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ROCK GARDENS

What is a Rock Garden?

Even though rock gardens have been in existence for many years, the concept of rock gardening is confusing to many people. In a pure sense, a rock garden could be any collection or display of rocks, excluding plants altogether. The Japanese practice this type of rock gardening by artistically incorporating only rocks and sand. However, the English style of rock gardening is most commonly associated with the term. Begun in England in the late 1800s, this style of gardening focused on creating an ideal growing site for alpine plants. Aesthetic quality increased as alpine gardening evolved, and rock gardens became more naturalistic in appearance. Garden designs attempted to capture the character and feeling of a mountain scene. Gradually, many excellent plants besides true alpines were introduced into the gardening as we know it today was born. In short, a rock garden is an integrated combination of rocks and plants selected to enhance both the cultural and aesthetic quality of the garden.

What is a Rock Garden Plant?

The term 'rock garden plant' is used to classify a broad group of horticultural plants that can be associated with rocks in an aesthetic and culturally correct manner. To satisfy the aesthetic requirement, a plant must be relatively low growing and have a growth habit that complements the natural effect of the rocks. To be culturally correct in a rock garden, a plant must be able to thrive in the unique microenvironments created by the rocks. Cultural factors include shard drainage, a cool root run, and protection of the foliage from splashing mud. Alpine and saxatile plants make up the majority of the group of rock garden plants. Although not normally considered to be rock garden plants, a few lowland wildflowers meet the aesthetic and cultural requirements and can also be classified in this category.

Types of Rock Gardens

Rock gardens are often classified into two main categories on the basis of the arrangement of the rocks: formal (architectural) and informal (naturalistic).

Dry walls and paving stones inhabited by various plants are examples of formal rock gardens. These gardens serve a utilitarian purpose, yet at the same time they have an aesthetic function. Where a path or retaining wall is needed, the formal rock garden provides an excellent solution to the problem. A formal rock garden should always be constructed in response to such a need; the awkwardness of a rock wall or path built solely to accommodate plants cannot be overemphasized. Formal rock gardens can be used effectively around buildings and as a transition between the house and naturalistic rock garden.

The informal or naturalistic rock garden is the most common, yet the most difficult type of rock garden to design and construct. Its basic purpose is to recreate a natural setting where rock garden plants will look and grow their best.

Many people think that a natural rock garden can be constructed in a haphazard manner without regard to basic design principles. This misconception has led to the creation of more rock piles than rock gardens. Studying rock formations in nature is a prerequisite to understanding natural rock garden design and construction.
Both formal and informal rock gardens can be further subdivided according to the individual gardener's interest. A *specimen* garden is primarily concerned with collection and growing as many different types of plants as possible. A design garden uses masses of plants in overall effect. Because the design gardener's and the specimen gardener's basic interests in plants are different, it is difficult to combine these two techniques in one garden. Thus it is important to determine your own interest before designing a rock garden.

ROCK GARDEN DESIGN AND CONSTRUCTION

Site Selection

Site selection should be a primary consideration before designing and building a rock garden. Important criteria for evaluating potential sites are exposure, drainage, background, natural features, and existing architecture.

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Drainage is the single most critical factor in site selection. Most rock garden plants require excellent drainage for successful cultivation. A well – drained environment can be obtained only if the original site has good drainage. Take advantage of natural drainage by selecting a sloping site and avoiding low spots where water may stand even for brief periods. Choosing a location with less-than-adequate drainage will prove to be a disappointing and discouraging experience.

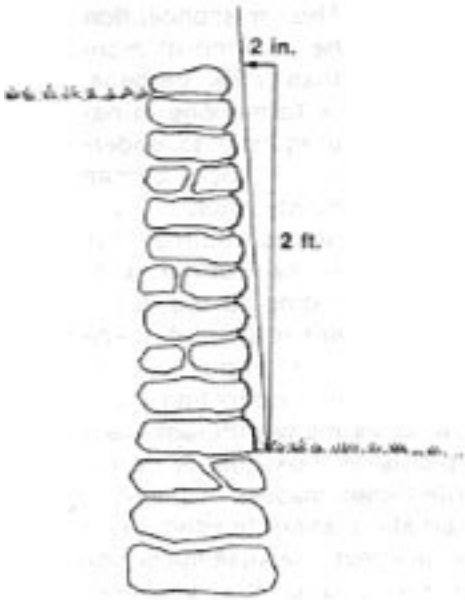

Figure 1. A rock garden wall should slope backwards 1 inch for every vertical foot.

Exposure dictates what type of plants can be grown at that location. Most rock garden plants prefer a sunny location, but a few of the choice specimens thrive in shaded areas. A site with a variety of exposures ranging from full sun to full shade will accommodate the greatest diversity of plant materials. However, if a choice must be made between a location with all sun or all shade, the sunny location should be selected.

Background is important in capturing the beauty of a rock garden. A naturalistic rock garden should not be built near architectural backgrounds such as buildings. The most desirable background is composed of a combination of conifers, broadleaved evergreens, and deciduous trees and shrubs. The contrasting foliage textures of these plants will provide depth and interest year round. If a suitable background does not exist, allow adequate space in the basic design for planting one. The depth of the background is variable, but it should be at least two plants deep. Planting should follow an informal arrangement, not a formal hedge planted in straight rows. The skyline created by the background should be irregular to enhance the natural effect of the garden.

Existing natural features can have major influence on deciding where to locate a rock garden. With slight modification, a rock outcrop or stream may be an ideal site. However, most modern residential properties have had these features removed during construction. The rock garden is but on element in the total landscape and should be situated with regard to existing architectural features. Rock walls and paving stones present an architectural form and provide an effective transition from the formality of a building to the informality of a naturalistic rock garden.

Any one location is not likely to conform to all of the criteria. But if a site cannot provide adequate growing conditions, it would be pointless to build a rock garden there, because the primary purpose of the site is to provide a satisfactory environment for cultivating rock garden plants. Other site selection criteria, such as background and architectural relationships, are important to good design but should not be used as the primary reason for abandoning the construction of a rock garden.

Wall Gardens

Wall gardens are both attractive and functional. A wall garden is a dry wall constructed with soil instead of mortar so that plants can be grown on the wall. The soil-filled crevices provide an excellent growing site for many interesting rock garden plants.

Designing a wall garden is fairly simple and straightforward because the retaining wall follows the curves and contours of an existing bank. Wall gardens can be from 1 to 5 feet tall, be held together with mortar for stability and, therefore, cannot be used for a wall garden. As the height of the wall increases, so should the thickness of the wall and the size of the stones.

Construction. The main principle of wall construction is to allow the wall construction is to allow the wall to have a backward slope. This slope gives the wall strength and also enables rain to penetrate the wall surface. The recommended slope or *blatter* is 1 inch back for every vertical foot. Therefore, a 3 feet high wall would slope backwards 3 inches. The individual stones should also have a slight backward tilt to contain soil between the stones and prevent the stones from shifting during cycles of freezing and thawing.

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Rock Selection. Many different types of rocks are suitable for wall construction. Choose a type of stone on the basis of availability rather than aesthetic qualities. One type of stone, not a mixture of different types, should be used throughout. The size and shape of the rocks are more important than the type of rock. Large rocks are necessary to build a wall that is strong and durable. The higher the wall will be, the larger the stones should be. Flat rocks with at least one square surface make the best dry walls.

Soil. Before constructing the dry wall, prepare the soil that will be used to fill the rock crevices and to back fill behind the wall. A special soil mix, prepared by adding sand and peat moss to the existing soil, will improve the drainage and moisture-holding capacity of the soil. Heavy clay soils should be mixed with equal parts of sand and sand and peat moss to produce a loose, friable soil mixture. Top soil or garden loam can be improved by adding equal parts of sand and peat moss to two parts of soil.

Laying the Wall. The first step in laying the wall is preparing the foundation. Low walls can be built directly on the ground without a foundation. However, walls that will be higher than 2 feet require an adequate foundation, which can be made by excavating a strip 1 foot deep along the path of the wall. Place the largest stones in this ditch to serve as the foundation. Make sure that all the stones are firmly in place before proceeding with construction.

The prepared soil mixture should be used between the layers of rock as if it were mortar used to hold the wall together. Spread a 4-inch layer of soil over the stones. Work the soil into the vertical joints and pack it down firmly. Packing the soil prevents the wall from shifting and eliminates air pockets, which are harmful of the plants. Back fill the wall as each layer of stone is added.
Each new course of stone is laid in the same manner, but alternating so the vertical joints do not coincide. This process is continued until the wall reaches the desired height. Check the batter frequently to assure that the wall has the proper backward slope.

Planting. Plants can be placed in the wall either during or after construction. Each method has its advantages and disadvantages. Planting is easier during construction because the plants are custom fitted into the crevices and the roots can be spread out well. Trying to insert plants in the rock crevices after construction is a tedious job, and getting plants firmly in the wall may damage the roots. Seedlings or cuttings with small root systems should be used to reduce root injury.

However, if planting is done during construction, plants may be accidentally damaged while the upper portion of the wall is laid. Another disadvantage to planting during construction is that it is difficult to visualize the placement of the plants before the entire wall is finished. Also, because most rock garden plants should be planted in the spring, planting during construction limits the time of the year when the wall can be built.

Planting Design. A planting design should be developed before a wall garden is actually planted. The design takes into consideration time of bloom, flower and foliage color, and plant shape. Its objective is to coordinate colors and arrange plants by blooming periods for a uniform display of flowers throughout the season.
Several basic design principles unique to wall gardens should be considered. One of the most common mistakes in planting a wall is over planting. Much of the beauty of a wall garden is derived from the contrast of rocks and plants. Do not plant in straight

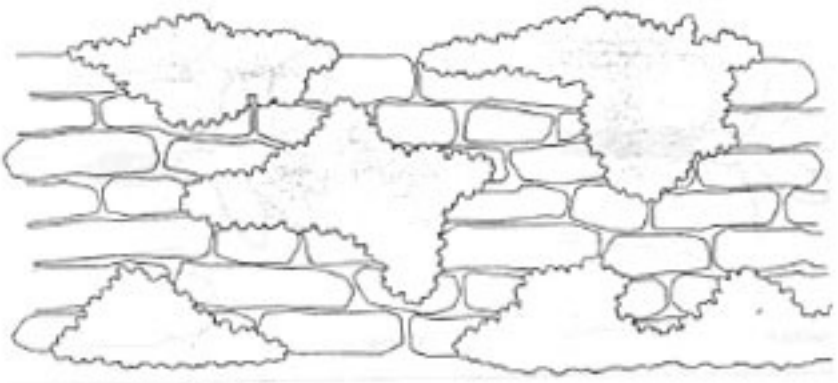


Figure 2. Planting design. Arrange plants in irregular masses and leave portions of the wall exposed.

rows or columns, but preferably in irregular masses, leaving ample portions of the wall exposed. Another factor that is often overlooked is planting above and below the face of the wall to add depth and interest to the wall garden. Allow some of the mass plantings to spill over and continue along the top and bottom of the wall. The top of the wall can also be planted with a few dwarf conifers to provide year-round interest.

Planting Depth. The correct planting depth will help to ensure the success of a wall garden. When a plant is inserted too deeply, the crown is exposed to excessive moisture and poor air circulation, which result in rotting and eventual loss of the plant. However, if the planting is too shallow, roots that are exposed will perish and the plant will be lost. A little extra care during the planting process will be well rewarded later.

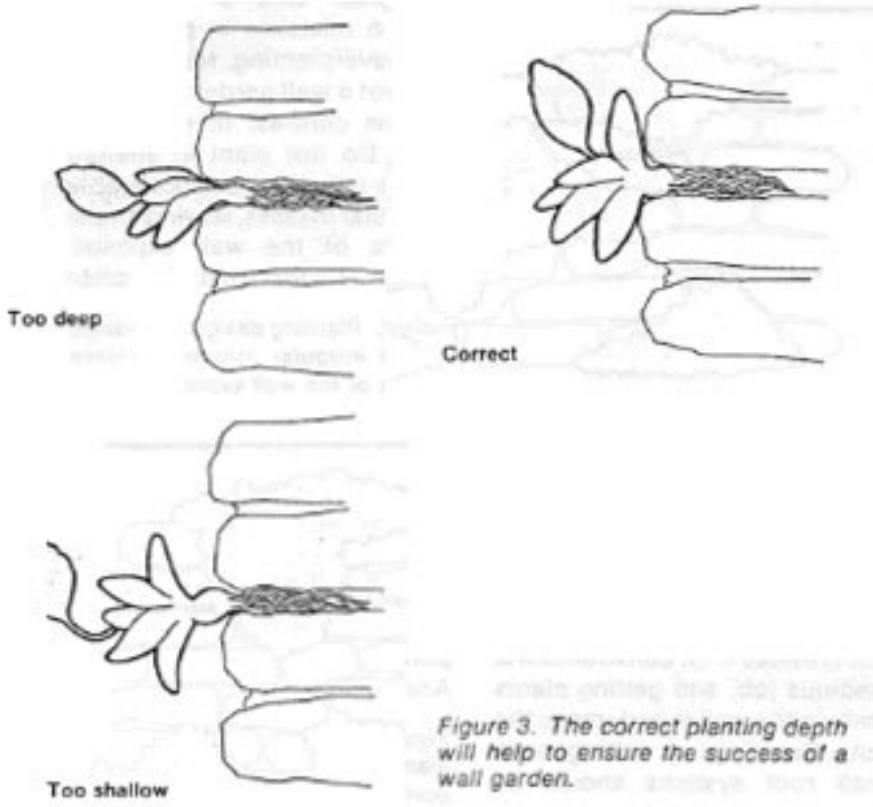


Figure 3. The correct planting depth will help to ensure the success of a wall garden.

Naturalistic Rock Garden

Design. Designing a naturalistic rock garden is more than merely arranging rocks and plants in a random manner. The difficulty lies in creating a natural effect rather than an artificial, man-made one. Building a naturalistic garden is an art that is best developed through experience and an understanding of basic design principles. Simple designs generally provide the most satisfying results. Do not attempt to build a scale model of a mountain range in your own backyard; instead, work to capture the essence of a smaller, more personal natural setting. Trying to duplicate a site exactly is not nearly as important as trying to capture the overall effect of the site.

The type of stone that is used is not important as long as the same type is used consistently throughout the garden. Avoid the temptation to include exotic, shiny, or colored stones. Rocks with a weathered face are preferred to rocks that have been cut or broken.

Another common problem is the use of too many small rocks. The garden design should be based on a few large rocks strategically placed to create a naturalistic effect. Many small stones produce a busy appearance at best. Generally speaking, any rock that can be easily handled by one person is too small to be used as part of the backbone rock formation. Keep in mind that the size of the rocks should be in proportion to the size of the garden.

Construction. The primary objective of construction is to set the rocks firmly into place and to develop a site with good growing conditions. All of the topographic or contour modifications should be done before the rocks are laid, but do not over exaggerate contour changes by making large mounds of soil. After the basic shape of the garden had been formed, the rocks should be set into place. The procedure for placing rocks in the garden depends on whether stratified or unstratified rock is used.

An **outcrop** is a large underground rock formation that has a few exposed rock faces. Stratified rock such as limestone or sandstone formed from many layers or strata is best suited for constructing outcrops. Lines of stratification from the various rocks must be parallel and continuous. Generally, the angle of the strata is not important as long as it remains the same. However, on flat sites, the angle of the strata should be steep to expose the greatest surface area of the rock face. By placing the rocks deep into the ground and maintaining parallel strata, the impression of one large rock outcrop can be created. It is a good idea to place the largest, most dominant stone first and then align the strata of the smaller stone o the larger one. Always pack the soil around the rocks to keep them from setting and altering the continuity of the strata.

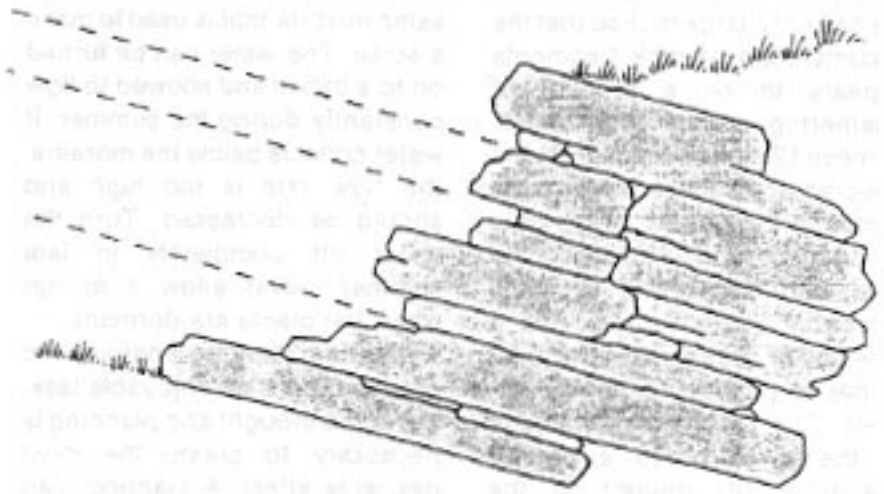
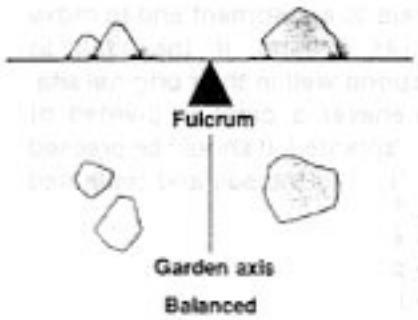


Figure 4. In an outcrop, the lines of stratification from the rocks must be parallel and continuous.

Unstratified rock, a rounded type of stone that has been transported and deposited by glacial action, is best for making a **boulder field** rock garden. Because these rocks don't have lines of stratification to be matched, the placement becomes more arbitrary and possibly more difficult. Even so, a haphazard approach should not be adopted. Keep in mind that a few large boulders should be used as the main features. The rock arrangement should have a sense of balance; but in a naturalistic type of garden, do not rely on symmetry or uniformity to provide it. Instead, achieve balance in a naturalistic way by thinking of the central axis of the garden of the axis as a fulcrum, then a natural sense of balance is a attained by placing several smaller rocks to the left of the axis. Once the rocks are arranged, they should be buried to the original ground line or until they are firmly secured.



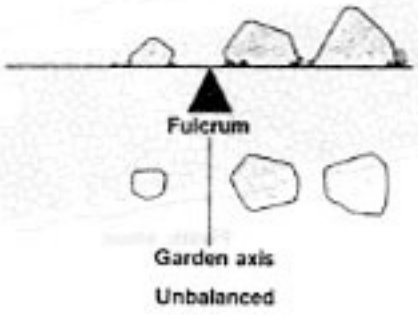


Figure 5. Achieve balance in a boulder field by thinking of the central axis of the garden as a fulcrum. A large stone placed to the right of the fulcrum is balanced with several smaller rocks placed to the left.

Drainage. Next, during this initial construction phase, make certain that the garden has the good drainage required by most rock garden plants. Normally, some soil modification will be necessary to provide optimum growing conditions. Heavy clay soils are difficult to amend and should be replaced, if possible. Garden loam can be made into suitable rock garden soil by mixing equal parts of sand or fine gravel with the soil and spreading it over the garden at a depth of 6 inches. No soil modifications are needed on a well-drained, gravelly soil.

Many choice plants are difficult to grow even in a well-constructed rock garden. These plants require extra-sharp drainage, which can be provided by building either a scree or a moraine. A naturally occurring **scree** is primarily composed of small rock fragments that have broken from and accumulated at the base of a large rock mass. A scree provides the rapid drainage preferred by many of the alpines. To build a scree, select the site at the base of a large rock so that the accumulation of rock fragments appears to be a product of weathering on the rock above. Remove 12 inches of soil from the selected area. Place a few large stones in the bottom of the hole for drainage, and fill the rest of the hole with fine gravel or small pieces of broken stone. Add a little soil or peat moss to the top 2 inches to provide some nourishment. The extra-sharp drainage of the scree poses a greater possibility of drought in the summer, and the scree must be kept well watered during dry periods.

Probably the best location for growing difficult alpines is the **moraine**. This site is composed of rock fragments that were deposited by glacial action. Because of the proximity of the glacier, the moraine is supplied with an underground flow of water from melting ice and snow during the summer. This site has the advantage of perfect drainage in the winter and ample moisture in the summer.

Building a moraine in the rock garden is similar to constructing a scree, except for the addition of the underground irrigation. Once the area is excavated, a perforated water pipe is placed at the upper end. The bottom of the hole is covered with plastic so the water will seep along the base of the moraine. Fill the hole with the same mixture that is used to make a scree. The water can be turned on to a trickle and allowed to flow constantly during the summer. If water collects below the moraine, the flow rate is too high and should be decreased. Turn the water off completely in late summer; never allow it to run when the plants are dormant.

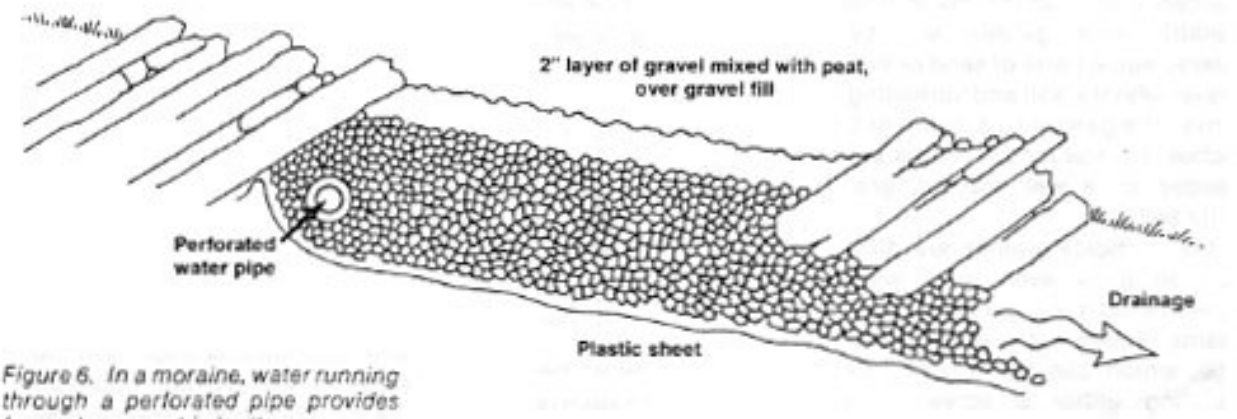


Figure 6. In a moraine, water running through a perforated pipe provides for underground irrigation.

Planting. Planting a naturalistic rock garden is an enjoyable task, but some thought and planning is necessary to create the most desirable effect. A planting plan should be developed beforehand, with plants being located in a pleasing arrangement according to their cultural requirements.

It is important to be aware of the various microclimates in the garden and to locate the plants according to their specific needs. Sometimes, you may have to place a choice plant in several locations before finding the niche where it grows best. Don't be afraid to experiment and to move plants around if they fail to respond well in their original site. Whenever a plant is planted or transplanted, it should be pressed firmly into the soil and replanted at the same depth.

The first step in developing a pleasing planting arrangement is to become familiar with the following plant characteristics: time of bloom, flower color, size, and growth habit. In a naturalistic garden, planting in formal

rows or geometrical patterns should be avoided. Planting in irregular groups will strengthen the desired naturalistic effect.

Rock garden plants can be grouped according to function in the design. They may be used for a mass effect or planted individually as specimens. Plants like *Arabis caucasica* and *Aubrieta deltoidea* are used most effectively as a mass planting for the background of the garden. Depending on the size of the garden, several plants are grouped together to form the mass. Some of the smaller plants, such as *Draba aizoides* or *Erinus alpinus* are best used as specimens. These plants are generally located in the foreground or in a rock crevice where they can be noticed and appreciated. In designing the planting arrangement, however, always keep in mind the naturalistic appearance of the garden.