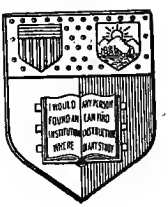

# THE SMALL ROCK GARDEN


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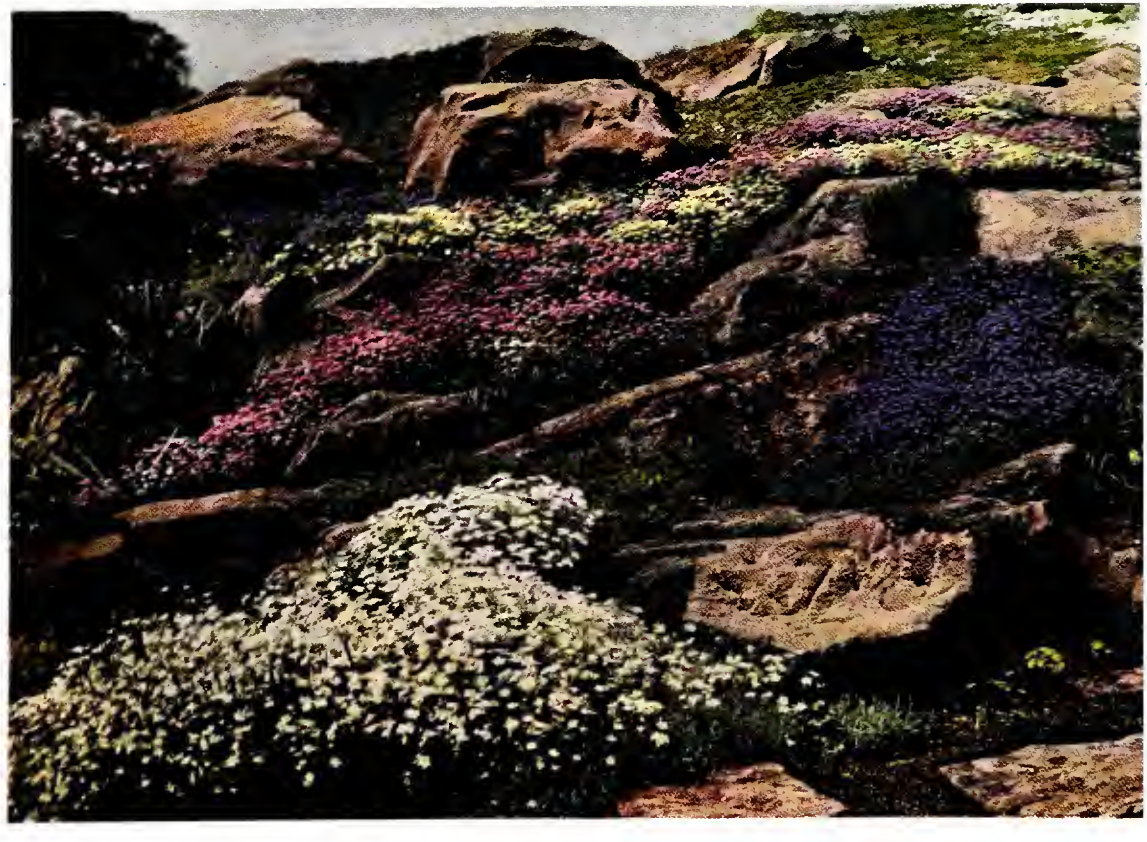

IDEAL PLANT GROUPING IN THE ROCK GARDEN

# THE SMALL ROCK GARDEN

By

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Edited by

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# PREFACE

In the whole history of gardening there has never been so much interest taken in the cultivation of alpines as there is to-day. Not very many years ago it was quite exceptional to find a rock garden worthy of the name in any but the largest of our private gardens. To-day, however, a garden of any appreciable dimensions is not considered complete unless it contains a portion devoted to the cultivation of alpines.

The primary reason for this development is undoubtedly the beautiful alpine plants which have been so successfully displayed at the great horticultural exhibitions. The public have seen the wonderful variety of plant life that can be arranged in a natural manner in a small space, and the resulting demand for rock gardens has, during the last two years, been little less than phenomenal. The second, though minor reason, has been the introduction of a great many new plants which are suitable for either the rock garden proper or the small bogs or pools that can be appropriately associated with it.

In conjunction with this widespread interest in rock gardens there has arisen a demand for information about them, and the plants suitable for growing therein, and it is for the purpose of supplying this information that this little book has been prepared. Rock gardening contains many pitfalls for the beginner, and the aim of this book is to show how these pitfalls may be avoided and how success may be achieved. Mr. Jenkins is well known amongst lovers of alpines as a practical

exponent of their proper cultivation, and the advice he gives may be acted upon, with every confidence, not only by the beginner but by all who are in any doubt as to the best methods to pursue. Believing as we do that sound information is of the utmost importance in a book on gardening, no effort has been spared to make this little volume as practical as possible, and it is with this end in view that the text and illustrations have been prepared.

The excellent reception accorded Mr. Jenkins' "Hardy Flower Book" has induced us to adopt a somewhat similar arrangement in this companion volume. The selection of a suitable site and the proper construction of a rock garden are the first essentials to success, and these are fully dealt with in the opening chapters. Bogs and cascades, the moraine, wall gardening and paved pathways, all of which are legitimate adjuncts to the rock garden, are dealt with in separate chapters. Town and suburban gardens are not ideal for the cultivation of alpines, but many of necessity cultivate their plants in such surroundings, and for their assistance a special chapter has been included. The tabulated lists of plants suitable for all purposes and seasons, with their height, necessary aspect, soil, colour, flowering period and method of propagation, will provide the reader at a glance with the necessary cultural details of the best alpine plants, and the list of undesirable plants for the rock garden concludes what is hoped will prove a practical and valuable guide to all who are interested in rock gardens and the beautiful if lowly flowers that find a home therein.

F. W. HARVEY

## CHAPTER I.

### The Best Position for a Rock Garden

That there is nothing better than the best everybody will be ready to admit, hence "the best position for a rock garden," put in question form, would have for its answer, "One entirely in the open, a position removed from the presence or near proximity of large trees, equally prejudicial to success by reason of their root-spread and the shade or drip consequent upon their overhanging branches." In respect to the root-spread of certain trees—Elm, Lime and Poplar, for example—it need only be said that their root fibres are capable of travelling a considerable distance, even 40 to 60 feet from the spot where the original specimens were planted. Moreover, in the case of the Elm, the trouble is not at an end with the felling or uprooting of the tree, since on its roots are formed eyes or buds which, springing quickly into active life, send up suckers in all directions. In the case of the Lime, an instance came to my notice many years ago where the roots of the trees had crossed a road 40 feet wide, and so occupied a rockery on its one side as to render it useless for all plant life. In this particular instance the difficulty was overcome at the suggestion of the author by digging out a deep trench outside the rockery boundary and severing all root fibres, and subsequently remaking that portion of it affected. The first part of the suggestion had to be undertaken every two or three years, as the trees grew in an adjoining garden. Hence it will be seen at the outset that the selection of a suitable site is a matter of some moment if our efforts are to be crowned with a

moderately full measure of success. Even when large trees exist at some distance from the rock garden, the shade is detrimental to plant life, while light and air—which are among the life-giving essentials to alpine vegetation—are in large degree excluded from the plants. Even the more or less prevailing practice of planting Pines or tall-growing coniferous plants within the limitations of the rock garden merits vigorous condemnation, more because of the exceeding dryness and soil-robbed conditions existing in the near proximity to such trees. Outside the boundary these trees might be tolerated or even desirable, though that would depend upon the immediate surroundings. Shade of a kind, and shelter, too, must be embraced if we would cultivate all the best a rock garden might contain, but these can be provided by the arrangement of the rock itself through the intelligent thought and work of the operator from within.

Equally bad, too, near to rock gardening of any kind is the presence of high buildings; light and air excluders of the worst type, and, often enough, the precursors of a set of conditions most uncongenial to alpine vegetation. Extreme dryness is almost sure to be one of them, the rain being prevented from reaching the plants. Occasionally, however, one sees a rock garden surrounded by high walls—one so encompassed on three sides is in the mind's eye at the moment—its ill-effects, the outcome largely of dryness consequent upon a prevailing vacuum, not likely to be forgotten. Worst of all, the rats discovered in its unoccupied recesses a safe retreat; eventually it became to them a veritable stronghold as well. Thus it will be seen that, for varying reasons, even the selection of a suitable position—a modification of the "best"—is a matter of some importance. The "best position," therefore, is undoubtedly one quite in the open, one unfettered by tree life, and far removed from the formal garden and the house. It should, indeed, be a thing apart, a phase or department of outdoor gardening worthy of careful study and special

treatment. If to such a position as this there could be added a site having an undulated surface, then I believe we shall have gone a long way towards securing "the best" so far as position alone is concerned.

**The Builder of the Rock Garden.**—The best position, however, is, as it were, but a single step, though an important one, and in its subsequent treatment—in building up the other steps of which rock gardening may be said to be composed—it is capable of being made or marred. Its fashioner, or builder—I am strongly opposed to such terms as "designer" and "architect" in these matters, since it is not a brick and mortar arrangement whose "elevations" can be more or less accurately displayed—should be a man of the widest sympathies, a close observer of Nature and Nature's ways if the best results are to follow. Such an one will see to it that a certain informality, whether of rock or general outline, exists everywhere. Anon, it may be ruggedness, should the extent of the arrangement and its immediate environment render a bolder treatment more in keeping with the general surroundings, which, indeed, should never be left out of the reckoning. In any case, it should please by reason of its naturalness, whether it be large or small; and while we cannot imitate in lowland gardens the majestic grandeur of Alpine regions, we can, at least, use our best endeavours to demonstrate our sympathies with Nature and Nature's work by producing something which is at once picturesque and useful. It is necessary in these rock-gardening times to lay some stress upon this latter phrase, since not a few of the rock gardens we see are too slavish an imitation of Nature's own, and where rocks existed for centuries without becoming ornamented in the slightest degree, they are calculated to be of little use if re-arranged on Nature's plan in our gardens. What is possible by a modification of it is in the keeping of the rock builder, and he, having also a more or less profound knowledge of the requirements of Alpine vegetation, is not likely to go very far astray.

## CHAPTER II.

## Rocks and Soil.

**Natural versus Artificial Rock.**—The question of the selection of the most suitable rock naturally follows closely upon that of position, and merits careful consideration. Upon a good, or, shall I say a right, selection much depends. Into rock-garden construction in the past two classes of rocks have freely entered without regard to their suitability or otherwise. These are the "natural" and the "artificial." Of the former there are many types—good, bad and indifferent—hence they merit attention accordingly. The so-called "artificial rocks" are almost all wholly bad, and merit a "vote of censure" from the standpoint of utility if nothing more. For the moment, however, these might be dismissed altogether, having regard to the greater value of natural rock (Fig. 1).

**Natural Rocks.**—These, as already stated, are of many types, and of necessity include the suitable and the unsuitable—that is to say, those of a sympathetic and nourishing nature, or the reverse, and as one of the primary objects of a rock garden is that it be endowed with alpine vegetable life, it is those of the first-named set that are best suited to our purpose. Into this category fall quite naturally the vast majority of the sandstones and limestones found in these islands. One uses the word "majority" advisedly, inasmuch as there are the good and bad of both, hence the value of a right selection at the outset. Certain types of rock—the inferior oolite of the Cotswolds for example—crumble quickly under the influence of frost and exposure, hence a rock garden constructed of such material would soon be crumbling to decay, with, possibly, serious results. The magnesian limestone of the same range of hills is also unsuitable, as much for the defect already named as for its glaring whiteness, which renders it an eyesore.

*Fig. 1.—A NATURAL ROCK GARDEN.*

**The Great Oolite of the Cotswolds** is, on the other hand, one of the most valuable to the rock-garden builder, being good in colour, variable in size, usually of a distinctly stratified character, and, above all, sympathetic to plant life. Occasionally, even with this excellent rock, a little selection may be necessary, and at such times the advice of the quarrymen who "work" the stone is well worth while. Quite naturally even the limestones are an exceedingly variable class, as witness those of the range just referred to and others from Yorkshire and Derbyshire. Of the serviceability of the limestones from these districts one has but to remark upon the thousands of tons which have found their way from thence to Friar Park, Henley-on-Thames, where Sir Frank Crisp, Bart., for a score or more of years has been fashioning out of its majestic blocks—and the end is not yet—the noblest example of a rock garden this or any other country has ever seen. From the utilitarian standpoint no greater tribute could be paid to any class of rock, save that of the garden itself, which speaks in volumes at every turn. The rock employed is that known as Millstone Grit, and is available from blocks of a few hundred weight to others of ten or a dozen tons apiece. Chief among the good attributes of this rock, apart from the picturesque character and boldness which are so ennobling in effect, is its porosity, its apparent sympathy with all vegetable life, and that, weathering down by exposure and climatic influences, it is quickly brought into submission, soon losing the one defect of quarried newness inseparable from the greater rock masses. Weathered limestone (Fig. 2), the result of long exposure, is also valuable, its dull grey tone and that of certain Lichens and Mosses that often find a home thereon rendering it highly decorative. It has the merit of age at the outset, and for the smaller type of rock garden is certainly one of the most desirable.

**The Purbeck Limestone.**—Quite one of the finest types of limestone is that known as the Purbeck, found in the neighbourhood of Swanage. This, in its selected

*Fig. 2.—AN EFFECTIVE USE OF WEATHERED LIMESTONE.*

form, is ideally beautiful and picturesque. Moreover, it is available in large or small blocks, possesses a well-defined stratification (Fig. 3), and, above all, is entirely sympathetic to plant life. It appeals to me personally by reason of its rich marl-brown colour, and colour is not to be ignored in such work. In this respect, the Purbeck limestone and the great oolite of the Cotswolds have much in common, and both are excellent for the rock-garden builder. From the foregoing remarks it will be seen that limestone rocks are available in one form or another in many parts of the country, hence the best advice that can be given in such circumstances is to make use of those nearest to hand.

**Sandstone Rocks.**—While the best limestones are placed in the forefront so far as general utility is concerned—and none who have had experience with the varied classes of rock in relation to alpine culture would care to deny their right of place—the best sandstones may safely be placed a good second. These, like the first named, are of a porous or more or less absorbent nature, an attribute of the highest importance to the plants one has in mind. In like manner, too, they are widely distributed and greatly varied—Kent and Surrey, Cheshire and Worcester, Sussex and Warwick having, among others, their quota. Some sandstones, too, possess the attributes of boldness and ruggedness, are of good colour, and weather well. Others less good in these respects, and of a pale-yellow cheese-like colour, detract considerably at first from the arrangement and the plants, and attract much attention to themselves, which is not to be desired. Others, again, have neither "form nor comeliness," nor beauty that the rock builder may desire, and are obviously better suited to wall and house building. There are others of a thin, shaly character, which are only of service as stepping stones over water or for paved walks whether in the rock garden or elsewhere. We have, however, on occasion, seen such stones up-ended in the rock garden, where they are certainly most incongruous, and, worse

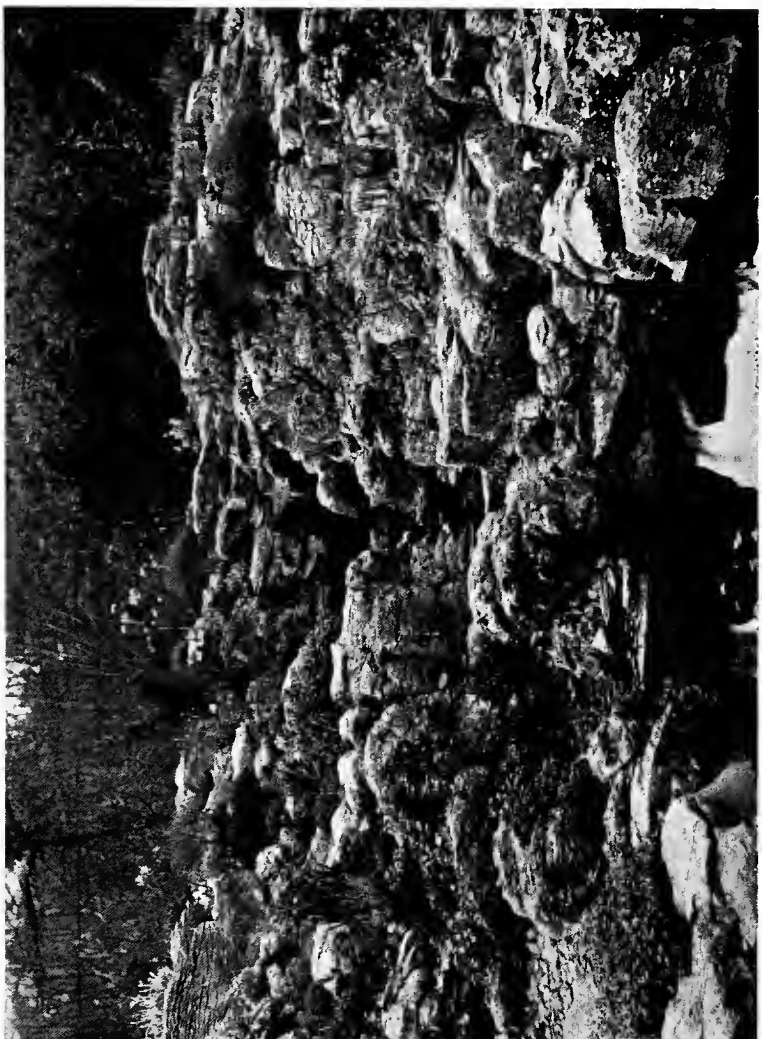


*Fig. 3.—LIMESTONE SHOWING STRATIFICATION.*

still, incapable of ornamentation. Most usually, almost invariably, however, sandstone rock is to be regarded as of a sympathetic nature to plant life, to which the built sandstone walls of Cheshire, Worcester and Warwick and the outcrop and unquarried rocks of many parts bear abundant testimony. Plants of many diverse kinds, Ferns, Mosses, Lichens, and others appear to take kindly to it, and the fact is a valuable object lesson to the rock gardener.

**The Red Sandstone.**—As regards choice, however, I should place the red sandstone first, that of the old red sandstone formation more particularly by reason of its rich, red warm hue, which contrasts so effectively with vegetable life. From the standpoints of porosity and coolness it is also good, while its exposed parts are soon moulded and fashioned by wind and storm. The sandstone of this formation is generally reliable, while those of Sussex require a more intimate knowledge and not a little selection. In these matters the quarrymen on the spot are the best authorities. Some of the types of Sussex sandstone are, to the stranger, of a deceptive character, and because of their softness when freshly quarried would be rejected. It not infrequently happens, however, that such as these harden considerably by exposure and wear well. Others which, to the inexperienced, seem better, presently "fly" or crumble under the action of frost. Hence the value of the experience of those constantly working among them.

**Tufa and other Rocks.**—For outdoor work, the first-named on the question of expense alone may at once be dismissed. In the conservatory it is frequently preferred because of its high decorative value, though from the point of utility I know of no useful purpose it may serve that could not be served by the carboniferous limestones, *e.g.*, the famous Millstone Grit. It scores chiefly by reason of decorative effect, and in this sense tufa is probably unique. Highly fossilised rocks, as those belonging to the Gryphæa and Ostrea group of the Cotswolds, and others which in Nature have become

crystallised by contact with rocks in the molten state, I regard as unsuitable for rock gardening in general. The first-named attract too much to themselves, and are otherwise too thin for effective work. In their own district they are frequently used, though they are mostly in demand for the dry stone wall fence so characteristic of the Cotswold region.

**Granite Rock.**—This is the last of the natural rocks of this country calling for remark here, and it is, in my opinion, the least valuable, primarily because of its nature —hard, impervious and non-absorbent—which is known to all. Hence it is at once, broadly speaking, unsympathetic to plant life, and, therefore, unsuited to the purpose we have in view. It has, however, the merit of cheapness, with a boldness and ruggedness which surpasses all others perhaps, and, of course, everlasting wear. In these respects it is, without question, unapproachable, and those whose idea of rock gardening consists in the piling up of huge boulders alone may find in granite something after their heart's desire. The object in view, however, is rock building in conjunction with alpine gardening, and while Nature through the centuries had adorned the granitic rock fissures or recesses with more or less luxuriant vegetation, the instances of such in gardens are exceedingly rare. In granite, too, the nourishing quality of the limestones is entirely lacking, hence our low estimate of its worth when we are gardening in conjunction therewith.

**Artificial Rocks.**—In the opening lines of this chapter these were referred to as "almost all wholly bad," meriting a "vote of censure" by reason of their inutility. I have no desire to withdraw one word of it or to lessen the severity of the condemnation. The kind of thing one has in mind is that made up of brick-bats, clinkered burrs and the like, the whole so cemented together as to make them appear like natural rock. They differ, however, from the latter by reason of their impervious and unsympathetic nature, and generally by their unsuitableness to plant growth. Presenting more or

less externally the characteristic features of natural rock, they are usually a delusion and a snare, and one is sorry for the gardener whose duty it is to keep plants alive on such erections. Not infrequently they are welded and cemented together to form one continuous, unbroken mass, and, devoid of fissure or crevice—assets of inconceivable value even in the best-arranged rock gardens—are all but useless to the gardener. I am speaking now of the great piled-up masses of such things, more than one of which occur in well-known gardens near London to-day. Many years ago the present author had charge of such a rock garden, and is, therefore, speaking as one "having authority" and not as a "scribe." Moreover, it is difficult to realise any point in their favour, since they perform no useful office of which the natural rock is not capable, whether it be boldness or picturesqueness, while bereft entirely of the life-giving effects and charm of the natural rock masses when these are intelligently regarded. The main object of referring to the artificial kinds then is to discourage their use. They are not economical, rather the reverse, and remaining unornamented year by year have nothing of beauty to attract. Happily, the cement gives a colour tone which is not unbearable, and happily, too, these wrong things in right places are not on the increase.

**The Question of Soil.**—For the sake of convenience, one need but refer here to the staple soil; its greater variety, that suited to the largest number of alpine plants, can be best treated elsewhere. Rock, it should be stated, despite its ornamental and not a little also its utilitarian value, is not essential to the cultivation of many alpines, while soil, freely mingled with grit or gravel, is absolutely so. Hence, at the outset an assured depth of soil, one free from such insidious weed pests as coltsfoot, bindweed or couch, should exist. Where the coming rock has to be built or arranged against a steep slope or bank, uncultivated through many years, it is of the highest importance that the weed pests named should, if existing, be eradicated at the start. In this the greatest personal care should be exercised, since

once covered in, they will ramify in all directions, and, finding a congenial home beneath the rocks, become an intolerable nuisance for all time. Apart from this, not a few of them presently find a lodgment in the clumps of the more tufted alpines, which they quickly disfigure or perhaps destroy if they are not checked in time.

In general terms it should be stated that the greatest number of alpine plants prefer a light, loamy and rather gritty soil. Hence, should soil of an opposite nature exist as the staple, it will be necessary to remove and discard some of it during the early excavations. Clay soils, and those in particular of a tenacious, water-holding nature, will require special treatment and drastic measures—such as the discarding of them to a considerable depth and even effectually draining the subsoil might be rendered necessary. Thus it will be seen that the selection of a bank or slope where greasy, tenacious clay abounds is not desirable, and apart from the question of soil, an excessive rainfall might even endanger the stability of the structure as a whole. In those instances where sand, gravel or chalk to a considerable depth constitute the subsoil, the rock builder will have but little to fear in the matter of soils, since in all such it will be but a question of modification or re-adjustment according to circumstances. Moreover, in all of these the drainage of the whole—an item of supreme importance in some soils—is already perfected and complete in Nature's own way. In very large degree mountain, bog and marsh plants, Trillium, Meconopsis, Lady's Slippers and the like prefer rich vegetable soils, peat, loam and leaf mould, in about equal parts, though to some of them a cool position with moisture is equally important. In this latter category might well be placed some of the Primulas of the high Himalayas, such as rosea, denticulata, and its great following, also sikkimensis, to each of which a cool or shady place with some degree of moisture is a necessity. In Chapters IV. and XIV., those dealing with "The Bog Garden" or "shade loving alpines," the question of a suitable soil for given plants will permit of discussion in fuller detail.

## CHAPTER III.

### A Rock Garden in the Making.

In the making or fashioning of a rock garden, the operator gets into immediate touch with serious work, which, in the not distant future, must of necessity reflect credit or the reverse. Hence, much thought and care are needed at the outset. Such fundamental questions as "Form and Outline," the all-supreme question *in some instances* of "Drainage," and the "Disposition of the Rocks" should be carefully considered in the order named. Each in turn, however, must of necessity incline to circumstances. For example, the "outline" of a rock garden may resolve itself into nothing more than its boundary line, while within that area "form" in its many phases, aspects and variety may everywhere abound. There is, of course, that type of it which, for lack of a better name, one may style "a rock garden over all," where path, stepping-stone, crevice and fissure each contain its quota of plant life, and, while not entirely effacing rock in any instance, playing its part by life-affording effects and charm in all directions. This, indeed, should be the aim and object of the true rock builder, since it is of a type which most nearly approximates to Nature's own. And it may be ours on either a large or small scale, just as miniatures are also true to their kind though in reduced degree. All this and much more is but the outcome of study, sympathy and foresight at the beginning or later on. It is, indeed, work of this kind, in conjunction with pulling down and putting up, which secures the best effects in the end. The rock garden that is "begun, continued and ended" in a week may be something to boast of at the moment. It is

rarely convincing, however, as a good and permanent home for alpine plants, and if not this, it certainly misses its mark. In this connection the following passage may not be out of place. It is taken from that remarkable guide to Friar Park, Henley-on-Thames, where the most elaborately designed rock garden in this or any other country exists. At page 73 it is stated that "The leading idea was to make it as natural in appearance as possible, and the position of almost every stone was individually thought out before it was placed, or was subsequently altered to get the best effect." This, indeed, has been the keynote of the remarkable success achieved in the past; its harmonies or unisons but the reward of patience and perseverance, in conjunction with much fundamental knowledge and large sympathies with Nature's work. This, indeed, should also be the guiding spirit of every rock builder, and where it exists there need be no fear as to the results. A rock garden in truth may be but a modified rubbish heap, a stone-yard, a plant cemetery, or a perpetual paradise teeming with the choicest of Nature's gems, just in proportion to the amount of thought and sympathy—not necessarily of cash—bestowed upon the work throughout.

**Form and Outline.**—We have said these must be largely governed by circumstances. The prospective site of our rock garden might be of many kinds, a steep, more or less rocky, one-sided bank, a natural depression, or a piece of level ground out of which it is hoped to raise something worthy. Hence, all cannot be treated alike. The worst idea of all—it is mentioned in the fervent hope that it may not be any longer propagated—is that type of rock garden which exposes the rock everywhere. One sees such incongruities beside lake or pond; occasionally it may be with a view to shut out something else, or anon built upwards from the turf without rhyme or reason. Such erections suffer most of all from extreme dryness, and are usually a failure.

It would surprise one, indeed, if they were anything else. At all times and upon all occasions air and wind are playing an antagonistic part, and the whole idea is so opposed to Nature that the error should be obvious at a glance. In all good rock gardens only the surface should be exposed, not the footing-courses and the entire area of the superstructure to boot. Nature exposes but the superficial surface of her rock garden; millions of tons of rock and earth protecting it meanwhile. Hence, let me say, with all the emphasis at my command, that the elevated all-out-of-ground rockery without a protecting bank of earth would be the greatest of all fundamental errors, and, foredoomed to failure as it undoubtedly would be, should never be attempted—never, indeed, thought of, much less countenanced.

In the matter of outline, and where guiding pegs are a necessity, as they not infrequently are, the first essential is informality. Bays, recesses, prominences are also essential to the accommodating of the greatest variety of plants by reason of the diverse aspects they present. These are important, no matter what the size of the erection. Where a path is contemplated it should take the form of a meandering streamlet, and never formally curved or straight as by line or compass—but moulded and fashioned in Nature's own way. A rock garden should never be in the nature of a vista, hence, too much of such a path should not be seen from any one point—the unseen parts are as pastures new.

**Drainage.**—Here, too, the operator will have to be guided entirely by circumstances, though *perfect drainage is an absolutely essential item.* Each district, each soil, has its own peculiarities, so that one can only be certain as to fundamental principles—guiding lines as it were, no one set of conditions sufficing for all. To the vast majority of alpine plants perfect drainage is of the highest importance, and should be ever present to the rock builder. It may be that in the lie of the land

*Fig. 4.—A ROCK GARDEN IN THE MAKING. THE DRAINAGE FOR THE CENTRAL MOUND IS WELL SHOWN.*

this question of drainage is perfectly met. It is possible, too, that with deep subsoils of sand, gravel or chalk, the operator will be able to ignore all idea of artificial drainage, or it may be that even the sharpest bank slope may have water oozing from it during six months of the year. The only effective way of dealing with all such would be to cut trenches in the bank to connect below the main pathways, and these latter and the bank trenches filled with clinker, brick-bat or any waste stone would suffice for all purposes (Fig. 4). A much more serious condition of affairs is set where the staple soil is clayey loam, the subsoil being of the retentive or water-holding type. Here it will be necessary—if a successful rock garden is to be established—to effectually and systematically drain the entire foundation or base before laying a single stone. In such a case the cost of providing a few dozen loads of chalk or other suitable material would be small compared to that of excavating, discarding in part the soil, and supplying fresh, since, in such circumstances, every inch of soil would require special treatment also. It is, however, within the bounds of possibility that any excess of water could be conducted to some central or extreme position there to constitute the supply for bog-loving plants. At Friar Park both drainage and stability are secured to the whole by thousands of tons of rock raised above a bed of natural chalk, and by thousands of deep fissures—albeit, rock and soil charged—running in all directions. In the clay-bound area, and by discarding the great bulk of the soil, it would not be difficult to emulate the Friar Park conditions, were it possible also in conjunction therewith to emulate the patience, perseverance and enthusiasm demonstrated by the great work itself. Thus it will be seen that even in the all important matter of drainage there are circumstances and conditions requiring no elaborate precautions, while others necessitate the closest scrutiny and care. Hence, in this as in all else, the coat must be cut according to the cloth.

*Fig. 5.—A ROCK GARDEN IN THE MAKING. THE LOWER STRATA OF ROCKS ARE PLACED IN POSITION FIRST.*

**The Stability of the Rocks.**—In the constructive work of the larger rock garden there is nothing of more vital importance than stability. Conversely, there is nothing so disastrous as shifting or settling rock. Such settling is most likely to occur after heavy rains, and in those instances where much fresh soil has been piled up or where the bank soil is of a greasy, retentive nature. In such cases, the result is not pleasant to contemplate. It might seriously affect the erection as a whole or in part, and cause much otherwise unnecessary work. Hence there is the need of starting from a solid foundation (Fig. 5). In the majority of gardens a comparatively solid foundation can be obtained on gravel or clay. In others, adequate safety may be assured by sinking the larger rocks into firm, undisturbed soil. The naturally endowed site, undulated bank or rugged picturesque slope is in a different relation altogether, for the soil is already in position, and usually is stability itself. Since stability, however, is materially affected by the moisture-holding properties of the soil, and by the rainfall, this phase of the subject should be considered in conjunction with that of drainage.

**Rock-building.**—This constitutes the more serious constructive work, and it is here that the most glaring blunders are made. Writers on the subject repeatedly urge the teachings of Nature without giving the beginner in rock-gardening the least idea of the good and bad, so far as these pertain to our gardens. In Nature, of course, everything is right, though it by no means follows that all is alike suitable. For example, in Nature we see great unquarried masses of rock that for gardening purposes would be wholly unsuited—which have, indeed, remained exposed for centuries, perhaps, without attracting vegetation to themselves, hence to copy and reproduce such would be a great mistake. Moreover, it is not the unyoked savagery of Nature that we require for our purpose, but her choicest bits, those into which we can introduce the exquisite inlaid jewellery

of an alpine slope with every hope of success. Too many rock gardens to-day err on the side of pretentiousness; there is too much rock of too wall-like a pattern too much exposed. And, further, as though the chief idea of the builder was a display of rocks, they are thrust under one's nose in order, apparently, that their incongruities and shortcomings might be fully realised.

**The Best Teachings of Nature** in such matters—best because embracing utility with a graceful contour—are the teachings of our own hillsides. Here, in touch with the rolling bank—sculptured and fashioned by thousands of years—we see all that is good, all, indeed, for our use, and all we require to copy. We neither have room for nor require the whole even of this; it will suffice if we grip its vital principle, modifying or adapting it to our circumstances as may seem desirable. The occasional boulder, projecting ledge or outcrop rock, now exposed, or, anon, nearly mantled from view by the ever-moving *débris*, will all be here, ever suggestive of possibilities by their position, connected or disconnected as the case may be, each an object lesson of the highest importance for those who have eyes to see. It will be seen how that these rocks invariably lie to the bank—the hillside—for the obvious purpose, apparently, of arresting the downward progress of seed and soil, and, while playing the part of receivers and retainers of moisture, also by their lie conducting it to the roots of the plants. Hence their teaching value is enormous. To comprehend all such teaching conveys is to grasp the first great fundamental principle of rock-building; to ignore it would be but to hopelessly flounder in the dark, and always with "rocks ahead." On the other hand a mere slavish imitation of unquarried rock would be wrong from every gardening point of view. These noblest monuments of Nature we may admire to the full from afar. Replicas of them in miniature in our gardens would be entirely out of place; wholly unsuited to the children of the mountains with which we desire to garnish them.

We have referred to the lie of the rocks to the bank and dwelt on its advantages. Occasionally the exact opposite is seen, where in stratified rocks the natural lie has been disturbed. In its worn and sometimes polished surface, the absence of cumulative grit or *débris*, we get great teaching value also—a direct example of what *not* to do. We also see like instances in many a garden where the rocks constitute a shoot directing all moisture away from the roots of the plants. Rocks having an inclination down the bank are to the gardener impossibles ; they gather to themselves neither soil nor *débris* ; dew and rain are speedily carried away, and in the garden, save for some long trailing subject, would remain indefinitely unfurnished. Equally bad and wrong, too, in a gardening sense, are overhanging rocks, those more particularly which roof over the plants, rendering the soil dust dry and unfit to the great mass of vegetable life. A few subjects may endure for a time in such places ; but it is painful to see them. Quite wrong, too, is the rock whose basal part is fully exposed. Frequently in Nature this is hidden from view, and soil and grit associating itself therewith would constitute an ideal spot for colonising the choicer plants. Here, indeed, the operator may copy Nature to the full, and in so doing will never err. The foregoing include some of the most valuable object lessons of our own hillsides, and from this standpoint are well worth committing to the tablets of the brain.

**The Disposition or Arrangement of the Rocks** is a matter of great importance, though impossible to discuss in detail. In principle, however, it is so nearly akin to " the best teachings of Nature " that probably the reader will have already grasped its import. We have seen how, in the main, the rock should lie to the bank, there to be in direct touch with an assured depth of soil uninfluenced by external conditions of dryness. The prevailing idea of the rock-builder should be that he is setting a certain rock or forming a given colony for some

particular type of vegetation. It may be a dryish place and sunny withal, suited to Opuntia, or the Cob-web Houseleek (Sempervivum arachnoideum). Or it may be a high-up rocky ledge where Saxifraga cotyledon in any form would find a congenial home; or a sunnier ledge, sub-vertical wall, or sharply sloping bank, somewhat lower down, where the great Pyrenean Rockfoil (S. longifolia) might fittingly congregate. Anon, he may be dealing with a more spacious area better suited to alpine Phlox, Polygonum affine, or Saxifragas apiculata or Sancta. For so distinct a trailing subject as Polygonum vaccinifolium the face of a nearly vertical rock would have to be found, while for such notable groups as Haberlea and Ramondia moist shady ravines, or shady, nearly vertical, moisture-laden walls would have to be commissioned. These, however, are types for which allotted places and conditions are essential. Between them comes a great alpine host—the rank and file of an army thousands strong—whose requirements are less fastidious. The miniature growing Androsaces, such as pyrenaica, villosa, chamæjasme and others that bejewel the face of the rock in Nature, will be at home in chink or crevice, while the trailing, profuse-flowering A. lanuginosa might be given a few yards of space to fill with its silvery trails and pink-flowered tresses.

Avoid in rock-building continuous repetitions; diversify in some form or another the higher rock from that immediately below. Avoid the stone wall arrangement. Don't let the base of a rock expose to view an ugly space. The base of a rock should be at least half buried from view. Be very sure, should it be necessary to arrange two pieces of rock one above the other, that no vacuum is allowed to exist. Such things must for ever remain ungarnished, inert, and an eyesore. Above all things, never employ stratified rock other than in its true form. To up-end a stratified rock is to ignore the best teachings of Nature, and is alike an offence to good taste. Moreover, such rocks have no planting value, and are calculated to remain bare for all time.

**Fissure and Crevice.**—In the arrangement or disposition of the rocks I regard these as of the highest importance, since they form, or should form, a setting —a fitting setting—for the choicest jewels found in Nature. It is into these that we can introduce, with every hope of success, the inlaid jewellery of an alpine slope, and, by endowing them with the best, make them appear a part of Nature's own. To the true rock-builder the fissure or crevice is far more precious than the larger planting areas, for in them he sees the hope of success for not a few of the sweetest of Nature's children, denizens of the higher rocks and secluded places, which are doomed to failure in the ampler soils of the rock garden lower down. That they require and must have their own special fare there is no doubt; hence the rock-builder must see to it that every fissure is filled as the work proceeds; each to form a larder stored with the choicest morsels, grit, rocky *débris*, and soil after its own kind. Here, in touch with absorbent rock itself, quite removed from the soil and soil-damp so fatal in lowland gardens to high alpine vegetation, fed and nourished imperceptibly by dews and rains, with perfect drainage, and with root fibres a yard or so away, many of these delightful plants will be as safe as the hills themselves.

## CHAPTER IV.

### The Bog Garden or Rock Garden Pool.

I HOLD that the bog garden proper should be without the rock garden, amid moist woodland scenes or other

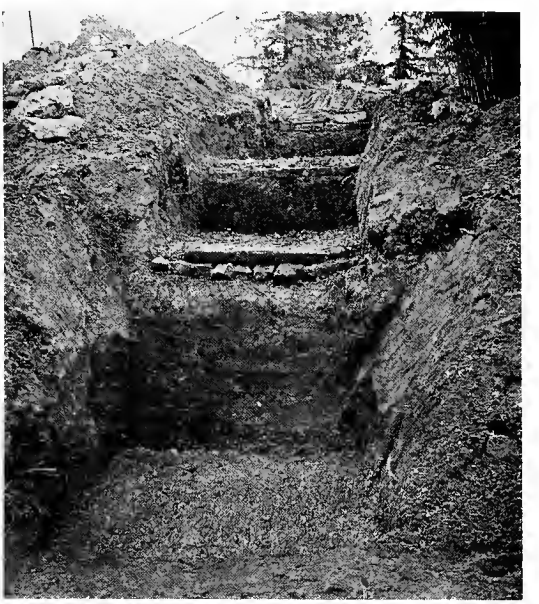


*Fig. 6.—A ROCK GARDEN CASCADE IN THE MAKING.*

place apart. Water, however, in some form or another —the tiny streamlet or the overflow from dripping cave supplying the rock garden pool, and from thence to a

low-lying depression, might fittingly constitute an adjunct to the rock garden of an interesting and useful kind. For present purposes, therefore, we might assume we have such at our disposal; the water supply

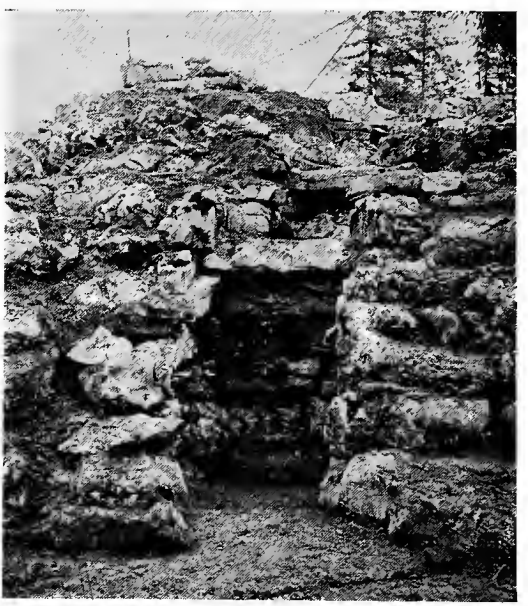


*Fig. 7.—THE CASCADE COURSE COMPLETED.*

adequate yet under control. Dripping from fern-lined cave, or falling more abruptly as from a miniature cascade (Figs. 6 and 7), the first function of the surplus would be to occupy a pool, from the overflow of which the whole of the remainder would be supplied. By fixing the pool at a slightly higher level, or by more deeply

*Fig. 8.—TRILLIUM GRANDIFLORUM ROSEUM IN THE ROCK GARDEN.*

excavating the depression at the other extreme, gravitation would be secured. If needs be the water-loving things could be accommodated first, the moisture and cool-loving subjects later. Throughout the great guiding principle should be vested in the securing of adequate moisture without stagnation. The one is life, the other is death.

**Making a Bog Garden.**—In its arrangement a water-tight foundation is a necessity. It may be of puddled clay or concreted. When of any extent it should be arranged in sections so that the water may moisten the soil without passing too quickly away. If arranged in one section only, the outlet should be so raised and plugged that saturation of the whole at will is thereby rendered possible. Above the cemented floor a six-inch bed of gravel or brick-bats should be placed. Over this a good thickly cut layer of turf, set grass-side downwards, and over this the soil—loam, peat and leaf-mould—or what is considered best for the plants. Of this latter a foot or eighteen inches should be supplied. By arranging the soil in compartments, quite a variety may be accommodated in a small area. For example, Primulas, such as japonica, pulverulenta, rosea and Sieboldii, Anemone robinsoniana, Parnassia and Ourisia coccinea would be good for sandy or pasture loam, as would also those fine foliage subjects Saxifraga peltata and Rodgersia. Trilliums (Fig. 8), Cypripediums, and such Lilies as canadense, superbum, and Grayi would be happy in peat and leaf soil, while Darlingtonia, Sundew and Sarracenia would revel in peat and sphagnum. Pinguiculas could be strewn on the damp moss-covered sandstone bordering the streamlet. The following is a selection of plants suitable for the Bog Garden :—

## Selection of Plants for Bog Garden.

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| Anemone robinsoniana | ½ft. | Shade | Loam | Pale Blue | April | Division |
| Chrysobactron(Bulbinella) Hookeri | 2 ft. | Any | Peat, loam | Yellow | June | Seeds |
| Cypripedium Calceolus | 1 ft. | Shade | ,, ,, | Yellow,brown | May, June | ,, |
| ,, pubescens | 1 ft. | ,, | ,, ,, | ,, ,, | ,, ,, | ,, |
| ,, spectabile | 2 ft. | ,, | Peat | Rose, white | June, July | ,, |
| Gentiana asclepiadea | 3 ft. | ,, | Loam | Blue. | July, Aug. | ,, |
| ,, ,, alba | 3 ft. | ,, | ,, | White | ,, ,, | ,, |
| ,, Andrewsii | 1 ft. | Any | Peat | Blue. | Aug., Sept. | ,, |
| Lobelia cardinalis | 3 ft. | ,, | Loam | Scarlet | ,, ,, | ,, |
| Meconopsis integrifolia | 2 ft. | Open | Peat, loam | Yellow | June | ,, |
| ,, Wallichii | 5–6 ft. | Shade | ,, ,, | Blue. | July | ,, |
| Omphalodes verna | Creeping | Any | Loam | ,, | Spring | Division |
| Ourisia coccinea | 1 ft. | ,, | Loam, peat | Scarlet | May, June | ,, |
| Pinguicula, in variety | ¼ft. | Shade | Sphagnum and stone | Various | Summer. | Seeds |
| Primula denticulata, in variety | 1¼ft. | Any | Loam | ,, | Spring | ,, |
| ,, japonica, in variety | 2 ft. | Shade | ,, | ,, | May, June | ,, |
| ,, rosea | 1 ft. | ,, | Light loam | Scarlet | Mar., Apr. | ,, |
| ,, Sieboldii, in variety | 1½ft. | Any | Loam | Various | Apr., May | Division |
| ,, pulverulenta | 3–4 ft. | Shade | ,, | Crimson. | June, July | Seeds |
| Rodgersia pinnata | 3 ft. | ,, | ,, | Cream | August | Division, seeds |
| ,, podophylla | 3 ft. | ,, | ,, | ,, | ,, | ,, ,, |
| Sarracenia purpurea | ½ft. | ,, | Peat and sphagnum | Various | Summer. | Seeds when available |
| Saxifraga granulata plena | 1 ft. | Any | Loam | White | May | Division |
| ,, peltata | 2–6 ft. | ,, | Peat & leaf mould | Pink | ,, | ,, |
| Trilliums | ½–1½ft. | All | ,, ,, | Various | Spring | Seeds |

## CHAPTER V.

### The Moraine.

In Nature the Moraine is of an age only equalled by mountain and glacier, at whose latter's feet it is most usually found; a mingling of sand, *débris* and rock of varying sizes and forms according to the nature of the ground above, to which, of course, and to the ever-melting snow and ice, they owe their being. In gardens, the artificially arranged Moraine is of necessity bereft of not a few of the chief characteristics of that formed in Nature. The altitude, the melting snow and ice of summer-time, with the eternally moisture-saturated rocks around, these are the things we realise to be absent, quite apart, possibly, from many more whose absence is less conspicuous at first sight. Then, too, we cannot overlook the great cooling effects of the glacier itself, on all that is in Nature around, and, while the Moraine is situated, as I believe the majority are, in full sun, the near proximity of so much ice must exert an influence of which we have but little idea. Then, too, it is doubtful whether we shall ever arrive at a true estimate of the value to plant life in those regions of the constant supply of the ice-cold water or its relative merits or demerits, compared with that supplied in the artificially arranged Moraine in our gardens. These, perhaps, are problems the true solutions of which will never be found, or, if discovered, will prove to be impossible of imitation.

**The Lesson of the Moraine.**—Nature everywhere affords the observant student innumerable object lessons, and one of the chief lessons of the Moraine, as it appears to the writer, is the indifference with which many high alpines regard certain soils. It would be true of the most of them to say that they are but the

creatures of circumstance. To arrive at this one argues from the standpoint that not a few of the plants found in natural Moraines were, perchance, long ago higher up, that they have been carried thither by the moving snow and ice, and, having become located in the Moraine, have endeavoured to adapt themselves to their surroundings. Their introduction may have been by means of seeds, or plants, or both, though, doubtless, no matter upon what rock formation the plants formerly existed, that rock would be saturated with moisture. Hence, the moisture, in conjunction with the poorest of soils—sand, grit, rock—as opposed to the richer vegetable soils, may be said to be among their greatest needs.

**Its Relation to the Rock Garden.**—What is a Moraine? The dictionary rendering is "an accumulation of stones and other *débris* found at the foot, along the edges, or down the centres of glaciers," hence, of necessity, well supplied with moisture, and, above all, always cool, at least, below. The glacier, the ice and snow, we cannot imitate; the cool conditions below we can in our own way. In Nature, too, the majority are in full sun; that condition we might also imitate, though, naturally, partially or very feebly. We can, however, give our Moraine the fullest possible exposure, and with moisture and crushed rock and grit at our disposal do much for the plants reputedly at home in such places. These latter, indeed, constitute the essentials; their opposites —rich soil and dryness—the fatal doses of poisons as it were to the root-fibres of those high alpines to which it must be so absolutely and entirely foreign.

Now, what is the relation of the Moraine to the rock garden as *we* know it? It is as the veriest babe in long clothes, its most recent phase, an adjunct, a something of which the best informed know a little and imagine much, a something, however, which is most likely to become a necessity in all the best equipped rock gardens if the endeavour to cultivate choice alpines from near

the snow line is to be crowned with success. In all probability the oldest constructed Moraine in British gardens has not yet seen a couple of decades; a far greater number a couple or so of years. To plant a variety of things to-day and write of their doing well in the Moraine a month or two hence does not command confidence. Above all, it lacks experience. We fully believe that it will prove a home for many things hitherto a complete failure when grown in rich soils. How great the variety may be, however, and how much success is likely to be assured, are questions to be answered by time and by experience only. The free-growing alpine plants we grow quite well elsewhere, hence, our Moraine should not be in the nature of a dumping ground.

**Constructing the Moraine.**—The essentials are moisture, supplied from below, the presence of grit and, more or less, finely pulverised rock, and an entire absence of rich vegetable soils. Finely sifted peat and leaf soil in proportion to one-sixth for the majority adding a little loam for Gentians, Primulas and Ranunculus. The process of formation, to secure a watertight bottom and varying levels to suit the needs of a variety of plants, might be conducted on the same lines as those suggested for the bog garden (Fig. 9). A watertight condition may be secured by puddling with clay, or by the use of cement concrete or both. Beds or compartments at different levels, allowing for two or, possibly, three distinct depths, should also be arranged. With the watertight compartments completed and tested, and arrangements made for relieving the beds of superfluous moisture, *e.g.*, small drain pipes which might be plugged up at will, the filling in may be proceeded with. Over the bottom place a six-inch thick layer of rather coarse gravel. Next above place a thick layer of sphagnum or other moss to prevent the finer sand particles being silted through. Above the moss arrange a few inches deep of sand, grit, finely pulverised rock

*Fig. 9.—SILENE ACAULIS IN A MORAINE GARDEN.*

and granite chips, the latter to be in the form of a surface mulch or in small proportion elsewhere. The water supply should be under complete control, and in addition to the larger lead perforated pipes to flood the whole of the beds, smaller ones, also perforated, should be arranged at the sides and, occasionally, in other parts of the beds where these are of large size, but always obscured a couple of inches below the surface. The best time for planting the Moraine is spring and early summer. The best type of plant is the seedling raised in pots or pans on the orthodox Moraine plan. Such as these arranged in colonies or groups are not likely to disappoint once they become established (Figs. 9 and 11). On page 36 is appended a list of plants suggested for the Moraine. All are of diminutive stature, their flowers appearing in late spring and early summer.

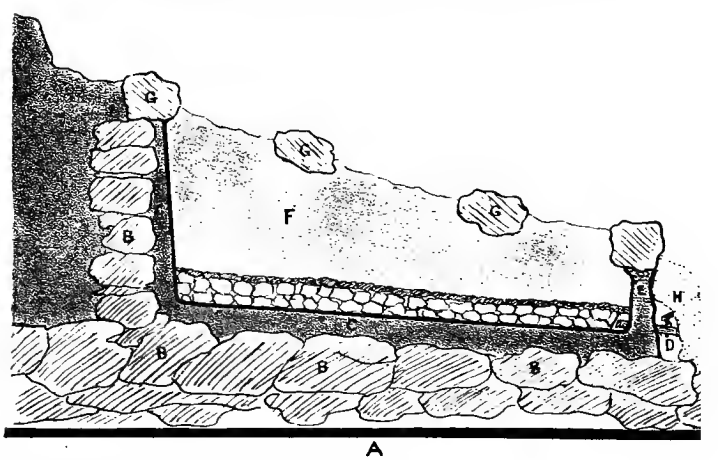



*Fig.* 10.—*Sectional Plan showing construction of a small Moraine.*

A, horizontal line; B, hard core foundation; C, cement concrete, draining towards outlet; D, winter outlet with perforated zinc cover; E, 8-inch overflow; F, Moraine soil, upon small, then large rubble for drainage; G, decorative stones; H, stone hiding tap of winter outlet.

*Fig. 11.—GENTIANA VERNA AS A MORAINE PLANT.*

## Plants suggested for the Moraine.

Androsace glacialis
,, villosa
Asperula athoa
,, suberosa

Campanula Allionii
,, cenisia
,, excisa
,, pulla
,, Raineri
,, Zoysii

Dianthus alpinus
,, Freynii
,, neglectus
,, glacialis

Epilobium Dodonæi
Eritrichium nanum

Gentiana bavarica
,, imbricata
,, pumila
,, pyrenaica
,, verna

Lobelia radicans

Mazus rugosus
Morisia hypogæa
Myosotis rupicola

Pinguiculas (all)
Parnassias (all)
Petrocallis pyrenaica
Primula farinosa
,, ,, alba
,, frondosa
,, minima
,, scotica

Ramondia (all kinds)
Ranunculus alpestris
,, glacialis
,, parnassifolius

Saxifraga aizoides
,, ,, autumnalis
,, cymbalaria
,, Hirculus
Silene acaulis
,, Elizabethæ
,, Hookeri
,, pumilio
Soldanella alpina
,, montana
,, pusilla
,, pyrolæfolia

Viola cenisia

Wahlenbergia pumilis

## CHAPTER VI.

### Rockwork as Edgings to Flower Borders.

The prevailing idea here is to produce an informal living edging of plants as opposed to the dead formal edgings of brick and tile for all hardy flower or other borders. In some few instances, grass or turf walks take the place of gravel, and though they are not infrequently arranged on the straight line plan, we infinitely prefer them to others which destroy rather than make for beauty. The worst offenders in the case —and it were better for the gardener and all concerned that they should be mentioned by name—are the so-called garden-edging tiles in their varied and usually ugly patterns and colours. Not far removed are those others of plain brick set slantwise in the ground, and both are easily kicked out of place unless well cemented in. Set in position they are ugly in the extreme, wretched usurpers of ground otherwise easily adorned with plant life and always informal and natural-looking when furnished, bristling for a long time in spring with many-hued flowers and which create picture effects of their own.

Moreover, such creations, while beautifying the margin of the border for a very considerable period, also mirrors into greater life the contents of the border itself. In other words, it is the very threshold of the border, and, later on, becomes an integral part of it. Not the least attractive feature of such an arrangement would be the cushioned tuft or trailing habit of the plants, the latter now spreading on to the gravel walk itself or on to the border on the opposite side, in both doing good service. In some instances known to the writer the plants have been so inobtrusively introduced that, in conjunction with an entire absence of stone, there is really no line

of demarcation 'twixt path and border, the plants having developed in much their own way. The idea, however, good enough within the limits of the woodland garden or its approaches, is not recommended for general adoption for the border, no matter what its kind.

**The Arrangement of the Informal Edging** is simple enough, though its size—and width more particularly—would have to bear a certain proportion to the border of which it is destined to presently become a part. For example, borders of twelve feet or eighteen feet wide might be fronted by a margin equal to one-sixth part of these widths; in other words, they should be two feet wide and three feet wide respectively. Borders of these widths would, of necessity, be proportionately long, hence their margins would soon become a feature. The latter may be the result of the use of one kind or variety of plant, as, *e.g.*, Aubrietia Dr. Mules, Phlox Nelsoni, Campanula pusilla Miss Willmott, Gentiana acaulis, Iberis correæfolia, or one of the many vigorous growing varieties of the newer mossy Saxifragas. An arrangement on these lines would be of a most imposing character; the chief and only drawback is probably the short-lived season of flowering. By embracing the whole of the plants named, and setting them out in lengthy stretches, an equally imposing array would be presented, and a much longer season of flowering secured. Small irregular pieces of sandstone or limestone would be the best material to employ, so setting them into the ground that they show six inches or more above it. There should be no formal placing of the stones. In every direction should there be seen a little irregularity. Neither should the stones be set out to the full extent suggested. Rather should they be within the boundary so that the two fronts facing on path and border could be rightly treated with plant life (Fig. 12).

Do not overload the informal edging or bordering with stones. The aim should be to get the greater irregularity by the plants themselves; their own heights, and, in some instances, a tendency to mount or clamber

*Fig. 12.—ROCKWORK AS EDGINGS TO KITCHEN GARDEN BORDERS AT ALDENHAM HOUSE.*

over the stones doing much in this direction. Assuming that the border has been well prepared, and that the soil is not of a tenacious clay, no special soil preparation will be necessary for the marginal subjects. Generally, however, soil of a light to medium character will be best. The spaces between the stones should be filled with soil to not more than half their above-ground heights. For

*Fig. 13.—PERENNIAL CANDYTUFT, SAXIFRAGA AND THRIFT IN A ROCKWORK EDGING.*

planting, it is suggested that ordinary sized nursery plants or rather small fresh pieces be used in preference to older clumps. This is most important in the case of Gentian, Candytuft, Mossy Saxifrage (Fig. 13), the Setacea and other Phloxes, it being well known that old plants of the latter do not take kindly to the soil. In the appended list a selection of the best only is given, great variety being far from desirable :—

# Rock Plants for Borders.

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| Achillea tomentosa | ½ft. | Any | Any | Yellow | June, Aug. | Division |
| Ajuga reptans atropurpurea | ½ft. | ,, | ,, | Violet | ,, ,, | ,, |
| Alyssum saxatile compactum | ½ft. | Sun | ,, | Yellow | May, June | Seeds |
| Antennaria tomentosa | Creeping | ,, | ,, | Silveryfoliage | — | Division |
| Arabis albida variegata | ½ft. | Any | ,, | White | May, June | Division, cuttings |
| ,, ,, fl.-pl. | ½ft. | ,, | ,, | ,, ,, | ,, ,, | ,, ,, |
| Armeria cephalotes rubra | 1½ft. in flower | Sun | ,, | Rose | ,, ,, | Seeds, division |
| Aubrietias, any, a great class. | ½ft. | Sun & shade | ,, | Lilac, rose, violet | May, July | Cuttings, seeds |
| Campanula pusilla | ½ft. | ,, ,, | ,, | Pale blue | June, Aug. | Cuttings, division |
| ,, ,, alba | ½ft. | ,, ,, | ,, | White | ,, ,, | ,, ,, |
| ,, ,, Miss Willmott | ½ft. | ,, ,, | ,, | Pale blue | ,, ,, | ,, ,, |
| Cerastium tomentosum | ½ft. | Sun | ,, | White | June, Sept. | ,, ,, |
| Crucianella stylosa | ½ft. | ,, | ,, | Rose | July, Sept. | ,, ,, |
| Dactylis glomerata variegata | 1ft. | ,, | ,, | Variegated grass | — | Division |
| Gentiana acaulis | ½ft. | ,, | Light loam | Fine blue | May, June | ,, |
| Hepaticas (all) | ½ft. | Shade | ,, ,, | Red, white, and blue | Mar., Apr. | Division, seeds |
| Iberis (Candytuft) (all) | ½ft. | Sun | ,, ,, | White | Apr., May | Cuttings, seeds |
| Phlox setacea, vars. (any) | ½ft. | ,, | ,, ,, | White, lilac, pink | ,, ,, | ,, ,, |
| Saxifragas, mossy sorts | ½–1ft. | Sun, shade | Moist soil | Red & white | ,, ,, | Cuttings, division |
| Viola cornuta purpurea | ½ft. | ,, ,, | ,, ,, | Royal purple | Apr., Aug. | Cuttings |

## CHAPTER VII.

### The Town or Suburban Rock Garden.

The town rock garden must ever be of a subordinate kind—subordinate to buildings, fences, walls; arranged within a limited area, in danger of its soil area being robbed by tree roots travelling from adjoining gardens, and in various other ways. The strictly limited scope of its own boundary fences of necessity minimises all hope of "selecting a site," and not a little, too, that of "aspect" also. Light in very large degree will be shut out by adjacent buildings or trees, and, generally, the outlook, bereft of many of the essentials which the professional builder of rock gardens believes to be necessary to success, would appear very black indeed. Happily, however, the beginner in such matters is quite oblivious of all these things, and, were it otherwise, so great is his determination and enthusiasm once he had made up his mind, that they would be accounted naught, and he would be prepared to face all and give his own ideas a chance, oft-times successfully (Fig. 14).

Of rock-building principles he probably knows nothing and cares little. In the main he has made up his mind to have a rockery, and that after his own heart's desire. Of the orthodox methods of arranging sandstone or limestone he knows nothing, and as he usually does not intend purchasing either of these for his use, there is no need for him to learn. In short, his own ideas of the affair are as limited as the scope of his garden, and he considers himself surpassingly rich in the possession of of a few clinkered burrs, brick-bats or concrete blocks; anything, indeed, that is capable of being plastered together with cement to form "pockets" for soil and plants.

*Fig. 14.—A TOWN ROCK GARDEN ONE YEAR AFTER ITS FORMATION.*

**A Fundamental Error** in such a case is that the miniature "pockets" usually formed are not infrequently rendered almost watertight, and the plants being out of touch with mother earth quickly perish of starvation. There is, however, no need for this. The miniature or town rock garden need not of necessity fail because of its size or position; while for the rest there is a remedy, and the difficulties are not insuperable. By first digging up the existing soil, adding grit, gravel, old mortar or the like to afford increased drainage, and bringing into position a few barrowsful of garden soil, a mound will be formed equivalent to the soil bank of the larger erection. Then, when forming the receptacles—"pockets"—for the plants take care that their bases remain open, so that through the crevices or fissures thus formed the roots of the plants will have a chance of getting away. In these and in other ways the town rockery may be placed on all fours with that of a more pretentious character. Everything, it should be remembered, is being done on a small scale, hence miniature ravines may be constructed for the smaller plants, with snug little bays for many more (Fig. 15).

**Natural Rock.**—There is, of course, no reason why natural rock should not be employed, and either sandstone or limestone may usually be had at no great distance. A rockery bed of either, in sun or shade, would have a much prettier effect than the cemented article, though we are not going to deny that even out of this latter the amateur, by reason of his abundant enthusiasm, will obtain a very fair measure of success. Occasionally, a water tank for Lilies forms part of the scheme, its overflow constituting the supply for a bog garden, where plants from the dwarf-growing Sundews to Mocassin Flower and Panther Lily of eight feet high are grown. Such combinations are not a little remarkable in their way, and afford their owners an infinite amount of pleasure. The following plants may be fairly expected to do very well in town gardens, except where the air is poisoned with chemical fumes :—

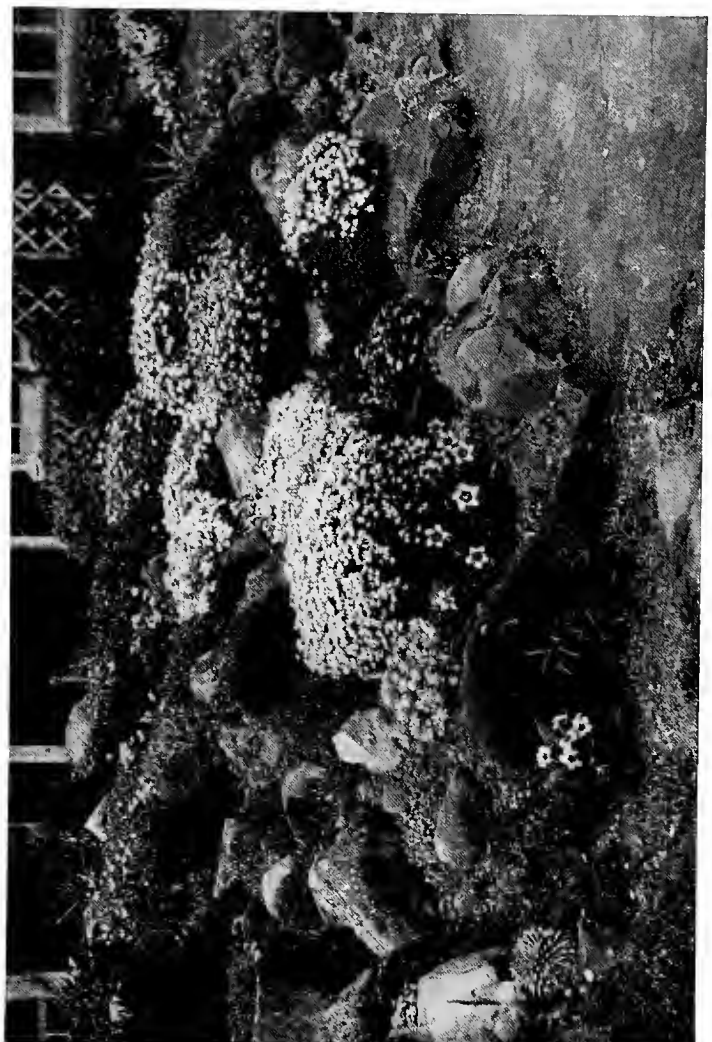


*Fig. 15.—A SMALL ROCK GARDEN SHOWING THE WISDOM OF MASSING FLOWERS.*

# Selection of Plants for Town Rock Gardens.

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| Achillea Clavennæ | ½ft. | Sun | Gritty loam | White | July | Seeds |
| ,, rupestris | ½ft. | ,, | ,, ,, | ,, | June, July | Seeds, division |
| Androsace Chumbyii | ¼ft. | ,, | ,, ,, | Pink | May, June | Division, seeds |
| Anemone Hepatica, in variety | ½ft. | Shade | Loam | Various | Mar., Apr. | ,, ,, |
| ,, angulosa | ½ft. | ,, | ,, | Blue. | ,, ,, | ,, ,, |
| Arabis albida fl.-pl. (Fig. 16) | ½ft. | Sun | Gritty loam | Blue. | Apr., July | ,, ,, |
| Campanula muralis | ¼ft. | Shade | ,, ,, | Royal purple | May, June | Division |
| ,, pulla | ½ft. | Sun or shade | Loam | Blue & white | June, July | ,, |
| ,, pusilla, in variety | ¼ft. | Sun | Gritty loam | Rosy crimson | June | Seeds |
| Dianthus alpinus | ¼ft. | ,, | ,, ,, | Yellow | Apr., May | Seeds |
| Draba aizoides | ½ft. | ,, | Sandy loam | Orange | May, June | ,, |
| Erigeron aurantiacus | ½ft. | ,, | Light loam | Fine blue | ,, ,, | Division |
| Gentiana acaulis | ½ft. | ,, | ,, ,, | Rose | May, July | Seeds, division |
| Geranium cinereum | ½ft. | Sun or shade | Sandy loam | White | ,, ,, | ,, ,, |
| Gypsophila cerastioides | Creeping | Sun | Any | ,, | May, July | Cuttings |
| Iberis sempervirens (Little Gem) | ½ft. | ,, | Limestone soil | ,, | June, July | Seeds |
| Leontopodium Alpinum (Edelweiss) (Fig. 17). | ¾ft. | Partial shade | Sandy soil. | Blue. | May, June | Seeds, division |
| Myosotis alpestris | ½ft. | ,, ,, | ,, ,, | ,, | ,, ,, | ,, ,, |
| ,, rupicola | ¼ft. | Sun | Gritty soil. | Yellow | June, July | Cuttings |
| Onosma taurieum | 1ft. | Shade | Peat & loam | Scarlet | July, Aug. | Division |
| Ourisia coccinea | 1ft. | | | | | |

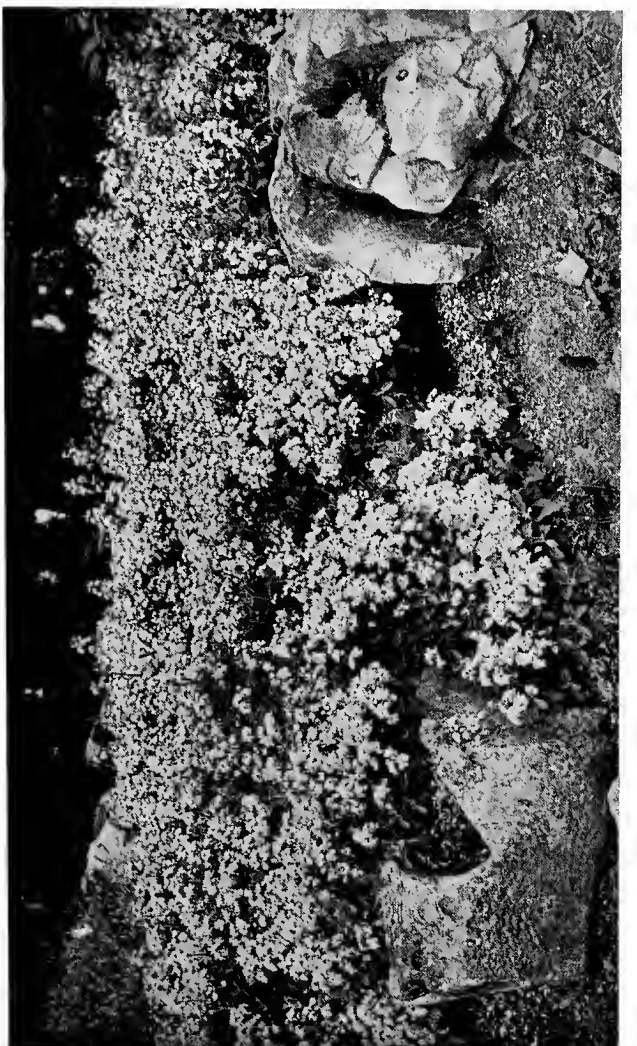


*Fig. 16.—THE DOUBLE ARABIS AS A ROCK GARDEN PLANT.*

## Selection of Plants for Town Rock Gardens (contd.).

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| Phlox subulata Nelsoni | Spreading | Sun | Light loam | White | May, June | Cuttings |
| Primula farinosa and alba | ¼ft. | Partial shade | Leaf mould and loam | Pink & white | ,, | Seeds |
| ,, nivalis (pubescens alba) | ¼ft. | ,, ,, | Rich loam | Pure white | Apr., May | Division |
| ,, marginata | ¼ft. | ,, ,, | Gritty loam | Lilac blue | ,, ,, | Division, seeds |
| ,, rosea | ½ft. | Moist and shade | Damp soils | Rose | ,, ,, | Seeds |
| Ramondia pyrenaica | ½ft. | ,, ,, | Peat & loam | Mauve | June | Seeds |
| Saxifraga aizoon rosea | ½ft. | Sun | Gritty soil | Rose | ,, | Division |
| ,, apiculata and alba | ½ft. | ,, | ,, ,, | Yel. & white | Feb., Mar. | ,, |
| ,, burseriana major | ¼ft. | ,, | ,, ,, | White | ,, ,, | ,, |
| ,, ,, gloria | ¼ft. | ,, | ,, ,, | ,, | ,, ,, | ,, |
| ,, cochlearis | 1ft. | ,, | ,, ,, | ,, | June | ,, |
| ,, ,, minor | ½ft. | ,, | ,, ,, | ,, | ,, | ,, |
| ,, Elizabethæ | ¼ft. | ,, | ,, ,, | Yellow | Feb., Mar. | ,, |
| ,, lantoscana superba | ½ft. | ,, | ,, ,, | White | June, July | ,, |
| ,, longifolia | 1¼ft. when flowering | ,, | ,, ,, | ,, | Summer | Seeds |
| ,, muscoides purpurea | ¼ft. | Sun or shade | Moist loam | Reddish | Spring | Division |
| ,, mossy sorts (new) | ¾ft. | Partial shade | ,, ,, | Red & white | ,, | ,, |
| ,, Wallacei (Camposii) | ¾ft. | ,, ,, | ,, ,, | White | ,, | |
| Sempervivum arachnoideum | Spreading | Sun | Gritty soil | Pink | July | |
| Shortia galacifolia | ¼ft. | Shade | Peat & loam | Pink & white | Apr., May | ,, |
| Silene acaulis | Carpeter | ,, | Moist loam | Pink | July | ,, |

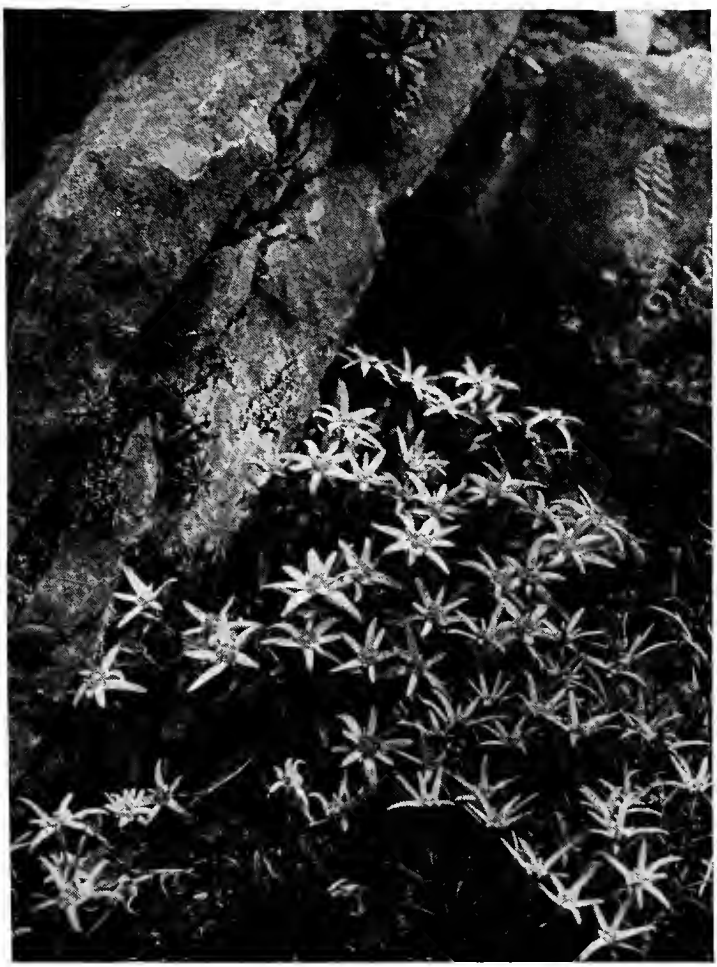


*Fig. 17.—THE EDELWEISS (LEONTOPODIUM ALPINUM).*

## CHAPTER VIII.

### Wall Gardening.

Gardening on walls is considered by many to be in the nature of a novelty. It is not so, however, though, compared with gardening as a craft, it is certainly modern. More than thirty-five years since, the writer had charge of an establishment largely devoted to hardy plant-gardening wherein not less than a quarter of a mile of walls—retaining walls, chiefly—were to be found, specially constructed to receive plant life. A small part of these had existed for some time; the majority, however, were, so to speak, of the moment. One long stretch was in woodland shade throughout, but the efforts to grow plants, ferns or otherwise, were not crowned with much success. This I attributed to dryness, water being at a distance, and the rainfall diverted by the woodland trees. The ferns we desired to clothe it with by the introduction of their spores. Wall-Rue (Asplenium ruta muraria) and Black Ribbed Maidenhair Spleenwort (Asplenium trichomanes) were a continued non-success. The woodland trees, chiefly clean, young oak, were more precious in the eyes of my employer than the success of the ferns, hence the latter had presently to take the proverbial back seat. I am fully persuaded, however, that such a wall, with its north-westerly exposure, would have given but little trouble in the open where occasional rains would have materially assisted vegetation. The unusual dryness in this case precluded success, and it is emphasised here for what it is worth. For the rest our success was proverbial, the majority of the walls being quite features

*Fig. 18.—A DRY WALL SHORTLY AFTER CONSTRUCTION.*

of the place in which they were situated. Some, however, were too well built for this phase of gardening, were, indeed, not built for it at all, but rather to support the great banks of clay that existed behind. Hence their small and almost solid stone-like joint presented some difficulty. Presently, however, Erinus did well, and, by degrees, Linaria pilosa, the smaller encrusted Saxifragas and the Cobweb and other Houseleeks were made to bejewel the joints. No plant, I think, appealed to me of all those in that rather difficult wall so much as the Linaria first named. It not only appeared made for the wall, but became an effective picture by threading itself between the joints in all directions.

**Wall Building.**—One or two essentials merit attention here. We have just seen that, for our purpose at least, the mason or correctly built wall is wrong, or, generally, ill-suited. The desire is to grow plants, not starve them. Hence if our wall has to perform the function of a retaining structure, the actual strength for this must be a thing apart from the planting section. In other words, it should be built in behind and quite obscured from view. For this purpose there is nothing like good cement concrete set with a batter of one foot in four or rather less, with three-inch drain pipes at the base and occasionally elsewhere to deal with the moisture. This much being in order, the planting wall—that portion we desire to make beautiful—can be arranged in front at will.

**The Best Materials.**—As in rock-gardening proper, either sandstone or limestone should be selected (Figs. 18 and 19) ; bricks, clinkered bricks or burrs only being used as a last resource. We want just that degree of informality here as in the rock garden. We want, too, the fullest measure of sympathy and nourishment the natural rock is capable of giving to the plants, believing that the properly equipped wall garden is a panacea for many of the ills to which high alpines are prone in lowland gardens, and believing, too, that their true

*Fig. 19.—THE SAME WALL A YEAR LATER.*

solution is to be found in the use of natural rock or stone. Apart, too, from the sympathetic and nourishing effects of natural rock, there are the added advantages of larger cavities, greater grit and soil spaces, than would be possible in brickwork. To the plants this has an importance of its own.

**The Set-Back Ledge.**—In the process of building up the planting face of the wall, three things are absolutely

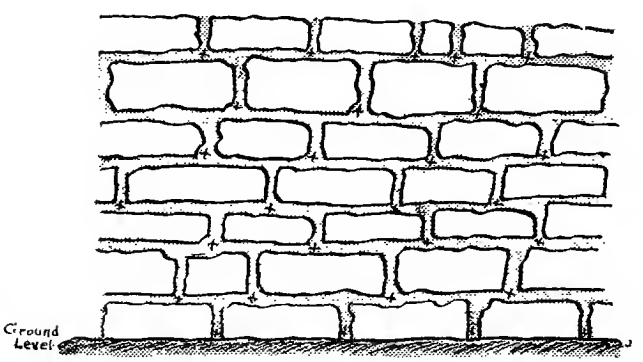



*Fig. 20.—ELEVATION OF A DRY WALL.*

*The Shaded parts represent Soil; the Crosses indicate positions for Plants.*

essential. These are: (1) a slight dip or tilt of each stone from front to back to carry water to the roots of the plants; (2) the set-back ledge or front of the stone so that the one immediately below it receives and retains the moisture; and, (3) that all spaces or crevices between stones be filled up with soil as the work proceeds. At the back of the stone work, and between it and the concrete retaining wall, a soil cavity not more than three inches wide might be arranged, and if charged

with more or less pulverised rock, old ceiling plaster, grit and loam in about equal parts, there will be presented to the roots of plants, in modified degree, the indeterminable fissure of the mountain, the well-supplied

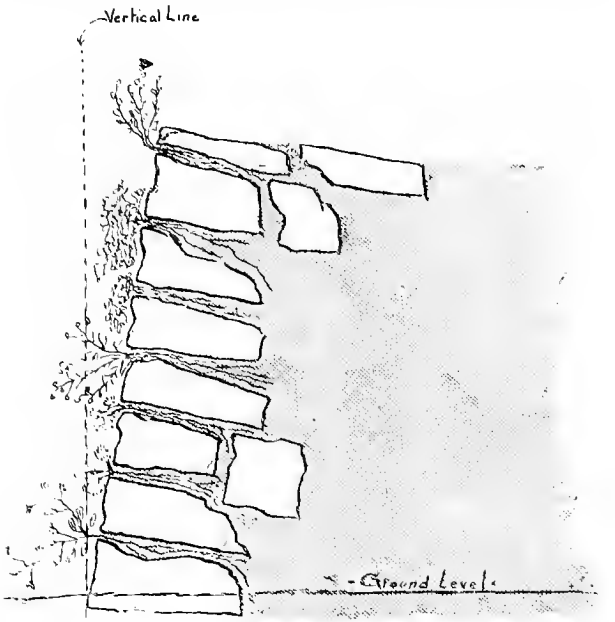



*Fig. 21.—SECTION SHOWING THE PRINCIPLE OF ARRANGING STONES IN DRY WALLS.*

*Note how the Stones slope back from the vertical.*

larder from which the plants may draw sustenance at their own sweet will (Figs. 20 and 21).

**When and How to Plant.**—Planting may be done as the work of building proceeds, or when it has been completed. For the freer growing subjects it may be

done with the building ; for choicer things it were better otherwise. On the principle of " one thing at a time being quite enough," I much prefer undertaking the building and planting at different times. The mind can then be concentrated on either the building or the planting, and far better results obtained. Then I prefer plant grouping in the walls, a grey patch here, a white patch there, a deep sombre green as a mirror to the other two not far away. I prefer, too, as plants, small bits, freshly rooted cuttings, seedlings, or quite small divisions, anything, indeed, endowed with the possibilities of new life, destined soon to become vigorous patches. Such work I contend is best undertaken without interruption, not by attempting to do two things at once. The small seedling or freshly rooted cutting or divided example is easily pricked into position by the aid of a discarded carpenter's wood chisel or similar implement, and a colony of ten, twenty or fifty quite expeditiously formed. Seed sowing has the merit of cheapness, and, for old walls, ruins and the like, and especially with such plants as Wallflower, Snapdragon, Iceland Poppy, Thrift or Valerian, is to be recommended. Within the garden, where the more select things should be seen, there is nothing to equal the cutting-raised plant, or small divided examples raised from the most distinct varieties of each group. Exceptional plants, like Ramondia and the great Pyrenean Rockfoil (Saxifraga longifolia) (Fig. 22), will of necessity have to be planted as fair-sized specimens, while so unique a subject as the Cobweb Houseleek should be introduced in single rosettes an inch or so apart. This plant is a great charm either in drier crevices of the wall or the rock garden, its cottony rosettes becoming whiter because of the conditions and the immunity from soil splashes so disfiguring to it on more level ground. For the type of wall described, February to April may be accepted as a good period for planting, always, however, to be followed, for some time, by careful attention to watering.

*Fig. 22.—"THE QUEEN OF THE SAXIFRAGAS" (SAXIFRAGA LONGIFOLIA).*

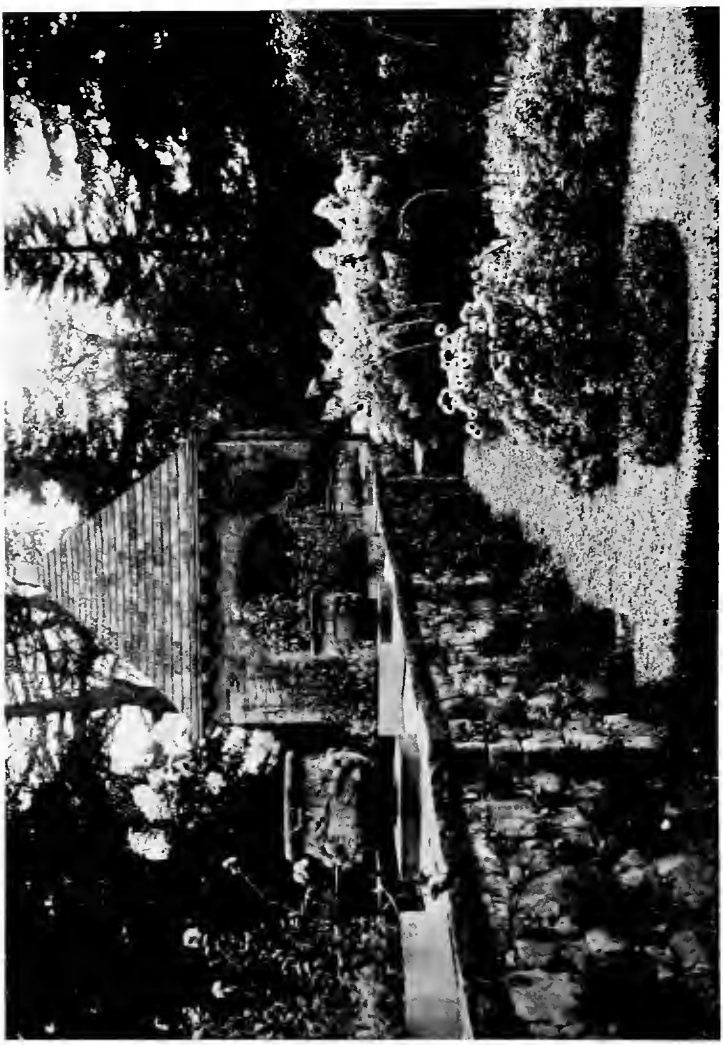


*Fig. 23.—AN OLD WALL SUCCESSFULLY PLANTED.*

**Treatment of Old Walls.**—These are difficult of treatment generally, and the planter is well advised to confine his work to the top. In the case of old buttressed walls which terminate in V-shaped top and plinth, the lower parts are almost impossible of treatment because of the dryness. Having successfully treated the upper parts of such walls, I have found seeds by far the best method, mingling a few with a handful of moistened clay soil. The number should be strictly limited, as the plants which succeed in such places produce seeds abundantly, and vegetate freely and quickly. A few of the joints will have to be raked out, *i.e.*, freed of the cement-like mortar, and having been soaked a few times with water, introduce the seed-charged soil into the crevices. Autumn is the best time for the work, as before the coming of the dry weather of spring the seedlings will have taken to their places. Wallflower, Snapdragon, Aubrietia, Corydalis lutea, Red Valerian, Thrift, and Iceland Poppy are among the most useful plants for this type of wall (Fig. 23). Artificial caricatures of old ruins and the like are treated with a much larger number of things, and it is their undoing.

The following plants are suitable for planting in walls. Those preceded by an asterisk are best suited to bold positions, ruins, and similar places:—

## Selection of Plants for Wall Gardening.

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| *Achillea tomentosa | ½ft. | Any | Any | Yellow | July, Aug. | Division |
| *Antirrhinum (Snapdragon) | ½–2 ft. | Sun | ,, | Various | June, Aug. | Seeds |
| Arenaria balearica | Creeping | Shade | Wall face | White | May, Aug. | Division |
| Asplenium ruta muraria | ¼ft. | ,, | Old mortar | — | — | Spores |
| ,, Trichomanes. | ½ft. | ,, | ,, ,, | — | — | ,, |
| *Aubrietias (any) | Creeping or trail'g | Sun | Any | Various | Apr., June | Seeds |
| Campanula cæspitosa and alba | ½ft. | Shade | ,, | Blue & white | June, July | Division |
| ,, muralis | ½ft. | Sun | ,, | Blue. | Apr., June | ,, |
| ,, pulla. | tufted ½ft. | Shade | Sandy loam | Royal purple | June, July | ,, |
| *Centranthus ruber (Valerian) | 2ft. | Sun | Loam or chalk | Scarlet | July, Aug. | Seeds |
| Ceterach officinarum (Fern) | ¼ft. | ,, | Old mortar | — | — | Spores |
| *Cheiranthus (Wallflower) | 1ft. | ,, | Any | Various | Spring | Seeds |
| *Corydalis lutea (a gem) | Curtains of growth | ,, | ,, | Yellow | May, Sept. | ,, |
| Dianthus Cæsius | ½ft. | ,, | ,, | Rose | June, July | ,, |
| ,, alpinus | ½ft. | ,, | ,, | Rose crimson | ,, ,, | ,, |
| * ,, deltoides | ¾ft. | ,, | Limestone. | Rose pink | ,, ,, | ,, |
| Edraianthus serpyllifolius | Trailing | Light shade | Gritty loam | Royal purple | May, June | ,, |
| Erinus alpinus and albus | ¼ft. | Sun | Any | Purple & white | June, July | ,, |
| *Iberis (Candytuft) | Trailing | ,, | ,, | White | May, July | Cuttings |

## Selection of Plants for Wall Gardening (contd.).

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| Leontopodium alpinum (Edelweiss). | ½ft. | Sun . . | Limestone. | White . . | May, July | Seeds |
| Linaria pilosa. . . . . | Creeper | Shade . . | Gritty soil. | Violet . . | May, July | ,, |
| * ,, Cymbalaria . . . . | Trailing | Any . . | Any . . | ,, . . | May, Aug. | ,, |
| Omphalodes Luciliæ . . . . | Tufted | Partial shade | Gritty loam and peat | Blue. . . | ,, ,, | ,, |
| Onosmas (any) . . . . . | 1ft. . | Sun . . | Loam in fissures | White & yel. | May, July | Cuttings |
| Ourisia coccinea . . . . . | 1ft. . | Shade . . | Moist loam | Scarlet . . | June, Aug. | Division |
| Papaver alpinum . . . . | ½ft. | Sun . . | Gritty soil | Rosy . . | Summer | Seeds |
| *Phlox subulata, vars. . . . | Trailing | ,, . . | Gritty loam | White & pink | Apr., June | Cuttings |
| Phyteuma comosum . . . | ¼ft. . | ,, . . | ,, ,, | Bluish . | May, June | Seeds |
| *Polygonum vaccinifolium . . | Trailing | ,, . . | ,, ,, | Pink. . . | Aug.-Nov. | Cuttings |
| Ramondias (any). . . . . | ½ft. | Shade and moisture | Peaty soil . | Various . . | June, July | Seeds |
| Saxifraga aizoon rosea . . . | ½ft. . | Sun . . | Gritty soil. | Pink . . | May, June | Division |
| ,, ,, rosularis . . | ½ft. . | ,, . . | ,, ,, | White . . | ,, ,, | ,, |
| ,, apiculata . . . . | ½ft. . | ,, . . | ,, ,, | Yellow . . | Feb., Mar. | ,, |
| ,, Burseriana, in variety | ¼ft. . | ,, . . | ,, ,, | White . . | ,, ,, | ,, |
| ,, cochlearis . . . . | 1ft. . | ,, . . | ,, ,, | ,, . . | June . | ,, |
| ,, lantoscana superba . | ½ft. . | ,, . . | ,, ,, | ,, . . | ,, . . | ,, |
| ,, longifolia . . . . | 1½ft. . | ,, . . | ,, ,, | ,, . . | Summer. | Seeds |
| Sempervivum arachnoideum . | ½ft. . | ,, . . | ,, ,, | Pink. . . | ,, . | Division |
| *Zauschneria californica . . . | 1ft. . | ,, . . | ,, | Scarlet . . | Aug., Sept. | ,, |

## CHAPTER IX.

### The Paved Pathways of the Garden

The flagstone pathways of the garden are largely modern, their arrival being contemporary with the pergola, and both rightly placed and furnished have their uses. Near to old Tudor or Elizabethan houses they are excellent, and as much in keeping with the outward and visible parts of such places as would be the well-chosen, genuine antique furniture within. In modern erections of red brick, and in conjunction with such brick-pillared pergolas, the flag-paved way is not a little incongruous—a misguided attempt to combine antique and modern—while a brick-paved way may be more in keeping with its surroundings. Honestly, however, I do not favour brick in any form. Red brick attracts too much to itself, and is out of harmony with most forms of plant life. In short, there is nothing to equal the old paving stone where procurable, though in many districts it is quite a scarce commodity. Where procurable, that with rounded or long-ago broken corners and well-worn surface is by far the best, and carefully, *i.e.*, intelligently and not too formally, laid, it will at once appear its full age. In laying it there should be no attempt to make good the many faulty corners; these are needed most of all; to embellish them with plant life should be our first thought (Fig. 24). Never dream of employing a mason to lay them, for he of the fixed type cannot work without spirit level and the like, while his eternal side tapping with trowel will make hundreds of new cuts no one wants to see. A rough garden labourer will do the work much better—from the gardening point of view. In not a few instances where these paved ways appear they were originally laid to secure dry winter walks, after being laid in good mortar on a deep bed of cinder ash. Later plant cultivation between the joints came

*Fig. 24.—A PAVED PATHWAY WITH LARGE INTERSTICES SUITABLE FOR LOW-GROWING PLANTS.*

into being, and pretty effects having been secured, the idea grew, and has now reached some degree of popularity. In some quarters—a very feeble minority, we believe—the idea has been ridiculed, on the ground that a pathway was intended to be walked upon and not so occupied with plant life as to make movement difficult. If this style of planting were general, the complaint would be justified. We have seen a few instances where the plants used were much better suited to the garden border. These, however, are the errors of individuals, and the principle should not be condemned because of them. The number of suitable plants is not large, and a knowledge of their habits is at least desirable. In not a few instances flatish slabs of sandstone or limestone are employed. They are not a bad substitute where they are in agreement with their surroundings. The chief idea to be kept in mind is narrow openings between the stones; nine-inch wide gaps or more are an error. Do not lay the stones on a bed of brick earth and expect plants to thrive. A little preparation is necessary.

**The Stone Steps** of the garden may likewise be made effective with pretty plants and ferns in nooks and corners, though in these, unless arrangements have been made for their reception, the available space is not large. As in the case of the paved way the plant life introduced should be in the nature of garniture (Fig. 25), affording a suggestion of age and repose. The plants, in other words, should never be an obstruction to the pedestrian, and should never be large enough to usurp positions for which they were never intended. The base of a set of steps or their sides may merit special treatment; the cracks between the "treads" will have to be considered apart. For these latter, the introduction, here and there, of a seed, with soil, will be found the best method of planting. For the rest, small bits of plants will suffice. Fig. 26 represents bold and effective stone steps without vegetation. The subjects suitable are very few, and in the following list only the

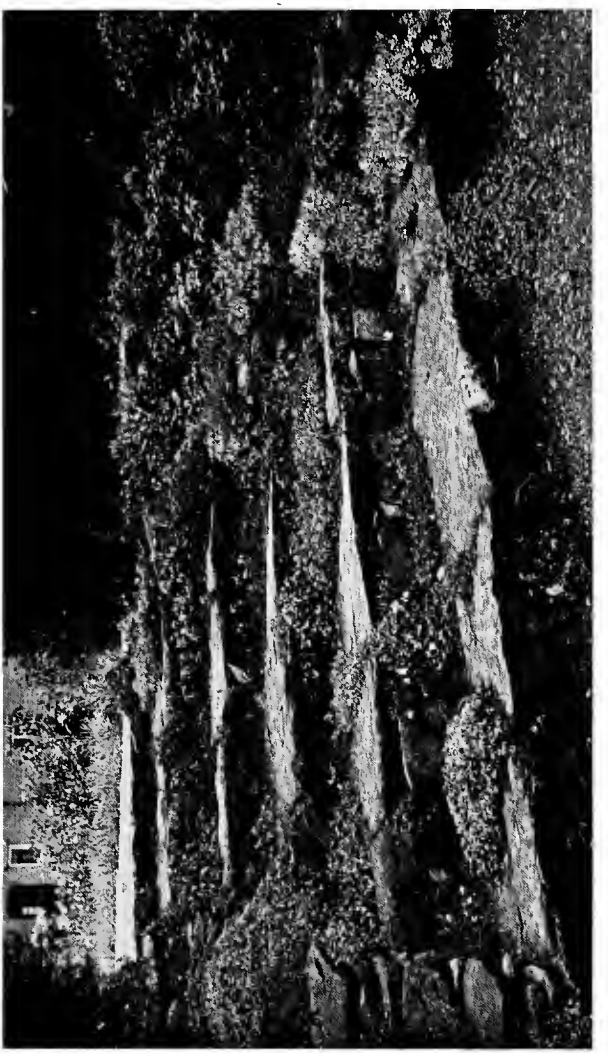


*Fig. 25.—WIDE STONE STEPS EFFECTIVELY PLANTED.*

*Fig. 26.—BOLD STONE STEPS DEVOID OF VEGETATION.*

dwarfest plants have been selected. Those marked by an asterisk, thus (*), have low, spreading carpets of leaves.

*Acæna microphylla
*Antennaria tomentosa
*Arenaria balearica (beside steps)
Aubrietia tauricola
Campanula muralis
,, pusilla and alba
,, pulla
Dianthus squarrosus
Draba aizoides
Erinus, in variety (in steps)
*Helxine solieroli
Hutchinsia alpina
*Leptinella scariosa
Linaria pilosa (steps)
*Mentha Requieni (a gem)
Myosotis rupicola
Oxalis acetosella
Saxifraga aizoon, vars.
,, muscoides, vars.
*Sedum corsicum
* ,, hispanicum glaucum
*Sibthorpia europæa
*Thymus lanuginosus
* ,, serpyllum coccineum

## CHAPTER X.

## The Alpine House.

The alpine house is unmistakably the most enjoyable phase of hardy plant gardening, from December to April inclusive, albeit it has been called in question by a few—a very few. In its modernised form—it is not an absolute novelty—it has become more necessary than formerly owing to the great influx of early-flowering

*Fig. 27.—PINK, WHITE AND BLUE HEPATICAS.*

plants, whose beauty it was impossible to see or realise in the rock garden, or even in the ordinary garden frame. We grow plants, I take it, for our enjoyment. They afford pleasure and provide relaxation from the common tasks of life. Hence it becomes almost a duty that we do our best by them, and get the most out of them. In no other way is it possible to realise a tithe of their beauty or characteristic charm (Fig. 27). To grow a plant to the flowering stage and see it dashed to pieces by rain or wind, or spoiled by snow, is disappointing. To be able to view the same plant in comfort in the alpine house, and see the best it is capable of giving for a fortnight or so, is the reward of patient care and intelligent cultivation. In the rock garden or frame not one-half of the plant's beauty is ever seen, and particularly is this true of the miniature growing class. In the alpine house the plant is raised nearer the vision, and points of interest are revealed which were previously undreamed of. For example, I grew the lovely Saxifraga burseriana major for a score of years in rock gardens and frames without realising the delightful fragrance of its flowers. In the cold greenhouse this was detected at once, and the plant is endowed with a greater charm because of that fact.

**The Essential Principles of an Alpine House.**—Firstly, and, if you will, "secondly, thirdly, finally, and in conclusion" it should be—*must be*—an absolutely cold structure (Fig. 28). There must be no half measures about this, no putting in heating appliances in "case they are wanted in severe weather." Bogies of such a kind are quite out of place. We never attempted to artificially heat our rock gardens in the past, and we do not do it to-day. We have heavily matted the alpine frame, however, to our cost, and lost many a precious bit through damp or slugs, or both. The vital principle of an alpine house is protection—protection prior to and through the flowering period of the plant, protection which insures overhead dryness, and shields the subjects from the worst of the many climatic and atmospheric

*Fig. 28.—THE ALPINE HOUSE AT KEW.*

changes. The plants of our choice are not tender, but invariably hardy; and hardier still where overhead dryness is secured to them, because they are invested with greater powers of endurance. Cold, dry cold, they enjoy; damp is doom. In my dealings with the alpine house

*Fig. 29.—THE WHITE SIBERIAN SQUILL (SCILLA SIBIRICA ALBA).*

it was an inflexible rule that the side and roof ventilators should never be closed. I had faith in the complete hardiness of my subjects, and provided them with hygienic conditions by a constant circulation of air. One of the finest collections of choice alpines I ever had in my keeping was in an amply pigeon-holed brick frame at back and front, yet those plants, in the teeth

of wind and frost for weeks with the thermometer repeatedly at zero, came through the ordeal unharmed. Overhead dryness is therefore important. I am emphatic on this point, possibly a little dogmatic, having seen the dangers and drawbacks of a "little heat" applied and misapplied, and equally so that caused by

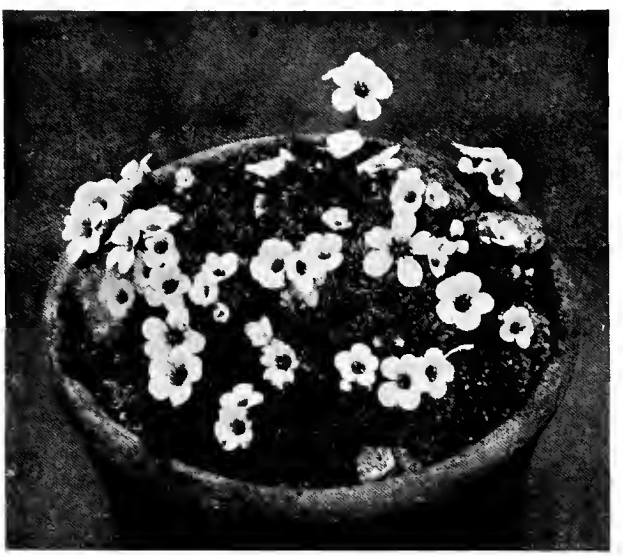


*Fig. 30.—A CHOICE ROCKFOIL FOR THE ALPINE HOUSE (SAXIFRAGA BOYDII ALBA).*

condensing moisture consequent upon completely closing up the house. In a few words, the alpine house is intended to preserve character, not to destroy it. (Figs. 29 and 30).

**The Ideal Structure.**—The nearest approach to the ideal is that known as span-roofed. It should occupy a position entirely in the open, with uninterrupted access

to light and air, and commanding a maximum of winter sunlight. For convenience, a width of ten feet or twelve feet should do quite well, with ridge placed about seven feet high. It should be arranged from ground level, and not partly sunk—pit-house fashion. The most complete system of bottom, side and top ventilation that can be devised should be indulged in so that all parts of the house may be abundantly ventilated at all times. Internally the staging should be raised to the level of the opening side lights so that the plants are ever receiving fresh supplies of air. If from any cause it is deemed necessary to close the side ventilators, those below the staging in the outside walls should be immediately opened—if not already open—to act in conjunction with the roof ventilators which should never be closed. By these means, dryness and buoyancy are secured. The plant stages should have solid bottoms, provided either by strong sheets of corrugated iron, by slate slabs, or by cement concrete with an inch or more of granite chippings, Thames sand, finely powdered coke or shell to arrange the plants on. By reason of their introduction into the alpine house, the natural flowering period of the plants and their heights are somewhat changed, hence we give a list of the names of only the more suitable. The list might be indefinitely increased.

Achillea argentea
" Heuteri
Adonis amurensis
" " fl.-pl.
Anemone blanda (Fig. 31)
" " scythinica
" " Pulsatilla
" " " alba
" " " rosea
" " Robinsonii

Daphne Cneorum

Crocus asturicus
" pulchellus
" sativus

Erythronium (Dog's Tooth Violets), all

Fritillaria aurea
" citrina
" Meleagris, in var.
" persica
" pudica
" recurva
Galanthus (Snowdrop), any

Iris alata
" bakeriana
" histrioides major
" orchioides
" Heldreichii

*Fig. 31.—ANEMONE BLANDA.*

*Fig. 32.—PRIMULA MARGINATA.*

Iris reticulata major
" " Krelagei
" Tauri

Morisia hypogæa
Muscaria botyroides
" " album
" conicum

Narcissus cyclamineus
" Bulbocodium, in variety
" minimus
" triandrus

Primula denticulata and alba
" " cashmeriana
" farinosa
" marginata (Fig. 32)
" megaseafolia
" pubescens alba
" rosea
" viscosa

Ramondia pyrenaica
" " alba
" serbica Nathaliæ

Saxifraga apiculata
" " alba
" burseriana gloria
" " magna
" " major
" " tridentina
" Borisii
" Boydii
" " alba
" " Faldonside

Saxifraga cotyledon pyramidalis
" Griesbachii
" Hostii
" Kestonensis
" oppositifolia
" " alba
" " splendens
" Paulinæ
" Sundermannii
" sancta
" scardica

N.B.—Any of the encrusted Saxifragas are worthy of inclusion for their enhanced leaf beauty alone.

Scilla siberica, in variety
Sempervivum arachnoideum
Shortia galacifolia
" " rosea
" uniflora
" " grandiflora
Silene acaulis
Sisyrinchium grandiflorum
" " album
Soldanellas, of sorts

Thalictrum anemonoides
" minus adiantifolia
Trilliums, aoy

Viola pedata
" " alba

## CHAPTER XI.

### Frames for Alpines.

Frames are necessary adjuncts either to the rock garden or alpine house. They are essential to the due preparation of the plants for the latter, and equally so as cultivators, caretakers and storehouses from which the supplies for the former may be drawn. Failures and deaths from causes unforeseen will of necessity arise, and slug and vole must always be reckoned with if the rock garden is to look its best. To be of a serviceable kind the alpine plant frame must be of special design or construction, and particularly so in the all-important matter of ventilation. The ordinary garden frame will not do. It is too close and stuffy, conserving too much moisture for woolly-leaved subjects in particular, and, generally, for other plants not of this nature, but which are not content unless breathing a pure, bracing air. We have, however, laid so much stress on the question of ventilation in respect to the alpine house that we have need here only to drive home the point, remembering that the frame is but a modified form of it, whose restricted air space and opportunities for ventilation are all opposed to the success of the plants we have in mind. Damp, stagnant air is fatal to most alpines, while highly congenial to the presence of slugs, the arch-enemy of our favourites. From more than one point of view, then, the chief object should be that we dispel damp.

**The Best Type of Frame.**—The nearest approach to the perfect frame I have ever seen or handled was brick-built. The front wall was two-and-a-half feet high, the back wall three feet three inches. The frame lights and wall plates were of the usual pattern. Studs, six inches long, were screwed to the latter so that the lights could be raised in wet weather. The pit portion of the frame was filled rather more than half its depth with rubble, clinker and ashes, and these, while insuring perfect drainage to the plants, raised them well above

their general surroundings. Thus root-dryness with perfect drainage—a not unimportant item—was secured. The point to which I attach the greatest importance, however, was the pigeon-holed condition of the walls at back and front. A condition which, no matter what the weather, provided a constant stream of air over the heads of the plants day and night, the efficacy of which I have had abundant proof over and over again. Upon no occasion was any attempt made to stop any of these holes. What was especially aimed at was root and overhead dryness. These secured the plants were capable of enduring any frost experienced in these islands.

**A Good Second** to the above is the span-roofed garden frame of the leading horticultural builders, while a more exaggerated form of it might prove almost its equal. By this is intended a frame set upon brickwork two feet high, the pit thus formed to be filled with rubble of any description to afford drainage. It will thus be seen that great importance is attached to drainage generally and to lifting these frame-protected plants above their immediate surroundings. The soil at ground level is of necessity cold and damp or wet. To choice alpine vegetation these combined forces are often fatal; continuous damp is death.

**A Matted-up Frame for Alpines** is a delusion and a snare, and we say at once, with all the emphasis we can command that it is not only unnecessary, but, in certain circumstances, may be positively harmful. Hence we discourage it by every means at our disposal. These plants are made hardier and sturdier by perfect drainage, root and overhead dryness, and by continuous ventilation, and having done this they are enabled to endure extreme degrees of cold. Coddling is entirely wrong, and artificial heat is worst of all. To these denizens of mountain, glacier or snow it is opposed in principle; a perpetual robber of that characteristic charm with which the plants have been so abundantly endowed by Nature. Hence from every point of view these alien methods should be avoided.

## CHAPTER XII.

### The Propagation of Alpine Plants.

Regarded collectively propagation is a phase of the subject which more closely concerns the commercial aspect of the case albeit not a few amateurs are anxious to have a finger in the same pie. The commercial grower has to "create" stock of necessity to meet a demand, the amateur doing so in minor degree as the outcome of enthusiasm, and to see the results of his own handiwork. If, in the latter case, the desire leads to the increase of valuable stock, it makes for progress and the general good by increasing that sphere of interest which stimulates expansion and extension. The interest spreads, too, among friends and acquaintances, hence alpine plant cultivation receives a gentle all-round impetus.

**Methods of Propagation.**—Alpine plants are increased by the generally accepted methods of cuttings, division or separation of the tufts, and by seeds. The two former are the methods invented by man, the latter is that which Nature adopts. Each, however, to the gardener has a value of its own, and should be indulged in as circumstances demand and allow. In some few instances all three are possible; in others, some may be either impossible or impracticable. For example, Ramondia, Haberlea and Primulas generally cannot be increased by means of cuttings, though the two first-named genera are reproduced abundantly from seeds, the latter submitting well to division of the root-stock while also coming freely from seeds. Much definite information on this head will, however, be found in the tabulated lists appended to many of the chapters.

**Raising from Seeds.**—This, as we have said, is Nature's own way, although we think the gardener does not fully realise its importance. A solitary capsule (seed vessel) may contain a score or twice that number of fertile seeds, and a dozen such may contain several hundreds. Too often these are disregarded and wasted, whereas a tithe of them in the seedling plant form would be sufficient to make a goodly group. The seeds of many alpines are small, others minute, and none of them require deep coverings of soil. Some prefer none at all, or at least very fine sand of not more than a shilling thickness. Where soil is used with the sand the whole should be baked to destroy weed seeds and insect life. It would be better if the whole of the soil used were treated in this way. Everything—pots and potsherds—should be scrupulously clean. Half fill the pots with the latter, cover with moss, and finally fill to within one-inch of the rim with finely sifted, very sandy soil. Cover with very fine sand and make the surface quite even. Soak with water and allow the pots to remain twenty-four hours before sowing the seeds. The seeds should be sown in autumn or winter so that vegetating in early spring-time, there remains a full growing season for development. This is most important. Seedling alpines may be raised on a firm bed of cool, moist sphagnum moss with exposure, but they resent conserved or stagnant moisture about them. Overhead watering is also harmful. Stand the seed pots in deep saucers and water them from below. Cover each pot with a sheet of glass to keep off birds and mice. Avoid thick sowing; it is often ruinous. On a shilling piece you may place a few hundreds of seeds. Do not sow them all in a four-inch diameter pot. A cold frame or greenhouse is the best place for the seed pots.

**Propagating by Cuttings.**—A large number of plants, Campanulas, Onosmas, Setacea and other Phloxes, Aubrietias, Lithospermums, Saxifragas and the like may, with advantage, be increased by means of cuttings. The first-named root quite well in pure sand, when

cuttings of the soft young shoots are used. The others named, except Saxifragas, require to be secured with a heel, *i.e.*, youthful bits an inch or so long with the junction of a parent stem attached thereto. The flowering branches of the Aubrietias and the others named are wiry and often valueless to the plant propagator, but if the plants are cut back somewhat when flowering is over they will soon give a plentitude of cuttings of the right sort. These, when of the required length, should be pulled away by a downward movement and inserted in very sandy soil without further ado. Much time is wasted and thousands of cuttings spoiled in trying to "make" them. Moral: don't do it! A uniformly cool garden frame is the best place for the majority. Soft cuttings like those of Campanula do not mind a little warmth.

**By Division.**—This consists of pulling tufted growing plants to pieces, and nothing is easier. It is, of course, important that root fibres be attached to each division. In the case of some of the "mossy" and "encrusted" Saxifragas, also Cobweb and other Houseleeks, every growth will be found so endowed. Hepaticas will require to be divided with a knife, and so, too, will the Adonis, while the garden Gentianella should first have all soil washed away and then be carefully pulled asunder. Spreading plants like the alpine Phloxes or Aubrietias are divided with greater success when the tufts have been mulched with sandy soil some weeks in advance. Where a few additional plants only are required, or an attempt is being made to add new vigour to the stock, this system, in conjunction with re-planting, has much to recommend it.

## CHAPTER XIII.

### The Planting of Alpines.

In a general way the planting should resolve itself into the one word " colonising " or " grouping," and whether we are dealing with yard wide areas, or fissure or crevice, the importance of grouping—*i.e.*, the self-grouping of one variety of plants—not mixtures or jumbles, should be kept constantly in view. A principle to be observed is that there should be a beginning and an end to each group, then a rest for the eye, and that best of all rests a complete change to something else beyond. The patchwork, indiscriminate grouping, too common on the improvised rock gardens at exhibitions. should be ignored, and in its stead a scheme or plan, definite and bold, should be adopted. Only in the case of the rarest kinds should solitary examples be tolerated, while the more free-growing, free-flowering plants should be seen in quantity. The solitary example of Saxifraga apiculata of a year ago should to-day, if it has made any progress at all, be the parent of a dozen—it may be a score—and these, planted at a few inches apart, would cover a considerable area. The division and replanting, consequent thereon, all make for progress, and, by affording room for the development of every rosette the plants contain, endows them with that greater vigour and freedom of blossoming all too rare. Left alone the same solitary example at the end of two years will have formed a cushion-like tuft, whose central parts, lifted out of touch with Mother Earth, will be in danger of burning up with heat and drought. Hence free division

and replanting is a safeguard against such happenings. Not all the Saxifragas are, however, of the apiculata class, though a large number, and the figure includes sancta, Rocheliana, Cochlearis, alberti, and the whole of the "mossies," respond to a like treatment. Even the Burseriana and Boydii sets, Valdensis (of gardens), and others of diminutive growth must be included in this principle of free treatment; or, better still, to that of propagation by means of cuttings, to which one and all are alike amenable. But whether by cuttings or division the twain, in conjunction with replanting, tends to a fuller, freer development of the plant, the precursor of greater vigour, and a more abundant flowering. Hence such work is worthy of our best endeavours.

It should be noted that many alpines, Saxifragas, Primulas, the tufted Androsaces, and others, root afresh from the base of the rosettes of leaves, hence in replanting the divisions should be inserted low down, *i.e.*, almost level with rock or soil. In Nature, these children of the mountain receive annually—It may be much more frequently—liberal mulchings of grit, rocky *debris* and the like brought down by snow and rain, and without which many would doubtless perish. In our dealings with these plants the principle it involves should be kept in view. Mulching, indeed, is of inestimable value to many alpines. The planting of seedlings does not differ materially from that of the divided specimen, and the main object of both is to create effective groups as opposed to the far feebler effect of solitary examples. Draba, rocky mountain and other Columbines, Morisia, Ramondia, Haberlea, and the great Pyrenean rockfoil (Saxifraga longifolia) are some of those giving fine effects when raised from seeds, and a score or a hundred may be seen and enjoyed where a solitary plant would fail to attract.

**In Fissure or Crevice Planting** it is essential that no vacuum exists. In other words, that the fissure or crevice be fully charged with grit, pulverised rock and

soil. If these are supplied in about equal parts there need be no fear as to the results, for successes with rare plants will be greater here than on the more flat soil areas, and, in fine, the fissure will sparkle with the choicest gems of an alpine slope. Silenes, Cotyledon Saxifragas and Onosmas will flourish here as nowhere else, and, while enjoying greater immunity from slug and other pests, will provide garniture of the best—garniture, alas! too often conspicuous by its absence in not a few of the rock gardens which have been hurried into existence during recent years.

## CHAPTER XIV.

### Alpines for Shady and Sunny Positions.

Happily for those who garden entirely in the open air the choice of subjects is practically unlimited. Indeed, at no time in the history of hardy plants has there been such a choice as now, while to variety and general high excellence must be added that greatest of all attributes, amenability to the British climate. Without this, to growers and lovers of choice alpines, the great influx of novelties during recent years would be but the veriest farce, and the cultivation of them would soon go out of fashion. Fortunately for the lover of this particular phase of gardening, no such disaster has been experienced, and it is not impending. On the contrary, with the growing taste for these plants has arisen a more intimate, intelligent knowledge of their requirements, and the rudiments once mastered but encourage the enthusiast to greater heights. And there is room and scope for all, just as there is out of the array of species and varieties now known to cultivators plants suited to every aspect, whether of sun or shade (Fig. 33). There are varieties, too, suited to all gardens, large or small, so that the millionaire or the artisan may indulge to the full and obtain an equal modicum of pleasure as a result. In dealing with alpine plants preferring sun or shade, we must not be taken as saying that those so marked must of necessity be subjected to an inflexible rule. For example, the shade-loving Ramondias, or such moisture-loving Primulas as rosea and Sikkimensis, will be found perfectly happy in full sun if abundant moisture be within reach of the roots, and instances may be multiplied to the same end. To these, then, the moisture is essential to the altered conditions. Quite naturally, however, there are degrees, both of moisture and shade, meriting

*Fig. 33.—A SHADY CORNER IN THE ROCK GARDEN.*

*Fig. 34.—A SILVERY-LEAVED ROCKFOIL FOR A SUNNY POSITION (SAXIFRAGA PARADOXA).*

consideration. The plant of the woodland—Shortia, Galax, Anemone Hepatica, Gaultheria procumbens, Cyclamen, Epigæa repens, Rhexia virginica, Cornus canadensis, or Linnæa borealis—is content with the cool, and shelter this Nature-given protector affords. In such a case humidity may not only be entirely lacking, but dryness of a more or less parching nature present for long periods. Hence the uniform coolness of the position shutting out great heat would appear important. If we bring these plants into fuller light and exposure, more root moisture—the equivalent in many instances, of much shade—must be given, albeit some would not respond so well even then. In short, the denizens of the woodland appear largely to have a choice apart, revelling as much, it may be, in the companionship of the low-growing herbs by which they are surrounded as in the shelter, and resenting separation from either. It is a little doubtful, perhaps, whether this fact is appreciated by cultivators at its fullest worth, and we direct attention thereto accordingly.

The true sun-loving subjects are not, on the other hand, so amenable to altered conditions as the shade lovers, since sunlight and sunheat—the chief stimulants to all vegetable life—would appear to be their all in all. To plant, for instance, the incrusted and allied Saxifragas (Fig. 34) in a shady place would quickly bring about their undoing. They revel in sunlight and warmth, dryness and perfect drainage coming next in importance. Some of these plants may, by reason of their vigour, be cultivated on level ground, in moist clayey soils, though not with a full measure of success. That is to say, some of their characteristic beauty and charm is lost, a little may be by too close association with the soil and its richer food supplies, and a little also by the absence of rock which is doubtless so much to the plants. Hence if we yearn for their higher encrusted development, we must see to it that the conditions engendering it are not lacking.

The following is a list of alpine plants for shady and sunny positions :—

*Fig. 35.—A TALL WINDFLOWER FOR THE ROCK GARDEN (ANEMONE SYLVESTRIS).*

# Alpine Plants for Sunny and Shady Positions.

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| **Acantholimon** venustum | ½ft. | Sunny | Gritty loam | Pink. | July, Aug. | Seeds |
| Achillea Clavennæ | ½ft. | ,, | ,, ,, | White | June, July | Seeds, division |
| ,, Heuteri | ½ft. | ,, | ,, ,, | ,, | ,, ,, | ,, ,, |
| ,, sericea | ½ft. | ,, | ,, ,, | ,, | ,, ,, | ,, ,, |
| ,, rupestris | ½ft. | ,, | Sandy loam | ,, | ,, ,, | ,, ,, |
| ,, tomentosa | ¾ft. | Open | Loam | Yellow | July, Aug. | Division |
| ,, umbellata | ½ft. | ,, | ,, | White | ,, ,, | ,, |
| Adonis **pyrenaica** | ¾ft. | ,, | ,, | Yellow | Mar., Apr. | Seeds, division |
| ,, vernalis | 1ft. | ,, | Deep loam | ,, | ,, ,, | ,, ,, |
| Æthionema grandiflorum | Trailing | Sunny fissure | Gritty loam and peat | Pink. | Apr., June | Seeds |
| Androsace carnea | ½ft. | Partial shade | ,, ,, | ,, | April. | Division |
| ,, chamæjasme | ½ft. | Sunny | ,, ,, | White | Apr., May | ,, |
| ,, Chumbyii | ½ft. | ,, | ,, ,, | Pink | ,, ,, | ,, |
| ,, foliosa | ½ft. | ,, | ,, ,, | Pale pink | May, June | ,, |
| ,, lanuginosa | Trailing | ,, | ,, ,, | Pink. | May, Sept. | Cuttings |
| ,, sarmentosa | Prostrate | ,, | ,, ,, | Pink. | June, July | Division |
| Anemone alpina | 1–2ft. | Open | Deep loam | White | May | Seeds |
| Hepatica, in variety | ½–¾ft. | Half shade | Sandy loam | Red, white & blue | April. | Seeds, division |
| angulosa | ¾ft. | ,, | ,, ,, | Blue. | ,, | ,, ,, |
| Pulsatilla | 1–1½ft. | ,, ,, | Chalky loam | Purple | ,, | ,, ,, |
| ,, sulphurea | 1–2ft. | ,, ,, | Sandy loam | Yellow | May | ,, ,, |
| ,, sylvestris (Fig. 35) | 2ft. | Open | Loam | White | May | ,, ,, |

*Fig. 36.—A HYBRID HAREBELL (CAMPANULA STANSFIELDII).*

## Alpine Plants for Sunny and Shady Positions (contd.).

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| Aquilegia cærulea | ½–¾ft. | Sunny | Sandy loam | Blue & white | May, June | Seeds |
| ,, glandulosa | ½–¾ft. | ,, | ,, ,, | ,, ,, | ,, ,, | ,, |
| ,, Stuartii | ½–¾ft. | ,, | ,, ,, | ,, ,, | ,, ,, | ,, |
| Arnebia (Macrotomia) echioides | ¾fti | Open | ,, ,, | Yellow | May | Division |
| Aster alpinus, in variety | ½ft. | ,, | Loam | Pink, blue and white | ,, | Seeds |
| Aubrietia, in variety | ½ft. | Open or distant shade | ,, | Various | Apr., June | Seeds & cuttings |
| Campanula muralis | ½ft. | Open | ,, | Blue. | Apr., Aug. | Division |
| ,, Profusion | Trailer | Shady fissure | Sandy loam | ,, | Aug., Sept | Cuttings |
| ,, pulla | ½ft. | Cool | ,, | Purple | June, July | ,, |
| ,, pulloides | ½ft. | ,, | ,, ,, | ,, | ,, ,, | ,, |
| ,, Raineri | ½ft. | ,, | Gritty loam | Blue. | ,, ,, | ,, |
| ,, Stansfieldii (Fig. 36) | ½ft. | ,, | ,, ,, | Pale blue | July, Aug. | ,, |
| ,, Waldsteiniana | ½ft. | Cool rock fissure | ,, ,, | ,, ,, | ,, ,, | ,, |
| Daphne rupestris | ½ft. | Half shade | Sandy peat | Wax pink | June. | ,, |
| Dianthus alpinus | ½ft. | ,, ,, | Sandy loam | Pink. | May, June | Seeds |
| ,, neglectus | ½ft. | ,, ,, | ,, ,, | ,, | ,, ,, | ,, |
| Edraianthus serpyllifolius | Trailer | Half shaded rocky slope | Gritty loam | Royal purple | May, June | ,, |

*Fig. 37.—A WELL-FLOWERED COLONY OF GENTIANA FREYMANIANA.*

## Alpine Plants for Sunny and Shady Positions (contd.).

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| Gentiana Freymaniana (Fig. 37) . | ⅜ft. . | Half shade | Peaty loam | Blue. . . | June, July | Seeds |
| ,, septemfida . . . . | Procumbent | ,, ,, | Loam . . | Deep blue . | August . | ,, |
| ,, verna . . . . . | Carpeter | Mid-day shade | Cool rooting medium | ,, , | May . . | ,, |
| Haberlea rhodopensis. . . . | ¼ft. . | Shade . . | Sandy peat and leaf soil | Violet . . | May, June | ,, |
| ,, ,, virginalis . | ¼ft. . | ,, | ,, ,, | White . . | ,, ,, | ,, |
| Incarvillea grandiflora . . . | ⅜ft. . | Open . . | Rich loam. | Carmine . | June, July | ,, |
| Iris cristata . . . . . | ½ft. . | Half shade | Peaty loam | Sky blue . | May, June | Division |
| Lithospermum prostratum . . | Trailers | ,, ,, | ,, ,, | Intense blue | May Aug. | Cuttings |
| ,, ,, Heavenly Blue | ,, | ,, ,, | ,, ,, | ,, ,, | ,, ,, | ,, |
| Omphalodes Luciliæ . . . . | ½ft. . | ,, ,, | ,, ,, | Sky blue . | ,, ,, | Seeds |
| Onosmas (all) . . . . . | ½–1ft.. | Sunny fissures | Gritty loam | Yel. & white | May, July | Cuttings |
| Ourisia coccinea . . . . . | ⅜ft. . | Half shade | Peaty loam | Scarlet . . | May, June | Division |
| Phlox subulata, in variety . . | Prostrate | Open . . | Sandy loam | Various . . | ,, ,, | Cuttings |
| Phyteuma comosum . . . . | ¼ft. . | Sunny . . | Limestone fissures | Blue. . . | ,, ,, | Seeds |
| Primula farinosa and alba . . | ¼ft. . | Shade or root moisture | Rich vegetable soil | Various . | Apr., May | Seeds |
| ,, frondosa . . . . . | ¼ft. . | | | ,, . . | ,, ,, | ,, |

*Fig. 38.—A RARE SAXIFRAGE (SAXIFRAGA GRIESBACHII).*

## Alpine Plants for Sunny and Shady Positions (contd.).

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| Primula involucrata | ½ft. | Shade or root moisture | Rich vegetable soils | Various | Apr., May | Seeds |
| ,, rosea | 1ft. | | | ,, | ,, ,, | ,, |
| ,, scotica | ¼ft. | | | ,, | ,, ,, | ,, |
| ,, viscosa and others | ¼–½ft. | Partial shade | Limestone soils | ,, | Apr., June | ,, |
| Ramondia Nataliæ | ½ft. | Cooling shade, or sun and moisture | Peat, leaf soil and sand | Mauve | May | Seeds (all) |
| ,, pyrenaica | ½ft. | | | Light purple | ,, | ,, ,, |
| ,, ,, alba | ½ft. | | | White | ,, | ,, ,, |
| ,, ,, rosea | ½ft. | | | Rose | ,, | ,, ,, |
| Saxifraga (all encrusted and allied sorts) (Fig. 38). | Various | Sunny | Sandy loam & old mortar | White | Mar., June | Seeds, division and cuttings |
| Saxifraga (all mossy sorts) | ½–¾ft. | Open or partial shade | Moist loam | White or red | Mar., May | Division, cuttings |
| Schizocodon soldanelloides | ¼ft. | Light shade | Peaty soil | Pinky white | May | Division |
| Shortia galacifolia | ½ft. | ,, ,, | ,, ,, | Pink | Apr., May | ,, |
| ,, ,, rosea | ½ft. | ,, | ,, ,, | Rose | ,, ,, | ,, |
| ,, uniflora | ¼ft. | ,, | ,, ,, | Pinky white | ,, ,, | ,, |
| ,, ,, grandiflora | ½ft. | ,, ,, | ,, ,, | ,, ,, | ,, ,, | ,, |
| Soldanellas (any) | ¼ft. | Open | Moist loam | Purplish | Mar., Apr. | ,, |
| Viola pedata and alba | ¼ft. | Shade | Moist peat | Purple or white | May, June | Seeds |

## CHAPTER XV.

### Bulbous and Tuberous Rooted Plants.

If we look to the greater array of tufted and other alpines for providing the richer floral wealth of the rock garden, no matter what the season of the year, there still remains a few—a notable minority it may be—which, embraced under the above heading, we cannot well ignore. Viewed collectively they might be said to constitute an interesting assembly, though, if regarded in greater detail, the interest develops into importance. To get an idea of their variety and the lengthy season covered by their flowering we have but to recall the winter Aconite, Snowdrop, early bulbous Irises, winter, spring and autumn flowering Crocuses, the richness of the Chionodoxas budding as it were with the melting snow, the exquisite charm of some of the Anemones, particularly those allied to the Grecian Windflower (A. blanda) and others related to our own Wood Anemone (A. nemorosa), than whose sky-blue forms the genus holds nothing half so precious to the spring gardener. Then we have beauty also both of leaf and blossom in the spring and autumn-flowering Cyclamen, such extensive groups as the Fritillaries and Dog's Tooth Violets adding quaintness or interest over a very considerable period. Apart from these there is the boldness or daintiness of Trillium and the unusual vigour of the meadow Saffrons (Colchicums), the two genera while rich in variety flowering at widely diverse seasons of the year. Then, without greatly straining a point, one might include the well-known Primula Sieboldi, which, if neither bulbous or tuberous-rooted, is certainly rhizomatous, and, being in other respects suited to the rock garden, might well be admitted within the scope of the present work.

Happily, too, in the plants we have in mind, there are those suited to dry and moist places, likewise to sun or shade, hence it would be easy enough to distribute a selection of bulbous and allied plants far and wide. For example, nearly or all the Crocuses revel in comparative soil warmth and sunlight, to which latter the flowers are ever ready to respond. The same might well be said of the brilliantly flowered Anemone fulgens in all its forms, and in slightly modified degree of the Grecian Windflower (A. blanda) and its lovely blue and white variety, A. b. scythinica. The exquisite Anemone nemorosa Alleni and A. n. Robinsoni, revellers in thin woodland shade and moist, as well as rich soils are reserved for affording beauty spots in quite another direction, and the bog bed chiefly built for the accommodation of the Mocassin flower (Cypripedium spectabile) might well be carpeted with these and their kindred to flower ere the principal occupants of the bed are half awakened from their winter's sleep. The Anemones are not peat lovers as is the Lady's Slipper named; they prefer rich loam freely mingled with vegetable soil, leaf mould and the like, while the moisture, which is so much to them, should never be absent from January to December. Indeed, under no other conditions is one half of the charm of these precious spring flowers revealed. The charm, too, strengthens with the years; increased stature following on the heels of the established plant, and with it blossoms twice as large as those produced in the first year of flowering. Hence culture of the right kind merits every attention and care, so that the best the plant is capable of giving may be ours at will, The whole of the bulbous plants named should be planted in early autumn, although that is the season of flowering of not a few of them. The following list will give some idea of the great variety of bulbous plants suitable for the rock garden :—

*Fig. 39.—AMERICAN COWSLIPS OR SHOOTING STARS (DODECATHEON MEADIA).*

## Selection of Bulbous Rooted Plants.

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| Allium pedemontanum | ¾ft. | Open | Sandy loam | Dull red | June | Seeds, division |
| Anemone blanda | ½ft. | Sunny | Rich loam. | Blue. | Feb., Apr. | Seeds |
| ,, ,, scythinica. | ½ft. | ,, | Rich light loam | Blue & white | Mar., Apr. | ,, |
| ,, nemorosa Allenii | ½ft. | Sunny or light shade | Moist loam | Sky blue | April | Division |
| ,, ,, Robinsonii | ½ft. | ,, ,, ,, | ,, ,, | ,, ,, | ,, | ,, |
| ,, ranunculoides | ½ft. | ,, ,, ,, | ,, ,, | Yellow | Mar., Apr. | ,, |
| Chionodoxa Luciliæ | ¾ft. | Open | Sandy loam | Blue & white | Feb., Mar. | Seeds |
| ,, ,, alba | ¾ft. | ,, | ,, ,, | White | ,, ,, | ,, |
| ,, sardensis. | ¾ft. | ,, | ,, ,, | Deepblue | ,, ,, | ,, |
| Colchicum speciosum. | 1ft. | ,, | Deep loam | Rosylilac | Sept.. | Division |
| ,, ,, album | 1ft. | ,, | ,, ,, | Pure white | ,, | ,, |
| Crocus asturicus | ¼ft. | ,, | Sandy loam | Violet | ,, | Seeds |
| ,, medius | ¼ft. | ,, | ,, ,, | Deep lilac | Sept.,Oct. | ,, |
| ,, nudiflorus | ¼ft. | ,, | ,, ,, | Lilac | Aug., Sept | ,, |
| ,, Sieberi. | | | | | | |
| ,, speciosus | ¾ft. | ,, | ,, ,, | Purplish blue | ,, ,, | ,, |
| ,, zonatus | ¼ft. | ,, | ,, ,, | Rosy lilac | ,, ,, | ,, |
| Cyclamen coum and album | ¼ft. | Half shade | ,, ,, | Red & white | Feb., Mar. | ,, |
| ,, ibericum | ¼ft. | ,, ,, | ,, ,, | Red | ,, ,, | ,, |
| ,, neapolitanum | ¼ft. | Open or shade | ,, ,, | ,, | Sept.. | ,, |
| Dodecatheons (all) (Fig. 39) | ½–1ft. | Half shade | Peat & loam | Red & white | Spring | Division |
| Eranthis hyemalis. | ½ft. | Woodland or shrub shelter | Chalky loam | Yellow | Jan.-Mar. | ,, |

*Fig. 40.—THE SPRING SNOWFLAKE (LEUCOJUM VERNUM).*

## Selection of Bulbous Rooted Plants (contd.).

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| Erythronium (Dog's Tooth Violet) (all). | ¼–1ft.. | Light shelter | Sandy loam | Various . . | Spring . | Seeds |
| Fritillaria aurea . . . . . | ¼ft. . | Open . . | Sandy peat | Golden . . | Apr., May | ,, |
| ,, meleagris, in variety . | 1–1½ft. | ,, . . | Moist loam | Various . . | Mar., Apr. | , |
| ,, pyrenaica . . . . | ¾ft. . | ,, . . | ,, ,, | Purplish . | May, June | ,, |
| Galanthus Elwesii . . . . | ¾ft. . | ,, . . | ,, ,, | White . . | Feb., Mar. | ,, |
| ,, Ikariæ . . . . . | ½ft. . | ,, . . | ,, ,, | ,, . . | March . | ,, |
| Iris persica Heldreichii . . . | ½ft. . | Light shelter | Sandy loam | Violet blue . | Mar., Apr. | ,, |
| ,, reticulata . . . . . | ¾ft. . | ,, ,, | ,, ,, | Royal purple | March . | ,, |
| Leucojum vernum (Fig. 40) . . | ½ft. . | Open . . | ,, ,, | White . . | Mar., Apr. | Seeds, division |
| Muscaria botryoides, in variety . | ½ft. . | ,, . . | ,, ,, | White & blue | April. . | ,, ,, |
| Narcissus cyclamineus . . . | ½ft. . | ,, . . | Moist loam | Yellow . . | Mar., Apr | ,, ,, |
| ,, moschatus . . . . | ½ft. . | ,, . . | Sandy loam | Cream white | April. . | ,, ,, |
| ,, triandrus, in variety . | ¾ft. . | ,, . . | Peat & loam | ,, ,, | Mar., Apr. | Seeds |
| Puschkinia libanotica compacta. | ½ft. . | ,, . . | Sandy loam | Porcelain blue and white | April. . | Seeds, division |
| Scilla bifolia, in variety . . . | ½ft. . | ,, . . | ,, ,, | Various . . | ,, . . | ,, ,, |
| ,, sibirica, in variety . . . | ¼ft. . | ,, . . | ,, ,, | Blue & white | Mar., Apr. | ,, ,, |
| Trilliums (all) . . . . . | ½–1ft.. | Shady . . | Peat & loam | Various . . | Apr., May | Seeds |
| Tulipa bifolia major . . . . | ¾ft. . | Open . . | Sandy loam | White & yel. | April. . | Division |
| ,, Kaufmanniana . . . | ¾ft. . | ,, . . | ,, ,, | White&scarlet | ,, . . | Seeds |
| ,, ,, aurea. . | ¾ft. . | ,, . . | ,, ,, | Yellow . . | ,, . . | ,, |

## CHAPTER XVI.

### Effective Plant Grouping for Various Seasons.

There would appear to be an increasing desire on the part of the owners of gardens—born, doubtless, of the period during which they are in residence in town or country—to have their rock gardens, as, indeed, all other parts of the garden, as effective as possible at such times. The idea is both natural and legitimate. Of necessity, however, in such instances, the greater variety of plants available have to give way to a limited number whose flowering can be relied upon when required. In accomplishing this it almost invariably happens that the choicer gems of crevice and fissure are displaced by others capable of a greater display, those, like the Aubrietias, alpine Phloxes, or Gentianella, that afford pictures of colour—veritable sheets or carpets of flowers—for weeks together. Such as these, indeed, may be made much of in the hands of the intelligent plant grouper; he who, being quick of discernment and of an artistic temperament, will fashion his groups accordingly, and, while avoiding formality—the usual failing in these cases—secure pleasing harmonies or striking contrasts in a way which commands attention at once. Such an one will not blaze forth all the colours of the rainbow in rapid succession on a solitary bank or slope to constitute one huge incongruous whole. Preferably will he dispose his groups in massed battalions where the effect will be whole-hearted, complete, invulnerable. In such cases the colour groups, unless agreeably harmonising, should not run one into the other; rather should they cease to be at a certain point, then a foil,

a rest for the eye, and presently a complete change. If, for example, the plant grouper were working with such well-known subjects as Aubrietia Dr. Mules and Saxifraga camposii (Wallaceii), violet purple and pure white respectively, on a single bank or slope, the termination of the one should be determined by a depression by the intervention of an irregular, undulated grassed bank of sufficient proportionate size to catch the eye, to act as a foil, and to mirror into greater life and beauty what is above and beyond. The marginal termination of any such grouping should never be formal or rounded as though moulded into shape ; a broken line fashioned by the presence of rock here and there will be much more in keeping, and the plants presently finding their way over them will afford a picture as nearly ideal as any true landscape gardener could desire. That the lower or succeeding groups in such arrangements should not be in slavish imitation of the first is a warning hardly needed after what has been urged against formality; indeed, each group, whether large or small, might well provide a feature alone.

Generally, it will be found advisable in the case of families of plants—*e.g.*, Aubrietias and Setacea Phloxes —containing many varieties each to work with the more distinct, the best results being secured in that way. Such indispensable rock gardening subjects as Saxifragas apiculata, Elizabethæ, and Sancta (yellow-flowered), and Burseriana Gloria (white flowered) will be found invaluable in the winter or spring section, while the many forms of S. cotyledon and S. cochlearis will fittingly represent the genus during the summer months. For both the spring and summer sections there is a great wealth of material awaiting intelligent use.

**For the Rock Garden in Autumn** there is a lesser wealth of material, though the variety is greater than many suppose. In the past, generally speaking, the best use has not been made of the things that exist. For some years, however, there has been an increased demand for

autumn-flowering plants for the rock garden, and specialists are as keen in their desire to have the best at this season as at all others. We rejoice at the fact, inasmuch as an extended season of flowering or gaiety at such a time will not merely provide an increased interest in the department, but furnish a useful opening for the would-be raiser of new plants who is ever-seeking "for fields and pastures new." Just now there is a demand—not calculated to be a transient one—for alpine plants flowering in autumn, and with the demand the supply will presently come. Meanwhile, we can make the best use of what we possess, and by planting them in bolder groups or masses, or even endeavouring to make autumn rock-gardening a feature, be playing our part with the rest. In this direction we shall find some of the hardy Heaths of great service, as much by their dwarfness and freedom of flowering as by their amenableness to the work we have in mind.

In the subjoined lists of plants it may be noted that some of the plants occur in more than one season. This is frequently the result of a prolonged period of flowering. Where such is the case the flowering of the subject at the period indicated may be accepted as fairly reliable. In others the time of flowering should be regarded as approximately correct, much depending upon locality, position, and the varying seasons. To render the lists of greater service for ready reference we have given the plants in their seasons: —

# Effective Plant Grouping for the Spring Season.

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| Adonis amurensis | 1ft. | Sunny | Rich loam | Yellow | Feb., Apr. | Seeds, division |
| ,, ,, fl.-pl. | 1ft. | ,, | ,, ,, | Yel. & green | ,, ,, | ,, ,, |
| ,, vernalis | 1ft. | ,, | ,, ,, | Yellow | April. | ,, ,, |
| Alyssum saxatile compacta | 1ft. | ,, | Garden soil | ,, | Mar., Apr. | Seeds |
| Anemone apennina | ½ft. | ,, | Sandy loam | Blue. | ,, ,, | ,, |
| ,, blanda | ½ft. | ,, | ,, ,, | ,, | Mar., May | ,, |
| ,, ,, scythinica. | ¼ft. | ,, | ,, ,, | Blue & white | Mar., Apr. | ,, |
| ,, Hepatica, in variety | ¾ft. | Half shade | ,, ,, | Red, white, blue | Apr., May | Seeds, division |
| Arabis albida, fl.-pl. | ¾ft. | Open | Garden soil | White | ,, ,, | Cuttings |
| Aubrietias (any) | Carpeter | ,, | ,, ,, | Various | ,, ,, | ,, |
| Cheiranthus alpinus | ¾ft. | ,, | ,, ,, | Yellow | ,, ,, | ,, |
| Chionodoxa Luciliæ | ½ft. | ,, | Sandy soil | Blue. | Feb., Mar. | Seeds |
| ,, sardensis | ½ft. | ,, | ,, ,, | Deep blue | ,, ,, | ,, |
| Cyclamen coum | ¼ft. | Half shade | ,, ,, | Red | ,, ,, | ,, |
| Draba aizoides. | ¼ft. | Sunny | Gritty soil. | Yellow | Mar., Apr. | ,, |
| Erica (Heath) carnea | ¾ft. | Open | Peat & loam | Red | Feb., May | Division |
| ,, ,, ,, alba | ¾ft. | ,, | ,, ,, | White | ,, ,, | ,, |
| Gentiana acaulis | ¼ft. | Sunny | Sandy moist loam | Blue. | Apr., June | ,, |

*Fig. 41.—RAMONDIAS IN A SHADY ROCK GARDEN.*

## Effective Plant Grouping for the Spring Season (contd.).

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| Morisia hypogæa . . . . . | Prostrate | Sunny . . | Sandy peat | Yellow . . | Feb., Mar. | Seeds |
| Phlox amœna . . . . . | ½ft. . | ,, . . | Sandy loam | Red . . . | Apr., May | Division |
| ,, subulata, in variety . . | Procumbent | ,, . . | ,, ,, | Red, white, lilac | ,, ,, | Cuttings |
| Primula denticulata, in variety . | ¾ft. . | Shade . . | Moist loam | Purple & white | ,, ,, | Seeds |
| Ramondia (all the kinds) (Fig. 41) | ½ft. . | ,, . . | Sandy peat | Various . . | May . . | ,, |
| Saxifraga apiculata and alba. . | ½ft. . | Open . . | Sandy loam | Yel. & white | Jan, Apr. | Division |
| ,, Burseriana gloria . . | ¼ft. . | Sunny flank of rock | Gritty soil | White . . | Feb., Mar. | ,, |
| ,, ,, major . . | ½ft. . | ,, ,, | ,, ,, | ,, . | ,, ,, | ,, |
| ,, Elizabethæ . . . . | ¼ft. . | Open . . | ,, ,, | Yellow . . | ,, ,, | ,, |
| ,, oppositifolia, in variety . | Procumbent | ,, . | ,, ,, | Red & white | ,, ,, | ,, |
| ,, Rhei, Guildford Seedling & Clibrani (all mossy sorts. | ¼–½ft.. | ,, . . | Moist loam | Red flowered | Apr., May | ,, |
| ,, sancta . . . . . | ¼ft. . | ,, . | ,, ,, | Yellow . . | Mar., Apr. | ,, |
| ,, camposii (Wallacei) . . | ½ft. . | ,, . | ,, ,, | Pure white . | June. . | ,, |
| Tiarella cordifolia . . . . . | 1ft. . | ,, . . | ,, ,, | Cream . . | May . . | ,, |

N.B.—It should be noted that in the genus saxifraga alone there are some dozens of other kinds flowering in Spring. Those named, however, are best for display purposes.

*Fig. 42.—A CHARMING PLANT FOR THE SUMMER ROCK GARDEN (ANDROSACE LANUGINOSA).*

## Effective Plant Grouping for the Summer Season.

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| Acæna Novæ-Zelandiæ | Prostrate | Sunny | Loam | Crimson. | June, Aug. | Division |
| Achillea Clavennæ | ½ft. | ,, | Sandy loam | White | June, July | ,, |
| ,, rupestris | ½ft. | ,, | ,, ,, | ,, | ,, ,, | ,, |
| ,, tomentosa | ½ft. | ,, | Moist loam | Yellow | June, Aug. | ,, |
| ,, umbellata | ½ft. | ,, | Sandy loam | White | June, July | ,, |
| Ajuga Brockbankii | ½ft. | Open | Loam | Blue. | ,, ,, | ,, |
| Androsace lanuginosa (Fig. 42) | Trailing | Sunny | Sandy soil. | Pink & white | June, Aug. | Cuttings |
| ,, ,, Leichtlinii | ,, | ,, | ,, ,, | ,, ,, | ,, ,, | ,, |
| Aquilegia cærulea | ½–¾ft. | ,, | ,, ,, | Blue. | June, July | Seeds |
| ,, glandulosa | ½–¾ft. | ,, | ,, ,, | ,, | ,, ,, | ,, |
| ,, Stuartii | ½–¾ft. | ,, | ,, ,, | ,, | ,, ,, | ,, |
| Armeria maritima Laucheana | ¾ft. | Open | ,, ,, | Red | ,, ,, | Division |
| Campanula G. F. Wilson | ½ft. | ,, | Moist loam | Violet purple | July, Sept. | |
| ,, garganica (vars.) | Prostrate | ,, | ,, ,, | Blue & white | ,, ,, | ,, |
| ,, muralis | ½ft. | Sunny | ,, ,, | Blue. | June, July | ,, |
| ,, Profusion | Trailing | Half shade | ,, ,, | Sky blue | Aug., Sept. | ,, |
| ,, pulla | ¼ft. | Cool spot | ,, ,, | Imperial purple | June, July | |
| ,, pusilla, in variety | ½ft. | ,, ,, | ,, ,, | Blue & white | July, Aug. | ,, |
| ,, ,, Miss Willmott | ½ft. | ,, ,, | ,, ,, | Pale blue | ,, ,, | ,, |
| Coronilla iberica | Procumbent | Open | Loam | Yellow | ,, ,, | ,, |
| Crucianella stylosa | ½ft. | ,, | ,, | Reddish. | July, Sept. | ,, |

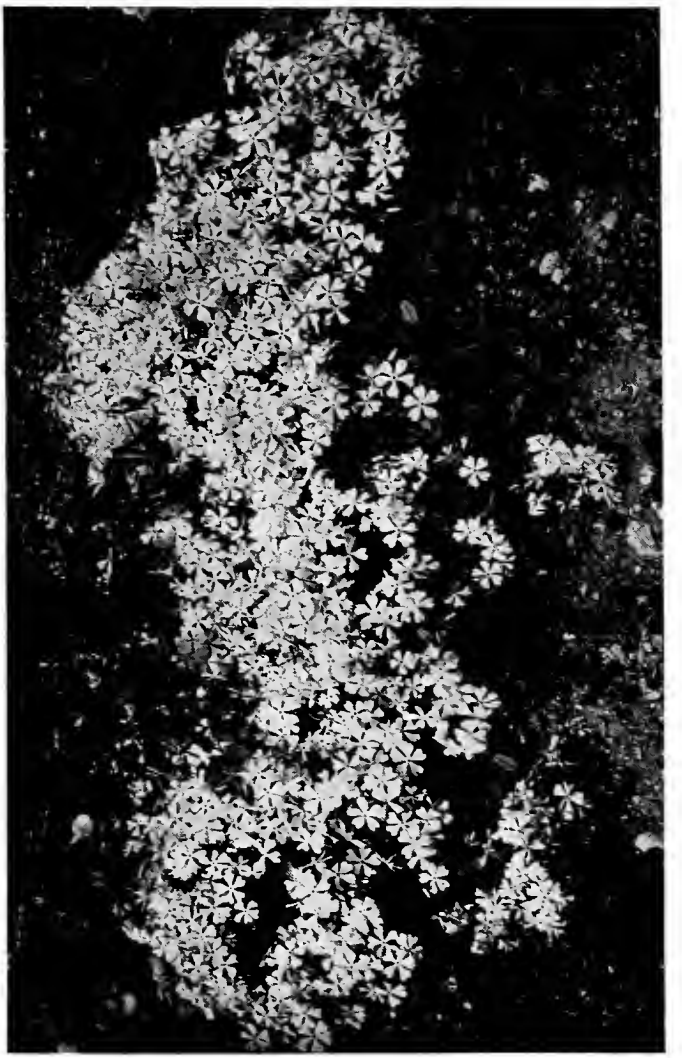


*Fig. 43.—PHLOX DIVARICATA GROWING ON A BANK.*

## Effective Plant Grouping for the Summer Season (contd.).

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| Dianthus alpinus | ¼ft. | Sunny | Gritty soil | Red | June, July | Seeds |
| ,, cæsius | ½ft. | ,, | ,, ,, | Rosy | ,, ,, | ,, |
| ,, glacialis | ¼ft. | ,, | ,, ,, | Rose-crimson | ,, ,, | ,, |
| ,, neglectus | ¼ft. | ,, | ,, ,, | Rosy red | ,, ,, | ,, |
| Edraianthus serpyllifolius | Trailer | Half shade | Moist gritty soil | Royal purple | ,, ,, | ,, |
| Gentiana septemfida | ½ft. | Cool spot | Peat & loam | Blue | Aug., Sept. | ,, |
| Gypsophila cerastioides | ¼ft. | Open | Sandy soil. | White | June, July | Division |
| Hutchinsia (Noccaæ) alpina | ½ft. | ,, | ,, ,, | ,, | July, Aug. | ,, |
| Iberis correæfolia | ¾ft. | ,, | Garden soil | ,, | June, July | Cuttings |
| ,, sempervirens | Trailing | Sunny | ,, ,, | ,, | ,, ,, | ,, |
| Leontopodium alpinum (Edelweiss). | ½ft. | ,, | Limestone soil | ,, | July, Aug. | Seeds |
| Lithospermum prostratum | Trailing | Open | Sandy peaty soil | Blue | July, Sept. | Cuttings |
| ,, ,, Heavenly Blue | ,, | ,, | ,, ,, | ,, | ,, ,, | ,, |
| Ourisia coccinea | ¾ft. | Half shade | Moist loam | Scarlet | June, July | Division |
| Phlox divaricata (Fig. 43) | 1ft. | Open | Loamy soil | Bluish | ,, | Cuttings |

*Fig. 44.—A BEAUTIFUL PRIMULA FOR THE ROCK GARDEN (P. PUBESCENS ALBA).*

## Effective Plant Grouping for the Summer Season (contd.).

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| Primula farinosa | ½ft. | Shady | Moist soil | Lilac | June, July | Seeds |
| ,, marginata | ½ft. | ,, | Sandy loam | Bluish | ,, ,, | ,, |
| ,, pubescens alba (Fig. 44) | ½ft. | ,, | Rich loam. | White | June. | Division |
| ,, rosea | ¾ft. | ,, | ,, ,, | Rose | ,, | Seeds |
| ,, viscosa, in variety | ¼ft. | ,, | ,, ,, | Various | June, July | ,, |
| Ranunculus amplexicaulis | ½ft. | Open | ,, ,, | White | ,, ,, | ,, |
| Saponaria ocymoides alba | Trailing | ,, | ,, ,, | White & red | June, Aug. | ,, |
| ,, ,, splendens | ,, | ,, | ,, ,, | ,, ,, | ,, ,, | ,, |
| Saxifraga aizoon balkana | ½ft. | ,, | Gritty loam | White & pink | July | Division |
| ,, ,, rosea | ¾ft. | ,, | ,, ,, | Rosy red | ,, | ,, |
| ,, Camposii | ¾ft. | ,, | Loam | White | June. | ,, |
| ,, cochlearis | 1ft. | ,, | Sandy loam | ,, | July | ,, |
| ,, ,, major | 1ft. | ,, | ,, ,, | ,, | ,, | ,, |
| ,, ,, minor | ¼ft. | ,, | ,, ,, | ,, | ,, | ,, |
| ,, Cotyledon, in variety | 2ft. | Sunny | ,, ,, | ,, | ,, | Offsets |
| ,, lantoscana superba | ½ft. | ,, | ,, ,, | ,, | June, July | Division |
| ,, longifolia | 1½-2ft. at flowering | ,, | Gritty soil. | ,, | July | Seeds |
| Thymus lanuginosus | Trailing | ,, | ,, ,, | Reddish. | August | Cuttings |
| Veronica saxatilis | Carpeter | Open | Moist soil | Blue. | June, Aug. | Cuttings, division |
| ,, Teucrium dubia (prostrata) | ,, | ,, | ,, ,, | ,, | ,, ,, | ,, ,, |

## Effective Plant Grouping for the Autumn Season.

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| Acis autumnalis | ¼ft. | Sunny | Sandy loam | Pale pink | Aug., Sept. | Seeds |
| Atragene (Clematis) alpina | Trailing | ,, | ,, ,, | Blue. | ,, ,, | ,, |
| ,, ,, alba | ,, | ,, | ,, ,, | White | ,, ,, | ,, |
| Campanula garganica (vars.) | ,, | ,, | Moist loam | Blue & white | ,, ,, | Cuttings |
| ,, Hendersoni | 1ft. | Open | Deep loam | Blue. | ,, ,, | ,, |
| ,, muralis (second flowering) | ½ft. | ,, | Cool loam | ,, | Aug., Oct. | ,, |
| ,, Profusion | Trailing | Half shade | Moist loam | Sky blue | Aug., Sept. | Division, cuttings |
| Ceratostigma plumbaginoides | ¾ft. | Open | Peat, loam | Blue. | Aug., Oct. | Division |
| Colchicum speciosum | ¾ft. | ,, | Deep loam | Lilac & white | Sept., Oct. | ,, |
| ,, ,, album | ¾ft. | ,, | ,, ,, | ,, ,, | ,, ,, | ,, |
| Crocus speciosus | ½ft. | Sunny | Sandy loam | Violet purple | Aug.,Sept. | Division, seeds |
| ,, medius | ½ft. | ,, | ,, ,, | Violet | Sept., Oct. | ,, ,, |
| ,, nudiflorus | ½ft. | ,, | ,, ,, | Lilac, purple | Sept. | ,, ,, |
| ,, ochroleucus | ¼ft. | ,, | ,, ,, | White | ,, | ,, ,, |
| ,, zonatus | ¼ft. | ,, | ,, ,, | Lavender | ,, | ,, ,, |
| Cyclamen neapolitanum | Carpet'g | Open | ,, ,, | Rose pink | ,, | Seeds |
| ,, ,, album | ,, | ,, | ,, ,, | White | ,, | ,, |
| Erica cinerea | ¾ft. | | Peaty | Reddish. | Sept., Oct. | Cuttings, layers |

## Effective Plant Grouping for the Autumn Season (contd.).

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| Erica cinerea alba | ¾ft. | Open | Peaty | White | Sept., Oct. | Cuttings, layers |
| ,, ,, atropurpurea | ¾ft. | ,, | ,, | Deep purple | ,, ,, | ,, ,, |
| ,, ,, atrosanguinea | ¾ft. | ,, | ,, | Deep red | ,, ,, | ,, ,, |
| ,, ,, coccinea | ¾ft. | ,, | ,, | Bright red | ,, ,, | ,, ,, |
| ,, ciliaris mawiana | ¾ft. | ,, | ,, | Deep red | Aug., Oct. | ,, ,, |
| ,, vagans | 2ft. | ,, | ,, | Pink | ,, ,, | ,, ,, |
| ,, alba and rubra | 2ft. | ,, | ,, | White & red | ,, ,, | ,, ,, |
| Polygonum affine | ¾ft. | ,, | Loam | Red | ,, ,, | Division |
| ,, vaccinifolium | Trailing | ,, | Sandy soil | Pink | Sept., Nov. | ,, |
| Sedum Ewersii | Tufted | ,, | ,, ,, | ,, | Sept., Oct. | Cuttings |
| ,, Kamschaticum | ,, | ,, | ,, ,, | Yellow | Aug., Sept. | ,, |
| ,, pulchellum | ½ft. | ,, | ,, ,, | Pink | ,, ,, | Division |
| ,, Sieboldii | Tufted | ,, | ,, ,, | ,, | ,, ,, | ,, |
| ,, spectabile, in variety | 1–2ft. | ,, | Loam | Pink & red | ,, ,, | ,, |
| ,, spurium, in variety | Trailing | Sunny | Garden soil | Various | ,, ,, | ,, |
| Sternbergias (all) | ½ft. | ,, | Sandy soil | Yellow | ,, ,, | Seeds |
| Zauschneria californica | 1ft. | ,, | ,, ,, | Scarlet | Aug., Oct. | Division |
| ,, ,, splendens | 1ft. | ,, | ,, ,, | ,, | ,, ,, | ,, |

*Fig. 45.—A COLONY OF SAXIFRAGA APICULATA.*

## Effective Plant Grouping for the Winter Season.

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| Adonis amurensis | 1ft. | Sunny | Rich loam. | Yellow | February | Seeds, division |
| ,, ,, fl.-pl. | 1ft. | ,, | ,, ,, | Yel. & green | ,, | ,, ,, |
| Crocus Imperati | ¼ft. | ,, | Sandy soil | Violet | ,, | Seeds |
| ,, Sieberi | ¼ft. | ,, | ,, ,, | Lilac purple | Feb., Mar. | ,, |
| ,, ,, versicolor | ¼ft. | ,, | ,, ,, | Various | ,, ,, | ,, |
| Cyclamen cilicicum | ¼ft. | Half shade | ,, ,, | White & red | ,, ,, | ,, |
| Eranthis hyemalis | ½ft. | Open | ,, ,, | Yellow | Jan., Feb. | Division |
| ,, cilicicus | ½ft. | ,, | ,, ,, | ,, | ,, ,, | ,, |
| Galanthus (Snowdrop). All | ½ft. | Shade | Loamy soil | White | ,, ,, | Seeds |
| Helleborus niger (Christmas Rose). All the forms. | ½-¾ft. | Light shade | ,, ,, | ,, | Nov., Feb. | Division |
| Hyacinthus azureus | ¼ft. | Open | Sandy soil | Blue. | Feb., Mar. | Seeds |
| Iris reticulata | ½ft. | Sheltered | ,, ,, | Violet & gold | ,, ,, | ,, |
| Saxifraga apiculata (Fig. 45) | ½ft. | Open | ,, ,, | Yellow | Jan.-Apr. | Division |

## CHAPTER XVII.

### Shrubs in the Rock Garden.

There is probably no aspect of rock-garden equipment requiring greater consideration from the gardener than this, and none to which the usual run of text-book recommendations apply with less force or directness. The inclusion of shrubs, chiefly of the coniferous order, may be desirable enough, or even essential, but to what extent they may be employed will, of necessity, depend upon the size or limitations of the rock garden itself, and not a little also upon the nature of its surroundings. In no circumstance, however, should shrubs play a conspicuous part. Much less should they appear in columnar form at regular intervals, an offence to the eye, and an evidence of the bad taste of the operator. In a word the shrub of columnar outline should find no place in *our* rock garden, since it will not merely rob the soil in its vicinity, but will ruin the soil quite near by reason of the unparalleled dryness which would prevail. Hence we require none of these. What we might tolerate, and what also would be capable of doing good service whilst imparting diversity or affording character to the whole, are the dwarf, compact or pigmy growing forms of such shrubs, of which a few are of considerable importance. Golden-leaved or variegated subjects should never be used; their sickly presence is not required. Occasional examples of Yucca, as recurva, angustifolia and filamentosa, behind or at the summit of a rock; or a drooping or bush-formed Cotoneaster or Berberis might each do good service, while in certain circumstances a dwarf tree Ivy would not be out of place. Everything, as we have already stated, depends upon environment, and, of course, the disposition of the plants themselves. Herein, indeed, lies the true value of the shrub in its relation to the rock garden; a plant, while

destined only to play a minor part, plays that part exceedingly well by adding variety and, perhaps, picturesqueness of a kind to the whole. Occasionally, too, the dark, sombre tints of the shrubs pressing closely to rock are of assistance to the plant grouper, the effect of white-flowered groups of plants particularly being enhanced by their near presence. In these and in other ways, therefore, there is room for the shrub, and there is work for it to do. The following lists will give readers a good idea of the best kinds of shrubs for the rock garden :—

## Evergreen Shrubs.

*N.B.—Those genera marked by an asterisk are also of value for their flowers.*

Abies (Picea) excelsa clanbrasiliensis
,, ,, conica
,, ,, compacta
,, ,, gregoryana
,, ,, pumila glauca
,, ,, pygmæa
,, pectinata nana
,, Remontii
,, sub-alpina compacta
*Andromeda tegragona
*Cassinia fulvida
*Cotoneaster adpressa
,, congesta
,, horizontalis
,, microphylla
,, thmyæfolia
(Berry bearing)
Cupressus Lawsoniana nana
,, ,, minima glauca
,, ,, lycopodioides
*Daphne Blagayana
* ,, cneorum
Escallonia Langleyensis
Gaultheria procumbens (Berry bearing)
Hedera minima
Ilex (Holly) crenata
,, Perneyi
Juniperus canadensis nana
,, Hibernica compressa nana
,, sabina prostrata
,, ,, tamariscifolia
*Lavandula compacta
*Otbonnopsis cheirifolia
Pinus cembra pumila
,, strobus nanus
,, ,, pumila
,, ,, tabulæforme
Retinospora obtusa nana
Santolina Chamæcyparissus (Fig. 46)
Taxus Dovastonii pendula
*Veronica buxifolia
,, carnulosa
,, cupressoides
,, glabra-cœrulea
,, Hectori
,, pimelioides
,, salicornioides
*Yucca angustifolia (Fig. 47)
,, filamentosa
,, pendula
,, recurvifolia

*Fig. 46.—THE COTTON LAVENDER (SANTOLINA CHAMÆCYPARISSUS).*

## Select Flowering Shrubs for the Rock Garden.

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| Azalea indicum amoenum | 1-3ft. | Half shade | Peaty | Rosy red | Spring | Cuttings |
| Berberis empetrifolia | 1-2ft. | Open | Ordinary | Orange | May | Seeds, cuttings |
| ,, Wilsonii | 1ft. | ,, | Sandy loam | — | Red fruits in Autumn | Seeds |
| Cistus florentinus | 3ft. | ,, | Loam | White | Summer | Cuttings |
| ,, lusitanicus | 3ft. | ,, | ,, | Yellow | Aug.,Sept. | ,, |
| Cytisus Kewensis | 1½ft. | ,, | ,, | Creamy | Spring | ,, |
| ,, præcox and albus | 3-5ft. | ,, | ,, | Yel. & white | ,, | Seeds, cuttings |
| Daphne Genkwa (Fig. 48) | | | | | | |
| Daphne Mezereum, in variety | 1-2ft. | ,, | ,, | Red & white | March | Seeds, grafts |
| Erica carnea and alba | ¾ft. | ,, | Peaty loam | ,, ,, | Spring | Layers, cuttings |
| ,, cinerea | ½ft. | ,, | ,, ,, | Purplish | Autumn | ,, ,, |
| ,, ,, alba | ½ft. | ,, | ,, ,, | White | ,, | ,, ,, |
| ,, ,, in variety | ½ft. | ,, | ,, ,, | Red chiefly | ,, | ,, ,, |
| Fuchsias (hardy sorts) | 1-3ft. | ,, | Loam | Scarlet | Summer, Autumn | Cuttings |
| Genista tinctoria fl.-pl. | Sub-prostrate | ,, | ,, | Yellow | May, Aug. | ,, |
| Ononis fruticosa | 1-2ft. | ,, | ,, | ,, | June, Aug. | Cuttings, seeds |
| Rhododendron ferrugineum | 1½ft. | Half shade | Peaty soil | Rosy red | May, June | Cuttings, grafts |
| ,, ,, album | 1½ft. | ,, ,, | ,, ,, | White | ,, ,, | ,, ,, |
| ,, racemosum | 2ft. | ,, ,, | ,, ,, | Pink & white | ,, ,, | ,, ,, |
| Rhodora canadense | 2-3ft. | ,, ,, | ,, ,, | Purplish | ,, ,, | Cuttings |
| Rosa rugosa (for large places) | 2-5ft. | Open | Ordinary | Reddish | Summer | ,, |
| Spiræa arguta | 2-3ft. | ,, | ,, | White | Spring | ,, |

*Fig. 47.—A SUITABLE YUCCA FOR THE ROCK GARDEN (Y. ANGUSTIFOLIA).*

*Fig. 48.—DAPHNE GENKWA, A LITTLE-KNOWN SPECIES WITH LILAC-BLUE FLOWERS.*

## CHAPTER XVIII.

### Heaths in the Rock Garden.

The hardy Heath—the term is used advisedly to separate those common to our own land and countries equally cold from those inhabiting South-west France, Spain and Portugal—is a host in itself, and to-day no garden of any pretensions is complete without a well-equipped Heath garden of its own. For some years these plants have been winning their way into favour with the result that we see broad stretches of them in many directions; now as fringes or borderings, sometimes massed in beds, on the lawn or playing the part of carpeters to plants of taller growth, though best of all, perhaps, apart from the heath garden itself, when employed as a groundwork to choice shrubs, constituting great belts to the shrubbery, or flanking the entrances to the rock garden in their own inimitable way. There is only one way of dealing with these plants in gardens if we would get more than a fractional part of the beauty and colour warmth they are capable of giving, and that is to group them freely in masses. In no other way are they of half the value, and the fact is writ large on peaty waste and moorland in many parts of these islands. It is, indeed, due to the heath alone that thousands of acres of British landscape are beautified year by year by plants inimitable in colour effects, and in their powers of endurance while growing in the poorest of soils. In these, indeed, they brave the fiercest summer sun we experience; though, in all probability, their own spread and density of growth shield them from much harm in the direction indicated.

**In respect of soils,** however, the gardener need not fall into the too common error of slavish imitation. In Nature these plants almost invariably inhabit peaty and sandy wastes, though they not infrequently take to other soils usually deficient in lime just as kindly, or even more so. A case in point occurs at Gravetye, Sussex, where Mr. Robinson for many years has had a heath garden upon cool, loamy soil, without a particle of peat added or otherwise, and not much sand ; and it may be said of the plants that they appear to revel in it—from those of dwarfest stature to the Portuguese Heath whose handsome bushes attain six to eight feet. In this respect they may be compared to not a few alpine plants which are quite indifferent as to the soil or geological formation on which they grow in Nature.

Generally speaking, however, peat will be found desirable where a heath garden is in course of formation. Very fine, sandy peat, as much of the one as the other, will be found the best or even with a small percentage of loam added—that of a poor or stony nature for preference. Within the limits of the rock garden a similar mixture will do quite well. In no circumstance should rich soil be provided. It is never wanted by the plants, and in all probability would tend to an excess of growth at the expense of flowers. Firmness of soil about the roots of the plants is also an essential to success, and rarely, indeed, are they seen to be happy without it. Firm soils, too, assist in retaining the character of the plants, and all the Heath tribe, whether greenhouse or hardy, delight in these conditions.

**A Not Infrequent Error** when growing these heaths in the rock garden, or in conjunction therewith, is that of piling up much rock and setting solitary examples between the stones. One such, in the mind's eye, was of a two-sided character and raised several feet out of the ground, the heaths like specks over all. This should never be. The excess of dryness by wind and exposure would almost always be fatal to success, and in any case

good effect would be non-existent. Far better that a rocky bank had been formed than these tons of rock piled high, demonstrating, one thing—*what not to do.* Then, whether in the rock garden or elsewhere, the plants should appear in visible groups or masses, not pocketed here and there in isolation. To what good effect we might use them will depend upon the size and extent of the erection. If small—say under a quarter of an acre—a few groups of some of the more distinct should suffice. Frequently on the upper reaches of the rock garden, where tall herbaceous plants appear unhappily placed, these heaths would constitute the best possible adornment—garniture of a type unequalled from January to December. For not only is there the beauty of flowering, there is a charm of leaf and colour warmth even from the dried and withered flowers which is acceptable at other times. The best general planting season is the autumn. Unless in favoured districts the more tender sorts, lusitanica (Portuguese Heath), Arborea, Mediterranea and its varieties, and the newer Veitchi should not be used. Moreover, their taller growth, often six to ten feet high, unfits them for use in the rock garden generally.

## Good Hardy Heaths for the Rock Garden.

| Name. | Height in Feet. | Aspect. | Soil. | Predominant Colour. | Flower'g Period. | Method of Increase. |
|---|---|---|---|---|---|---|
| Erica carnea (Winter Heath) . | ¾ft. . | Open . . | Peaty . | Reddish. . | Feb., May | Layers & cuttings |
| ,, ,, alba . . . . | ¾ft. . | ,, . | ,, . | White . . | ,, ,, | ,, ,, |
| ,, ciliaris mawiana . . . | 1½ft. . | ,, . | ,, . | Deep red . | July, Oct. | ,, ,, |
| ,, cinerea . . . . . | 1½ft. . | ,, . | ,, . | Reddish purple | May, Aug. | ,, ,, |
| ,, ,, alba . . . . | 1½ft. . | ,, . | ,, . . | White . . | ,, ,, | ,, ,, |
| ,, ,, atropurpurea . . | 1½ft. . | ,, . | ,, . | Deep purple | ,, ,, | ,, ,, |
| ,, ,, atrosanguinea. . | 1½ft. . | ,, . . | ,, . | Deep red . | ,, ,, | ,, ,, |
| ,, ,, coccinea . . . | 1½ft. . | ,, . . | ,, . . | Bright red . | ,, ,, | ,, ,, |
| ,, ,, purpurea . . | 1½ft. . | ,, . . | ,, . | Purple . . | ,, ,, | ,, ,, |
| ,, ,, rosea . . . . | 1½ft. . | ,, . . | ,, . . | Rose . . | ,, ,, | ,, ,, |
| ,, multiflora . . . . | 1–1½ft. | ,, . . | ,, . . | Red . . . | Autumn | ,, ,, |
| ,, Tetralix. . . . . | 1ft. . | ,, . . | ,, | ,, . . . | Summer & autumn | ,, ,, |
| ,, ,, alba . . . | 1ft. . | ,, . . | ,, . . | White . . | ,, ,, | ,, ,, |
| ,, ,, rubra . . . . | 1ft. . | ,, . . | ,, . . | Deep red . | ,, ,, | ,, |
| ,, vagans (Cornish Heath) . | 2ft. . | ,, . . | ,, . | Pink. . . | Aug., Oct. | ,, ,, |
| ,, ,, alba . . . . | 2ft. . | ,, . . | ,, . . | White . . | ,, ,, | ,, ,, |
| ,, ,, grandiflora . . | 2ft. . | ,, . . | ,, . . | Deep pink . | ,, ,, | ,, ,, |
| ,, ,, rubra . . . . | 2ft. . | ,, . . | ,, . . | Reddish . | ,, ,, | ,, ,, |

## CHAPTER XIX.

### Ferns in the Rock Garden.

Happily for the rock garden and its adjacent parts there is a wealth of beauty, diversity of form and elegance in the fern tribe to be found nowhere else in the vegetable world. The plants were obviously intended to attract by their many graces, and whether in the freshness of their spring or early summer toilet or that of maturer autumn days, they rarely fail to play their part. Then, too, there are ferns to suit all circumstances, giants of the bog like the Royal Fern (Osmunda) that attain to six feet or eight feet high, and miniatures like the Wall-Rue (Asplenium ruta-muraria) of but an inch or two high, that delight in the dry crevices of a wall and to which soil would appear abhorrent. These are the two extremes, whether of stature, likes and dislikes, and there are species and varieties, happily, all the way between. It is from out of this greater host that the cool, sequestered places of the rock garden may be ornamented and beautified; that the moist or dripping cave may have its quota of choice adornment, or that the drier places may receive their rightful share.

Culturally, it would appear that moisture or dryness plays a more important part than soil, while position must be relegated to third place. For example, to the true bog-loving Ferns, Osmunda and Struthiopteris, moisture is a first essential, and being present the soil may be of a leafy nature or strong loam. On the other hand, to such as the Parsley Fern, Scaly Fern, or Wall-Rue, dryness is important. The commoner sorts, Hart's Tongue and Filix-mas, succeed almost anywhere, though assuming their greater luxuriance in loamy soils uniformly cool and moist. The vast majority appreciate shade. The perfectly delicate and beautiful North American Maidenhair (Adiantum pedatum), content in the moist

places of the bog, is prone to be touched by cutting wind or frost in spring, and should be given a sheltered place. It is a quite deciduous species. The dwarf-growing crested Hart's Tongues in many varieties merit attention apart; the intensity of the green shining fronds is noteworthy, and their heavily tasselled and often much divided extremities provide them with a presence of their own. Too much trimness among Ferns in the places we have in mind might prove quite wrong. There is natural protection in the old bronzed fronds, and the Fern quarter is not to be regarded as a flower bed on terrace or lawn. Planting may be done from March to October, though, preferably, during the early spring months, informal grouping, such as that shown in Fig. 49, being desirable.

## Ferns for the Rock Garden.

| Name. | Height in Feet. | Aspect. | Soil. |
|---|---|---|---|
| Adiantum pedatum | 1½ft. | Moist, sheltered | Peat & loam |
| Allosorus Crispus (Parsley Fern) | ½-¾ft. | Dry, shade | Light loam and grit |
| Asplenium adiantum nigrum | ½ft. | Partial shade | Loam |
| ,, ruta-muraria | ¼ft. | Dry, open | Old mortar and limestone |
| ,, trichomanes | ½ft. | ,, ,, | ,, ,, |
| Athyrium filix foemina capitatum | 1½-2ft. | | |
| ,, ,, corymbiferum | 1½-2ft. | | |
| ,, ,, cristatum | 1½-2ft. | Partial or thin shade | Loam and vegetable soils |
| ,, ,, frizelliæ | 1½-2ft. | | |
| ,, ,, ,, cristatum | 1½-2ft. | | |
| ,, ,, plumosum | 1½-2ft. | | |
| ,, ,, Victoriæ | 1½-2ft. | | |
| Blechnum spicant cristatum | ¾ft. | Cool, shady places | Moist loam |
| ,, ,, imbricatum | ¾ft. | ,, ,, | ,, ,, |
| Ceterach officinarum | ½ft. | Dry walls | Old mortar and rubble |
| Cystopteris fragilis | ½ft. | Dry, shady places | Light loam and leaf soil |
| ,, montana | ½ft. | ,, ,, | ,, ,, |

*Fig. 49.—HARDY FERNS IN THE ROCK GARDEN.*

## Ferns for the Rock Garden (contd.)

| Name. | Height in Feet. | Aspect. | Soil. |
|---|---|---|---|
| Lastrea Filix-mas cristata | 2ft. | Half shade | Loam and leaf soil |
| ,, ,, grandiceps | 2ft. | | |
| ,, ,, goldieana | 1½ft. | | |
| ,, montana | 1½ft. | | |
| ,, pseudo-mas cristata | 2ft. | | |
| ,, thelipteris | 1ft. | | |
| Onoclea sensibilis | 1½-2ft. | Open, wet or boggy places | Loam, peat and leaf mould |
| Osmunda Cinnamomea | 2ft. | | |
| ,, Claytoniana | 2ft. | | |
| ,, regalis (for boldest places) | 4-6ft. | | |
| ,, ,, cristata | 1½-2ft. | | |
| Polypodium calcareum | ¾ft. | Light shade | Chalk soils, leaf mould, and loam |
| ,, dryopteris | ½ft. | | |
| ,, phegopteris | 1ft. | | |
| ,, vulgare cambricum | 1-1½ft. | Light shade dryish places | Leaf mould and loam |
| ,, ,, grandiceps | 1-1½ft. | | |
| ,, ,, pulcherimus | 1-1½ft. | | |
| Polystichum acrostichoides | 1½ft. | Half shade | Loam |
| ,, angulare cristatum Wollastoni | 2ft. | Partial shade | Loam and leaf mould |
| ,, ,, divisilobum acutum | 2ft. | | |
| ,, ,, grandidens | 2ft. | | |
| ,, ,, imbricatum | 2ft. | | |
| ,, ,, lineare | 2ft. | | |
| ,, lonchitis (Holly Fern) | ¾ft. | Shade | Sandy loam |
| Scolopendrium vulgare Coolingii | ½-1ft. | Shade and moisture | Leaf soil and loam |
| ,, ,, cristulatum | ½-1ft. | | |
| ,, ,, crispum Bowdenii | ½-1ft. | | |
| ,, ,, densum | ½-1ft. | | |
| ,, ,, digitatum | ½-1ft. | | |
| ,, ,, fissum | ½-1ft. | | |
| ,, ,, grandiceps | ½-1ft. | | |
| ,, ,, Kelwayi | ½-1ft. | | |
| Woodsia alpina | ½ft. | Partial shade, dry | Sandstone, leaf mould and loam |
| ,, ilvensis | ½ft. | | |

## CHAPTER XX.

### Animal Pests of the Rock Garden.

The worst of all the insect pests of the rock garden is the ubiquitous slug, and, like the thief, working chiefly in the night, is the most to be dreaded. In a mild winter like that of 1912-13, when little or no frost was experienced, the slugs in ever-increasing numbers were at work the winter through, playing havoc with not a few plants, while threatening to exterminate some of the most choice. The rarer Dianthi and choice Silene never escape their attentions, while choicer morsels still, like Omphalodes Luciliæ have been sorely tried again and again. The Campanulas, too, when just pushing their greenish buds from the stools appear to possess for him a very special fascination, and in the case of so exquisite a thing as Campanula Waldsteiniana they will greedily devour every vestige of life. During the winter named they were most persistent in their attacks upon early flowering plants, the buds of the Apiculata, Boydii and Burseriana Saxifrages being devoured as soon as they appeared.

**Preventive Measures and Traps.**—For choice alpines occupying solitary positions the ordinary perforated zinc collar placed around the plant will often suffice to keep them at bay, particularly if it be surrounded by soot, lime, sifted coal ash, or finely broken granite chips, over which they do not like to crawl. Applications of salt or of some of the advertised soil fumigants are effectual destroyers of the slug, though both are impracticable if used in the well-planted rock garden. Slices of apple or potato or turnip constitute excellent baits,

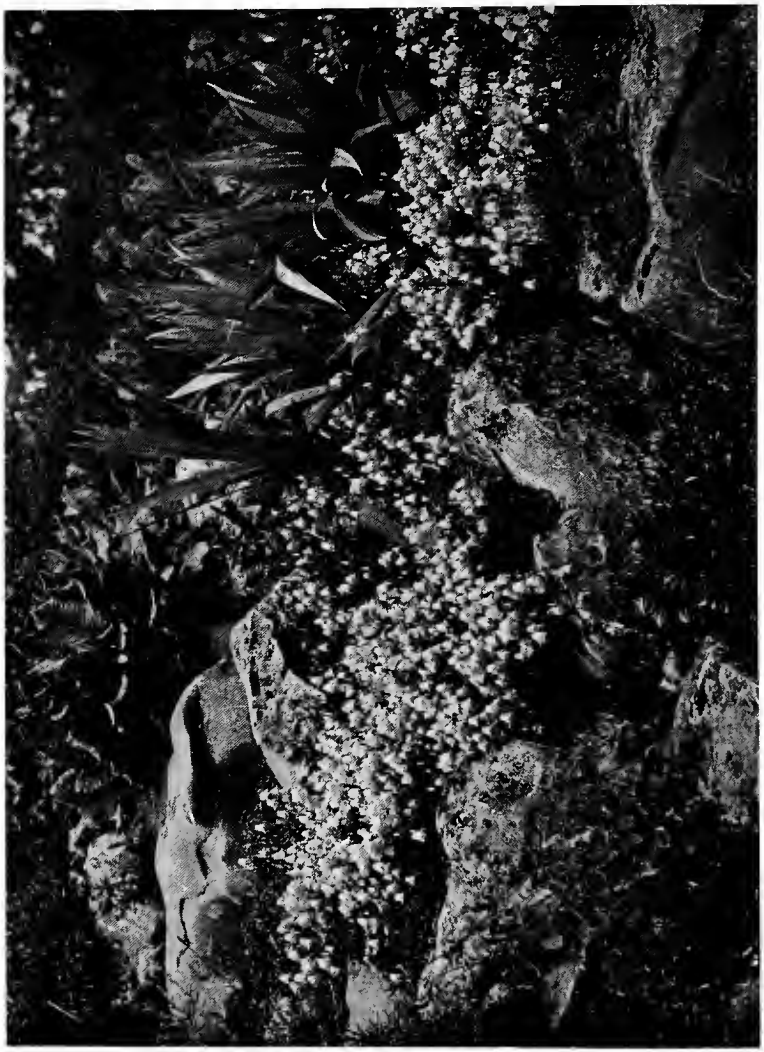
and frequent examination of them, dropping the pest into a strong solution of salt-water, will get rid of many. The most effective trap that I know, and which not infrequently draws the pest towards it by reason of the shelter it affords, is a wet or damp sack, or slate or board if these latter can be placed. Slugs revel in uniform moisture, and the wet sack never fails to harbour them. Hand picking, slow and irksome though it be, has still to be resorted to. In searching for the slug watch also for its eggs ; their destruction will stem the rising flood. The best slug trap we have tested is the V.T.H. This is filled with salt-water and baited with dry bran. It is most effective.

**The Short-Tailed Vole** is occasionally troublesome, but is by no means comparable to the slug. It is particularly fond of all the Pink tribe, also Campanulas and other plants. As it is capable of doing much mischief in a short time it should never be neglected. The small break-back traps, baited with green food, *e.g.*, Carnation leaves cut into inch long lengths, is the best. Occasionally birds at nesting time will carry away whole tufts of mossy or other Saxifragas, which they leave alone if the plants are dusted with soot to render them distasteful.

## An Alphabetical List of Choice Alpines.

*N.B.—Those marked by an asterisk * are best suited to the small rock garden. Those marked thus † are recommended for cold districts.*

Acantholimon androsaceum
† ,, glumaceum
* ,, venustum
Achillea clavennæ
* ,, sericea
† ,, rupestris
,, umbellata
*Adonis amurensis
,, ,, fl.-pl.
* ,, pyrenaica
† ,, vernalis
*Æthionema grandiflorum
,, pulchellum
†*Ajuga Brookbankii
†Alyssum saxatile citrinum
,, spinosum
,, ,, roseum
*Androsace carnea
,, chamæjasme
* ,, foliosa
,, helvetica
†* ,, lanuginosa
† ,, ,, oculata
* ,, pyrenaica
* ,, sarmentosa
,, villosa
* ,, ,, chumbyi
†Anemone alpina
,, angulosa
,, blanda
* ,, ,, scythinica
,, Hepatica, in var.
* ,, pulsatilla
* ,, ,, alba
* ,, ,, rosea
* ,, vernalis
†Anthyllis montana
*Aquilegia alpina
,, cærulea
,, glandulosa
* ,, Stuartii
†Arenaria balearia
† ,, montana
†Armeria alpina
* ,, cæspitosa
†Armeria cephalotes rubra
† ,, ,, rosea
†*Arnebia (Macrotomia) echioides
*Asperula athoa
,, nitida
* ,, suberosa
†*Aster alpinus, in variety
Astilbe simplicifolia
†*Aubrietia Dr. Mules
† ,, Fire King
†* ,, Lavender
†* ,, Leichtlinii
† ,, Mrs. Lloyd
† ,, Pritchard's Al
Campanula Allioni
†* ,, carpatica White Star
,, cenisia
† ,, G. F. Wilson
* ,, garganica, in variety
†* ,, muralis
,, ,, major (bavarica)
,, profusion
* ,, pulla
* ,, pulloides
† ,, pusilla alba
†* ,, ,, Miss Willmott (Fig. 50)
,, Raddeana
,, Raineri
* ,, Stansfieldii
,, Waldsteiniana
Ceratostigma plumbaginoides
*Cyclamen, in variety
†Daphne Blagayana
†* ,, Cneorum
* ,, rupestris
*Dianthus alpinus
,, cal-alpinus
,, Freynii
†* ,, graniticus
* ,, neglectus
† ,, sylvestris



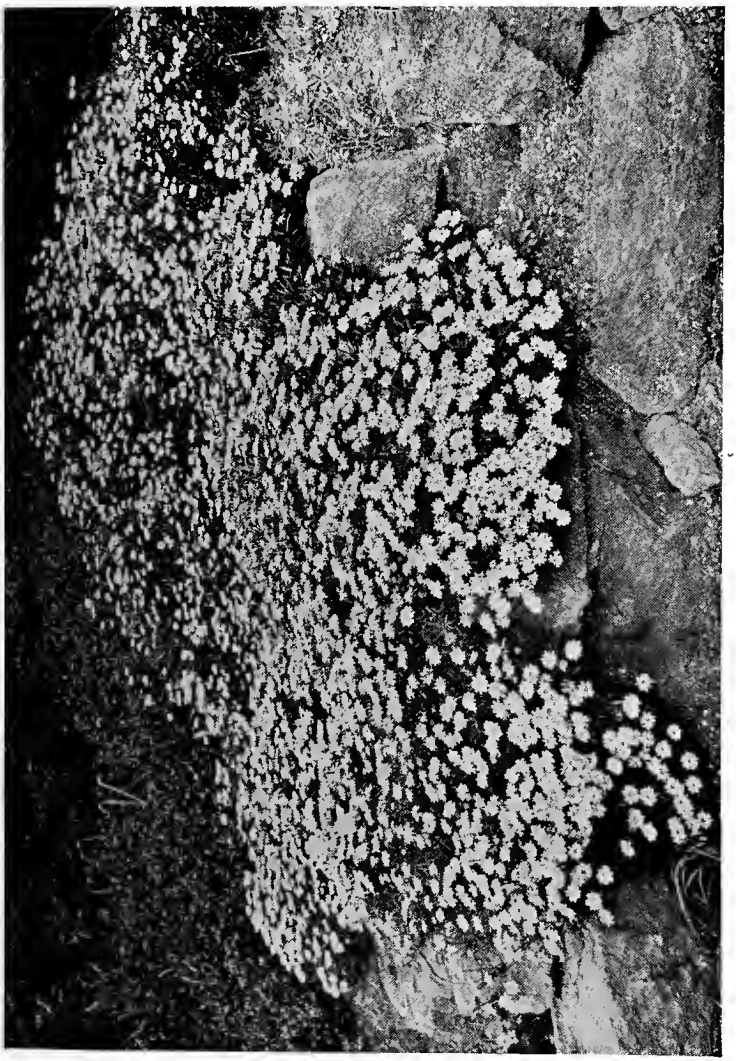


*Fig. 51.—THE EVERGREEN CANDYTUFT (IBERIS SEMPERVIRENS).*

## List of Choice Alpines (contd.).

Douglasia lævigata
*Draba aizoides
,, Dedeana
†Dryas Drummondii
† ,, octopetala
†*Edraianthus (Wahlenbergia) serphyllifolius
Epigæa repens
*Erigeron aurantiacus
Eritrichium nanum
Erodium Reichardi
,, trichomanifolium
†*Gentiana acaulis
,, bavarica
†* ,, septemfida
,, verna
*Geranium argenteum
† ,, cinereum
,, ,, album
†Globularia nana
,, ,, alba
* ,, nudicaulis
*Gypsophila cerastioides
† ,, prostrata
,, ,, rosea
Haberlea Ferdinandi Coburgii
,, Heldreichii
†* ,, rhodopensis
* ,, ,, virginalis
†Horminum pyrenaicum
†*Hutchinsia alpina
*Hypericum ægypticum
,, coris
,, empetrifolium
†*Iberis correæifolia
† ,, Little Gem
,, Sempervirens (Fig. 51)
* ,, superba
†*Incarvillea grandiflora
*Iris cristata
,, gracilipes
,, lacustris
Isopyrum thalictroides
†*Leontopodium alpinum (Edelweiss)
Linaria alpina
,, hepaticæfolia
Linaria pallida
Linnæa borealis
*Linum flavum
Lithospermum graminifolium
,, prostratum
* ,, ,, Heavenly Blue
,, rosmarinifolium
Lychnis lagascæ
*Mazus rugosus
*Morisia hypogæa
Myosotis Rhecteineri
†* ,, rupicola
*Omphalodes cappadocica
,, Luciliæ
Onosma albo-roseum
,, Bourgæi
* ,, echioides
,, tauricum
Origanum Dictamnus
,, pulchellum
†*Ourisia coccinea
*Oxalis enneaphylla
,, ,, rosea
Patrinia palmata
*Pentstemon cæruleus
,, glaber
,, heterophyllus
*Phlox amœna
† ,, ovata
†* ,, subulata atropurpurea
* ,, ,, Nelsonii (Fig. 52)
,, ,, sprite
,, ,, The Bride
* ,, ,, Vivid
*Phyteuma comosum
†Polygala chamæbuxus
,, ,, purpurea
†Polygonum affine
,, vaccinifolium
Potentilla Tonguei
†Primula Bulleyana
,, calycina
,, capitata
,, Cockburiana
,, denticulata, all forms, including cashmeriana

*Fig. 52.—PHLOX SUBULATA NELSONII.*

## List of Choice Alpines (contd.).

*Primula farinosa and alba
,, Forrestii
,, frondosa
* ,, integrifolia
† ,, intermedia, in var.
,, involucrata
* ,, Juliæ
* ,, marginata
,, megaseæfolia
,, Palinuri
†* ,, pubescens alba (nivalis)
,, pulverulenta
†* ,, rosea
,, Sieboldi, in variety
* ,, viscosa, in variety
†Pulmonaria arvernense
Ramondia Heldreichii (Janka)
†* ,, Nataliæ and var. alba
†* ,, pyrenaica
†*Ramondia pyrenaica alba
* ,, ,, ,, rosea
,, serbica
*Ranunculus amplexicaulis
,, glacialis
†Saxifraga aizoon lutea
†* ,, ,, rosea
†* ,, apiculata
* ,, ,, alba
,, Borisi
* ,, Boydii
* ,, ,, alba
* ,, Burseriana gloria
* ,, ,, major
,, ,, tridentina
,, cæsia
† ,, camposii (Wallacei)
†* ,, Cochlearis
†* ,, ,, minor (valdensis of gardens)
* ,, coriophylla
,, cotyledon (all vars.)
,, diapensioides
†* ,, Elizabethæ
,, Ferdinandi Coburgii
,, Griesbachii
,, Kestonensis
Saxifraga Kyrillii
†* ,, lantoscana superba
,, longifolia
* ,, marginata
,, "mossy" sorts, red flowered
† ,, muscoides purpurea
†* ,, oppositifolia, in var.
* ,, paradoxa
* ,, Paulinæ
* ,, Petraschii
†* ,, Salomoni
†* ,, sancta
* ,, scardica obtusa
Sedum corsicum
* ,, Ewersi
,, Kamschaticum
,, ,, fol. var.
,, obtusatum
* ,, pulchellum
,, rupestris
*Sempervivum arachnoideum
* ,, ,, Laggeri
*Shortia galacifolia
* ,, ,, grandiflora
* ,, ,, rosea
,, uniflora
*Silene acaulis
† ,, alpestris
,, Elizabethæ
* ,, Schaftæ
*Soldanella alpina
* ,, montana
†*Thalictrum adiantifolium
†Thymus lanuginosus
,, serpyllum coccineum
Tiarella cordifolia
†Veronica saxatilis
† ,, Teucrium var. dubia (prostrata)
*Viola pedata
* ,, ,, alba
*Wulfenia carinthiaca
* ,, amherstiana
Zauschneria californica

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While every gardener will do his utmost to keep out of his rock garden such pernicious and ever-encroaching weeds as Colt's Foot (Tussilago), Couch Grass, Bindweed, and others that are frequently existing in the staple soil, or introduced in a variety of ways, there are other more or less undesirable tenants of the rock garden by reason of their root spread, and the plant that is quite suited to the wild garden may be wholly unfitted for association with rocks, and from which, when once established, they cannot well be eliminated. A plant, too, may not be out of place in the larger rock garden, but quite unsuited to the majority of smaller ones. In this connection it is important to remember that the weed of one soil is not necessarily so of all (Convolvulus althœoides is a case in point). In Southern counties on chalky soils it is quickly in every crack and cranny, while in other districts the cultivator can hardly tempt it to grow. The following are to be guarded against:—

- Achillea millæfolia in any form
- Asperula odorata
- Calystegia pubescens (vars.)
- Campanula rapunculus
- Cerastium tomentosum
- ,, Biebersteinii
- Convolvulus althœoides particularly on chalk soils
- Coronilla varia
- Euphorbia cyparissias
- Galium molugo
- ,, verum
- Glechoma hederacea
- Hieracium aurantiacum
- Muscarias generally
- Oxalis Corniculata
- Petasites (Tussilago) fragrans
- Sedum album
- ,, spurium in variety
- Symphytums, of sorts
- Tropæolum speciosum
- Vancouveria hexandra
- Vincas (generally)

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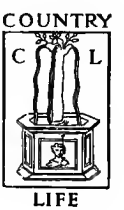

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