scree, the stone

below the surface tends to retain a film of moisture even when the surface is dry. We find that deep-rooting plants do well in them, but there is a problem in getting small plants established. The smaller aquilegias, like *A.kitaibelii* and *A.thalictrifolia,* have done well; and *Douglasia laevigata, Primula latifolia, Saxifraga caesia* and *SS. squarrosa* and *retusa, Campanula caespitosa* and *Phyteuma hemisphaericum* are among plants which have grown and flowered well in these screes. But there have also been a very great many losses, particularly of aretian androsaces, and in this second summer of drought in 1976, when watering was not permitted, the screes became graveyards with serried ranks of tomb-stone labels. One plant that has done emphatically well in the limefree screes is sorrel *(Rumex acetosella,* I think): I suppose that if one is perverse enough to provide for calciphobe plants in one's chalky garden one must expect calciphobe weeds. However, the sorrel proved to be anything but calciphobe: not content with penetrating the two square yards of a lime-free scree, it spread out into the chalk and invaded 40 square yards or so, necessitating a major reconstruction operation — and the sorrel still turns up here and there.

One of the two lime-free screes carries a sheet of polythene over it in wet weather in the winter. To do this I made four metal sockets, about two inches square (by beating a piece of galvanised iron sheeting with a hammer round a length of 2" square oak) and sank them a few inches into the ground: these receive the feet of a simple framework to which the polythene is attached, so that it is held 9 or 10" above the soil, sloping so that water runs off it. The idea of this was simply to keep rain off some high alpine plants in the scree, particularly aretian androsaces. I can't say that it has been very successful: in fact I found that although no direct rain fell on the scree, in humid weather it was always damp.

Kabschia saxifrages in the limestone scree. *Dr. L. J. Bacon*


Beech hedge
ROUGH GRASS
Macedonian bed
Greek bed
Spanish bed
Treat-'em Rough" bed
wall
To Alpine House
shrub bed
N
LAWN
THE DRIVE
"Turf" Kabschias
"Turf"
New Scree
New Peat bed
LAWN
Lime-free scree
tufa
Lime-free scree
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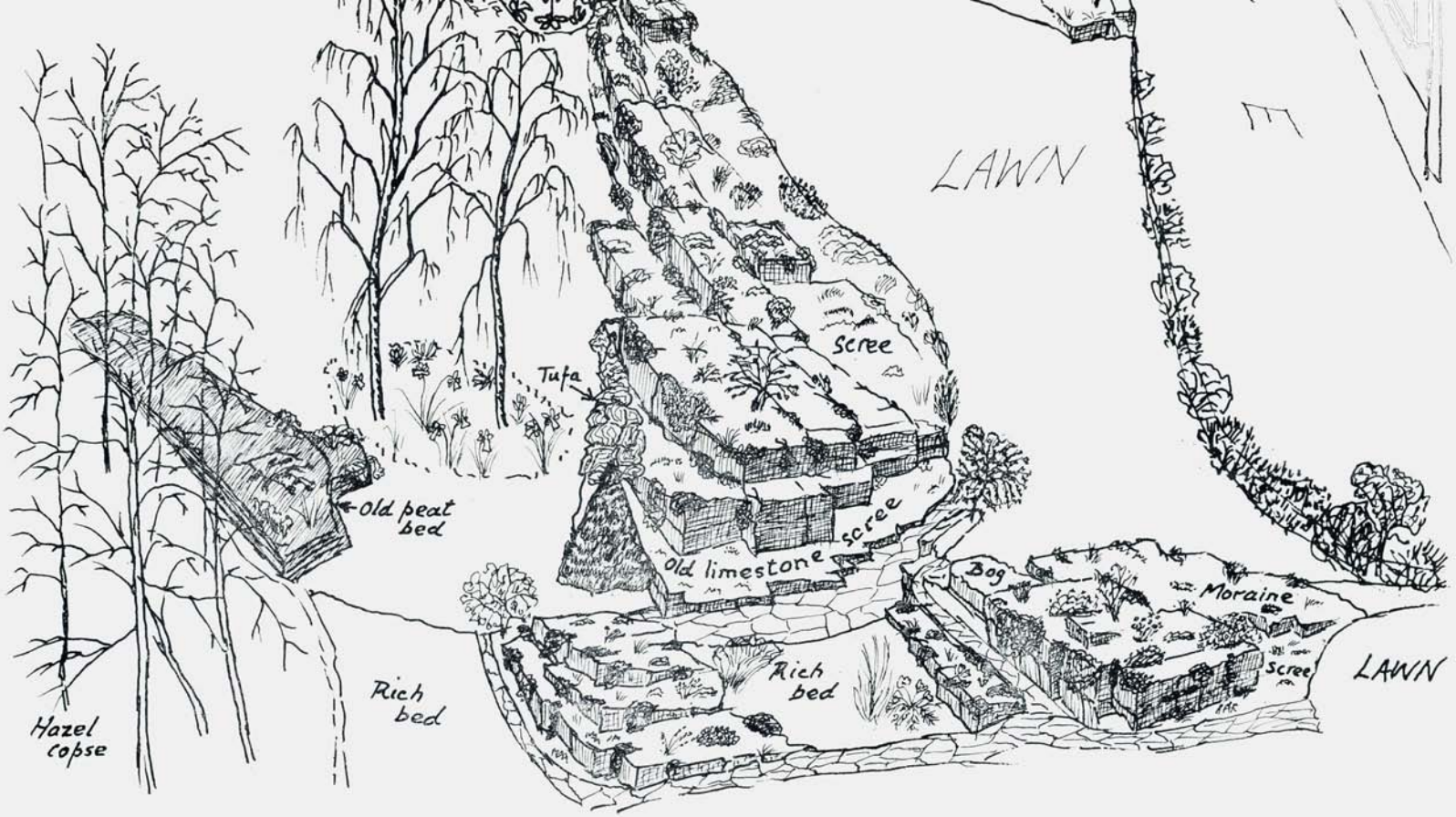


An Impression of the Front Garden
at Whiteleaf

There are several screes in the rock garden which do not aim or claim to be lime-free. They vary somewhat in their aspects (on the whole I favour a slight northerly slope) and in the amount of grit, which I suppose has varied from about 50 to 75%, in their construction. One was originally made with limestone grit (which I can no longer obtain), and it houses mainly kabschia saxifrages. These grow well in such a scree, but are very subject to scorching in summer sun. Indeed, in 1970, and again this year (1976) the drought losses have been disastrous. Fortunately my wife also grows them under more protected conditions in the alpine house, and so I have been able, by taking cuttings, to keep a stock of new young plants going. On the advice of Valerie Finnis, we have taken these cuttings in October, when there is more time available than at the more usual time immediately after flowering, and they have rooted very well. Many other plants than the kabschia and engleria saxifrages flourish in these screes: *Dianthus alpinus* and *D.callizonus*, *Saponaria caespitosa* and *S.X. olivana*, *Edraianthus serpyllifolius*, *Acantholimon venustum* and *Vitaliana primuliflora* are among them. *Saponaria X olivana*, a hybrid between *S.caespitosa* and *S.pumilio*, does not seed freely; but by hunting a few seed can be found in the great baggy calyces, and these produce interesting hybrids, depending, I would suppose, on the other saponarias available in the vicinity. Some of our seedlings seem to have had *S.ocymoides* as pollen parent, but there have also been neat, compact, glossy green leaved plants with quite large flowers which I suspect result from crossing back with *S.caespitosa*, or even with *S.pumilio*, which we have had transiently in a lime-free scree.

The most specialised scree in the garden is the "moraine". This derives from an earlier stage before the present pool was made, when there was a pool alongside the drive from which water was pumped up to a feed-pool, whence it ran down and watered a bog and then flowed under the moraine and so back into the pool (excess water returning as a small waterfall). The moraine was made by digging out a large flat-bottomed sloping tray which was cemented over, and onto its floor were built little walls about 2½ inches high, running zigzag fashion so that the water, entering at the top, formed a series of shallow slow-moving pools on its way to the bottom. This was then filled in with drainage material, a layer of peat, and then a deep (12 inches or so) layer of grit with a small amount (about 25%) of soil. This mixture is of course very fast-draining, but provided that it is watered sufficiently frequently it is a very effective growing medium. With the removal of the pool, the water-circulation has had to be scrapped, and the bog and moraine are now watered by hose or can through a pebble soakaway which replaces in function the old feed-pool. Essentially, the moraine differs from our other screes only in being much more easy to water and in its high grit-content. Many plants have lived and flowered well (and many have died) over the years in the moraine. One that has done especially well, of which we are rather fond, is *Epilobium fleischeri*, which runs underground as it does in the glacier-moraines of the Swiss Alps, and pops up here and there, doing no harm to anybody and dying down totally in the winter, and covering itself first with flower and then with fluffy seeds in the summer. *Linaria alpina*, *Papaver sendtneri*, *Androsace villosa*, *A.lactea*, *Campanula arvatica* and *Asperula suberosa* are

among the plants which have been reasonably permanent residents in the moraine. *Eritrichium nanum* lived and flowered there for two years — hardly a permanent resident! Perhaps surprisingly, *Crocus dalmaticus* and some *C.chrysanthus* hybrids have found the moraine very much to their liking, and give a first-rate show in February. Even more surprisingly, a plant of *Erinacea anthyllis* has flourished and flowered in the moraine for nearly twenty years: in the rocky uplands of Spain it can hardly have its roots in moisture as it does here.

The moraine, like the rest of the rock garden, gets a periodical top-dressing, including just a little soil and peat, some leafmould, and small quantities of "fritted" trace-elements — and then plenty more grit. This gritting applies to the other screes, too, and indeed to the whole rock garden other than areas like the peat-beds, where a grit dressing would obviously be inappropriate; so that, at least for a short time after the grit dressing is applied, the screes are indistinguishable in appearance from the rest of the garden.

The bog is a small area, only a yard or so square, but packed with pleasure (as well as some rather difficult weeds, such as pearlwort and some rushes and sedges). It is in essence a cement basin, with a deep layer of pea-gravel at the bottom covered over with about 10 inches of a finely sifted mixture of peat and lime-free leafmould and sand. This acid bog is kept sodden, and in it we grow such plants as primulas — *P.clarkei, warshenewskiana, farinosa, mistassinica, scotica, modesta, rosea* and *halleri* — *Parnassia palustris, Anagallis tenella, Gentiana pneumonanthe, Soldanella villosa, Bulbinella hookeri, Epipactis palustris* and several species of pinguicula (of which only *P.vulgaris* is inclined to stay long). The bog is not of course watered artificially in the winter: it is however protected by wire netting, because the birds love to grub around in it, and in particular they throw out the resting growth-buds of the pinguiculas and some of the primulas.

There are two areas which, though we do not attempt to keep them lime-free, are enriched with leafmould and peat: one of them is furthermore in part-shade (near the hazel-copse), and forms a link between the copse and the old peat-bed on the one hand and the rockwork on the other.

We grow a few rather bigger and lusher plants in these beds. One that has given us particular pleasure for the past 21 years is a large plant of *Pulsatilla alpina*. For most of this time it has flowered well. It is getting smaller now, and though I have tried to restore it to its former glory by forking in cow-manure, I fear that old age is taking its toll. However, we have grown plenty of seedlings from it over the years, and some of these are coming along to replace the fine old plant. A *Daphne sericea* (syn. *collina)* in the same bed came to occupy a space of a square yard or so, and overlay its neighbours, till at last (having established plants from cuttings elsewhere in the garden) we uprooted it to make space for primulas, lilies, paradiseas, anthericums, etc.

Two small areas of the rock garden are built up as tufa banks. One is in light shade from the birch trees, and the other faces north. I must confess that I have not had great success with them: probably I have not used them to best advantage. In a garden where the lie of the rock is regarded as important, amorphous stone such as tufa is unsatisfactory

stuff to handle. The interstices between the rounded lumps are packed with a mix containing a lot of grit and dust derived from the tufa, and most of my plantings have been into these interstices rather than into holes drilled into the stone. *Phyteuma comosum* is however in such a hole, and over several years has made a successful plant which looks well but remains very small: it has done much better in ordinary soil. *Potentilla nitida* however has really flourished in the tufa, spreading right over it and, to my satisfaction, hiding large areas of the stone. *Potentilla clusii*, also from the eastern Alps, is rather less attractive but still well worth growing, and this too has done quite well in the tufa. *Saxifraga burserana* has on the whole I think been more enduring (and less subject to scorch) in tufa than with the other kabschias in the limestone scree. But plants like *Campanula zoysii* and *C.morettiana*, and *Primula wulfeniana* and *P.spectabilis*, have proved no more enduring in the tufa than in scree.

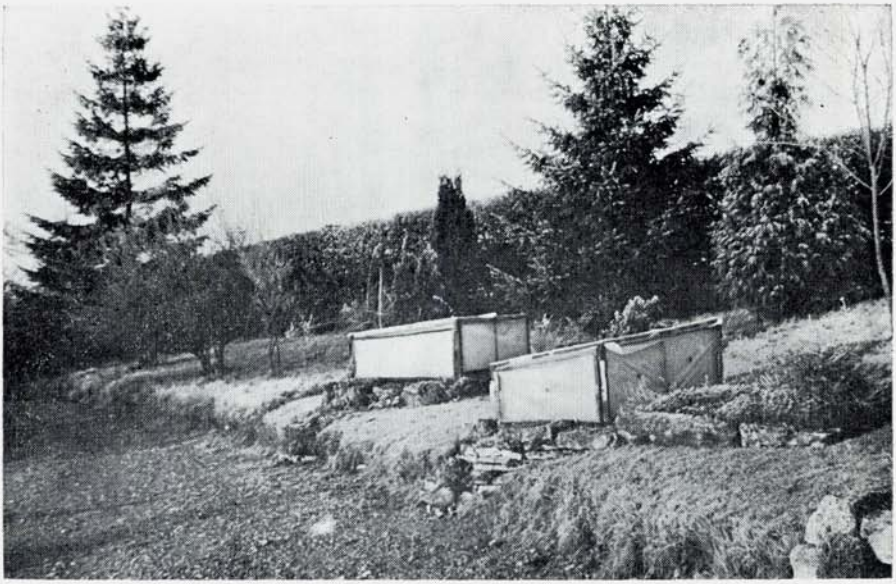
Calendula suffruticosa in the wall. *Dr. L. J. Bacon*

Right near the house there is a small brick wall, which at the start was purely functional; but I rebuilt it as a double wall and filled the space with standard rock-garden mixture and top-dressed it. It houses a number of plants most of which have grown well in it over many years, and it serves to make a break (or link) between the formal structure of the house and the "wild" rock garden. Some of the plants are native to Cape St. Vincent in Portugal. These include the very sticky-shiny-leaved *Cistus palhinhae*, *Halimium verticillatum*, *Ameria pungens* (distinct and attractive in leaf but an ordinary 'thrift' in flower) and *Calendula suffruticosa*. This last is a perennial, and it survived two winters, seeded down into the drive below, and flowered for months on end. I was doubtful about the hardiness of these Cape St. Vincent plants, and rather fancifully hoped that on frosty nights the cold air would flow off the wall (all three feet of it!) rather than lying on the plants. There has in fact been no sign

of frost-damage to these particular plants in the wall. But an attempt to grow *Eunomia oppositifolia* was a failure; every year in the scree its buds had been destroyed by frost and the plant had slowly shrunk — and the same thing happened in the wall. It is an area of perfect drainage, and one might have supposed that drought would be a major problem, but in fact even in these last two years of severe drought the plants in the wall have survived very well.

I think that of all our "special areas" those that have given us the greatest pleasure have been the Greek bed, the Spanish bed and the Macedonian bed. They were not built primarily with a view to displaying plants on a geographical basis — it was just that when a number of plants from each of these areas in turn became available there wasn't room for them anywhere else and a new bed had to be made. The Greek bed came first, and it was manifest that if we were to have any chance of growing low-level plants from Greece and Cyprus we would have to provide protection against frost. The bed was built facing south: it was raised, and was composed of our standard limy rock-garden mixture. Four sockets were sunk into the ground (made in the way already described) to take the legs of a light frame clothed in two layers of polythene sheeting separated by an inch and a quarter air space. The frames are made in five separate pieces (the four sides and the top) which are easily handleable and are erected in little more than a minute. They are put on on still, frosty nights. They are not beautiful to look at, but unless you visited our garden on a still, frosty night you won't have to look at them! On the whole the frost protection has been remarkably successful. The fun in this bed starts in late September, with yellow-flowered *Oxalis lobata* (not hardy without protection here), *Cyclamen mirabile*, *Colchicum pusillum* and *C.boissieri*. The crocuses follow on — *CC.hadriaticus*, *niveus*, *crewei*, *goulimyi*, *boryi* and *pulchellus* in succession through October. I daresay that some or all of these would in fact survive without protection, and indeed some of them pop up outside the protected area, which does not go right to the edges of the bed.

Three of the plants originally introduced (this was in 1968) are annual or biennial, but seed themselves abundantly inside and out of the protected area. They are the large quake-grass *(Briza maxima)*, *Aethionema saxatile*, and *Erodium gruinum*. The last of these came from low levels in Cyprus, and I did not expect it to be hardy; but in mild winters at least it has come through without protection and under the cover has survived at 12°F. Its red-veined leaves are attractive now (in November) and its pretty violet blue flowers, a little small for the foliage, are produced through many months of the year. The briza and the aethionema likewise have shown themselves quite capable of surviving outside the protection: the cover provides insurance against really hard winters, though I suspect that ungerminated seed of all three of these plants is probably very hardy. The aethionema shows a good deal of attractive pink flower now; but its real display is in the early part of the year, when it forms a matrix through which grow *Ranunculus asiaticus*, *Anemone coronaria* and *AA.pavonina* and *stellata heldreichii*, *Asphodelus acaulis*, *Cyclamen persicum* (this has produced foliage in each of the last six years but has yet to flower), ornithogalums, gageas, *Orchis papilionacea*, various ophrys and serapias, *Hermodactylus tuberosus*,



The Greek and Spanish beds protected against frost. *Dr. L. J. Bacon*

Lithodora hispidula, etc. Many of these plants flower early in the year, when only in the alpine house is there a better display.

The Spanish bed is a little more recent (1970), and contains a protected area on just the same lines as the Greek bed. The unprotected area however is bigger, containing many plants from the Pyrenees and the Picos de Europa in northern Spain which I think are fully hardy. The protected plants are mostly native to southern Spain (Sierra Cazorla, Sa.Nevada) or the western Mediterranean low-level areas. Our special pride in this bed is *Viola cazorlensis,* which has grown and flowered here for six years. In several of these years we took cuttings at what seemed the logical time — just after flowering: they rooted quite easily, and appeared to be well established by the autumn, but did not make new growth the following spring. So last year we took cuttings earlier, before the plant came into flower, and this time several plants burgeoned healthily after their winter rest — so we hope we have found an answer to the problem of propagating this plant, though further experience may show that it was some other factor, such for instance as the hot dry summer of 1975, which led to success. *Thalictrum tuberosum* is another Spaniard that we hold in high regard. It has large ivory (sometimes pink-tinged) flowers over delicate rue-foliage, and sets viable seed. *Allium roseum* of Greek origin we have had for many years, and come to regard with disfavour, because its many bulbils between the flowers (as well as underground) make it invasive. A plant of Spanish origin however is dwarfer, larger flowered, and produces only underground bulbils, and is a beautiful and highly valued plant. We acquired *Allium moly* (I know not whence) in 1949, and brought it with us to Hampshire, but it was cast out from the rock garden as being too large-leaved and coarse: but a plant from the Sierra Cazorla has flowers as large and of as rich a yellow but with dwarfer stature and much smaller leaves. Among the many orchids in the

Spanish bed, *Orchis longicornu* is particularly striking. As you would expect, narcissi feature prominently in this bed, ranging from the huge-flowered *N.nobilis* (noble indeed!) to the tiny delicate *N.triandrus cernuus* from the Sierra Nevada. The yellow-flowered jonquils are a particularly confusing group: we call some of ours *N.juncifolium* and some *N.rupicola*, but they do not fit comfortably into the taxonomists' pigeon-holes.

Ophrys tenthredinifera and O. speculum in the Spanish bed.

Dr. L. J. Bacon

This bed has a longer flowering period than the Greek bed, because the plants represent a bigger range both of latitude and of altitude. Such plants as *Aquilegia pyrenaica* and *Geranium cinereum* are in full flower in June, and little *Teucrium spinosum* follows in July and August.

The last (and most recently constructed) bed in this group is the "Macedonian" bed, which houses a number of interesting and beautiful plants from northern Greece and southern Yugoslavia. It has no artificial protection, but is raised, well-drained, limy, and in full sun. On the north-east side the rockwork falls steeply, and here, receiving little sun, grow *Ramonda nathaliae* and *R.serbica*. There are some attractive saxifrages of the Kabschia-Engleria Section — *SS.grisebachii, sempervivum, marginata rocheliana, scardica* and *spruneri*. Macedonia is an area rich in bulbous plants, and among those in this bed are *Fritillaria graeca* and *F.pontica*, *Crocus veluchensis*, *Lilium candidum* and *L.chalcedonicum*, and *Asphodeline lutea* and *L.liburnica* All these have proved hardy in our relatively mild winters of the past five years. We take special pride in two plants in this bed. One of them is *Erodium guicciardii*, whose silver-grey leaves are reminiscent of those of the better-known *E.chrysanthum*, but the flowers on the male plants are a rich rose-carmine: those on the female plants are a little smaller and paler. It seeds around, and plants are established in well-drained positions in various parts of the garden. The other is *Anchusa macedonica*, whose narrow strap-shaped, slightly scalloped leaves are reminiscent of those of *A.caespitosa*, though they are rather bigger. The intensely blue flowers are borne profusely in arching sprays, so that the whole plant forms a low dome of brilliant blossom. I have yet to solve the mystery of its seeding: seedlings appear around the main plant, but I have never found any seed yet! It has a long tap-root, making it difficult to transplant, but enabling it to be propagated by root-cuttings.

Viola cazorlensis in the Spanish bed. *Dr. L. J. Bacon*

Finally, mention must be made of my wife's alpine house. It is a unit in its own right, but to omit all mention of it would give quite a wrong impression of the way our team works. The plants in the alpine house are of course grown for display. All are in pots, all are carefully grown, nurtured, groomed and individually loved: whereas in the garden, however much a plant may be loved, it has to take its chance with the rest and is not so much an individual exhibit as a part of a general display. But there is a good deal of traffic between the garden and the alpine house. Difficult plants, provided that they are sufficiently small and neat and attractive, and particularly those whose hardiness is in any doubt, are generally grown in the alpine house first; but my aim is always to "try it in the garden" as soon as a piece can be spared. On the other hand, if a plant (of sufficient breeding to qualify for the alpine house) is ailing or failing in the garden, then I try to prevail upon my wife to give it a period of rehabilitation. Not that the alpine house is to be thought of as a hospital! — indeed the plants there are generally in healthier condition than their counterparts in the open because of the protection and care they receive. What is of particular interest, however, is that some of the plants in the alpine house are so grown as to produce a different life-cycle from that of their counterparts in the garden. The "house" is kept frost-free by electric heating, with a thermostat set at 34°F. This results in a less complete winter dormancy than many of the plants manifest in the wild, or even in the open garden; and their growth and water requirements differ accordingly. This is I believe a particularly interesting field of study — since the cultivation of alpines is not just a matter of trying to reproduce the wild growth-conditions, but also involves trying to adapt the plants to artificial growth-conditions. The main practical result of the difference in life-cycle is that from December to March, when the garden is full of promise as yet largely unfulfilled, my wife's alpine house is a haven from the elements and filled with colour, scent and interest.

TAILPIECE — In our neglected back garden, screened from view by a privet hedge, are the compost heaps and the leaf-pile. And here too is a battery of frames and plunge-beds, screened by netting against the birds and the beasts — for this is the propagation area, without which the rock garden would soon lose many of its plants, and most of its fun.

SMILACINA RACEMOSA PRESENTS ITSELF

Mrs. Ralph Cannon, Chicago, Ill.

Many sugar maples, *Acer saccharum*, grow in our Illinois woodland. These beautiful trees are large, perfectly shaped with dense foliage of plane-like leaves and roots that grow close to the surface. This growth of surface roots makes the ground-cover under the branches a problem.

Since we like to use native flora wherever possible in our woodland we keep our eyes open for nature's help. One day in early spring a small natural group of *Smilacina racemosa* was sighted under a large maple. This indigenous plant, worthy of any garden, is a rhizomous plant, and in a few years it completely carpeted the ground all around and under the maple to such a degree that it had to be restrained somewhat. This is the only bad feature of this plant, but good ground covers are naturally invasive.

Not only are these herbaceous plants handsome in foliage but in flower and fruit as well. From a rhizome, stems arise about two feet high in spring carrying alternate glossy lanceolate leaves which terminate in a flower raceme or panicle about 5 to 6 inches long of numerous white starry flowers. These white panicles, with the soft background of green, light up the whole area like little lamps.

The fragrance of these flowers is delightful and they are useful as cut flowers. Since the slightly arching stems grow close together and remain upright even with their heads of berries, they make a fine ground cover. Following the white flowering stage green berries are formed, which turn red as the seeds ripen. These heads of red berries make a lovely fall picture under the yellowing maple.

Smilacina will tolerate quite severe conditions. The rhizomes are not damaged by minus 20°F cold. The thicket of swaying stems remained straight and upright in summer heat of 100°F, as well as during our disastrous drought of 1976.

Although there are numerous ground-cover plants, this is a plant that presented itself in our woods and then developed itself into a fine ground-cover under a large maple tree, bringing enjoyment and a minimum of labor for all of us.

Mrs. Cannon is clearly a serendipitous gardener (see also her piece in our Winter '76 issue). She finds beauty in a volunteer, undeterred by the vigor of the plant in question or by its most unfair popular name — False Solomon's Seal — false indeed! Mrs. DeVault, on the other hand, searches out rare and distinguished plants and makes them look as if they had volunteered. There should be a moral here somewhere.

FOUR UNCOMMON GROUNDCOVERS

Dorothea DeVault, Monroe, Conn.

Although pachysandra and vinca are adequate, popular, and easy-to-grow groundcovers, they are over used. We wanted something more elegant for the annex to our rhododendron area begun the spring of 1975. Of the four plants we decided to grow three were evergreens, one deciduous.

We had already grown them for several years in other sections of the garden. They met our requirements of good looks and low maintenance. Now they are to be grown in quantity to give harmony to a collection of rhododendrons.

The three evergreens, not in order of their importance, were *Cotoneaster dammeri (humifusa)*, Rose family, and *Gaylussacia brachycera* and *Vaccinium vitis-idaea minus*, both of the heath family, and the deciduous herb was *Epimedium*, barberry family.

Cotoneaster dammeri is a very low growing trailing shrub that roots along the ground and grows in sun or light shade. The numerous white flowers are followed in the fall by bright red berries. Although it sometimes browns in winter, it can get along without winter protection. Neutral or acid soil satisfies its growing habits. It is simple to use the self-rooting branches for new plants. Some weeding is necessary, but the plant is handsome and fits our category of interesting and carefree groundcovers.

Gaylussacia brachycera, the box huckleberry (and my favorite at the moment) is a rare and valuable shrub, also to date the most difficult for us to propagate. It is said to vary in height from a few inches to two feet, but ours have never exceeded ten inches. An acid, peaty soil is essential. The leaves are small, thick, box-like. The small pink and white clusters of huckleberry flowers on the tips of the branches are followed by edible blue fruit. The fall and winter growth is beautiful in shades of red and mahogany. Sun, shade, half-shade accommodate it. The "mother" plant sends out underground runners often some distance away, and these offspring are what we are using in the new garden.

To date I have not found the key to propagating *Gaylussacia brachycera* by cuttings although the Don Smiths of Watnong Nurseries, who have done much to publicize and preserve this ancient beauty, have tried to help us. Probably a mist nozzle and/or a greenhouse would help.

In addition to all its virtues this sturdy little ornamental has a fascinating and almost unbelievable history. Scientists tell us that a single colony may be more than 13,000 years old — far older than the bristle cone pine or the California redwoods. Original stands of isolated colonies are found in only seven states: Delaware, Kentucky, Maryland, Pennsylvania, Virginia, Tennessee, and West Virginia. Of course, the off-shoots are not 13,000 years old, but they all began and continued to grow from the original seedling 13,000 years ago. An entire colony which may stretch for more than a mile is considered a SINGLE PLANT!

The *Vaccinium vitis-idaea minus* forms a beautiful dense mat for us. (Perhaps we have been lucky, however, for we have read that it sometimes requires shearing to thicken.) Thick, shiny, dark green leaves grow just a few inches high. In the spring a cluster of huckleberry-type flowers appears on the tips of the branches, followed by a bright red berry known as the Swedish lingen berry and, like its relative the cranberry, suitable for a tart sauce — if you can gather enough berries!

Division of the stoloniferous growth is easy, but I usually treat such divisions as rooted cuttings, putting them in a very friable, sandy, and acid soil and taking care that they do not dry out during their first growing season.

I also take cuttings as early in June as possible, for *Vaccinium vitis-idaea minus* roots slowly in four or five months. Since we have no room in our cold frames, I propagate them in boxes in a rooting medium of 2 parts coarse sand, 1 part peat moss, and 1 part Vermiculite. Either Rootone or Hormodin #1 is the dip. The box, covered with pliofilm over wire hoops, is raised off the ground by bricks and placed in full light but with *no sun*.

In October the new plants are placed four or five inches apart in their permanent home. The woodsy soil is augmented with peat. In December to prevent heaving they are covered with hemlock boughs. Of course the covering is removed in the spring. This care is necessary only for the first winter.

The plants will need weeding until they spread and thicken. Our established patch never seems to require weeding. It is a grand groundcover.

The robust *Epimedium* belie their ferny, delicate look, grow in sun or shade in average soil, but profit from a woodsy loam and partial

shade. They grow approximately a foot high. The green, heart-shaped leaves on thin, stiff stems are sometimes edged with rose, sometimes washed entirely with rose. The dainty racemes of small flowers like tiny columbines in shades of rose, yellow, lilac, or white appear in early spring among and in some species above the lacy foliage.

Propagation is by division. An established plant has a root mass so dense that no weeds penetrate it, and a sharp butcher knife, even an ax, is used to split the divisions. We plant *Epimedium* along paths, not close to rhododendron. However, this is not an invasive herb. The leaves persist into December and appear again in early spring. Flowers follow surprisingly soon after the leaves.

Some of the *Epimedium* we are growing are: *E.* 'Rose-Queen', *E. macranthemum* (pink), *E. grandiflorum*, var. *niveum* (white), *E. pinnatum* (yellow).

Epimedium is a first-class perennial which, together with the three companionable evergreens, makes a quartet of unusual ornamentals for our garden — and perhaps for yours.

An untitled report from a new rock gardener, E. George Erdman, Jr., of Endicott, New York.

I sent seed to the ARGS Seed Exchange this year for the first time. I did so with some trepidation. On the one hand, having received seed for some two years now, I wanted to reciprocate in kind. On the other, I've only recently expanded my interest in bedding perennials to include rock garden plants, and I was afraid I had nothing of interest. But I sent in my seed, deciding finally that the ARGS must surely serve many as newly converted as I. Thinking, too, that the experience of more conventional plants is to the beginner just as interesting as that of the more difficult treasures to the advanced, I jotted down some notes on the species whose seed I sent on.

Would you believe *Cerastium tomentosum?* Can anyone have the temerity to grow such an unmanageable weed? I do, and manage. Bounded north and south by stone, east by *Stachys lanata* (this latter a tactical coup, since it's equally aggressive; but an aesthetic failure, the silver white of the leaves too similar for such proximity), the clump can only spread west. There I've marked the desired boundaries with small stakes. When they disappear under the encroaching foliage, I dig it back. A small expense of labor for an irregularly shaped 4' x 6' clump beautiful in flower and always neat, save for that brief stint of unthriftiness following the shearing of spent blooms.

I grow what everyone grows, sometimes just a little less successfully. *Alyssum saxatile*, that easiest of plants, never lasts long in my garden. Some rot at the base just as they come out of winter. Others spend themselves blooming and die immediately after, just like border pinks. So I sow fresh seed every year to maintain sizeable clumps. *Iberis sempervirens* is more reliable, maintained in a tight, dense clump year after year by hard pruning immediately after flowering. In my garden, its only drawback is its evergreen foliage, for most an outstanding feature. But I garden at the edge of woods and fields, and in midwinter the green of *Iberis* and *Dianthus caesius* is a magnet to deer, who can find it under a foot of snow. *Aquilegia* 'Biedermeier' gives me stout plants covered for a long period with blue shading to pink and purple. Its foliage stays neat well into the fall, a

leaf here and there disfigured of course by leaf miners. I recently read that only by digging up and burning the affected plant can the miner be surely eradicated. That may be, but it's like throwing out the baby with the bath water. Such draconic measures imply a standard of garden hygiene far beyond mine. Being imperfect myself, I can live with imperfection. I find, moreover, that the larger and more diversified my garden becomes, the less concentrated insect damage becomes, and random marauding goes unnoticed.

Some of what I grow is only a few generations domesticated. *Sanguinaria canadensis*, the subject of a Lincoln Foster article in the Spring '76 issue of the ARGS Bulletin, has thrived since I brought it onto the property. So, too, has *Geranium maculatum*, abundant in nearby woods. There, with poor soil and little direct sun, it's a solitary, gangly plant with few blossoms. I brought to better soil and more sun a half dozen some three years ago, and planted them hard up against each other. Now I have a thick, healthy clump covered with bloom for an extended period. Then, unfortunately, it turns unthrifty, no match for *G. sanguineum* with its shiny green foliage and continuous, though sporadic, bloom. Even now, the second week of October, I count a dozen blooms on the clump. *Verbascum blattaria* always finds its own way onto the property. Most I weed out, but some, like the one this year growing in the gravel drive at the foot of the rock garden, I tolerate for the sake of the white flower, its throat suffused deep purple. Sufficient compensation for the battered basal rosette and spindly stalk.

Not all my seeds are home grown. A trip to the midwest brought me in contact with two public gardens where, I was told, a seed head or two would not be missed. One features a garden for the blind where leaf texture and scent are the criteria governing the selection of material. There, a narrow gravel path is flanked by beds raised by rough stone walls to a height of some four feet. The beds are narrow enough to reach the backmost plants and the identification plates by each clump are in large print and braille. The *Santolina incana nana* and *ericoides* whose seeds I collected are for others, since they probably won't overwinter here. The *Oenothera missouriensis* will, though, and I look forward to a summer of the large, floppy yellow flowers followed by the no less outlandish seed pods. The *Yucca angustifolia* the second garden yielded I must be chary with, since I took but one seed pod. The flat, roundish seeds stacked tightly in the separate compartments, like pennies in coin wrappers, should have been ample. But on opening the pod I discovered a worm had tunneled dead center down the middle of each stack, giving me scads of neatly bored discs. Fine for stringing a necklace, but of doubtful germination.

Back to my home grown contribution, *Physostegia virginiana* 'Summer Snow', *Platycodon grandiflorum*, and *Lychnis chalcedonica* are, I admit, bedding perennials. But the first two I've let into the rock garden to good effect and the latter, separated by a swath of lawn, makes for a rugged backdrop. Besides, I can't believe you're all purists out there, interested only in the more retiring beauty of, say *Anacyclus depresses*. Mine, progeny of another ARGS contributor, were a limited success, limited by slugs in the fall and crown rot in the spring. What I was left with, though, bloomed

themselves silly.

Add *Primula veris* and *Campanula carpatica*, both always dependable, *Anchusa angustifolia*, in bloom from seed the first year, and *Aethionema warleyense*, possibly a red herring, and you have my first year's contributions. Pretty common stuff, I'll admit. But I'm getting more adventuresome. Thanks to last year's ARGS exchange, I'm going into the winter with largish clumps of *Aquilegia flabellata* 'Nana Alba', *Gentiana bisetea*, *Hutchinsia alpina*, *Polemonium delicatum*, and *Saxifraga caespitosa*. Hopefully, next year I'll have something of interest to the more advanced. And so, I'm sure, will you.

And an old pro, Palmer Chambers, of Guilford, Conn., says:

LET'S HEAR IT FOR WALLS

I always hesitate to write in these pages because my accomplishments have been so far beneath those of our experts, but I do feel that we duffers must communicate our small successes to others who struggle in the lower echelons of rock gardening.

For eighteen years I have been trying the various methods of keeping mountain plants alive at sea-level: rocky slopes with special soil mixtures, flagstone areas, gravel covered areas, etc., but none of them have compared with walls. My first wall was a free standing one about eighteen inches high, which I described in the Bulletin of April, 1971. Most of the original plants have done very well there, notably a *Draba rigida*, which now covers about 25 square inches, a big hedgehog of a *Dianthus noeanus*, an *Arabis sturii*, a *Penstemon menziesii*, a *Saxifraga longifolia*, a *Geranium dalmaticum*, an *Androsace chumbyi*, a *Vaccinium vitis idaea minus*, etc. This wall gets shade about a third of the day.

In front of my house are two elevated beds of pachysandra with about 50 feet of 12" to 18" dry wall of pink Stony Creek granite tailings holding them in place. A few years ago I worked soil into the top few inches of this wall, making it possible for plants set into the top of the wall to get their roots into the soil behind the wall. I was fairly well pleased with the result, but the pachysandra began taking over the wall at an alarming rate. Last spring I decided that I had had enough of that. I ripped out the whole wall and put a barrier of polyethylene against the pachysandra. Then I stood the longest rocks against the polyethylene and built a wall several inches in front of these rocks, leaving a space to be filled with soil and small rocks. In filling up such a space a hose should be kept running slowly to pack down the soil and wash it into the crannies. A sufficient supply of plants should be ready when building a wall so that they can be set in properly with the roots draped behind the rocks. This is infinitely preferable to setting them in later. The top of the wall should not look like a trough, but should have spaces for plants alternating with protruding rocks or flat rocks laid on top. Fill in around the plants with gravel.

For soil I didn't make any special mixture at all. I just scraped several inches of earth out of some woodland. It is amazing how much of it can disappear into such a wall. I have been more pleased with this wall than with anything else I have tried yet. Plants that had been

mimping along in other spots came to life as soon as I moved them here. There are more than 100 varieties, and all but a very few seem to like it. Among the plants which have shown a marked improvement are *Onosma tauricum, Arabis blepharophylla, A. rosea, A. lyrata, Chrysanthemum weyrichii, Phlox brittoni, P. divaricata, Erinus alpinus, Veronica bellidifolia, Globularia* (tiny).

BOOK REVIEW

ALPINES. By Dr. Lionel Bacon, David & Charles, 1973, pp. 246.

Last summer at the First Interim International Rock Garden Plant Conference I had the pleasure of meeting, among other distinguished and delightful rock gardeners from overseas, Dr. Lionel Bacon of Winchester, England. During one of our chats over breakfast we agreed to exchange books, I to send him a copy of my *Rock Gardening*, he to send me his.

I must confess that I was too embarrassed to ask for the title of his book because I thought he assumed I must have heard of it, as I should have. The book, with the straightforward title, *Alpines*, arrived toward the end of summer.

It is a rather slender volume of 246 pages, and the Garden Book Club Edition Dr. Bacon sent wore a somewhat gaudy dust jacket decorated with a garland of rather garishly colored alpines, among which I could identify a phyteuma, cyclamen, poppy, hepatica, anemone and eidelweiss. The contents of the book are, however, of a far different caliber. In the text, in compressed yet lucid prose, Dr. Bacon provides a wealth of sound information about alpine plants in nature and about how to provide a setting for them in the garden.

His scheme of presentation is highly successful. The first chapter discusses plant forms of mountain situations with descriptions of the various sites in mountains where different plants are found growing. These accounts are obviously based on careful first hand inspection and are clearly defined with Lionel Bacon's exemplary precision.

The following three chapters, titled "The Principles of Cultivation", "The Rock Garden", and "Plant Care", contain sound and precise information that should permit every new rock gardener to move forward confidently and make every old timer wish that he had had this book earlier. There is also a sound chapter on propagation and another on growing alpines in other ways than in the open rock garden.

There is likewise a brief descriptive listing of over 500 selected alpines with compact cultural information and special lists of plants for special sites.

The whole work is obviously the result of many years of first-hand observation and personal experience presented in a clean style without frills or fancy verbiage. There are some line drawings of plants by the author and some good black and white pictures of garden structures, that help to illuminate the text, but it is primarily the good writing based on first hand information that makes this work of particular value.

— H. L. Foster

Dr. Bacon's book is sold in the U.S. through David & Charles, Inc., North Pomfret, Vermont 05053. — Ed.

AMERICAN ROCK GARDEN SOCIETY
Constitution and By-Laws
(As amended July 20, 1976)

ARTICLE I — NAME

The name of this Society shall be the American Rock Garden Society.

ARTICLE II — PURPOSE

The purpose of the Society shall be to encourage and promote:

a) The cultivation, conservation and knowledge of rock garden plants, their value, habits and geographical distribution.
b) Interest in good design and construction of rock gardens.
c) Meetings and exhibitions.
d) Plant exploration and introduction of new species and forms.
e) Study of history and literature on the subject.
f) Acquaintance between members and groups with the resultant mutual exchange of experience and knowledge.

ARTICLE III — MEMBERSHIP

SECTION 1. There shall be four classes of membership: active, sustaining (patron), life, and honorary life.

SECTION 2. Active members shall be those who are actively interested in rock gardening.

SECTION 3. Sustaining members (Patrons) shall be those who are actively interested in furthering the objects of the Society.

SECTION 4. Life members shall be those who pay One Hundred Fifty dollars to the Society and receive the approval of the Board of Directors.

SECTION 5. Honorary life members shall consist of such outstanding persons in the horticultural world as may be selected by the Board of Directors.

ARTICLE IV — DUES

SECTION 1. Dues shall be levied as established by the Board of Directors (Officers, Directors, and Chapter Chairpersons).

SECTION 2. The annual dues for Sustaining Membership (Patron) shall be twenty-five dollars. Life members and Honorary members shall not be required to pay annual dues.

SECTION 3. All members of the Society shall receive the official organ of the Society, the BULLETIN. Other publications of the Society are available to members from the Secretary on request.

SECTION 4. Any member who shall be delinquent in dues for more than six months shall forfeit his membership in the Society.

ARTICLE V — MEETINGS

SECTION 1. The Annual Meeting for the conduct of business shall be held during May of each year in a place selected by the Administrative Committee, but the date of any Annual Meeting may be changed by the Board of Directors.

SECTION 2. Special meetings for the conduct of business may be held at the call of the President, or upon the written request of five members of the Board of Directors, or upon written request to the Secretary of twenty-five members of the Society, provided that such written request shall state the reason for the meeting.

SECTION 3. Written notice of the Annual Meeting and of special meetings for the conduct of business shall be issued to all members by the Secretary fifteen days in advance of said meeting.

SECTION 4. Only members in good standing shall be entitled to vote at meetings of the Society.

ARTICLE VI — OFFICERS

SECTION 1. The officers shall consist of a President, a Vice-President, a Secretary, and a Treasurer.

SECTION 2. The officers shall be elected at the Annual Meeting.

SECTION 3. The President shall serve for a term of two years and may be elected for a further term of two years, but not more than four years successively. All other officers shall be elected to serve two years, or until their successors are elected.

ARTICLE VII — BOARD OF DIRECTORS AND ADMINISTRATIVE COMMITTEE

SECTION 1. The general policies of the Society, except for those matters requiring a vote of the membership by the constitution, shall be established by a Board of Directors consisting of the Officers, nine Directors, and the Chapter Chairpersons. It shall meet at such times as may be deemed advisable by the Administrative Committee, or at the request of any three members of the Board. It shall have power to veto an appropriation of monies voted by members of the Society which it deems detrimental to the interests of the Society. It shall fill any vacancy that may occur between elections among the officers of the Society. It shall have power to change the date of an Annual Meeting. It may request reports from the President, Secretary and/or Treasurer, and shall perform all duties that may be necessary for the welfare of the Society.

SECTION 2. The Directors shall be elected at the Annual Meeting of the Society for a period of three years. Three Directors shall be elected each year.

SECTION 3. The affairs of the Society shall be administered by an Administrative Committee, consisting of the President, Secretary, and Treasurer and also the Vice-President and one Director who is selected annually by the officers aforementioned. The Administrative Committee shall appoint an indedendent auditor to examine the accounts of the Secretary and the Treasurer. It shall appoint, with the approval of the Board of Directors, the Editor of the Bulletin and the Director of the Seed Exchange. It shall implement the policies of the Society and advise the officers in the performance of their duties. It shall refer matters of general policy to the Board of Directors.

ARTICLE VIII — DUTIES OF OFFICERS

SECTION 1. The duties of the President shall be to preside at the

Annual Meeting of the Society, at any special administrative meetings of the Society, and at meetings of the Board of Directors and of the Administrative Committee; to call special meetings at his discretion as provided in Article V, Section 2; to appoint all committees; to countersign all orders upon the treasury; and to perform all other duties usual to the office.

SECTION 2. In the absence of the President, the Vice-President shall perform the duties of the President.

SECTION 3. The duties of the Secretary shall be as follows: To conduct the correspondence of the Society; to keep a record of the proceedings of the Society, of the Board of Directors, and of the Administrative Committee; to collect and deposit in the bank account of the Society all monies due the Society, giving the Treasurer receipts therefor; to receive all applications for membership; to mail notice of dues to all members; to arrange for all regular and special mailings to the full membership; to prepare and sign all legal and official documents except financial; to countersign all checks; to render reports to the Board of Directors, and at the Annual Meeting; to perform all other duties usual to the office.

SECTION 4. The duties of the Treasurer shall be as follows: To pay by check, countersigned by the Secretary, all monies, but only on written order approved by the Secretary and countersigned by the President; to keep records of receipts and expenses; to render accountings to the Board of Directors as required; to render a report at the Annual Meeting; to perform all other duties usual to the office.

ARTICLE IX — CHAPTER ORGANIZATION

SECTION 1. To further the purposes of the Society, chapters may be organized within the Society. These chapters shall be identified by titles indicating their geographic locations. The title and boundaries of a chapter shall be determined by the members of the chapter and may include one or more states or portions of states. All Society members residing within a chapter area shall be eligible for membership.

SECTION 2. The approval of the Administrative Committee is required for the formation of a new chapter. Groups previously organized as Regions or Districts shall be recognized as Chapters.

SECTION 3. Chapter officers shall consist of a Chairperson and Secretary, and such other officers and commitees as the chapter shall determine. There shall be at least one general meeting of the chapter members each year.

SECTION 4. Each active chapter and the name of its Chairperson shall be listed among the Society Directorate appearing in the Bulletin. A chapter failing to hold at least one meeting in one year shall be considered inactive.

SECTION 5. Each chapter shall send to the Secretary of the Society the names of the officers of the chapter upon their election. Each chapter shall send to the Secretary of the Society in April an account of its activities during the past year for the purposes of his report to the Annual Meeting of the Society.

SECTION 6. Procedural rules for the conduct of the activities of a chapter not herein mentioned shall be determined by each chapter.

ARTICLE X — AMENDMENTS

SECTION 1. These By-Laws may be amended at the Annual Meeting or any special meeting of the Society, provided that written notice of the proposed amendment has been mailed to the membership fifteen days prior to the meeting.

Globularia cordifolia

(*continued from p. 15, N. Deno on Dryas*)

attempts to grow them in pots or in the open but never obtained seedlings, and this experience has been confirmed by others. It was thus a special delight to find several self-sown seedlings appearing in the garden. Perhaps it is a case of only a small fraction of the seed being fertile or their having a short life in storage. We do not know the answers yet.

In this garden, attempts to cultivate Dryas have gone through an amusing evolution. Initially, the descriptions in the manuals of Dryas growing on the north coasts of Iceland and Greenland and on stormy alpine peaks led us to plant Dryas on steep north slopes in an effort to keep the soil moist and cool. Dryas grew in these locations, but it flowered sparsely, and it was prone to die out in patches. Fortunately it could easily be propagated from terminal branches containing a few roots. These are removed in early spring and planted directly in their final place. With plentiful material available, we planted Dryas in a variety of locations of increasing sunshine, increasing dryness, and increasing exposure to wind.

These tests soon showed that Dryas relishes a lot more heat and drought than we imagined at first. It grows best in a windy exposed position in full sun. Plants in such a location in a soil of 50% sand-50% limestone soil have quickly expanded into yard wide mats with little dieback in the center. It is in this location that the several self-sown seedlings have appeared. Actually Dryas will grow in pure sand, but such plants frequently totally collapse and die. Curiously, plants in sand show more tendency to produce sporadic summer flowers.

The wide distribution has led to many forms with minor variations in foliage and flower. The most marked variation is in the Dryas in the Canadian Rockies where the petals droop and are yellow. This is designated a separate species, *Dryas drummondi*.

The plants grown in our garden are clearly a limestone form. The plants observed in the Bighorn Mountains of Wyoming were also limestone plants. However, there may well be acid forms. The garden of Mr. and Mrs. Fred Case of Saginaw, Michigan, contained about six forms that had been collected in Alaska and Canada. Some of these had been collected in acid sites.

In November, the leaves of *Dryas octopetala* turn brown. Such leaves are not dead and miraculously turn a rich deep green next spring. This rebirth adds life and change. It is something more to watch and observe, giving evidence that the garden is a pulsing, living thing.

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