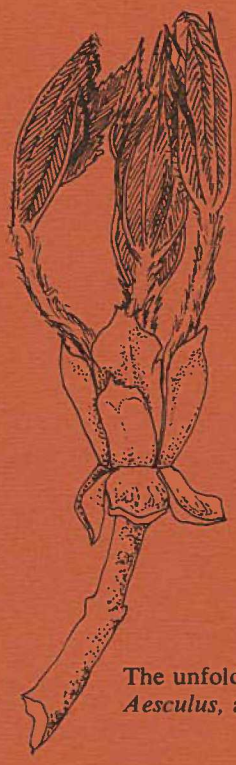
DAVIDSONIA

VOLUME 5 *NUMBER 1* *Spring 1974*

Cover

Pieris japonica, the Japanese Andromeda, a widely used ornamental in southwestern British Columbia. It is as much at home in patio planters as in shrub borders in large gardens. A particularly useful shrub in semi-shaded areas of the garden.



The unfolding of the leaf buds of *Aesculus*, a sure sign of spring!

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Trough Gardening

A. JAMES MacPHAIL

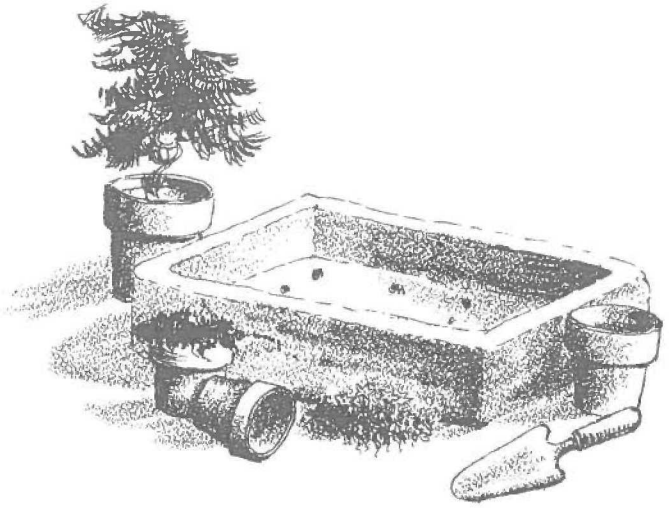
The creation of miniature rock gardens using troughs or sinks as containers is a relatively recent but increasingly popular activity among devotees of alpine gardening.

Objects in miniature, whether they be scale models of ships or automobiles, the Lord's Prayer imprinted on the head of a pin, a model of the Tower Bridge constructed of toothpicks, miniature paintings, sculptures and art objects of various kinds have always, in themselves, exhibited a compelling fascination. A garden in miniature, too, is an artistic creation but, unlike a painting, is a living ornament that provides within its framework a series of delightful pictures everchanging and evolving with the passing of the seasons.

The miniature garden can be displayed to advantage in many situations about the home landscape. It is usually raised up on a pedestal so that its diminutive plants can be seen to better advantage. Placed at the end of a garden path, a trough garden provides an interesting focal point, but perhaps its best use is in the more formal settings of a terrace or patio. Here it takes on a dramatic, sculptural quality and can be viewed frequently and cared for conveniently. If placed on a deck or balcony just outside a glass wall or window the garden may be enjoyed from the indoors as well.

Trough gardening or sink gardening is an innovation from England where, until recent times when the demand exceeded the supply, natural stone troughs or sinks could be found lying neglected in rural areas. These were generally made of native limestone or sandstone. Their original use was as kitchen sinks, or feed and water troughs for farm animals. Today, no longer considered as cast-offs but as artifacts, these natural stone containers command a high price. Most sought-after are those with obvious signs of antiquity: time-worn contours with lichen encrustations adorning the natural rock strata.

In this part of the world where natural stone containers are virtually non-existent, other materials must be used. Of course, there is nothing to stop one from fashioning, with hammer and chisel, a suitable container from one of the softer native rocks, sandstone perhaps, or basalt. The difficulties in this approach, however, would appear to be formidable indeed for the inexperienced.



Local nursery sales yards offer a variety of concrete containers ranging from ornately decorated urns and window boxes to other simpler shapes. Most of the former are far too flamboyant for association with alpine plants, but some of the simpler shaped ones would be adequate in some respects for our purposes. Indeed, some very attractive gardens have been made in concrete containers.

The trouble with concrete is that it is a sterile, soulless substance that is totally lacking in aesthetic appeal. It has been criticized as being antipathetic to the roots of alpine plants but, in truth, providing that the concrete is properly cured, there is little evidence to support this contention. A more valid objection to the use of concrete—apart from its appearance—is that it is essentially non-porous and therefore fails to provide the benefits that derive from the use of a porous container: better soil aeration and the ability to act to some extent as a moisture reservoir. In practical terms it can be observed that a soil mix is less likely to become sour in a porous container than in a non-porous one.

The shortcomings of concrete can be overcome by modifying the concrete formula by the addition of peat moss. This material, a mixture of peat, sand and cement, has been given the name "hypertufa" because of its superficial resemblance to tufa, a porous "rock" highly regarded by knowledgeable alpine gardeners as one of the most hospitable mediums for the roots of alpine plants.

A trough made of hypertufa by the process to be described has many of the attributes of one made from natural stone. The particles of peat distributed within the walls of the container serve to even out the moisture supply available to the roots of the plants. Indeed, should a plant be removed from the container after a year or two it will be observed that many of the plant's fine feeder roots have attached themselves firmly to the hypertufa surface, a sure token that they find this material to their liking. In appearance, too, the hypertufa trough resembles natural stone with its strata lines and roughened texture. Moreover, even a newly-made trough has an aged appearance, as though it had lain for decades awaiting discovery in some musty recess of an English farmyard.

Making the Trough

Basically the process of making the trough involves casting the hypertufa mix in a simple wooden mold. Random layers of pure concrete are added to provide the "strata lines". Before the material has completely hardened the mold is removed and the trough is "texturized" with a stiff wire brush. This brushing removes more of the softer hypertufa mix than the pure cement layers. This gives the surface its three-dimensional rock-like appearance. After a further drying period several drainage holes are drilled in the bottom. While the process is quite a simple one, there is something very soul-satisfying in any kind of masonry project, particularly one that combines functionalism with a certain degree of artistry.

The following is a detailed step-by-step outline for building the trough. Reference to the corresponding photographs should help clarify the procedure.

1. Assemble the wooden mold as shown in Figure 1.
   The overall dimensions for this particular trough are 36″ long by 20″ wide by 8″ deep. This represents a size that is about the maximum that can be moved about conveniently when planted. The builder may choose to vary these dimensions as he sees fit. The mold consists of an inner and an outer form. The space between between them determines the thickness of the walls of the trough. The space below the bottom of the inner form determines the thickness of the bottom of the trough. In our case the thickness of the walls and the bottom will be 2″. The outer form is held together with long wood screws applied from the outside of the four corners. The inner form is held together with metal "L" brackets, one on the inside of each corner. The removable wooden strips shown in Figure 2 connecting the inner and outer forms are not strictly necessary; they merely serve to maintain the proper spacing between the two forms, a job that can be done satisfactorily by eye. They do, however, provide a degree of repeatable accuracy if a number of troughs are to be made from the same mold. Removal of the mold is shown in Figure 3.

2. Use a paintbrush to apply linseed oil or motor oil to all wooden surfaces that will come in contact with the hypertufa mix, i.e., the inner surface of the outer form and the outer surface and the bottom of the inner form. The oil prevents the hypertufa from sticking to the sides of the forms when they are later taken apart.

3. With tin snips or heavy scissors, fashion a wire reinforcing basket from ¼″ to ½″ hardware cloth. This should be of a size to fit in the exact center of the walls and bottom of the trough, 34″ long x 18″ wide x 6″ deep for the size mold whose dimensions are given above. This should be cut from a single piece of hardware cloth, its sides and ends folded up, the excess material from the corners discarded, and the corners securely wired together (see Figure 4).

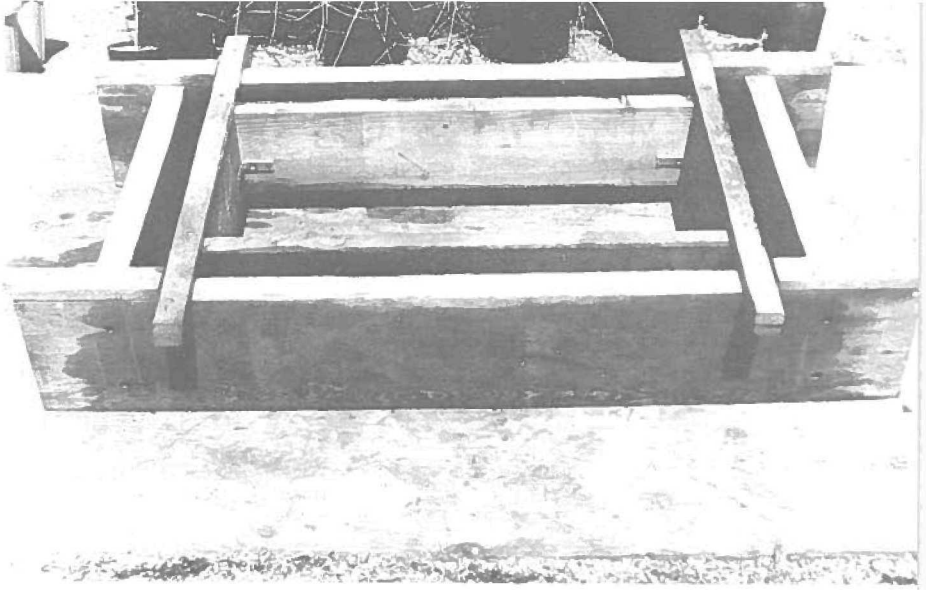


FIGURE 1. The wooden mold used for making hypertufa troughs.

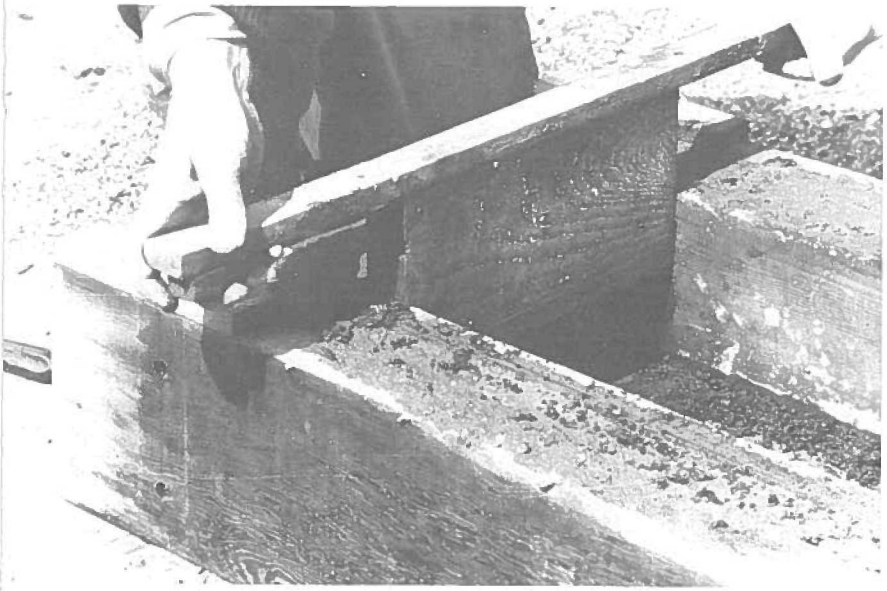


FIGURE 2. Inner form being removed illustrating connecting wooden strip to maintain uniform width of trough.

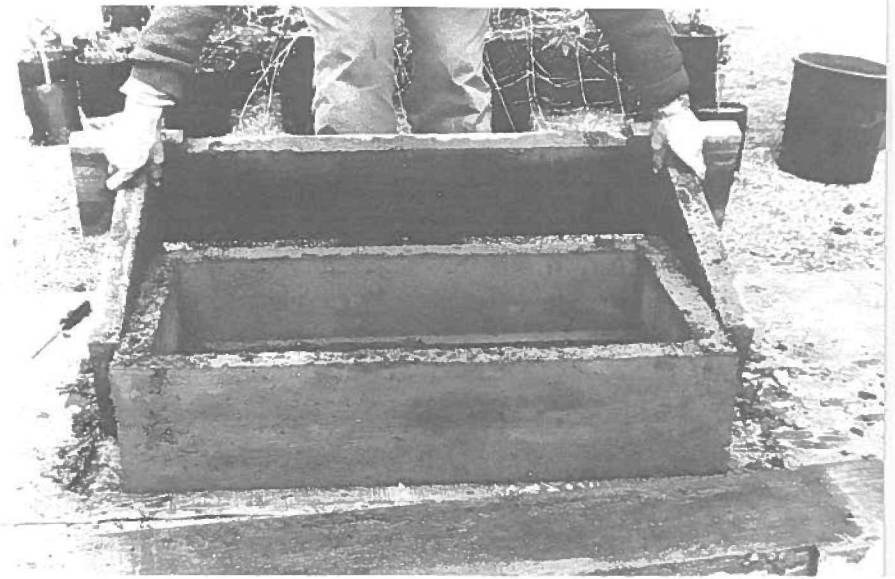


FIGURE 3. Removal of last portion of form revealing completed trough.

4. Place a layer of newspapers on your working surface, preferably a flat wooden floor or a 4' x 8' sheet of heavy plywood. Place the outer mold over the newspapers and check for squareness with a carpenter's square.

5. In a wheelbarrow mix together in a dry state 1 part cement, 1 part coarse sand and 2 parts baled shredded peat by volume. A trough of this size should require approximately one bag of cement, the same amount of sand and double the amount of peat. It is best to make two or three batches of this material as the work of filling the mold progresses, rather than try to mix it all in one wheelbarrow load. Stir in enough water to the mix to form a "muck" that is about the consistency of cottage cheese.

6. Mix together in a large bucket one part cement to two parts sand. To this add enough water to make a runny mix of about the consistency of thick pea soup. This will be the material that will be incorporated into the walls of the mold in very thin layers, alternating with thicker layers of the main hypertufa mix. Its purpose is to simulate the random occurrence of natural rock strata.

7. Now start the casting of the mold by filling the bottom of the outer mold to a depth of one inch with the hypertufa muck. Smooth and press the material well into all the corners using a mason's float or a small flat board.

8. Place the wire net reinforcing basket on top of the one inch thick layer, making sure that it is centered equidistant from all four sides of the mold.

9. Now build up the total thickness of the bottom layer to 2", covering the bottom of the basket with an additional 1" layer of the mix. The bottom of the basket should now be embedded as the middle layer of what will be the bottom of the trough.

10. Place the inner mold in position, resting it on the layer of mix at the bottom of the larger mold. The inner and outer molds should now be at the same height and with a space of 2" on each of the four walls remaining to be filled. The sides of the wire basket project upwards in this wall space to within 1" of the top of the molds.

11. Proceed to fill up the walls of the mold. Alternately pour in layers of hypertufa mix and thinner layers of the soupy mix. Use the end of a 1" x 2" stick to force this material well into the corners, making sure there are no air spaces remaining (Figure 5). Pour the mixes on both sides of the wire netting, trying to keep the netting centered in the walls. Continue in this manner until the entire mold is filled.

12. Now it is necessary to wait for a period until the trough reaches a semi-set condition. The exact time for this depends upon a number of variables: temperature, relative humidity, and the amount of water used in the mix. Generally, though, a time lapse of twenty-four hours is about right. After this period one can proceed to remove the molds. Remove the inner one first. Unscrew the four "L" brackets and collapse the mold inwards. This might present some difficulty. It may happen that some of the mix forming the bottom of the trough has risen above the bottom of the mold, preventing its easy removal. If this has happened the material can be gently scraped away from the bottom edge of the mold with a screwdriver. With patience the mold, now in four separate pieces, can be removed one piece at a time. Removal of the outer mold presents no difficulty. It is only necessary to remove the screws holding one of the long sides and remove the side. The remaining three sides can be removed as one piece if the two short sides are pressed outward (see Figure 3). The trough, now revealed in all its nakedness, is at this point not too different in appearance from one made entirely of concrete.

13. Now proceed to "texturize" the trough. Do this by brushing the exposed surface with a stiff wire brush, rather cautiously at first, as the trough is still very fragile (Figure 6). As the surface material is brushed away and the harder "strata lines" exposed, the trough will begin to look more and more like natural stone. Gently round off all exposed edges on sides and top. Brush the inside surfaces as well, in order to remove the nonporous surface glaze. It is as well not to carry the brushing process too far at this point, but to wait a further twenty-four hours before finishing the process to the degree desired.

14. After the trough is texturized, leave it undisturbed on the working surface for at least a week so that it can harden more fully. It will then be necessary to cure the trough, a process that neutralizes the harmful (to the roots of plants) effect of the cement. This is accomplished by filling the trough with water to which about half a teaspoonful of potassium permanganate crystals have been added. Let this solution stand for a few hours, then empty and rinse the trough with fresh water.

15. The trough can now be stood up on one end and drainage holes drilled through the bottom with a drill, preferably a masonry drill of at least ⅝" diameter. Drilling is easy at this stage as the trough is still relatively soft. Nine such holes widely spaced over the bottom in three rows will prove adequate for a trough of this size. After a few more days the trough should be hardened enough for use.

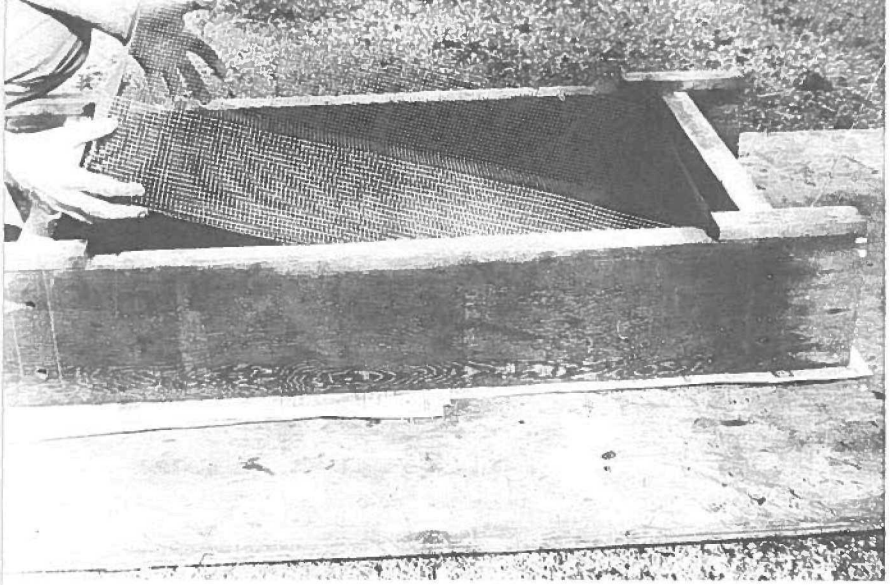


FIGURE 4. Reinforcing basket of wire being fitted in mold.

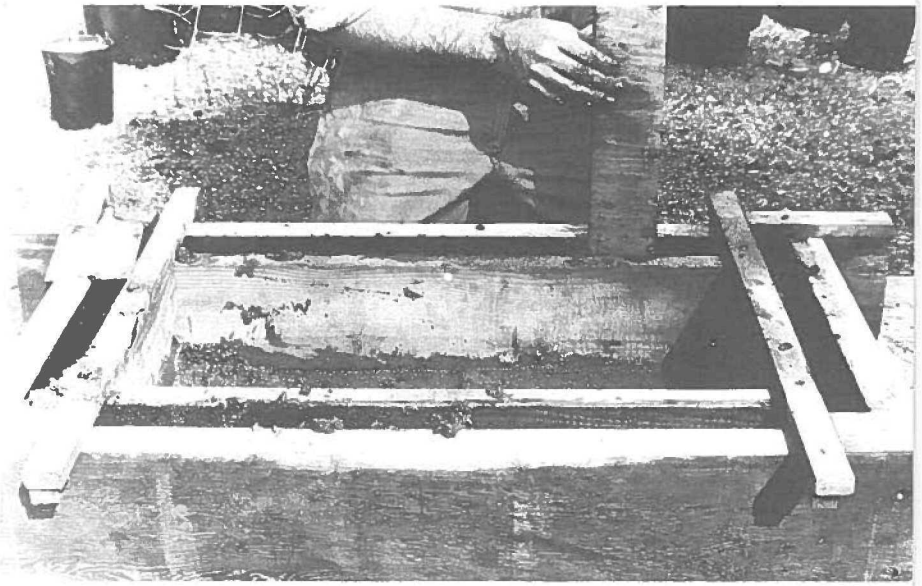


FIGURE 5. Tamping hypertufa mix in mold to ensure no air spaces remain.

FIGURE 6. New trough being "texturized" with wire brush. Right front of trough shows "untexturized" surface.

Preparation for Planting

It is much easier to place the empty trough in its final position and then plant it; a trough of this size full of soil mix, rocks and plants will weigh in the neighborhood of 300 pounds. When choosing a position for it, bear in mind that the vast majority of alpine plants require a good deal of sun in order to flower well and to retain their tight compact character. Those few plants that need shadier conditions can be planted in the shade of a rock or dwarf tree or shrub. The trough should be elevated off the ground in some manner, preferably on a pair of brick or masonry block pedestals. Be certain that none of the drainage holes are obstructed by the pedestals and that the trough is perfectly level. The site chosen should normally be unobstructed overhead so that the miniature garden is fully exposed to the open sky and whatever falls from it.

For that ever-increasing segment of the gardening population—somewhat derisively known as "cliff dwellers"—whose open air garden must be confined to the limits of their apartment balcony, this latter requirement cannot always be met. In many cases the balcony is roofed directly overhead with the deck that forms the balcony for the floor above, and the only rain that falls on each balcony is that which is slanted in by the wind. The owner of such a balcony might be cheered, however, to reflect that many of the choicer alpine plants are themselves natural "cliff dwellers" and will thrive in such a situation, protected as they are from the drenching rains of winter.

The trough should be prepared for planting as shown in the cross-section diagram, Figure 7. If there is one over-riding requirement for the successful cultivation of alpines it is the provision of absolutely faultless drainage. Each drainage hole should be covered with a piece of fine wire mesh. Next comes a 1" thick layer of fine gravel and on top of that, to prevent the gravel drainage layer from becoming clogged, a ½" layer of sphagnum moss, dried leaves, peat roughage (shredded block peat). This also acts as a moisture storage layer. The exact makeup of the next layer, the one in which the roots of the plants will grow, should be varied according to the requirements of the plants to be grown.

It is possible, within the confines of a miniature garden, to grow plants from such diverse native haunts as, for example, a windswept ridge in the Rocky Mountains, a Himalayan peat bog, an arid Persian plain, or a rocky scree high in the Dolomite Alps. Although they may come from vastly dissimilar regions, the vast majority of alpines can be accommodated in one of the following three soil mixes. In the list of plants given in Appendix II, the mixtures referred to by letter are those described below:

Compost A: 1 part loam
1 part flaked leaf mould
1 part coarse sand
1 part granite grit
Add 1 tblsp. of bonemeal for each cubic foot of mix.
This mixture is suitable for the majority of alpines, as well as dwarf conifers and bulbs.

Compost B. 2 parts granite grit
1 part coarse sand
1 part flaked leaf mould
Add 1 tblsp. of bonemeal for each cubic foot of mix.
This is an extremely fast draining mix suitable for rare and difficult high alpines, including most of the cushion type.

Compost C: 4 parts flaked leaf mould
1 part loam
½ part coarse sand
½ part granite grit
This is a moisture retentive soil for growing dwarf rhododendrons and other ericaceous plants and woodland plants.

The formulas for these soil mixes are given without intending to be overly dogmatic as to their precise makeup. Fortunately, alpines are undemanding plants that will allow considerable latitude in respect to soil mixes. The one thing they will not tolerate is a poorly drained mix. Certain substitutions could be made in the formulas. If you don't have any leaf mould, peat moss could be substituted in mix A or C. It

cannot be substituted for the leaf mould in mix B, however, as this mix, containing no loam, depends upon the leaf mould for a source of nourishment which could not be supplied by peat moss, an inert material. One would do better to gather leaf mould from a nearby deciduous wood, if it is not otherwise available. However it is obtained, it should be rubbed through a ½" screen before use. Both the leaf mould and the loam preferably should be sterilized but this is not absolutely necessary if they are reasonably free from weed seeds. Ordinary builder's sand, of the coarsest grade available, is a suitable type of sand. Building supply dealers can sometimes supply the granite grit (it is used in the fabrication of built-up roofing). If not, it is available in sacks as "chicken grit" from feed suppliers.

Planting

The trough should be filled and compacted almost to the rim with the soil mix or mixes appropriate to whatever planting scheme is decided upon. You may wish, for example, to have a dwarf rhododendron as the dominant plant at the left end of the garden. That end of the trough, perhaps for ¼ or ⅓ of the trough's length, would then be filled with Compost C. The balance of the trough might be filled with Compost A in order to accommodate a dwarf conifer, some bulbs, and a great variety of other plants. Somewhat to the right of the center you could have a raised planting area contained by a group of rocks and this could be built up using Compost B which would provide the ideal conditions for such choice cushion plants as *Androsace imbricata* and *Draba mollisina*. Thus it is possible to grow a great variety of plants in one trough.

The best rocks to use are those with weathered features and pronounced strata. They should not be dotted about at random but combined in groups to give the impression of a single rock outcropping with the strata all running in the same direction. The greater proportion of the bulk of each rock should be like that of an iceberg below the surface. One of the great features of rock gardening, whether on a normal or miniature scale, is that it is essentially a means for gardening in three dimensions. We can thrust upward with rock, creating cliffs and promotories with ledges and crevices from which plants can be allowed to cascade vertically downward or soar upward to even greater heights. Planted in a rock cranny, a cushion plant will in time tightly shape itself to the rock contours until it seems almost to become a part of the rock.

The choice of plant material for the miniature garden is, of course, subject to the likes and dislikes of the individual grower. Beyond such personal considerations, it should be noted that not all plants included under the name "alpines" are suitable subjects for the miniature garden. Some ultimately become too tall, too rampant-growing or too disproportionate in some way to be in scale with the dimensions of a miniature landscape. By studying alpines in books, visiting alpine nurseries, or observing the growth habits of different plants in the wild or in cultivation, the inexperienced trough-gardener will quickly become familiar with a wide range of suitable types.

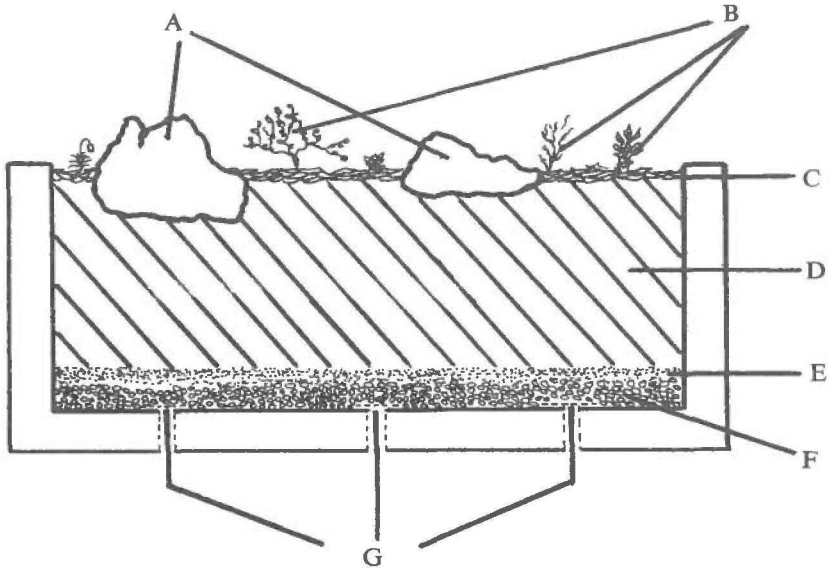


FIGURE 7. Cross-section of planted trough.
A. Decorative rocks, B. plants, C. a one-half inch layer of rock chips, D. prepared compost, E. layer of peat roughage, F. one-inch layer of fine gravel, and G. drainage holes covered with wire mesh.

Dwarf conifers are an extremely valuable group of plants for the miniature garden. Because they have a relatively large mass, they should be placed carefully in relation to the other dominant element in the composition, the rock outcroppings. The effect desired is a naturalistic one, therefore, any hint of symmetry should be avoided. Rather, one should strive for an arrangement based on asymmetrical balance. The dwarf conifer serves a further, more subtle purpose. Because the viewer can readily accept it for what it in fact is; a tree, he has no problem in accepting a nearby rock, for example, as being a quarter or half as big as a tree. Thus, the dwarf conifer establishes the scale of the whole garden; it enhances the illusion of a landscape in miniature. Suggestions for suitable slow-growing conifers are given in Appendix I.

The best time to plant the garden is undoubtedly in early spring when the roots start into active growth and the plants will quickly re-establish themselves in their new home. Plants obtained from a nursery will usually be received growing in pots in a somewhat richer soil mix than is considered ideal. The reason for this is that nurserymen, quite understandably, try to raise a saleable sized plant in as short a time as possible. If such a plant were to be planted with its root ball intact into a much faster draining medium such as Compost B, the plant might survive for a while in seemingly good health, but would very likely gradually decline and eventually die. The reason is that when the plant is watered the water soaks away rapidly around the root ball without penetrating it. This results in a hard, dry root ball that the roots are unable to break out of; the plant dies from lack of water and nourishment. It is important then, when the plant is to go into Compost B, that the old soil be shaken or washed away and the roots gently teased apart. Planted, firmed and watered into the trough, the plant should thereafter be shaded from direct sun for a few days.

If the plant is to go into Compost A or C the method is much more straightforward. Simply knock the plant out of the pot and remove any crocks or drainage material from the bottom of the rootball. If the plant is potbound or has great masses of roots growing in a circle, the root tips should be gently separated so that they will take hold of the new soil. It is then placed into the hole prepared for it and firmed into place.

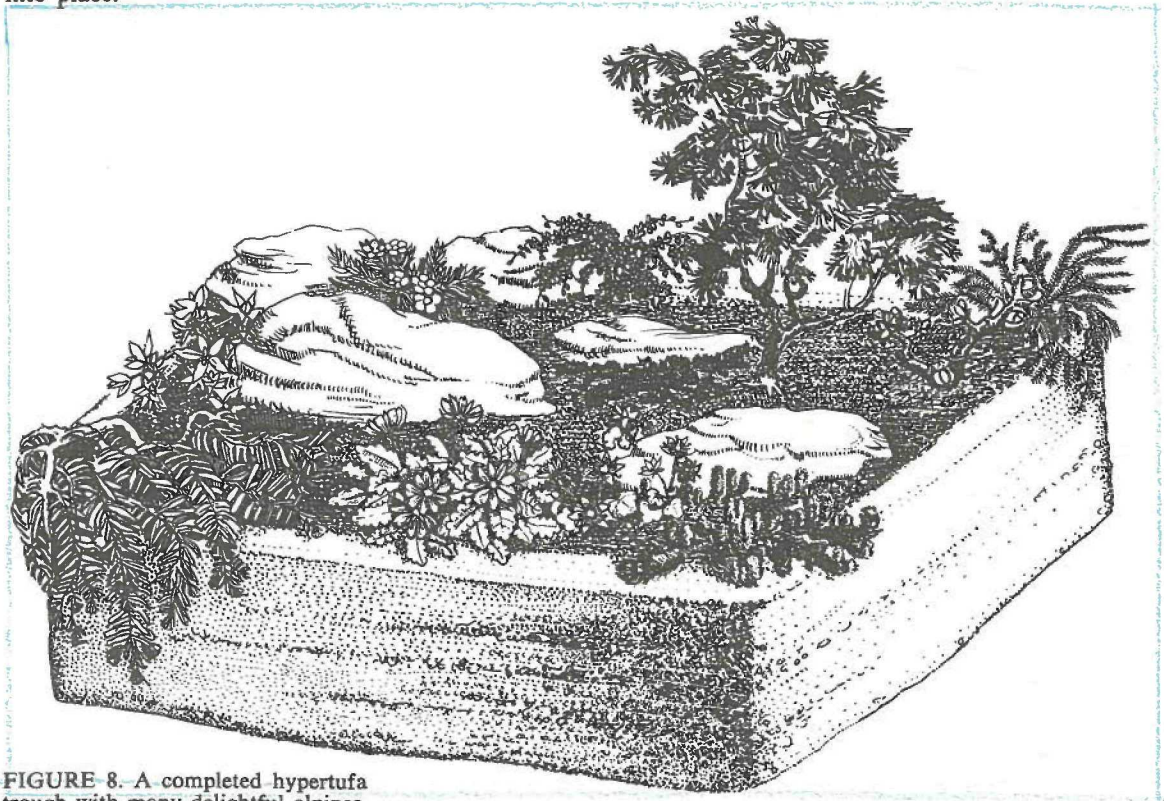


FIGURE 8. A completed hypertufa trough with many delightful alpines.

The plants should be planted so that the soil level in the trough comes about ½" lower around the collar of the plant than when it was in the pot. This is to allow space for an overall layer of chippings after the planting is completed.

The layer of chippings, which ideally should be of the same material as the rocks used in the trough, provides several beneficial effects: first, by covering the soil surface it adds immeasurably to the finished appearance of the trough (one seldom sees bare soil in a natural environment); it helps to conserve moisture by limiting surface evaporation; it tends to inhibit the germination of weed seeds; in damp weather it provides an extra measure of drainage around the collar of cushion plants which otherwise might develop rot at this point.

Maintenance

Far from being the burdensome chores they might be in the full sized garden, the routine watering, weeding, pruning and feeding of the miniature garden take on more the aspect of agreeable tinkerings. The gardener attains a high degree of intimacy with the garden's occupants and consequently a quick awareness of their needs.

The subject of maintenance can only be dealt with in very general terms as so much depends upon the number and type of plants grown. A garden made up largely of dwarf rhododendrons, cassiopes, phyllodoces and the like would need much more frequent watering, for example, than one consisting of sempervivums, sedums and dwarf bulbs. The latter group would need practically no watering after the bulbs had gone dormant. In general it can be said that most alpines should be watered heavily in spring and early summer, less frequently in autumn and hardly at all in winter. In fact, the most trying period for many of the more difficult alpines is winter when normal rainfall is far in excess of what they require. For this reason many alpine gardeners who grow these difficult plants in troughs will either move the troughs under cover or improvise a covering of glass or plastic for them.

The soil mix in the trough most likely will be full of plant roots after a period of two or three years. A feeding each spring of a balanced organic plant food such as liquid fish fertilizer can then be given and in the fall a topdressing of bonemeal. A zero-nitrogen plant food supplement may be of benefit where lots of healthy foliage is produced but few flowers.

Luckily, rock garden plants as a group are relatively untroubled by plant diseases or insect pests. The chief enemies are slugs and aphids, both of which are easily controlled with the usual baits and sprays.

Selected Lists of Plants

Appendix I is a representative selection of dwarf conifers. All do best in Compost A:

APPENDIX I—Dwarf Conifers

Group 1. These are readily available but relatively fast growing conifers that may in time—perhaps after a period of six or eight years—become too large for trough cultivation. As young plants they are quite suitable but may need to be restrained by pinching or pruning.

Cedrus libani var. nana
Chamaecyparis lawsoniana var. elwoodii
Chamaecyparis obtusa var. nana
Cryptomeria japonica var. bandai-sugi
Juniperus chinensis var. sargentii
Picea abies 'Clanbrassiliana'
Picea glauca var. albertiana 'Conica'
Pinus mugo
Thujopsis dolobrata 'Nana'
Tsuga canadensis 'Pendula'

Group 2. These, the jewels in any collection, have an annual growth rate measured in fractions of an inch. They are quite rare and apt to be rather expensive.

Chamaecyparis obtusa 'Nana Caespitosa '
Chamaecyparis obtusa 'Nana Minima'
Cryptomeria japonica 'Vilmoriniana'
Dacrydium laxifolium
Juniperus communis 'Compressa'
Picea abies 'Pygmaea'
Pinus sylvestris 'Beauvronensis'
Podocarpus nivalis
Tsuga canadensis 'Coles'

Appendix II is a representative but by no means exhaustive list of flowering plants chosen to provide a long-blooming season. Plants can be selected from this list to provide something in bloom almost the year round. *Abbreviations used:* Type: Sh=Shrub, Cu=Cushion plant, EH=Evergreen herb, HP=Herbaceous perennial, B=Bulbous plant. Position: S=Sun, Sh=Shade, HSh=Half shade.

APPENDIX II

Name of plant	*Type*	*Height × Spread In Inches*	*Position*	*Colour*	*Flowering Season*	*Compost*
Aethionema armenum	Sh	4″x8″	S	Pink	June	A
Alyssum serpyllifolium	Sh	1″x5″	S	Pale yellow	May	A
Andromeda polifolia minima	Sh	2″x6″	HSh	Pink or white	April	C
Androsace carnea	Cu	3″x4″	S	Pink	April	A
A. imbricata	Cu	1″x3″	S	White	April	B
A. sempervivoides	EH	2″x6″	S	Pink	April	A
Aquilegia flabella var. nana	HP	4″x6″	S	Blue	May	A
A. jonesii	HP	3″x4″	S	Blue	March	B
A. laramiensis	HP	2″x3″	S	Pale blue	April	B
A. scopulorum	HP	4″x5″	S	Pastel blue	June	B
Arabis bryoides var. olympica	Cu	1″x3″	S	White	May	B
Arcterica nana	Sh	2″x5″	HSh	White	April	C
Armeria caespitosa	Cu	2″x6″	S	Pink	April	A
Astilbe glaberrima var. saxatilis	HP	3″x6″	HSh	Pink	July	C
Bellium minutum	HP	2″x4″	S	White/red	June	A
Calceolaria tenella	HP	2″x4″	HSh	Yellow	June	C
Campanula morettiana	HP	2″x6″	S	Violet-blue	July	B
Cassiope lycopodioides	Sh	2″x6″	S	White	April	C
C. stelleriana	Sh	3″x6″	S	White	May	C
Ceanothus prostratus	Sh	2″x8″	S	Blue	May	B
Celmisia sessiliflora	EH	3″x6″	S	White	June	A
Chionodoxa luciliae	B	4″x2″	S	Blue	March	A
Crocus imperati	B	3″x3″	S	Buff, purple	February	A
C. medius	B	2″x3″	S	Purple	November	A
C. ochroleucus	B	3″x3″	S	White	November	A
C. susianus	B	3″x3″	S	Yellow	January	A
Cyananthus microphyllus	HP	3″x6″	HSh	Blue	August	A
Cyclamen cilicicum	B	3″x4″	HSh	Pale Pink	September	A
C. orbiculatum var. coum	B	3″x4″	HSh	Magenta	February	A
C. orbiculatum var. hiemale	B	4″x4″	HSh	Carmine	January	A
Cytisus demissus	Sh	3″x6″	S	Yellow	April	A
Daphne cneorum var. pygmaea	Sh	3″x6″	S	Deep pink	May	A
Dianthus alpinus	Cu	2″x6″	S	Rose pink	June	B
Douglasia laevigata	Cu	2″x6″	S	Deep pink	March	B
D. vitaliana	Cu	1″x6″	S	Yellow	April	B
Draba bryoides var. imbricata	Cu	2″x4″	S	Yellow	April	B
Draba dedeana	Cu	1″x4″	S	White	March	B
Dryas octopetala var. minor	Sh	2″x6″	S	White	May	A
Edraianthus pumilio	HP	2″x6″	S	Lavender	June	B
Eriogonum ovalifolium	EH	5″x6″	S	White	June	B
Fritillaria pudica	B	6″x2″	S	Yellow	March	B
Gaultheria humifusa	Sh	2″x8″	Sh	Blush pink	June	C
Galanthus olgae	B	4″x2″	S	White	November	A
Genista villarsii	Sh	2″x6″	S	Yellow	June	A
Gentiana saxosa	EH	2″x6″	HSh	White	July	C

Name of plant	*Type*	*Height × Spread In Inches*	*Position*	*Colour*	*Flowering Season*	*Compost*
G. verna	EH	3"x4"	S	Blue	May	A
Globularia nana	EH	1"x4"	S	Blue	June	B
Hebe buchananii var. nana	Sh	1"x3"	S	White	June	A
Hypericum reptans	HP	1"x8"	S	Yellow	July	B
Iberis saxatilis	EH	3"x6"	S	White	April	A
Ilex crenata var. mariesii	Sh	8"x4"	Sh	Foliage plant	May	C
Iris danfordiae	B	3"x3"	S	Yellow	February	A
Lapeyrousia cruenta	B	4"x3"	S	Pink	August	A
Leiophyllum buxifolium var. hugeri	Sh	5"x6"	Sh	Pink/White	May	C
Leucojum autumnale	B	2"x3"	S	Blush pink	September	A
Lewisia columbiana var. rupicola	EH	4"x3"	S	Magenta	May	A
L. rediviva	HP	2"x4"	S	Pale pink	June	B
Muscari azureum	B	3"x2"	S	Blue	March	A
Narcissus bulbocodium var. romieuxii	B	3"x3"	S	Pale yellow	January	A
N. watierii	B	4"x3"	S	White	March	A
Oxalis lobata	B	3"x6"	S	Gold	September	A
Penstemon davidsonii	Sh	3"x8"	S	Red	June	B
P. rupicola	Sh	4"x8"	S	Red	June	B
Petrocallis pyrenaica	Cu	2"x5"	S	Lavender	May	B
Petrophytum caespitosum	Cu	2"x6"	S	White	July	B
Phlox douglasii	Cu	2"x8"	S	Lilac	May	A
Phyllodoce nipponica	Sh	5"x7"	HSh	White	May	C
Polygonum tenuicaule	HP	2"x5"	HSh	White	April	C
Potentilla nitida	HP	2"x6"	S	Rose	June	A
Primula × bileckii	EH	1"x3"	S	Red	May	A
P. farinosa	HP	2"x3"	Sh	Pink	April	C
P. minima	EH	2"x4"	S	Rose	May	A
P. clarkei	EH	2"x4"	Sh	Deep pink	April	C
Pulsatilla vernalis	EH	4"x6"	S	White/violet	April	A
Raoulia australis	Cu	½"x6"	S	Yellow	June	B
Rhododendron impeditum	Sh	4"x6"	Sh	Lavender	April	C
Rhododendron radicans	Sh	2"x6"	Sh	Purple	May	C
Rhodohypoxis baurii	B	2"x5"	S	Deep pink	Summer	A
Salix reticulata	Sh	3"x6"	HSh	Yellow	May	C
Saponaria ocymoides 'Rubra compacta'	EH	1"x6"	S	Carmine	May	A
Saxifraga burseriana	Cu	2"x6"	HSh	White	March	A
Saxifraga × Irvingii	Cu	1"x4"	HSh	Lilac	March	A
Saxifraga × Myra	Cu	1"x4"	HSh	Red	March	A
Scilla autumnalis	B	4"x2"	HSh	Rose	September	C
Sedum spathulifolium	EH	3"x6"	S	Yellow	June	A
Sempervivum arachnoideum	EH	3"x6"	S	Rose	August	A
Silene acaulis	Cu	2"x6"	S	Pink	May	B
Soldanella minima	EH	2"x4"	HSh	Lilac	March	C
Talinum okanoganense	HP	1"x3"	S	White	May	B
Thalictrum kiusianum	HP	4"x6"	HSh	Mauve	June	C
Trillium rivale	B	2"x3"	HSh	White	March	A
Veronica bombycina	EH	3"x6"	S	Pale blue	May	B
Viola yakusimana	HP	½"x3"	Sh	White/lilac	May	C

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Osmaronia cerasiformis (Torr.& Gray) Greene

INDIAN PLUM, OSO-BERRY, BIRD CHERRY, SQUAWPLUM

Member of Family Rosaceae

Natural Distribution

Osmaronia cerasiformis occurs from British Columbia to northern California west of the Cascade-Sierra Nevada divide. In British Columbia it is found only in the extreme southwestern part of the province from the vicinity of Vancouver south, extending east in the Fraser Valley to Popkum and north to Squamish, while on Vancouver Island it is found south from Duncan.

Habitat

Osmaronia cerasiformis is found in the coastal Douglas fir and drier coastal Western hemlock Zones of British Columbia. The precipitation in these zones varies from 66 to 280 cm (Krajina 1969) with wet winters and dry summers. The shrub is found along stream banks, roadsides and in moist to fairly dry open woods at lower elevations (from sea level to 450 m on Vancouver Island and from sea level to 150 m on the mainland). It is most common on well drained moist alluvial soils in partly shaded situations.

Description

An erect, usually clustered, several-stemmed, deciduous, suckering shrub or small tree, 1.5-3(-5) m tall. Branches are rather straight and slender. If growing in the open the shrub is bushy and erect sometimes forming a thicket, but becomes sprawling and taller if shaded by trees. The earliest flowering shrub in British Columbia.

The root system is fibrous and close to the surface.

The bark is purplish brown or gray, smooth and bitter to the taste, when torn it produces an odor somewhat similar to wood-alcohol.

Twigs are terete and purplish, the branchlets are brittle, glabrous and ill-smelling. The pith is rather large, rounded, pale and chambered.

Buds are green, sessile or more-or-less supra-axillary or stalked, ovoid, obtuse, with about 3 exposed mucronulate scales.

Mature leaves are deciduous, alternate, thin, entire, (4-)5-12 cm long, 2-4 cm broad, narrowly ovate or elliptic to obovate, mucronate to acute at apex, of a peculiarly intense yellowish green, glabrous above, slightly paler and often pubescent but becoming glabrate on the lower surface, with prominent raised veins beneath, and occurring in upright clusters. Have a pungent smell when crushed sometimes described as cucumber-like. Petiole short, 5-10(-15) mm long. Stipules small, soon deciduous. Leaf scars alternate, somewhat crowded at tips of branches, shallow U-shaped or narrowly crescent-shaped, only slightly raised, stipule scars lacking.

Flowers produced from February to April depending on the range, appearing as the leaves unfold. Inflorescence a glabrous, bracteate, usually pendent raceme, 3-10 cm long containing 5-10 flowers and terminating leafy branchlets of the season. Pedicels glabrous with 2 bractlets. Bracts and bractlets membranaceous and deciduous. Flowers polygamodioecious or dioecious, white or greenish white, fragrant, perfect or imperfect, pentamerous, 8-10 mm across. Calyx 6-7 mm long, more-or-less turbinate-campanulate, lobes about 3 mm long, approximately equal to hypanthium, hypanthium gland-lined, persistent in staminate flowers but quickly circumscissile in pistillate flowers near the base leaving a collar-like remnant under the fruit. Petals 5, about 6 mm long, obovate or elliptic obovate, very short-clawed and spreading

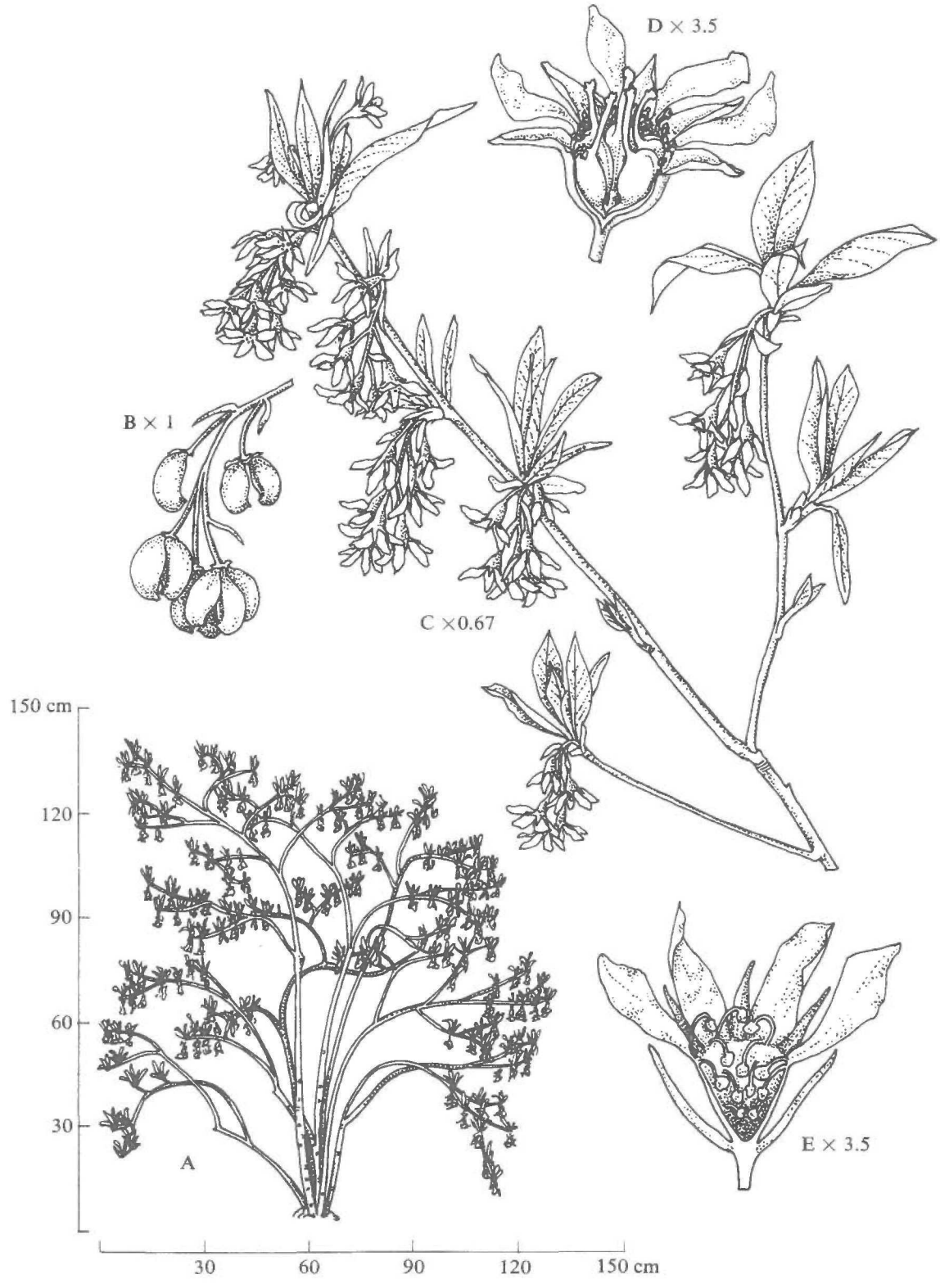

FIGURE 9. *Osmaronia cerasiformis*. A. Habit of shrub at flowering time (March/April), B. fruiting raceme, C. a portion of a staminate flowering shrub, D. pistillate flower, E. staminate flower.

in staminate flowers, shorter, narrower and erect in pistillate flowers. Stamens 15, inserted in 3 distinct series, 10 with the petals and 5 lower down on the disk lining the hypanthium, present also in the pistillate flowers but filaments very short and the anthers probably always abortive. Pistils usually 5, simple, free, distinct, glabrous, styles not exceeding calyx, jointed at base, deciduous, stigmas capitate. Ovary 5, superior with 2 ovules in each. Fragrance said to be cucumber-like, but can be oppressive to some people, especially when brought into the house.

Fruit a plum-like drupe, 1-5 produced per flower, 8-10 mm long, scarlet or orange when immature, becoming bluish-black when ripe, glaucous, ovoid or oblong, often a little flattened on one side, thin fleshed, bitter but not poisonous, smooth bony endocarp, 1-seeded. Collar-like remnant of hypanthium persistent under fruit.

Propagation

Seeds may be sown as soon as mature or after stratification.

Semi-ripe hardwood cuttings taken in July are easily rooted, Otherwise suckering or layering may be tried.

Transplantation

Fibrous rooted and therefore easy to transplant in spring at any size bare-rooted.

Conditions for cultivation

The rate of growth is moderate throughout its life. The recommended hardiness zones in Canada for *Osmaronia cerasiformis* is Zone 7. The shrub prefers humid soil with some summer moisture, and a partly shaded situation, but will become straggly if there is too much shade. If grown in the open it may become a bushy thicket. There is no need to prune annually, but if the growth becomes dense and overcrowded then the shrub should be pruned immediately after flowering.

Landscape Value

Not really a choice ornamental shrub although it is grown for the handsome foliage and the fragrant early-appearing flowers—as the earliest of our spring-blooming shrubs, it is attractive in the garden when other woody plants are bare. The berries are also attractive and are eagerly eaten by birds so do not remain on the shrub for long.

Availability

No known commercial source in North America.

Varieties and Ornamental Cultivars

Osmaronia is a monotypic genus present only on the Pacific Coast. Some locally differentiated forms occur, particularly in California. Most botanists now consider these forms to be merely extremes of the one species and previously named varieties are no longer used.

No ornamental cultivars have been developed.

Other Uses

The Indians of Western Washington apparently used to eat the fresh berries in a casual way although the Cowlitz tribe would dry them for emergency winter use. The southern Kwakiutl Indians of British Columbia ate them fresh with oil at family meals and at large feasts—they are, however, so dry and hard to swallow that a person unused to them would need a large quantity of oil. They also stored them for winter use in sealed oil boxes which were kept in a cool place.

Turner and Bell (1973) also mention a plant which they believe could be Indian plum which was chewed and applied to sore places, or was burned and mixed with catfish oil before application.

Diseases and Problems of Cultivation

Chlorosis may develop if the shrub is grown in shallow poor chalky soils.

Very little information is available about diseases and insects which may attack *Osmaronia cerasiformis*. Toms (1964) reports *Cylindrosporium nuttallii* (Harkn.) Dearn.—'leaf spot'—as occurring on the shrub in the coastal area of British Columbia.

The generic name *Osmaronia* is derived from the Greek adjective *osme* meaning smell or fragrant prefixed to the generic name *Aronia* which was the Rosaceous genus choke-cherry proposed by Persoon. It is presumed that this is because the shrub somewhat resembles the choke-cherry and is very fragrant. The The specific epithet *cerasiformis* means "shaped like a cherry", although the fruits actually resemble small plums rather than cherries.

The type locality for *Osmaronia cerasiformis* is the Columbia River where it was collected by Nuttall, Douglas and Scouler. The genus was originally named *Nuttallia cerasiformis* Torr. & Gray in Hook. & Arn. in honor of Thomas Nuttall as he was the first person to collect fruiting specimens, Douglas having collected flowering branches only.

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CLIMATOLOGICAL SUMMARY*

Data 1974	*January*	*February*	*March*
Mean temperature	36.90°F	40.0°F	42.65°F
Highest temperature	53.0°F	50.0°F	56.0°F
Lowest temperature	21.0°F	30.0°F	24.0°F
Grass minimum temperature	9.0°F	24.0°F	13.0°F
Total rainfall/No. days with rainfall	7.76"/20	5.57"/19	8.31"/19
Total snowfall/No. days with snowfall	7.4"/3	0	9.5"/3
Total hours bright sunshine/possible	77.3/265.39	58.9/278.24	118.9/361.16
Max. wind speed (m.p.h.) 1 hour/direction	16/SE	17/SE	14/SE
Mean mileage of wind at 3'	78.7	89.3	86.7
Mean mileage of wind at 40'	118.9	130.1	125.2

**Site: The University of British Columbia, Vancouver, B.C., Canada*
Position: lat. 49° 15'29"N; long. 123° 14'58"W. Elevation: 342.6'

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A miniature tufa rock garden.

Opposite: A view in the British Columbia Native Garden, where the natural coastal forest has been preserved. Such preservation will become more important to the University and the adjacent local community as development continues to erode the University Endowment Lands.

A delicate harbinger of spring, the Star Magnolia, *Magnolia stellata,* is a welcome white addition to the burst of color in the spring garden.

DAVIDSONIA

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