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SOME SUGGESTIONS FOR ROCK GARDENS IN SOUTHERN CALIFORNIA

EDWARD K. BALLS*

The rock garden has been so largely used for the cultivation of alpine plants that it has often become almost synonymous with the alpine garden. None the less, there are large numbers of plants, not alpine in character, which grow almost exclusively among rocks in their native places. The definition of an "alpine plant" has occupied many pages of controversy, but for the general rock garden it is perhaps unnecessary to be too exact in this matter. There are also many species of plants which do not grow among rocks which can be effectively used in the general planting of such an area. For effective landscaping a rock garden is not necessarily a completely rocky area, there is room for open spaces which compare with meadows or sand dunes or even plains among the rocky places of nature. It is important that the scheme of a rock garden should be developed in proportion to the space available so that the open places will be as natural as possible and the rocks themselves not overpowering or "fussy." Once the area and the lay-out are determined, the plant material to be used must be somewhat governed by these factors.

To set forth ideas for a rock garden in California one needs to have specific data as to exact location, as almost every spot in the state seems to require different treatment, both in lay-out and in the plants which can be expected to thrive there. Even in the south, where summers are hot and dry, and often wind-parched, there is still much plant material available which can be satisfactorily used in such a garden. Some of it may come from much higher altitudes than would naturally seem possible, as almost all of the plants used will need a good deal of individual care if they are to remain reasonably permanent in cultivation. Of course the planning of such a garden presupposes that a good deal of care and attention will be paid to the growing garden. (I do not say "finished garden" of deliberate intent for it seems to me that a garden is never completed, but is constantly growing and changing.) The site is important and the extent of the garden will determine much of the plant material which can be used in it, particularly the all-important item of shrubs.

First it should be stressed that no matter how dry the climate it is vitally important that the soil used should be well drained. The heavy clay and adobe so frequent in this region will be responsible for an extremely high mortality among the plants if it is not lightened to a depth of one to two feet with sand, humus and small crushed rock, such as is used for road surfacing. Water must not hang around the roots of the plants. It is better to have a soil

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which lets the water away too easily and to water more frequently, than to use a heavy, impervious soil. It is well to remember too that large numbers of the plants of the lower mountain ranges and of the deserts dry up in the summer and look shabby or dead. Some can be kept green by summer watering but the extra growth so gained, meaning a lack of their normal rest period, tends to exhaust the plant which will thus not live so long as it otherwise might. Over-watering will perhaps be the cause of the greatest number of deaths among the drought-loving southern species and it is often difficult to be sure just how much water should be given. In general the best practice is to water deeply and at longer intervals, and for many of the southern species overhead watering, particularly in summer, is not too good. Perhaps few people realize that vast numbers of perennial plants do die every year, in the wild, even when they appear to be in their prime, so that losses in cultivation are not necessarily the "fault" of the cultivator.

A garden of this type therefore, must largely become a series of experiments in which one learns what to grow and how to treat it for the best results as one gains intimate experience of the location and the plants. Even in their native areas it is not always easy to establish wild plants in the garden. Collected specimens of many species are impossible to re-establish and it is generally preferable to obtain seed and either to grow small plants in a nursery or to sow seed directly where the plant is to grow permanently.

Plants from higher altitudes, when brought down to the lowlands will usually require much more shade, or shelter, than they have in their native places, and the really high alpine from the Sierras will hardly be persuaded to grow at sea level, except in much more northern latitudes. Here at the Garden we are experimenting with two small shrubby penstemons, *Penstemon Newberryi* (4000 to 10,000 ft.) and *P. Menziesii* subsp. *Davidsonii* (7000 to 12,000 ft.), both northern Californians. Through the summer they have grown slowly and steadily, making neat, bushy and healthy growth, but the hot winds of late August and September are taking toll. It remains to be seen if we can keep them through the winter. They are planted on the northwest side of a tall group of *Quercus agrifolia* where the sun strikes only a part of the bed. Most of the plants which have so far died are those more exposed to the sun. Those more deeply in the shelter of the oaks are still promising. They need a weekly watering, but part of the need may be caused by the thirsty roots of the oaks, below the bed.

The extent of the rock garden will of necessity determine somewhat the type of the plants which can be used in it, for some relationship between the size of the plants and that of the area they grow in is essential to the satisfactory appearance of the whole. Particularly is this true of the shrubs and the stronger-growing perennial herbaceous species. While the extensive rock garden can absorb all the smaller growing species, in selected places, the small garden will soon be overpowered by the larger-growing plants except as they can be used beyond its actual boundaries for essential shade or screen. After the placing of the rocks and the shaping of the general contours of the garden the placing of the shrubs is of the greatest importance in the landscaping of any rock garden. Dwarf conifers, such as are used to the best effect in more

moist northern climates, are unlikely to do well in the parched atmosphere of Southern California. Possibly some of the prostrate junipers could be used, but except in an extensive area, they would need constant and careful pruning and would be liable to burn in the dry summer winds. Such small shrubs as *Fallugia paradoxa*, *Cneoridium dumosum* or *Tetracoccus dioicus* might well be kept in proportion. These all retain their leaves throughout the year but might yet grow too large for the really small garden. Few of the native wild-lilacs (*Ceanothus*) would fit in to any but the largest schemes, as in general they do not respond too happily to heavy pruning. Possibly *C. rigidus* might be kept small and *C. gloriosus* is a prostrate, mat-forming plant. Both are native to central California coastal areas and should not be expected to grow too fully exposed to the sun of the south. Of the monkey flowers, *Diplacus aridus* is perhaps the smallest and most compact-growing. *D. longiflorus* is an excellent plant also but will grow quite large. All the *Diplacus* species however will behave well under severe pruning and with caution most of them could be used in these areas. *Rhamnus crocea*, growing about three feet tall, will make a very delightful shrub. It can also be pruned quite heavily if necessary, and still produce a brilliant show of clear scarlet berries in late July. The desert shrubs *Cassia armata* and daleas (*Dalea arborescens*, *D. spinosa*, *D. californica* and so on) may be very hard to establish but are well worth trying in a hot, dry place. The Creosote Bush, *Larrea divaricata*, is apt to be too large, even if it will grow satisfactorily. *Simmondsia chinensis*, Goat-Nut, is more amenable and is a good evergreen shrub if not too large for the space available. *Leptodactylon californicum*, Prickly-Phlox, is apt to be ragged and shabby after blooming but its flowers are so generous and it will grow happily in such adverse conditions that it should be included wherever possible, remembering that its life-span may not normally exceed four or five years. Some of the sub-shrubby desert species, such as *Salvia mohavensis* or *Trixis californica* would be good, if they can be persuaded. *Psilostrophe Cooperi*, between shrub and perennial, makes a useful plant, flowering for five or six months in succession.

The herbaceous perennials are perhaps more easy to select, as suitable species are more numerous in this category. For southern gardens the first group to consider would be the succulent species which are scattered in all the rocky places from the coast to the Sierras. They include the dudleyas, stylophyllums, echeverias, sedums and gormanias. Some of these names are synonyms and you may meet the same plant under two or even more of these generic names. Among the dudleyas, *Dudleya minor*, from San Bernardino County, with pink flowers on three-inch stems, and bronzed-green rosettes, or *D. nevadensis* with grayer leaves and eight-inch stems bearing flattened heads of coppery-orange flowers, are fairly easy to establish and will take a sunny exposure. *D. pulverulenta* is one of the most handsome with rosettes of wide, pointed leaves densely white with farina and spreading a foot across. The flower-stems are tall and wide-branching at the tops, somewhat sprawling, with narrow red bells hanging from the sprays. Its old leaves will die towards the end of the summer and it is then apt to look shabby. It too will take a good deal of sun and grows in poor, gravelly soil. There is quite a long list of these



Plate XXIII—At the right, *Stylophyllum Traskae* in foreground and *S. insulare* to the back and left; in the Botanic Garden these succulents are grown in partial shade of *Pinus remorata*. *Linanthus dianthiflorus*, at the left; growing in the Botanic Garden and forming a veritable mat of pinkish lavender blossoms. Photos by Robinson.

dudleyas with flowers ranging from greenish-cream to red, and with rosettes green or glaucous-gray and flower-stems varying up to two feet tall. A number of them will take full sun, even in the hot south, though most of the coastal species will require light shade to compensate for the loss of the cooler air and the fogs of their native region.

Among the stylophyllums there are also both larger and smaller growing species. *Stylophyllum Orcuttii*, for instance, will form quite dense cushions of fleshy, awl-shaped leaves, an inch or two long, gray-white over bronze with small, pinkish-white flowers held on wiry stems six inches above the leaves. *S. edule* has bright green foliage and forms a wider cushion. Both these plants require some shade in the hotter areas. For good, hearty growth *S. insulare* and *S. Hassei* will provide rosettes a foot across with panicles of creamy-white or greenish flowers on stout, two-foot stems. Both will do better in shady places.

Most of the sedums come from the mountains and will require especially well-drained and gritty soil. Though they flourish normally in full sun they will produce better plants if placed near or between rocks, and where they can get some shade for the greater part of the day. There is a considerable variety of character of foliage among these mountain species. All of them make good rock-garden plants. *Sedum spathulifolium*, with rather small, spathulate leaves forming flat rosettes, has bright yellow flowers and prefers more shade than most of them. Its leaves vary from yellowish-green to gray and there is a variety known as *S. spathulifolium* var. *purpureum* which has very handsome plum-colored foliage well covered with gray bloom. This latter is very near to *S. pruinatum* in appearance, the latter may be easier to come by. *S. niveum* makes a dense, soft, bright green hassock an inch or two tall, and produces dainty white to pale pink flowers. It also does better with good, high shade. *S. obtusatum* (or *Gormania obtusata*) is a much stouter plant with leathery foliage often flushed with red. It has less flattened heads of flowers than most of the sedums, and in color varies from a rich cream to a strong yellow.

Some of the wild buckwheats are well worth growing, though those from the really high Sierras, which are so desirable, would be unlikely to succeed anywhere near the coast. It might be possible to bring them into cultivation on the lower slopes of the Sierras, but the spot would need to be carefully chosen. These gray-cushioned dwarfs include such species as *Eriogonum caespitosum*, *E. incanum*, *E. Lobbii* and *E. ovalifolium*. However, such plants as *E. crocatum* and *E. arborescens* could well be used in full sun, at lower altitudes, bearing in mind the ultimate size of the plants. Larger species such as *E. grande* var. *rubescens* and *E. umbellatum* are also suitable for the rock garden and dainty, pink-flowered *E. Wrightii* var. *subscaposum* would be ideal in a semi-shaded place.

The mountain lupins are notoriously difficult to grow in cultivation, especially in lowland areas, but there are some particularly delightful species among them such as *Lupinus aridus*, *L. Lyallii*, *L. Torreyi*, all silvery, woolly dwarfs belonging to the mountain tops. So far they have proved unwilling in captivity, but with more study of their requirements they may some day be brought into cultivation. Except in a very large area most of the lowland



Plate XXIV—Above, *Psilostrophe Cooperi*, the low rounded plant in foreground, at Kelso, Mojave Desert, May, 1941; completely covered with yellow heads. Below, *Diplacus aridus* against a granite boulder, Jacumba, San Diego Co., May, 1931; yardstick in background. Photos by C. B. Wolf.

lupins are too large for the rock garden until it comes to the annuals, which shall be treated in a separate section.

Among the *Penstemon* species some of the neater growing might be suitable, *P. fruticiformis*, *P. incertus*, *P. laetus* or in larger areas *P. heterophyllus* and *P. azureus* and their varieties.

Some of the plants from the beaches and sand dunes could well be used. *Oenothera cheiranthifolia* is apt to be somewhat rambling but well-grown plants are worthwhile. There is a variety *Oe. cheiranthifolia* var. *suffrutescens* which makes a neat little shrubby plant and is particularly attractive. The abronias, *Abronia umbellata* (pink) and *A. latifolia* (yellow) and *A. villosa* from the deserts are all good though they will spread over quite large areas and so need the more open spaces in the scheme. They might almost come under the heading of "ground covers." *Erigeron glaucus* is another good plant from the coast which will stand a moderate amount of sun but will do better with light shade. *Corethrogyne filaginifolia* is a more dwarf and compact plant than *C. californica* and should be useful among rocks as it naturally grows as a crevice plant.

The lewisias, from the mountains, are often quite tough though they demand a crevice or a spot where they can lie on their sides with no possible chance of water hanging round their crowns. They will need protection from the direct sun, when brought down to lower levels, and are not among the easier plants to retain in cultivation.

Baileya multiradiata, from the deserts, is an excellent subject in almost any soil. Its gray foliage and clear yellow flowers are among the best. It comes readily from seed and will flower within six weeks from germination. It also appears to be ready to flower over at least eight months out of twelve if the old flowers are cut away with reasonable regularity. Too rich a soil, and too much water will make it grow tall and lax and will shorten its natural life. This is perhaps not so serious, as it is so easy to grow and ready to raise. *Eriophyllum lanatum*, in its better forms, is also admirable and will do well with a good, sunny exposure. Its deep, golden-yellow flowers and often silvery foliage are lovely. The variety, *E. lanatum* var. *arachnoideum* is a good dwarf form, with leaves which are a dark, rich green above and white below, a grand foil for the rich golden yellow daisies. Most of these composites need constant cutting away of the dead flowers, and they can be kept in bloom over months at a time. Dainty, mauve-flowered *Erigeron foliosus* var. *Hartwegii* makes a neat little bushy plant a foot through and brings colour to the garden in August and September when most of the other flowers are over. It also will do well in full sun so long as the soil is really well drained.

A plant with a range of altitude from 2500 to 8000 ft., *Spraguea (Calyptridium) umbellata*, familiarly known as Pussy Paws should be a good subject. It is essentially a plant of screes and would need shade in the hot south. Its flattened rosette of leathery leaves is unremarkable but the flower-heads are delightful with their massed paper-like bracts, parchment-white and tinged and edged with pink and red. These "paws" lie stretched out on the ground at the ends of six-inch stems, raying from among the rosette of leaves. In too

fat conditions the plant will grow larger and the stems stand upright thus giving quite a different character to the plant.

Few of the native salvias are small enough to include in any but the most extensive plan, but *Salvia sonomensis* will form quite close mats of wrinkled gray-green foliage which itself is attractive even without the twelve-inch spikes of lavender flowers. Like most of the salvias it is strongly aromatic. *Salvia Clevelandii* is perhaps the next most suitable, and as a shrub may be trimmed quite severely, but it will soon grow to three feet tall and as much through. Some of the smaller monardellas such as *Monardella lanata* could well be used. The scarlet-flowered *M. macrantha* is particularly striking, in flower, but is also particularly reluctant in cultivation. It seems to need shade, a stony slope and no disturbance whatsoever. It also appreciates the protection of fallen leaves about it, and produces a rather open plant which never looks thoroughly contented.

In general the use of annuals in a rock garden has been greatly neglected, perhaps because, in thinking of annuals the gardener is inclined to turn to the cultivated plants such as *Antirrhinum* and *Zinnia* which are certainly much better grown in beds and borders away from the less formal atmosphere of the rock garden. But, California provides such a galaxy of beautiful native annuals that some of them certainly could happily be included in the rock garden. Many are so particularly suited to this purpose that it is a pity to overlook them. For the most part annuals should be planted in drifts to obtain the best effect of their massed colors. It is so that they grow in nature. It is therefore the lower, open spaces in the rock garden which are most suitable for them. A few, such as *Linanthus dianthiflorus*, will make beautiful single specimens if given sufficient space to develop and will look perfectly right as such. Some of the small eschscholzas, *Eschscholzia caespitosa*, for instance, will make most attractive wall, or crevice specimens though they are also happy in the open ground. *E. californica* is too large and overpowering for general use. *Baeria maritima* makes a carpet of gold, and if not over-grown and drawn up by other plants will remain only a few inches tall throughout its flowering period. The smaller *Linanthus* species, *L. androsaceus* and *L. parviflorus*, are delightful in masses but need some shade. There is a cultivated strain derived from *L. parviflorus*, under the name of "Leptosiphon, French Hybrids," with a wonderful range of very fine colors from lavender to deep raspberry red, and from white to strong orange, which might quite excusably be included in this list. These I have grown effectively mixed with *Lupinus nanus* and they will always remain in my mind as a natural combination and a most satisfying one. A few of the annual lupin species beside *Lupinus nanus* are well fitted for the rock garden. *L. Stiversii*, with striking pink and yellow flowers is not too large. It likes a deep, loose, gravelly soil and not over-much sun in the south. *L. Bentharii* will grow to nearly two feet tall, but its slender spikes of close blue and lavender blooms are excellent when rightly placed. Where space allows, such species as *L. subvexus* and *L. densiflorus* could well be used. Both are quite large-growing and need a yard or so, at least, to give them a chance to show to advantage.

If they could be satisfactorily grown, the desert floor provides a host of

annuals which would be lovely on the rock garden in scree-like conditions. *Hugelia* (*Eriastrum*), *Langloisia*, *Eriogonum*, *Chorizanthe*, *Eriophyllum*, the list is too long to enumerate complete! These plants are often so "filmy" in their daintiness that, except grown in goodly numbers they are almost insignificant. The annual desert oenotheras, *Oenothera brevipes* and *Oe. dentata* var. *Parishii* are excellent for the rock garden and can both be scattered rather than used in dense drifts. *Mentzelia involucrata*, from among the multitude of biennial mentzelias of the desert, is a lovely plant for hot sandy places. Its satiny flowers have a champagne coloring hard to tie down in description. Golden-flowered *Coreopsis Bigelovii* is one of the earliest and easiest of the annuals, but will grow tall (to 18 inches) if too well fed and watered.

Plants such as *Nemophila maculata* and *N. Menziesii* would be useful where shade is available. *N. maculata* needing a good deal more water than many of the other annuals still produces excellent results in full sun exposures here in the Botanic Garden. Of course it is over and done with before the real heats of summer begin. *Chorizanthe Douglasii* is a dwarf, pink and hairy replica of *C. staticoides*, Turkish Rugging, and scattered or in drifts is effective and fairly lasting in that it retains its color long after it has dried out. *Monoptilon bellioides* is a most attractive daisy from the dry washes of the desert. It forms flat little mats, six inches or so across, completely covered with yellow-centered, white daisies which are often pink and mauvish on the reverse of the rays. When in flower neither leaves nor stems are visible. *Nama demissum* is another flat, mat-forming annual from the same regions and habitat as the *Monoptilon*. It has small, trumpet-shaped bright pink flowers in clusters at the ends of the stems. The mats are often so interlaced that they are completely covered with flowers.

It should be remembered that annuals, especially when used in large masses, will leave empty spaces when they have finished blooming and the dead plants have been cleared away. This is not necessarily bad in a rock garden, though the circumstances may, to some extent be considered in determining the placing and use of such plants.