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CHRYSANTHEMUM ALPINUM.

See Part IV., Section B.
ALPINE FLOWERS
AND
ROCK GARDENS
ILLUSTRATED IN COLOUR

DESCRIBED BY
WALTER P. WRIGHT

WITH NOTES ON
"Alpine Plants at Home"
BY
WILLIAM GRAVESON

LONDON:
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Preface.

No apology need be offered for adding one more to the growing list of books on rock plants, since the present provides a special feature in the form of an extensive and beautiful series of colour groups of Alpines taken direct from Nature.

The opportunity furnished by their publication is taken advantage of to show how equally charming pictures may be provided in British and American gardens, by making a suitable choice of site, stones, soil and plants.

The contribution on Alpine plants in their native habitats by Mr. W. Graveson forms a valuable addition to the general information which it is my privilege to provide.

Walter P. Wright.
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"The cultivation of Alpine Plants has for some years past been mainly confined to gardens strictly botanical; a taste for their possession is, however, now on the increase, and collections are to be found in some of the private gardens of Great Britain and Ireland."

This is the opening sentence of the introduction to a book on Alpine Plants written by Mr. David Wooster—at one time joint editor of Loudon's "Encyclopædia of Gardening and Plants,"—published about forty years ago. It is quoted to show the extraordinary advance the rock garden and the growing of Alpine plants has made since that day. It was Mr. Wooster's desire to stimulate an interest in these beautiful flowers, which at the period when carpet bedding was so much the craze, had been so largely neglected,—and the effect of his volume with the hundred illustrations beautifully drawn and painted must have influenced many a gardener to turn his attention to Alpine plants. There were others who had a like desire, chief amongst them being Mr. William Robinson, whose books, especially "The English Flower Garden," have done so much to revolutionise our ideas on the arrangement of a garden; and now the rock garden has as enthusiastic workers as any other branch of horticulture; and at the great flower shows the display of Alpine plants is one of the chief attractions.
ALPINE FLOWERS AND ROCK GARDENS.

Their growth in popular favour has also been helped by the ever increasing love of travel, more especially amongst the mountains of Switzerland, and it is natural that those who have beheld the wealth of colour in the early summer on the high pastures of the Alps, should seek to have representatives of these beautiful flowers in their gardens. Hence it is that the claim of a rock garden consists not only in the variety and rich colouring of its flowers, but in the associations connected with the plants, and the memories they recall.

The enthusiastic rock gardener, it is safe to say, is generally one who has made the acquaintance of some of his favourites in their native haunts; and the sight of them as they come into bloom arouses memories of the day amongst the mountains when he saw them for the first time in all the glory of their wild beauty. For instance, in the writer's own small rock and bog garden, the purple Saxifrage recalls the day when he saw it growing amongst the boulders by the path over the Col de Torrent, in clumps eighteen inches square, one glowing mass of lovely purple bells. The Gentian brings to mind a day's tramp over Yorkshire fells, where it peered forth on the grassy hill-tops on which golden plovers were nesting. The mossy Campion carries one's thoughts to the crags above a mountain tarn in the Lake District, where it grew in luxuriant cushions of green, profusely studded with rosy blooms. The Birds'-eye Primrose, in the bog, has a score or more of associations, chief amongst them being an Alpine pasture near Piora, where it made a long bed
of deep pink between the mountain track and the river. Then there is the St. Dabeoc's Heath with its memories of the wide sweep of moor in Connemara; and its near relation the blue Menziesia, that grew in such abundance in the upper part of the Romsdal, along with other favourite mountain flowers, rosy-belled Andromeda, creamy clusters of May lily, and the delicate pink blooms of Linnaea.

And so the list might be prolonged, and the memories increased, and the traveller who has wandered to greater heights, and to lands farther away, will find his rock garden increase thereby in its fascination.

In one of his eloquent passages Ruskin has claimed for the mountain flowers a superiority over those of the lowlands. "The wood Hyacinth, and wild Rose," he writes, "are indeed the only supreme flowers that the lowlands can generally show; and the wild Rose is also a mountaineer, and more fragrant in the hills, while the wood Hyacinth, or grape Hyacinth, at its best cannot match even the dark bell Gentian, leaving the light blue star Gentian in its uncontested queenliness, and the Alpine Rose and Highland heather wholly without similitude."

The claim is a sound one, and will be generally agreed to. And there is this further point to be remembered, that whereas the gardener with his skill in culture can develop new varieties, and attain increased brilliancy of bloom in most flowers, he cannot excel the blues of the Gentian or the rosy clusters of moss Campion and Androsace. As we look at these Alpine plants, we marvel that such glowing colours are found amidst such
grim surroundings of rock, and think of the storms that they must weather in their high mountain homes.

Pictures of them in their surroundings have been painted, and the favour they find is shown by the popularity of Mr. Macwhirter's "June in the Austrian Tyrol," yet even in pictures like this the flowers do not get all their due. They are but a part of the landscape, and it is the artist's aim—and rightly so—to give the main features of the landscape with its lights and shades and the atmosphere of the whole. Hence flower lovers have sought to obtain illustrations of Alpines in their homes, in which the above conditions are reversed, and the flowers themselves are the main feature, and the surrounding landscape accessory to them.
ANDROSACE GLACIALIS

See Chapter I., Part IV.
PART I.

Characteristics and Habitat.
CHAPTER I.

What Alpine Plants Are.

ALPINE plants exercise a fascination on flower-lovers which frequently develops into complete conquest. The dainty denizens of the mountains wield an irresistible sway.

What is the secret of their charm? It is not mere beauty of blossom, because other plants have flowers equally as attractive. It is not entirely the fact that most of the Alpines bloom in spring, for many lowland plants of great beauty are then at their best. Perhaps it is due to what might be called "lovability."

An Alpine Phlox or Androsace nestling in a rocky crevice has only a tithe of the glowing splendour of a clump of Pride of Haarlem Darwin Tulips growing in a neighbouring border, but it draws the flower-lover with a closer bond. The great radiant cups of the Tulip arouse unbounded admiration, but they do not stimulate the more intimate emotions. Terms of endearment bubble to our lips as we gaze on the little sparkling tufts in their stone crèches. Their lowliness adds to their influence. They make the appeal which is the precious possession of every pretty living thing weaker than ourselves. All of gentleness, all of pity,
all of kindness, all of chivalry that is in our nature
goes out in response to the mute request for sympathy
and protection. Thus the plants do more than give
the cultivator pleasure by their beauty. They enrich
his nature.

There is at least one other important reason why
Alpine plants secure and hold an ever-widening circle
of supporters, and it is found in the fact that even in
the smallest places rock gardening, when intelligently
conducted, gives a pleasing sense of intimacy with
nature. Within the area of a few square rods of ground
we may have a little inner world of our own—a world
of hill and vale, of rock and water. Within its confines
we can cultivate a hundred kinds of beautiful plants
where another person might have nothing more in-
spiring than a belt of common shrubs. No hands
but our own need touch the rock garden when the
heavy work of getting in soil and stones has once
been done. Even if we are weakly we can fully
ministrate to the requirements of the plants—dividing
or otherwise propagating them when required, curbing
aggressive interlopers, supplying protection in the
rainy season, removing decaying flowers except when
seed is wanted, and performing such other cultural
acts as are called for, and which it is a constant
pleasure to provide.

With the growth of our love for rock gardening we
make a closer study of Alpine plants than we have
done hitherto. We have a desire to know everything
about them: their place in the economy of nature, their
native habitats, the difference between the various
species, and the special cultural treatment under which they thrive best.

What are Alpine plants? What are their distinguishing characteristics? How and why do they differ from other classes of flowering plants?

When we see, as we often do nowadays, a rock garden which includes herbaceous plants, bulbs and aquatics we naturally conclude that "Alpine" has a very wide application. It is certainly used commonly in a broad sense, nevertheless it has a specific meaning. Properly speaking it only applies to mountain plants. Not necessarily to the plants of "The Alps," be it observed. The substantive alp, a Latin word of Celtic origin, means mountain. It is allied to the Latin albus, white. Low-growing marsh plants may be admitted into the rock garden, but they are certainly not Alpines, indeed, if we wish to pose as purists we must restrict this term to plants which are natives of the higher altitudes of mountains.

In nature, Alpine plants have to adapt themselves to a short summer and a long, severe winter. They consequently develop a close, dense habit of growth, with very small, compact leaves on short stems, brilliant flowers with comparatively short peduncles, and a thick mass of strong, far-striking, much branched roots. With the close mat of foliage evaporation is reduced to a minimum and with the dense rootstock large supplies of moisture can be secured and valuable supplies of food stored up to sustain the plants during the long winters. The foliage is generally retained
throughout the year, and consequently the plants are what we should term "evergreens," although the silvery tints of many kinds make that term somewhat of a misnomer.

Alpine plants differ from lowland species in their special provision for a short summer and a long winter. They differ physically in producing rosettes of short, small basal leaves; and low, unbranched flower-stems. When we see a plant with tall stems, the leaves large and disposed at clear intervals, the flowers borne on long, branching peduncles, we know at once that it is not Alpine.

The plants of the mountains cling to the face of the stones, often growing in sandy, arid soil and drawing sustenance by thrusting their roots far down into the crevices, where rain and melting snow have accumulated a store of moisture. The air is cool and dry. The conditions of light are also very different from those which affect lowland plants, being much more intense.

Alpine plants are true creatures of their environment. They are a type developed to meet the peculiar conditions of light, climate, soil and moisture which prevail in high altitudes. As such they stand apart. Differing considerably from each other, the various species nevertheless have common characteristics.

Fortunately the Alpines do not sulk and die when transplanted to lowland gardens. A few, it is true, miss the covering of dry snow which is their natural protection in the mountains, and suffer from the heavy winter rains. This is particularly the case
ANEMONE SULPHUREA

See Chapter II., Part IV.
with those which have hoary leaves. But the plants are easily protected, as with grit placed round them, and squares of glass a few inches above them, they are rendered quite safe.

We can thus enjoy the beauty of these lovely mountain gems in gardens at or near the sea level.
CHAPTER II.

Alpine Plants in Nature.

People who have the means and leisure for travel derive great pleasure and improved health from visiting the Alpine plants in their native homes. The charming pictures of floral beauty, the pure, dry, cool air of the mountains, have an inspiring and invigorating influence.

From the garden point of view, the principal advantage of studying the plants in a state of nature is that true ideas can be formed of their structure, development, conditions of growth and general requirements. Lessons are learned of the arrangement of stones and the tasteful disposal of the plants.

It is safe to prophesy that as the years pass increasing numbers of flower-lovers will visit the Pyrenees and Alps in spring in order to see the mountain plants in Nature. The theatres, picture-galleries and churches of Florence and Rome will no longer monopolise the time and interest of tourists. Travellers will learn that Nature's handiwork in the form of flowers has at least an equal interest to man's craftsmanship in the shape of "brasses"—that "culture" may be acquired on the mountain sides as well as in art museums. And there is the additional advantage that the lessons
learned among the plants may be applied in the garden at home.

There is at present much that is either feeble or false (and sometimes both) in rock gardening. It is not with unmixed surprise that one occasionally hears a genuine flower-lover refuse to take up Alpines, on the ground that such examples of rock gardening as he has seen in the grounds of friends remind him of a quarry—there is an abundance of stones, but a singular paucity of flowers. Nature is prodigal of both, but she practises her greatest profusion with plants. She provides them with a lavish hand, and we who set out to learn from her must see to it that the end and aim of our home operations is the provision of flowers.

We have seen that Alpine plants in Nature are of close, dense, tufty habit, with flowers on short stems. They are a remarkable example of adaptation to environment. When transplanted to low-land gardens some of the kinds become modified, assuming a looser and more straggly habit. The well known Edelweiss is a case in point. At home, the Alpines exhibit a remarkable constancy. In his masterly work on the origin of species and varieties by mutation, Hugo de Vries calls attention to the number of species which are the same in Alpine and Arctic regions. He points out that some forms are identical, while others only differ so slightly as to suggest that they are elementary species of the same systematic type. This arouses a consideration of absorbing interest. It is impossible that the plants can have found their way or been transplanted from
the Arctic Circle to the summit of far-distant mountain ranges, and the great Dutch botanical investigator sees no other explanation than that the species sprang from a common ancestor, existed together in a previous glacial period, and have remained constant and un-
changed ever since.

As an example of the dispersion of Alpine species in Nature, de Vries points out that *Primula imperialis*, which was introduced from the high mountains of Java, has also been found in the Himalayas, Ceylon and Northern India. Species from Abyssinia have been found on the mountains of the island of Madagascar. Certain familiar Australian types have been discovered in the mountains of Borneo. These species are not to be found in the lowlands (in some cases seas) between, and "the only possible explanation of their identity is the conception of a common post-glacial origin, coupled with complete stability."

The object of de Vries in thus instancing the existence of the same species of Alpines in widely different parts of the world, and their constancy, is, of course, to emphasise the fact that external conditions do not necessarily influence evolution. That is a subject into which it is not our purpose to follow him, but we gladly draw from his rich storehouse of information on plant morphology data of such interest to all lovers of Alpine plants.

Certain plants are found in both lowland and Alpine regions, and a familiar example is the Harebell, *Campanula rotundifolia*. In all such cases a difference in the habit of the plants is manifest. Those in the
A CORNER OF A BEAUTIFUL ROCK GARDEN.

Photo by E. J. Wallis.
lowlands are taller and looser than those from the mountains. Botanists have made experiments with the object of ascertaining whether soil or climate is the more important factor in effecting this change of habit. An experiment made with Hawkweeds by Nägeli seemed to show that soil was the principal agent, since plants grown in the lowlands that assumed a taller and looser habit in good soil reverted to their Alpine character when transplanted into dry sand. But more complete and systematic experiments by Bonnier clearly proved that climate had far more influence than soil. He grew separate portions of the same plant in lowland France and in the Alps, and in order to set any doubts with respect to soil at rest, he transferred earth from one locality to the other, so that the plants grew in similar compost. Trials with various species gave the same result: taller and more slender stems, looser foliage and larger flower-heads on the lowland than on the mountain plants.

The interesting experiments made by Bonnier showed that the characteristics of Alpine plants are governed by the climate, and further tests, made entirely in the mountains, proved that light has the greatest influence, since plants partially shaded showed a tendency to develop lowland forms.

The theoretical interest of these experiments lies in the fact that every individual plant is shown to have the latent capacity for assuming different forms—a sufficiently impressive and remarkable power—and the practical value in the proof that it is not soil but light which has the greatest influence on the plants.
ALPINE FLOWERS AND ROCK GARDENS.

They teach us that our rock gems must have clear and unobstructed light—that the purer and sharper the air the better they are likely to conform to the dense, low, rosette-like habit which is one of their greatest charms.

Appreciating these facts, we shall avoid making a rock garden in a shady place. We shall give our favourites full exposure. With the best that we can do for them they will not receive that intensity of light which they enjoy in their Alpine eyries during the rich but brief summer; however, as a partial compensation they will get a longer period of light owing to the greater length of our summer.

There is no practical point in rock gardening which is apt to cause more doubt than the arrangement of stones. This is a matter that we shall deal with in our cultural section. Meanwhile, it is well to point out that flower-lovers who have the opportunity of studying Alpine flowers in nature have an unequalled opportunity for gathering information on the construction of rockeries, for they can take notes and make sketches of those "pieces" which appeal the most strongly to their sense of beauty, and reproduce them, or copy them as closely as possible, when they return to their homes.

They can also note those associations of plants which strike them as the most effective.
CHAPTER III.

Alpine Plants in British Gardens.

The knowledge that true Alpine plants grow under climatic conditions very different from those which prevail in Great Britain—that they live at altitudes where the light is very intense, the air dry, the summer short, and the winters attended by perpetual snow—may cause misgivings to those who have not had opportunities of seeing the success which attends intelligent rock gardening in Great Britain, with its diffused light, damp air and often wet, almost snowless winters.

Certainly the conditions are very different, and in one sense it is surprising that so few plants should give cause for anxiety in British gardens. But we must remember that the plants have an inherent capacity for adapting themselves to circumstances—a capacity which each individual member of a species possesses, and which has been latent in its kind for many thousands of years. The knowledge of this gives us confidence in such efforts as are required to give the plants the nearest approach possible to the conditions which prevail in nature.

The great majority of Alpine plants do well in England, and the flower-lover who sets out to practise
rock gardening in earnest rarely has to complain of failure. A school of Alpinists has grown up. The traces of it may be found in several directions, notably in the new style of exhibiting adopted at some of the great flower shows. Thirty years ago the whole of an exhibition was held under cover, to-day a considerable part of it is arranged out of doors. Then the main exhibits were huge "specimen" plants—Azaleas twelve feet high and perfectly pyramidal in shape, gigantic Pelargoniums trained in a circle—now the most interesting display is the series of rock and bog gardens, with plants growing among real stones and in real water.

When complete gardens, demanding many tons of rock and soil, and several hundreds of plants, not to speak of a considerable quantity of water, are set up in an exhibition enclosure, it is certain that far more expenditure is involved than in the transport of a dozen specimen plants, and it would only be justified by a lively public interest, which did not stop at admiration, but took some tangible shape in orders for stones and plants.

The considerate expert will readily condone slight lapses and overlook casual flaws in these efforts to arrest the attention of the flower-loving public, in view of the entirely artificial conditions and short period of time in which the work has to be done. As a matter of fact, conducted as it is by men who pass their lives in the formation of rock gardens, there is rarely serious ground for criticism, and frequently much material for instruction to the amateur.
CAMPANULA BARBATA.

See Chapter IV., Part IV
The one serious obstacle to the extension of rock gardening in Great Britain is the widespread belief that it is impracticable in small gardens. This is a complete delusion. There is no reason whatever why the culture of Alpines should be the prerogative of wealthy people. Perhaps one reason why it prevails is that rock gardening is either entirely neglected by most of the great public gardens and parks, or else conducted in such a way as to give the impression that a heavy expenditure on stones is necessary. When we see—as we may see—vast masses of rock looming over very small clusters of plants, we have no difficulty in understanding why it is that false ideas prevail.

The truth is that public gardening in England panders far too much to the crude tastes of the non-gardening classes. It caters for the curious crowds who throng the parks on Sundays, when there are no cricket or football matches to provide it with more thrilling and congenial fare. It does not lead public opinion. It does not keep pace with the most artistic school of gardeners. Happily the principal botanical gardens show a more progressive spirit, and most of them make a special feature of rock gardening.

Kew, which does most things well, gives us a very good example of rock gardening. It is hampered by a low and somewhat gloomy site, practically on a level with, and only a few yards from, the Thames. One descends into the garden as into some ferny dell, and in damp weather the place is apt to be uninviting. But at least an attempt is made, and not without
success, to show the salient features of Alpine gardening. We see ridge, cleft and hollow. We see the stone-lovers clinging to the rocks and the bog plants clustering in damp bays. We see good and interesting species of the principal mountain genera.

Some of the most interesting examples of rock gardening are to be found in the gardens of amateurs. These are not accessible to the general public, but it is not often that a flower-lover seeking admission to a garden in his neighbourhood for the sake of acquiring information fails to find a welcome. As a rule it is both ready and cordial. Each learner should make it his or her business to find out the best work in the vicinity of the home, or in such other districts as are visited, with a view to acquiring knowledge.

Certain natural circumstances favour the prospects of successful rock-gardening in Great Britain. To begin with, there is abundance of suitable stone. Then there is a plentiful supply of admirable soil. Further, there is no lack of water. Our equable climate, though very far from presenting Alpine conditions, is favourable in the main to plant growth. Its prevailing humidity is agreeable to almost every kind of plant, and certainly Alpines do not resent it, on the contrary, they probably enjoy it. At all events, it is certain that any slight disadvantage which may arise from the dampness of the climate is more than counterbalanced by the superior soil. Alpines adapt themselves to the poor soil of the mountain ranges, but they are fully capable of appreciating something better.
The conditions being thus favourable as a whole, we are not surprised to meet with many charming examples of rock gardening in Great Britain, and have no difficulty in prophesying a rapid extension of this delightful phase of gardening in the near future. Flower-lovers cannot realise all at once that the huge boulders so liberally used in some public examples of rockwork that they see are not indispensable. It does not always occur to them that a ton of stone, costing, perhaps ten, perhaps fifteen, shillings after freight has been paid, can be used in a hundred pieces as well as in one. They are chilled by the evidence that ponderous rocks, perched at dizzy angles, are the principal components of rock gardens, and that flowers are a minor consideration.

Whoever is capable of arranging stones, however large or small, in such a way as to form a natural home and foil for colonies of beautiful flowers is a successful Alpine gardener. Flowers are the first consideration. It may be that Nature put stones in the Alpine regions before she put flowers there, but we may be sure that organic life was the ultimate consideration with her. It is the one that should sway us first and last. There is undoubtedly an art in arranging rock-work, but it is all wasted if it does not favour beautiful plant life. We have to "make the dry bones live."

The untrained rock gardener cannot make a serious mistake if he arranges his stones in such a way that beautiful flowers grow happily among them. That, after all, is the real art. The flowers will be the best
evidence in his defence if he is arraigned for technical sins of construction. We cannot accept as a successful rockery that in which, at the season of blooming, the stones instead of the flowers become the topic of conversation.

Before rock gardening can become completely successful in Great Britain we must learn that it is not a mere appanage of hardy flower growing. We hear the phrase "herbaceous and Alpine gardening" much too often. The fact that an Alpine plant is sometimes grown in the herbaceous border, and that herbaceous plants are often part of a rockery, must not obscure the fact that the herbaceous border and the rockery represent two entirely separate phases of flower gardening, and attempts to combine the two generally end in failure. They should be treated as absolutely distinct. Let the flower-lover have herbaceous borders by all means, especially if he has a fairly large garden. With the best of the bulbous flowers in spring, followed closely by coloured Feverfews (Pyrethrums), Leopardsbanes (Doronicums), Columbines (Aquilegias), Sweet Rocket (Hesperis), Siberian and other early Irises, white mountain Centaury (Centaurea montana alba), Globe Flowers (Trollius), and orange Avens (Geum); and later by Pæonies, perennial Larkspurs (Delphiniums), Phloxes, Goat's rues (Galegas), Michaelmas Daisies (perennial Asters) and other noble plants, he will have much cause for satisfaction. But some of these plants, beautiful and delightful as they are, have nothing Alpine in their character, and can no more be associated
with rock gardening than with the bedding-out system.

As generally understood, the phrase "hardy herbaceous plants" applies to those which die down to a perennial rootstock every autumn, and grow again in spring. Plants of this class are not, as a rule, appropriate to the rock garden. An Alpine garden is never wholly bare. Most of the plants retain both stems and foliage throughout the winter. It is only permissible to include herbaceous plants when they are of small growth, neat habit, and restricted rooting powers. The smaller bulbs may be admitted. Non-evergreen plants should not be allowed to dominate the rockery. Even when, as in the case of some of the bulbs, they are remarkable for earliness or exceptional beauty of bloom they should only be accepted for use in colonies at different parts of the rockery. This, together with other practical points, shall receive adequate attention in the practical section.

There is one phase of flower gardening which lends itself admirably to incorporation with the culture of Alpine plants, and that is water gardening. So far from rock plants suffering from association with aquatics they probably benefit, for the neighbourhood of water means more humidity in summer and less frost in winter. From the artistic point of view there can be no dispute that a rock garden rising from a bog or pool has enhanced beauty. The whole surroundings of the rockery are improved by the presence of water. When, too, in the heart of summer the Alpines, following their inherited character of early seeding,
cease blooming, the garden remains attractive, for beautiful Water Lilies float on the surface of the sun-enlivened pool, and many other aquatic and bog plants are at their best.

In the moist British isles it is not only particularly appropriate but also relatively easy and inexpensive to associate Alpine and water gardening. The two phases can be blended, as we shall show, into a harmonious whole, and the future of Alpine gardening in Great Britain is the brighter for the tendency which is observable to bring these two fascinating branches of flower gardening into intimate association with each other.
PART II:
Alpine Plants at Home

WILLIAM GRAVESON
CAMPANULA THYR ROI DEA.

See Chapter IV., Part IV.
CHAPTER I.

Alpine Flowers at Home in Switzerland.

To the Englishman, and, indeed, it might with equal truth be said to the American also, the Alps of Switzerland and Italy, represent his Paradise for Alpine flowers. The Pyrenees possess a rich mountain flora, and the same may be said for many another highland of Europe. It is, however, to the Bernese Oberland, the Valais and the passes leading from Switzerland to Italy, that we naturally turn in thought when we wish to recall those halcyon days when we saw the flora of the mountains in its most perfect beauty.

And so the writer will ask the reader to accompany him on a typical day’s excursion among the Alpine pastures about Evolena, in the Valais, from whence we shall climb to the summit of the Pic d’Arzinol, close upon 10,000 feet above sea level.

We start by following the narrow path through meadows, down to the raging torrent, which is carrying its grey waters from the glaciers to swell the swirling Rhone in the wide valley below; and then ascend through some meadows till we reach the shade of the dark pines.

Swiss meadows are not like those of England—here at home their chief product is grass, there it is flowers.
ALPINE FLOWERS AND ROCK GARDENS.

Or if ours are coloured with flowers it is usually by some one or two plants, as by buttercups and daisies, flowers which are lost as the grass grows long. But there the grass is lost in the flowers, and of these the variety and colouring is a sight to behold. Blue and yellow are the prevailing colours, but purples and crimsons mingle with them, and in the rich medley of bright colours, the white of Narcissus and of Lily is all the more apparent. One and all are revelling in the sunshine, and from their midst the grasshopper sends forth his note which never flags till the sun has set.

A week ago we were full of excitement as we gathered the blue Sage for the first time, or saw to what dimensions the Rampion of the South Downs here attains. Then there was the Bistort of our English meadows, but looking plumper and more fair; the Columbine at times dark purple as well as blue; Goats' beard thrice the size of our common Tragopogon, together with the big yellow globes of the Trollius, the deep purple spikes of the Bell-flower, bluest of blue Forget-me-nots, and varying shades of purple of the Geranium.

Knap-weeds, with large purple rays, and mauve heads of Scabious called to mind chalk banks in Surrey, and the masses of orange Anthyllis and of bright yellow Hippocrepis, the luxuriant pastures of Kent. We have most of these to-day, for they are the common meadow flowers. But Swiss meadows are full of surprises, and we are at one moment full of rapture over a new Pedicularis, or at another lost in admiration as we gaze at an Anemone or Lily for the first time.
Hereabouts *Anemone narcissiflora* is the chief representative of the beautiful family of wind flowers; a few miles away the pastures are as full of the large sulphur Anemone, with blossoms the size of a crown-piece, as English meadows are with Cowslips, or favoured banks in the western counties with Primroses; whilst a bare week since as we ran down the steep slopes of Jaman we saw other pastures full of snowy-white Anemones and Paradise Lilies.

Other glories await us in the pine forests. The Scotch Fir and the Larch have much that is beautiful about them. The dark crowns, and the rich red trunks of the former, the fresh greens of the latter in early spring, and their carpet of soft needles in autumn, call forth our admiration, yet even they do not attain to the perfect standard of the pine of the mountain sides. It is impossible to look at them without recalling the magnificent passage in which Ruskin pours forth his praise of the Pine.

"Other trees," he says, "show their trunks and twisting boughs; but the Pine, growing either in luxuriant mass or in happy isolation, allows no branch to be seen. Summit behind summit rise its pyramidal ranges, or down to the very grass sweep the circlet of its boughs; so that there is nothing but green cone and green carpet. Nor is it only softer, but in one sense more cheerful than other foliage, for it casts only a pyramidal shadow. Lowland forest arches overhead, and chequers the ground with darkness; but the Pine, growing in scattered groups, leaves the glades between emerald bright. Its gloom is all its
own; narrowing into the sky it lets the sunlight strike down to the dew. And if ever a superstitious feeling comes over us among the Pine glades, it is never linked with the old German forest fear, but it is only a more solemn tone of the fairy enchantment that haunts our English meadows.'

Cheerfulness and perfection of form are not the only charms of the Pine. To these must be added the delicious odours which the passing breeze wafts abroad, and the soft murmuring melody which arises as the wind gently rocks their boughs. Lovely at all times are "ye pine groves with your soft and soul-like sounds." Beneath their shade the ground is covered with luxuriant mosses, with ferns, and dwarf evergreen shrubs. Though the true heaths are wanting, the heath family is particularly well represented by the large bushes of the Alpine rose, now in bud, and which in a week or two will be a gorgeous mass of red blossom; by Whortleberry with its delicate pink wax-like flowers; by the blue-berried Bilberry, and the crimson fruited Bearberry, and by the Pyrolas. One of these is only just coming into bloom, but the one-flowered species is fully out, and elsewhere we have seen the delicate bells of the round-leaved Winter-green almost as beautiful as those of the Lily of the Valley, of which we have gathered handfuls a few miles away.

Purple and cream Butterwort grow by the rills, which trickle through the woods; golden Saxifrage adorns the little pools; and the small Gentian greets us by the path side, with its lovely azure blooms. Blue Speedwells, purple Vetches, creamy clusters of the
PICEA EXCELSA PYGMAEA.
Photo by E. J. Wallis.
May Lily, and the white Mountain Avens are also in evidence, brightening the forest glades.

And then there are the Orchises, the curious coral-root, the tiny heart-leaved Twayblade, and, greatest prize of all, the lady’s-slipper—*Cypripedium Calceolus*. What a moment was that when our eyes wandered from the clump of May Lily, which surrounded a mossy stump, to a sunny dell some thirty yards below, where a colony of the *Cypripediums* were growing. The plants looked as though they must have strayed from a tropical forest, as though they had left their home amongst the palms and the giants of the new world, with their festoons of creepers and their long lianas, and sought the quieter life of a mountain pine wood. We picked two or three blooms, carefully safe-guarding the roots, and as we held them in our hands we thought that never should we handle more lovely flowers.

Meantime the track has been steadily ascending, and now comes the sound of a roaring torrent. We cross this by means of a loosely-made bridge, and are soon beyond the Pines. The second stage of our climb has commenced, and for the next hour we traverse the Alpine pastures. There is not the luxuriance of the lower meadows in these higher pastures, but the herbage though short is dense, and the cattle feeding in them look well cared for.

We press on up the green slopes, stooping to pick an unusually fine head of Bird’s-eye Primrose or some of the mountain Violets which are almost large enough for garden Pansies. The hillside becomes steeper,
and now as we surmount the crest before us, we pass into a new world.

Hitherto man's influence, his power of subduing the earth, and of causing it to minister to his wants, have been generally manifest; now his powers are stayed, Nature reigns sole and undisputed sovereign: all around are the signs of the sway of her vassal—the ice-king. Beginning on the left there sweeps round to the right a semi-circle of mountains with snow-clad sides, in parts densely snow-clad, with more masses of snow and a small glacier in their hollows. In the bright sunlight the snow glistens most dazzlingly, and the curves of the snow-drifts are perfect.

A new world, truly, and it is fitting that as we enter it we should hear the distant whistle of the marmot, and should startle two or three ptarmigan, who have not yet exchanged their winter for their summer plumage. We have entered the portals of the alpine garden, we are in the home of the Gentians, the Primulas, and the Soldanellas. We have, too, as it were, in a short hour retraced our steps some months in the year, for the stunted Larch which has managed to find footing in these high regions is just showing its rosy plumelets; the Alder is coming into leaf, and the Mezereon, which gladdened us with pink blossom in February, as we looked in our gardens for Snowdrops, is here in full bloom.

From a distance the approach to the glacier looks like a wilderness of grey stones; but see what bright jewels there are making the wilderness blossom like the rose. There is purple Linaria, richer in colour
and larger than the Mother-of-thousands which climbs about our flint walls, there is the little yellow Violet (*Viola biflora*), which makes amends for its diminutive size by growing in compact clumps. There are Crocuses, white and purple, somewhat starved looking, it must be admitted, as though sunshine and warmth were still rather rare. The white starry Saxifrages are much more in their element, and the yellow Draba and pink Androsace are full of vigorous life; it would seem that their one aim is to see how completely they could hide their foliage in the multitude of flowers. But see the side of that stone, it is as though garnets had been bestrewn with a lavish hand over a clump of freshest moss. Mossy Campion without doubt, but more dwarf than when last seen on the ledges of Glyder-fach, in Wales. And there close to it is the purple Saxifrage, its foliage absolutely hidden by its purple bells. Could any embroidery be more lovely than that which it gives to the big boulder, along the edge of which it flourishes?

Then there are white Buttercups, one kind appearing to brave the cold with easy assurance, another wrapping its petals round with downy sepals as with a blanket. The big white Anemones have a similar habit, and the beauty of their pure white blossoms is enhanced by the delicate shade of lavender in the fluffy coat which surrounds them. And last of all there are the slender pendent bells of the Soldanella, and the large deep blue trumpets of the Gentian. We met with the smaller species ere we left the Pine wood, and now we have both it and the much larger *Gentiana acaulis*. 
It is a moment to recall when one sees an Alpine Gentian at home for the first time, more particularly if the species should be the lighter blue *Gentiana verna*. There is something almost ethereal about it, it is a flower which seems to belong more to the blue heavens above than to the gross earth beneath. No wonder Alpine flowers excite the enthusiasm of all who go to Switzerland. It is due not merely to their beauty—marvellous as this is—but to the grandeur of their surroundings, and to the consciousness of the brave fight they wage with the rigours of the climate and the stormy elements. The choicest garden flowers owe their beauty to the unremitting care of the gardeners, to the constant development of a long race of cultivators, but these no man has aided; they have—if we accept the older view of creation—held their ground since the earth was commanded to bring forth "grass, the herb yielding seed, and the fruit tree yielding fruit," or, if we accept the evolutionary view, they have won their beauty of form and variety of structure in the great struggle for existence, and are its crowning effort.

Long might we linger over each plant, noting the manner in which all its parts are so put together as to aid its efforts to prolong life and to perpetuate its race, but let us note only this. In the mountain regions bright days are fewer than in the valleys, and when the lowlands are bathed in sunshine the high rocks are frequently hidden in low-lying clouds and mist. Hence it is of the utmost importance that every sunny hour of the short summer should be utilised. For this end the brilliancy of the floral colours is of immense
GENTIANA ACAULIS AND EDELWEISS.

See Chapter VII., Section A. Part IV., and Section B Part IV.
assistance, for not only do the gorgeous colours attract the bees, the butterflies, and the other insects, but they play an important part in the absorption of heat, in the process whereby light is transformed into heat. Herein may be seen one of the uses of the coverings of the Alpine Buttercup and of the Alpine Anemone.

Long might we linger over them, but two thousand feet yet remain to be climbed, so, setting ourselves resolutely to work we plunge knee-deep into the snow-drifts, and after traversing them, breast the steep hillsides, and with a final scramble over the loose boulders, tilted at all angles one against the other, we stand at last on the summit of the Pic, nearly 10,000 feet above the sea. What words are adequate to describe the view which now meets our gaze? All around is a circle of snow peaks; the giants of the Oberland, of the Zermatt district, and of Savoy—Jungfrau, Eiger, Matterhorn, and Dent Blanche, Grand Combin, and the monarch of Europe—Mont Blanc. They are not all clear at once, but all come into view and then are hidden under the white clouds which pass along the horizon. Above, the bright sun of a brilliant June day; around, the peaks of eternal snow; about, the stillness of the Alpine solitudes; a quiet only broken by the softened roar of the torrent in the valley some thousands of feet below, or the hum of a passing bee which has strayed from the flowery pastures above the Pines.

In one of his books Ruskin has said that the higher mission of mountains is "to fill the thirst of the human heart for the beauty of God's working, and startle
its lethargy with the deep and pure agitation of astonishment.” And thus the lovely flowers which every summer bloom in their hollows and amongst the rocks, have, as it were, the reflected glory of the great snow peaks; and some of the rosy glow which bathes their silent pinnacles, as the summer sun sets behind them, is imparted to the blossoms of Alpine flowers.
CHAPTER II.

Some Characteristics of Alpines.

Having in the previous chapter seen Alpine Plants amidst their natural surroundings, it may be of interest to take a few of the flowers we have gathered, and look at some of their characteristics. At the outset the question arises, how are we to determine out of the large number we have seen between leaving Evolena and reaching the snow line on the Pic d' Arzinol, which are true Alpines, and which are not. A similar question is often asked; and it must be confessed that it does not allow of a simple answer. That veteran investigator of the British Flora, Mr. Hewitt Cotterell Watson, seeking for some line of division in the plants of these islands, draws one between what he termed the Flora of the Agrarian Region, and of the Arctic Region. Pointing out that it is impossible to find any hard and fast line, he says that approximately a line of division may be made according to the presence or absence of the common Brake. "This fern," he remarks, "is abundantly distributed through the lower region, and from one extremity of our islands to the other; its upper limit usually running almost uniform with the climatic limit of corn cultivation; so that the two characters in connection afford a satisfactory test of the region."
On somewhat similar lines it may be suggested that the true Alpines are those that live above the limit of the Pines, that is to say, find on the high pastures above the mountain woods their chief centres. There are innumerable instances of Gentians, and Geums, of Saxifrages and Soldanellas descending far below the tree line; and in the same way the floral inhabitants of the valleys have pushed their way up almost to the limit of perpetual snow. One recent writer dilating on the fact that the Globe flower and some of the Primulas flourish at a low elevation in the Rhone valley, and that the stinging nettle makes itself at home by the chalets of the peasants on the high Alps, asks why the former should find its place amongst Alpine flowers, and the latter be excluded. To this the answer would be that the beautiful little Primulas have all the characteristics of the mountain race; and the nettle, those of lowland weeds. And whereas the former depend for distribution on their own powers, the nettle is one of the adjuncts of man which he brings with him from the cities to the uncultivated wilds. The way in which these weeds of civilization have followed man's track as he struck into new regions is a subject about which much might be said; but it must be evident that they and some of the meadow flowers that have found a habitation beyond the main centres of their race, are the immigrants, and not the original inhabitants, of the Alps.

One other point should be remembered, and that is the way in which the tree line varies according to latitude and temperature. Even in Central Europe
Hi: Knj:ni:. , (im-:l (ikk;, north wales.

A FAMOUS HAUNT OF ALPINES.
and the Pyrenees, there are variations between 4,000 and 7,000 feet. And this large margin is, of course, increased in the great mountain chains of the Himalayas and the Andes; and again in Lapland, Siberia and the most northern regions of Canada. Frequently it will be found that Alpine flowers descend lowest along the course of a mountain stream. Their seeds are carried down, and the coldness of the water renders the temperature by the stream lower. Hence it is that on the stony islands in the beds of the rivers some species may be gathered many hundred feet below their natural home.

Turning to a few of the characteristics of Alpine plants it will be found that they are mostly perennials, often with tough stems and abnormally long roots; that they are of dwarf habit, and compact growth; and that for their size they give a marvellous display of glowing colour. Their period of beauty is almost as short as the season of the hotel keeper, who has set up his holiday house in their home. No spring or autumn—long months of winter, when they are covered with a deep coating of snow, and a short three months of summer. Into this brief space all their flowering season has to be crowded. And how gloriously they make the most of it! They take every advantage of the short summer which breaks the long winter of the high mountain regions. Hardly has the snow melted before they begin to flower; and often the black, sloppy ground which is exposed as the snow melts is studded with white Crocuses, with Anemones, or with the delicate white-flowered *Ranunculus pyrecaeus*, and the ever
lively *Soldanella*. Indeed, at times the latter plant actually pierces through the snow. Kerner has so vividly described what takes place that a quotation may be taken from his pages, it being remembered that in its habits the *Soldanella* is but an example of other Alpines.

"As the snow melts," he says, "the tricklings there-from moisten the earth below, the *Soldanella* plants are aroused from their winter's rest. Their little arched flower stalks begin to elongate and come into contact with the hard under-surface of the snow, though the temperature here is zero. Growth is carried on at the expense of the supplies of materials obtained by the *Soldanella* in the previous summer, which have been stored up partly in the evergreen leathery leaves lying flat on the ground, and partly in the short root stock imbedded in the soil. The reserves are employed as substances for building, and a portion of them is respired in order that it may be possible to resolve the rest, to bring them to the places where they are required, and to obtain the force necessary for the work. The heat obtained by this respiration melts the granular ice covering in the immediate neighbourhood of the flower buds. In consequence of this a cavity is formed in the ice above each bud, or rather each bud becomes over-arched as if by a tiny dome of ice. But the stem continues to grow in height; and the flower bud borne on it, which is respiring and giving out heat, is accordingly raised up in the dome-shaped hollow space and pushed into it." This process being continued the *Soldanella* which looks so frail eventually bores for itself a way through the snow, and its lovely lilac purple bells come
forth and wave like a flag over the conquered snow-clad fortress.

In striking constrast to the solid, leathery-looking leaves of the Soldanella are the leaves of some of the other mountain plants. Let us take two as examples: the Birds'-eye Primrose, and the Edelweiss. They are not near neighbours, for the one loves the sides of rivulets and wet meadows; the other finds its home on the cliffs, or amidst the stones of the mountain sides, though in the eastern Alps it descends to lower levels. The chief characteristic of the Birds'-eye Primrose is the coating of white meal on the underside of its leaves; the chief feature of the Edelweiss is its felt-like covering of grey hairs. The one seeks to prevent the openings of its leaf-cells from being clogged with wet; the other strives to prevent excessive transpiration taking place in periods of drought.

How effective its coating of wax is to the mealy primrose may be seen if we dip one of its leaves into water, for whilst the upper surface of the leaf is moistened, the under side remains unaffected. There are other plants with a similar habit, such as the melancholy thistle, the handsome flowerhead of which, and its long grey-coated leaves, are found in mountain pastures. Hairs on the upper surface of the leaves have a similar use in the case of one of the commonest Alpine Hawk-weeds—Hieracium villosum; its long projecting hairs after a fall of rain are thickly beset with drops of water, but the leaf surface is not affected. Now, with other plants the felt-like covering serves as a protection against injury from dry winds and from
heat. To quote again from Kerner, "On the Alps the drying up of flowering plants by the sun only occurs in a very few cases, viz., where the scanty soil on the narrow ledges of steep projecting rocks and crags and on rocky slopes is only watered by rain, mist and dew. If no showers fall for several successive days and the south wind blows over the heights with a clear sky day and night, these scanty layers of soil may dry up to such an extent that they are unable to supply the necessary fluid food to the plants rooted in them. Under these circumstances plants growing there have most pressing need of means of lessening transpiration in their leaves. In places such as these are to be found, almost without exception, plants whose leaves and stems are thickly covered on all sides with hairs, together with succulent plants and Saxifrages incrusted with lime." He gives as examples of this class of plants the Edelweiss, a Ragwort, a Cinquefoil, and the scented Edelraut (*Artemesia Mutellina*). Akin to them in habit is the Mouse-ear Hawkweed of our sunny banks at home. Its bright yellow flowerets are familiar objects from the late spring to the autumn, and should there be a period of summer drought, the Hawkweed may be seen with its leaves curled up, dry and shrivelled, looking the picture of discomfort. Yet this habit and its coating of hairs give it no small measure of protection, and like some undeserving mendicant, its sufferings are not nearly so great as they appear to be.

We might find many other points for discussion in the leaf structure of Alpine plants, but the flowers
GENTIANA BRACHYPHYLLA

See Chapter VII., Part IV.
appeal to us more powerfully, and to these let us now pass on. Their richness of colour, the marked contrasts of colour, and their sensitiveness to the sunshine, are features which are specially striking. Some of the flowers appear to follow the sun in shining forth and disappearing according as the sky is clear, or clouds keep back his rays. Is it light or heat which regulates their movements? Is their unfolding due to the increased light that comes when the sun breaks through the clouds, or to the additional warmth? Once more we may find in the pages of Kerner some explanation of the subject, for, after giving particulars of experiments, he sums them up as follows: "As we know, if rays of light strike any object and are not entirely reflected from its surface, they warm it. This probably is the case with the Gentians, and the phenomenon may be explained as follows. The light vibrations are communicated to the flowers and converted into vibrations of heat. This heat produces changes in the turgidity of the tissues, affecting their tension and growth. The active energy of the heat is converted into another form of movement, which ultimately alters the position of the petals, and we see the flowers opening." This explanation arouses an interesting speculation as to the way in which certain pigments possess the power of converting heat into light. It appears probable that such a power is possessed, and that the dark fluffy coats of the Alpine Anemone, and the Alpine Ranunculus (Ranunculus glacialis) are of use in assisting the opening of their corollas.

Colour contrasts, as has been said, are very marked
amongst Alpine flowers. If their life is short, it is also gay; the blues, pinks and yellows of their summer dress, are of the most brilliant hues. The diversity of colour gives the flowers more of an individuality than does the blaze of a single colour, as in the case of the buttercups of our meadows, the poppies of our cornfields, and the purple heather of our moors. And it is suggested that the flowers benefit, as the contrasting colours more readily attract the insect visitors, whose assistance in the work of cross fertilization is so much desired. There are, indeed, instances where the normal colour of a species is changed for another colour when the change brings about a contrast to the prevalent shades of the plant's neighbours. "To blush unseen," in spite of Gray's lament, is the exception from the standpoint of the flower itself; it seeks to flaunt itself not from vanity, but for the perpetuation of its race. Hence the devices to invite the insects to seek its flowers, and the many details of form and structure—like the streaks of the pansies, and the lines on some of the gentians, to guide the winged visitor; and those other contrivances, calculated to ward off the marauding raids of undesirable guests.

Important as cross fertilization is to flowers, it is not essential. If it were so some of the plants would fare indifferently. Their summer is short, it is broken up by storms, days of rain or of drizzle and mist—days which hinder the insects from wandering abroad. Hence in many of the mountain plants, the essential organs for fertilization are so arranged that should cross fertilization fail, autogamy, or self-fertilization, takes place.
The *Anemone vernalis* exemplifies this, and it is the more interesting as the flower is a near relation of the Pasque flower of our chalk downs, and in its case a similar process takes place. When the blooms of the anemone first appear they are close to the ground, with hardly any stalk; but as the season advances the stalk lengthens, so that a bunch of anemones gathered late in the season forms a prettier sight than one picked when they first appear. Were we carefully to examine day by day the relative position of the stamens and pistils of one of these anemones, it would be found that whereas they were so arranged in their early stage as to prevent self-fertilization, their positions would so change as the season advanced that before the flowers passed away, self-fertilization was made possible, if not absolutely secured.

Many other questions will doubtless arise as we look over a bunch of Alpine flowers.

We may find our answers in the pages of Kerner or in other text books on botany. There is for instance the question of the origin of the Alpine Flora. This is too big a subject to deal with, but some light may be thrown on the subject in the succeeding chapter on British Alpines.
CHAPTER III.

British Alpines.

In that most delightful old garden book "Paradisi in Sole—Paradisus Terrestris," Parkinson relates how he had sent to him by a "Courteous Gentlewoman" living near "Ingleborough, the highest hill in England"—a rare flower—which he calls Elleborine major. In acknowledging the gift he digresses, and in the quaint phraseology which imparts such an added flavour to his book, he suggests that his countrymen should give more attention to the plants growing about their homes, and to those they come across in their travels, for he doubts not that there were many "that doe lye hid and not observed, which in time may be discovered." His book was written about a century before Linnaeus started on his journeys in search of flowers; and the knowledge of British botany amongst Parkinson's contemporaries was as cloudy as that of his own knowledge of the relative heights of English mountains. But his appeal—at least from the latter part of the eighteenth century—found an increasing response, and for many years the Flora of Great Britain has been thoroughly explored, and the plants tabulated according to the districts in which they grow.

The most arduous labours in this work of investigation fell to the men who explored the mountain districts,
ONE OF THE SPURS OF SNOWDON WHERE ALPINES FLOURISH.
more especially the Highlands of Scotland. And nowadays, when travelling is made so easy, and the most remote districts of Great Britain are within a day, or, at most, two days access of London, it is difficult to picture the hardships that pioneers like Don underwent in their mountain tramps. Hence it is fitting in this chapter on British Alpines to give a short sketch of the enthusiastic Scotch gardener and botanist whose researches added so much to a knowledge of the Highland flora, the more so as his Alpine garden at Forfar was one of the earliest in Britain.

George Don was born at Menmuir, Forfarshire, in 1764. From a boy he took a keen interest in natural history; as an apprentice at Dunblane he started his first collection of plants, and later, as a journeyman at Glasgow, he gave one day a week to the botanical exploration of the hill country as far as Loch Lomond. After a varied experience in other parts of Scotland, and in England, he settled down at Forfar in 1797, living on the products of a large garden, and renting several acres of land as a nursery for young trees and rare plants. Some idea of this garden may be gathered from an article in The Scots Magazine, in 1809, by Dr. Neill. "It is," he writes, "in alpine plants and in hardy perennials and annuals that the Forfar garden excels. The garden is situated on a bank which slopes down to the lake of Forfar, not far from the town; and it fortunately includes a great variety of soils, from dry to peat bog. No place could be found more favourable for alpines and aquatics, which are in general found to be of rather difficult cultivation, but which
flourish here as in their native habitats. . . To give some idea of the extent of the collection, I shall mention the number of species of several genera, which are at present growing in the garden. Of the genus *Veronica* there are fifty-five species, of *Salvia* fifty species, *Campanula* forty-four, *Allium* forty-four, *Saxifraga* forty-six—some of the rarest ones as *S. caesia*, *S. petraea*, *S. rivularis*, etc.; *Dianthus* about twenty species, *Cucubalus* thirteen—being the whole ever cultivated in Britain; *Silene* nearly fifty, *Fumaria* fourteen, the genera *Ononis*, *Lathyrus*, *Vicia*, almost complete, *Astragalus* forty species, *Trifolium* no fewer than sixty-nine, *Hieracium* forty-four. It were needless to enumerate more. The botanist will form a due estimate of this collection on being told that he may see here upwards of sixty species of *Carex* flourishing in great perfection."

This extract shows what a remarkable collection of plants Don had got together, and also how well his garden was stocked with mountain flowers. There is no doubt that the plants of his native hills were fully represented, and his home at Forfar was at the gates of the domain of the Highland flora. The mountains of Forfar and Aberdeen were his favourite hunting grounds, though his wanderings extended to the Moray Frith in the north, and to the island of Skye in the west. So absorbed was he in his pursuit of plants that he lost count of the days, and there is a delightful story related of how he turned up at a Highland manse "laden with specimens on a Sabbath morning as the occupants were going to kirk. There
he met his friend the minister, and asked him 'What day ist? Fast or Sabbath?' He got his answer, and replied, 'Man, I have lost count, but if I had my hands and face washed I would gang to the kirk too.' He was shown to a bedroom for this purpose, but when Mr. Muir, the minister, went to call him he found him fast asleep." Such wanderings with their continual exposure to storm and rain, were enough to sap the strongest constitution. His excursions in 1813 brought on illness which, through neglect, terminated fatally, and he died in January, 1814.

There was at one time a disposition to treat Don's plant records with suspicion. Some of his critics waxed sarcastic about his reputed finds; one critic even suggested that one of the greatest of his discoveries, *Lychnis alpina*, was sown on the mountain where Don reported it as growing. In this instance time has proved that it was the critic who was wrong, and the flower-hunter who was right; and the result of a careful investigation of Don's records, made by Mr. G. C. Druce, shows that his errors are far fewer than was generally supposed, and that out of the large number of his reported observations there are only about a dozen in which he made mistakes.

Passing on from this indefatigable explorer of British Alpines to the plants themselves, we find that they are distributed along the mountain ranges from the far north of Scotland to the Snowdon group in Wales. Their headquarters are in the Grampians; and the highest hills of Aberdeen, Forfar and Perth are the most prolific in the abundance and variety of species. The
total number of British Alpines depends on the system of classification followed by the counter; if he adopts that of Bentham's "Handbook of the British Flora" it will run to a hundred or so; if he adopts that of the "London Catalogue of British Plants," the divisions of some genera like Rubus, Rosa, Salix, and especially Hieracium will considerably increase the number. Indeed, the botanist who seeks to puzzle out the hundred species of hawkweed which "The London Catalogue" enumerates—to say nothing of the dozens of varieties—is apt to say that there is a different Hieracium for each highland mountain. Many of the plants have a wide distribution, and above an altitude of 2,500 feet, they form the chief vegetation of the mountain side. One by one they disappear as the summits of the highest hills are reached, till there are less than a dozen above the 4,000 feet line. Mr. Hewitt Watson has enumerated the species seen on Ben-mac-dhu and on Ben-na-Bourd—two of the highest highland mountains; and he records that six species only were growing on the summit of the former,—viz., the Mossy Campion (Silene acaulis), the Dwarf Willow (Salix herbacea), two rushes, Luzula arcuata and Luzula spicata; one Carex, C. rigida; and one grass, Festuca vivipara. Some idea of the relative altitude attained by other plants may be gathered from another list which records the Ling (Calluna vulgaris), at a height of 2,690 feet; the Juniper (Juniperus communis), 2,660 feet; the Cross-leaved Heath (Erica tetralix), 2,370 feet; and the Sweet Gale, at 1,400 feet. Here it will be noticed that some of the plants, abundant on the moors, and at times found
GENTIANA BRACHYPHYLLA
AND PRIMULA FARINOSA.

See Chapters VII. and XI., Part IV.
almost at sea level, climb up to the region of the British Alpines; and in the same way some of the latter occasionally descend considerably below their normal altitude. And here it may be well to point out that altitude is not the sole feature in determining the presence, or otherwise, of our native Alpines. That they should decrease in numbers as they pass over the border into Cumberland, and again into Wales is natural; but there does not at first sight appear to be adequate cause for such a difference between the higher hills of Carnarvonshire and of Brecknockshire. The scantiness of the flora of the Brecknock Beacons is in striking contrast to that of the Glyders; but whereas the latter have an abundance of stone-strewn surface, with hollows where the winter snow can lay long, and with corries and rivulets, the former are covered with grass almost to the top, with few springs and hardly any crags. It is on the ledges of rocks down which the water trickles, that the flowers grow in the greatest luxuriance; and on the hills where the mists gather, and the moisture from them keeps the plants well watered. Geological formation also plays its part, and those rocks that more easily disintegrate have the richest flora; and hence the rocks of the Breadalbane range provide a richer field for the botanist than does the monarch of Scotch mountains with its bewildering mass of granite boulders.

Most of the chief families of British plants have one or more representatives of Alpines; in a few cases, the mountain plants form a considerable proportion of the number, and in one at least—that of the Saxifrages,
ALPINE FLOWERS AND ROCK GARDENS.

the Alpines predominate over the lowland species. The Buttercup family is represented by the Globe Flower (*Trollius europæus*) the Pink family by the Mossy Campion (*Silene acaulis*), the Mossy Cyphel (*Cherleria sedoides*) and two or three species of *Arenaria* and *Cerastium*. In the Rose family there are sub-species of the dog rose; the Mountain Avens (*Dryas octopetala*), some *Potentillas*, and brambles. The Honeysuckle is represented by the trailing *Linnaea*; the Dogwood by the Dwarf Cornel (*Cornus suecica*). The great family of Composites has humble members like the Alpine Erigeron (*Erigeron alpinus*), and the Dwarf Cudweed (*Gnaphalium supinum*), and tall plants like the Hawkweeds, and the Alpine Sowthistle (*Mulgædium alpinum*). And in the catkin tribe which gives us our chief forest trees, the willows of the lowlands, are replaced by dwarf shrubs, one of which, the Alpine Willow (*Salix herbacea*), is only a few inches in height.

Some of these mountain plants are abundant, and have a wide distribution; there are others that are confined to limited areas. For example, the Spring Gentian (*Gentiana verna*), is only found in two or three English counties, and in one district of Ireland. Its relative the tiny *Gentiana nivalis* has its abode on a few Highland hills. The Catchfly (*Lychnis alpina*), discovered by Don is unknown elsewhere in Scotland than in the locality in which he found it; a colony on one Cumberland fell is its only other habitat in Britain. Three handsome mountain clovers, *Astragalus alpinus*, *Oxytropis campestris* and *Oxytropis uralensis*, may be
found by the botanist who knows their home in the counties of Forfar and Aberdeen, but with the exception of the third, which occurs in a few more stations, he will search in vain for them elsewhere. Again, the May Lily (*Maianthemum convallaria*), of which the creamy spikes of flowers are such a feature in the pine woods of Norway is only found in one favoured spot on a Yorkshire hillside; the Ladies' Slipper (*Cypripedium Calceolus*), most handsome of orchids, has kept its place in two or three remote woods where it is carefully preserved. Two other rarities are *Lloydia serotina*, and *Menziesia caerulea*—the former, a small bulb with white petals which contrives to hold its own amidst the rocks of Wales, finding, let us hope, a more secure refuge than Llewellyn and his followers; and the latter, which has survived the forays of lowland nurserymen, maintaining its small colony on one of the bens of Athol. To the flower-hunter, the mere recounting of names will call to mind memories of tramps over moor and crag, perchance to the high rocks where the Alpine Forget-me-not (*Myosotis alpestris*), with a blue deeper than that of its wood or riverside relatives, was seen; or the broad mountain top, where near lingering heaps of snow the Dwarf Cudweed (*Gnaphaliun supinum*) was gathered—a plant insignificant in appearance, yet possessing a charm on account of its kinship to the Edelweiss of the Alps.

Many other species might be described, but we must confine ourselves to the two families of the Saxifrages and the Heaths. The former is the most characteristically Alpine group in our native flora; the latter
ALPINE FLOWERS AND ROCK GARDENS.

includes the flowers that give such a rich colouring to the moors, and provide such a plentiful supply of berries. Of the thirteen species of Saxifrages figured in the book of "Illustrations of the British Flora," the accompaniment to Bentham's handbook, two-thirds may be grouped amongst the Alpines. Reference has been made to the Purple Saxifrage (Saxifraga oppositifolia,) and of its beautiful clusters of purple bells in the natural rock gardens of the Alps. It is equally at home in the corries of Wales, the Lake District, and Scotland. Near it and in more open situations may be seen the Mossy Saxifrage (S. hypnoides), with white flowers and feathery foliage, a plant that has several varieties, and makes a brave show in many gardens. The Yellow Saxifrage (S. aizoides), and the Starry Saxifrage (S. stellaris), love the banks of mountain rills, and the yellow to orange flowers of the one and the white spotted petals of the other add much to the beauty of many a rivulet and burn. They have near relatives, the one in S. Hirculus, and the other in S. nivalis, which are less widely distributed; and then there are three rarities: S. caespitosa, with crowded root leaves; S. rivularis, the lowly stems of which root where they touch the ground; and S. cernua, with small bulbs in the axils of the upper leaves. One highland mountain is the sole British habitat of the last of these, and a small number of hills in the Grampians of the second one.

If the Heath family is less exclusively confined to the Alpine group than the Saxifrages its chief members—the Ling (Calluna vulgaris), the Fine-leaved Heath
SAXIFRAGA LANTOSCANA.
Photo by C. P. Raffill.
BRITISH ALPINES.

(Erica cinerea) and the Cross-leaved Heath (Erica tetralix) are conspicuous on the moors, and on the lower mountain slopes. With them are blue-berried Bilberry, red-fruited Cowberry, Bearberry and Cranberry, and black-berried Bog Whortleberry, and Alpine Bearberry. These dwarf shrubs vary not only in the colours of flowers and fruits, but in their foliage. In the Bilberry (Vaccinium Myrtillus), and Bog Whortleberry (V. uliginosum), the leaves fall as winter approaches; with the Cowberry (V. Vitis Idaea), and Red Bearberry (Arctostaphylos Uva-ursi), they are evergreen. In the Alpine Bearberry (A. alpina), the foliage undergoes a rich autumnal colouring, and hillsides in northern Europe are dyed with their flaming tints.

The Pyrolas form another group of the Heath tribe. There are five species, and at first sight their delicate white bells seem to betoken a relationship to the Lily-of-the-valley rather than to the small, brilliantly coloured bells of the heaths. It is amongst the mosses of the pine woods that they find their home, and in the forests of Norway all five species may now and again be found in close proximity.

From the standpoint of colour British Alpines suffer in comparison with the flowers of the high Alps. They fall far short in variety of colour, and in impressiveness, unless the three common Heaths are classed with them. If these are counted then over a wide landscape no Alpine pastures can equal in brilliant colour the moors of Britain when the Fine-leaved Heath and the Heather are in their prime. Apart from them the colour effects are more subdued. Perhaps the nearest approach
that we get is in some of the higher pastures of the dales, which are starred with the deep pink of the Birds-eye Primrose, or with the yellow and purple bloom of the Mountain Pansies. For more individualistic effects Purple Saxifrage, Mossy Campion and Yellow Saxifrage are equal in richness of colour to what they are in Switzerland; and no Alpine rivulet can be gayer than a Scotch burn where the Yellow Saxifrage holds sway.

The term British Alpines has been applied to our native mountain flowers in the foregoing pages. It is, however, a term which is not scientifically correct; and should it suggest that this division of our native flora is solely derived from that of the Alps of to-day it may be misleading. The origin of our native fauna and flora is one of great interest. Many have been the naturalists who have sought for an explanation of the problems raised by the species of plants found in Great Britain, and by their distribution. With a few exceptions, the plants are those of the mainland of Europe, and the greater part are the dominant species of Germany, France and the adjoining countries. Our flora, then, is made up of immigrants which have come to us from the continent, just as our islands are peopled by invaders who have come from over the sea. And without pursuing the extremely interesting question of the invading divisions of our plants, we may say that as far as Great Britain is concerned, the Alpines represent the Celtic races, who were centuries ago pushed more and more into their mountain fastnesses by Continental invaders.
For how long a period this struggle has been going on it were difficult to say; but the commencement must have been at the termination of the last glacial epoch. The destruction of plants during that period must have been enormous. As the cold increased in the north, and glaciers covered the greater part of Britain, the plants that had survived would find themselves pushed further and further south. By similar causes the plants of Switzerland would be pushed northwards; and hence there would be to some extent an intermingling of the old Arctic and Alpine floras.

"At the epoch when glaciers attained their maximum dimensions," writes Kerner, "the places now covered by the forests of pines and firs which are so characteristic of the Baltic flora, and by vast scrubs of heath and broom, were occupied by low Alpine plants, which may for the sake of brevity be spoken of collectively as an Alpine flora." "Formerly," he adds, "botanists were of the opinion that this wonderful flora spread southwards like a flowing stream from the Arctic regions at the epoch in question. This view is not, however, in harmony with more recent discoveries. It was based on the erroneous assumption that the flora of the Arctic regions was the same as that of the Alpine regions of Central and Southern Europe." He proceeds to prove that the assumption was erroneous, amongst other points dwelling on the fact that the Alpine flora is so much larger than that of the Arctic regions, that its chief components are alien to the latter; and he ends by saying "there is much more reason for concluding that the scanty flora of the Arctic regions
was in part derived from the high mountain areas of more southern latitudes."

Be this as it may, it seems probable that our British Alpines were the advance guard of the plant army that took up the open ground as the cold moderated, and the glaciers began to shrink and finally to disappear. As the warmth increased, plants which had hitherto been unable to withstand the rigorous climate, would get a footing, and follow in the wake of the Alpines, and that keen struggle which is ever going on between plants, shrubs and trees for the possession of the soil—that greatest of all earth hungers—would assume a new form. Thus the increase of warmth would play a double part with the British Alpines; it would enable them to reach the hills, and to make their way up higher and higher towards their summits; but it would tell fatally on their rear, which would be overpowered by a more vigorous type. And thus as the centuries passed, the Alpines would secure a firm hold on the mountainous districts whilst the intervening lowlands became occupied by the more aggressive species of the central European plain; their lines of communication cut they would live in colonies more and more separated from one another. It was something like the invasion of the English long centuries after, when the land occupied by the older people from the Severn northwards, was broken into three parts by the wedges of conquest between the Dee and the Lune, and between the Solway and the Tay. As the Grampians resisted so much longer this wave of invasion, affording protection to the Highlander
GENTIANA CLUSII
AND PRIMULA LONGIFLORA.

See Chapters VII. and XI., Part IV.
from the men who had subdued the rest of the kingdom, so in the plant world they acted as a barrier against the invaders from the south. Time has been all against them, and the advance of civilisation, bringing with it increased cultivation, has increased their foes.

It is, alas, as a dwindling race that our British Alpines must be regarded. This is the greater reason for them to be accorded protection. The botanist, wishing to make his herbarium complete, naturally desires to obtain a specimen of the rarest of them; and there is the commercial collector who would sacrifice the oldest of the race of British plants in the pursuit of gain. The latter should be warned off by all local authorities; to the former an appeal should be made to leave the root in all cases, and to spare the flowers as much as possible. Surely in an herbarium it is better to see a specimen of a rare Saxifrage or Gentian that has been obtained where it is plentiful abroad, rather than a native specimen taken at the risk of the extermination of the plant in its British home. Let the collector reflect in time, and remembering the following lines of Hugh McMillan, in that delightful book of botanical rambles—"Holidays in Highlands"—spare these rare treasures of our mountains.

"How suggestive of marvellous reflection is the thought that these flowers, so fragile that the least rude breath of wind might break them, and so delicate that they fade with the first scorching heat of August, have existed in their lonely and isolated stations in the
Highland hills from a time so remote that in comparison with it, the antiquity recorded of time is but as yesterday: have survived all the vast cosmical changes which elevated them along with the hills upon which they grew, to the clouds—converted the bed of a mighty ocean into a fertile continent, peopled it with new races of plants and animals, and prepared a scene for the habitation of man! Only a few hundred individual plants of each species—in some instances only a few tufts here and there—are to be found on the different mountains; and yet these little colonies prevented by barriers of climate and soil from spreading themselves beyond their native spots, have gone on season after season for thousands of ages, renewing their foliage and putting forth their blossoms, though beaten by the storms, scorched by the sunshine, and buried by the Alpine snows, scathless and vigorous while all else was changing around."

William Graveson.

*The quotations from Kerner in Part II. of this book are from his Natural History of Plants, translated and edited by F. W. Oliver, M.A., D.Sc.

Since the account of George Don was written a monument to his memory has been unveiled at Forfar; on the occasion G. Claridge Druce, F.L.S., gave an address on his life and work.
PART III
Cultural
ROCK GARDEN IN A WOOD, KENT.

Photo by E. J. Wallis.
CHAPTER I.

How to Form Rockeries.

In proceeding from a survey of the characteristics and habitats of Alpine plants to practical matters we turn naturally to a consideration of the best way of constructing rockeries.

We have pressed home the paramount importance of getting a display of beautiful flowers, and have pointed out that in some cases the stones have undue prominence. But this is not to say that rockeries may be flung together in any sort of way, provided the plants have plenty of room and a sufficient supply of suitable soil. The choice of material, and the manner in which it is utilised, have a considerable bearing on a successful result.

It is not until an amateur rockery-builder finds himself with a heap of stones on one side and a mound of soil on the other that he realises how much art there is in bringing them together in such a way that they not only provide abundant accommodation for the plants, but look really natural and finished in themselves. His native wit may carry him through, but it is likely that he will have wasted a great deal of time in experiments before he sees a result that satisfies him.
There is always one simple resource open to the amateur rockery-maker, and that is to make a plain mound of soil, and place the stones in it in a series of ridges, with cross pieces at irregular intervals, some six, some twelve and some eighteen inches apart, to form pockets of different sizes. This is perfectly straightforward, and may very well settle the construction of the first section of rockery. What it really results in is a rock bed. Instead of a flat bed of Tulips or Begonias, the whole area of which we have beneath our eyes from one point of view, we have an elevated bed which must be examined from different positions. It is less brilliant than the Tulip bed, but more varied. It is not, so to say, gulped, but taken in savoury morsels. It is something that we linger over. We have to walk round it to take in all its beauty, and every step brings out some new feature of interest.

The modest Alpine-lover should not despise a plain rock-bed, especially if his garden be very small. Through its means he will be able to add a new and charming feature to his garden, and to gain experience and confidence in the utilisation of Alpines. Rock beds break the uniformity of a garden. They are not only interesting in themselves, but they relieve a flat surface. Flower gardens in general would be all the more interesting and attractive for the rapid multiplication of rock beds.

It cannot be said, however, that stone-lined heaps typify the most beautiful examples of natural Alpine scenery. There must be a considerable element of make-believe in connection with a mound that we can
see over, and which we can walk round in the course of a dozen paces. The construction is pretty, pleasing—a genuine acquisition to the garden—but it is not perfect. We see something wanting, but we did not enjoy making it the less because through it we felt our way to something better.

Before we can rest entirely satisfied with our efforts at Alpine gardening we have to construct a rock garden which completely fills the eye when we stand at its base. We cannot look over it to a line of Geraniums or a belt of Marigolds, which (in the absence of a capacity for make-believe that wipes them out of existence) are apt to spoil the picture. Such a construction is not impossible even in a small garden, nor does it necessitate a large number of half ton boulders.

The most perfect illusion of Alpine gardening is that in which the ground rises in a series of tiers, not geometrically exact like a flight of stairs, but irregular, indented here, projected there, and terminated in a ridge beyond which only the sky or distant landscape is visible. Such a scheme causes alarming visions of huge rocks to arise, and admittedly it is in aiming at this ideal that some of the worst errors are made. But great masses of thick rock are really out of place in this class of construction. Flat slabs weighing a few pounds each are the best, indeed, old, broken-edged paving stones may be made good use of, for if plants are put in the crevices between them they are robbed of all towny suggestiveness. They should, of course, be bedded loosely in soil, not set with cement.
Can the Alpine gardener, striving to grasp the principle of this class of rockery, imagine his mound to consist of a series of terraces or platforms instead of a regular slope? Can he see these terraces irregularly faced and floored with flattish stones? Can he imagine plants grouped in colonies on the terraces and sprawling over the precipitous or sharply sloped faces? If so, he may proceed to practical work with every confidence.

He will require more space than is needed for a mere mound, but it is not necessary to lay out sufficient ground to allow of the top terrace being above the level of the eye, because a colony of Heaths or a cluster of small Pines may be planted there. The width of the terraces may vary with the taste of the worker, but it is not necessary to have a greater average width than two feet. The height may range from a foot to eighteen inches.

An interesting and effective plan of building rockwork is to form a series of what I may term bays in a large mound. That is to say, instead of having a plain rock-bed on the one hand, or a terraced rockery on the other, form a mound with a series of deep indentations. The edges of the bays will form ridges, and may be set with stones, in the interstices of which plants will be put. A fairly large group or colony of some favourite plant can be planted in the widest part of the bay, and groups of stones, with other plants between, may be set at the back.

Always an attractive way of growing Alpine plants, this plan lends itself admirably to a combination of mountain and bog plants. It is to be particularly
GENTIANA LUTEA
AND GENTIANA PUNCTATA.

See Chapter VII., Part IV.
HOW TO FORM ROCKERIES.

recommended when the site to be dealt with is low, as then it will probably be easy to introduce water. This can be retained by puddling or concreting, in which case Water Lilies can be grown. If the ground is merely boggy, moisture-loving plants other than real aquatics may be cultivated.

Something approaching the ridge and bay system may be seen in the rock garden at Kew, which has a rather low site. Looking into a bay gives a pleasing illusion of distance. It tends to fill the eye more than a convex outline.

The larger the area available, the deeper the bays may be made, and the deeper the bays the longer the ridges. Before ever a spadeful of soil is turned the amateur may, if he likes, get an idea of the outline of a ridge-and-bay bed with the aid of a few pegs and a length of clothes-line.

Once upon a time boggy patches were regarded as a nuisance in a garden, now they are seized upon with joy. The old-time gardener, with his tender bedders, did not know what to do with them, and generally left them alone, to produce as choice an assortment of docks, crowsfoot, and other weeds as they were capable of producing; the modern gardener, well furnished with hardy plants, has no difficulty in turning a bog into one of the most beautiful features of the place. He sets lines of flattish stones in it, so that it can be crossed in comfort, and plants it with beautiful semi-aquatic and moisture-loving things.

Whatever plan of rockery-construction the flower-lover chooses he will be wise to bear in mind that he
cannot have a really satisfactory construction without a fairly good depth of soil and firmly-set stones. In a sharply-pitched mound and with loose stones there will be constant trouble from soil crumbling or being washed down, sometimes bringing stones with them, and leaving the plant with a draggily and hopeless aspect.

The steeper the pitch the closer the stones should be set. It might be thought that if the stones are packed close together the interstices will be so small that plants will be unable to establish themselves. This is by no means the case. Such pretty things as Aubrietias, Houstonia caerulea, Snow-in-summer (Ceras-tium), Sempervivums, Saxifraga hypnoides, Corydalis, Golden Drop (Onosma Tauricum), Thrift and Valerian will be happy in very small crevices. Some of them, indeed, may spread so fast as to need reduction. It follows from this that if the amateur has a very steep bank he may, if he likes, turn it into a rock garden by facing it with stones packed close together, and thrusting small bits of selected plants into the interstices. The chances are that the result will astonish him considerably, and that he will have a feature of such beauty as will vie with the most attractive parts of the garden.

These rock walls, built with loose stones, want a little supervision after a protracted spell of heavy rain, as occasionally one or two stones near the base will get loose and slip out, endangering the stability of those near them. Such weak patches should be taken in hand at once, and made good. A little earth should be scraped out, and the stones rammed well in. Whether stones be set in a wall, on a terrace, or in a
HOW TO FORM ROCKERIES.

ridge—whether, indeed, they are placed on a flat or on a precipitous surface, they should be bedded firmly in. No stone should be left loose and insecure.

If it be desired to combine a rockery with a pool, a raised "rim" of stones may be set round the edge of the water. If the ground is sloping, the stones may be carried up at the back of the pool. The Alpines, amid the stones, will have a very happy and natural look near the water. Forget-me-nots will luxuriate close to the edge, and long streamers of Rock Cress will dangle towards the pool.

On a sloping site water for the aquatics can only be retained in summer by artificial means. The soil must be puddled with clay or else sealed with concrete. Puddling is a slow, hard and "messy" process, and it necessitates a supply of clay, which must be chopped into small pieces and made into a mortar with water. It then requires to be well beaten or trodden to a thickness of at least six inches. On the whole it will be easier, pleasanter and perhaps little more expensive to form a concrete by adding two parts of powdered lime and one of Portland cement to six of gravel or stone chips, and plastering it on to the bottom and sides after making the soil smooth and firm. This sets into a hard crust impermeable by water. If the concrete is carried over to make a wide rim it will form a good base for the first tier of stones.

Wherever possible the flower-lover should find accommodation for a few hardy aquatics as well as for a collection of Alpines. When the early rock plants are over the water plants will be full of beauty.
CHAPTER II.

The Best Stones and Soil.

The cultivation of Alpine plants is, we have agreed, a delightful form of gardening. By its means we are able to add a new and extremely beautiful feature to a home. Let those who are beginning to experience the very human weakness of getting tired of the house they live in without being able to give a good reason why, add a rock garden to its surroundings, and their discontent will disappear immediately. The place will enjoy a new lease of favour. But it is useless to make pretences. A rockery cannot be established as simply as a bed of carrots. A man cannot buy a few penny packets of seed, scratch about for an hour with a rake, and see a complete Alpine garden arise.

It is obvious that to form a rock garden we must have stones, or something to serve as a substitute for them. Rock is not always easy to get, or suitable substitutes easy to find. This fact has more than once caused a slight hankering after a rockery to develop into a consuming passion for one. When a man says he thinks that he would rather like a rockery, and is told that he cannot have one because there is nothing to make it with, he generally becomes possessed with an almost overwhelming desire for a rockery. An
LARGE ROCKS WITH ALPINES GROWING DOWN THE FACE.

Photo by E. J. Wallis, Kew.
Alpine garden, and nothing less, will satisfy him. Many a fair flower-lover has extracted a rock garden from a half-hearted husband by a knowledge of masculine peculiarities.

The stone question is one that is well worthy of careful consideration. It must be taken into account at the very outset. We have agreed that it is worth while to try to put the rockery together in such a way that it looks intrinsically pleasing and natural, while giving full acknowledgment to the predominance of the flowers. Now, one cannot very well construct an artistic rockery of any odds and ends which happen to be handy. The staff of a country railway station will sometimes give quite a cheerful appearance to a platform garden by whitening some large clinkers and planting Rock Cresses among them, but although we admire from the passing train, we should not be satisfied with clinkers, whitened or not, in our gardens.

There is a way of getting rock which has the merits of simplicity and complete efficacy, and it is to buy it through the large hardy plant firms. It seems odd to go to a nursery for stone, but the fact is that the more important firms who deal in Alpine plants are so often asked not only to supply the flowers but also to construct the rockery that they have contracts with quarry-owners, and in some cases actually own quarries themselves. These people know exactly what is required. They know the size, shape and texture that is most suitable. If the prospective rockery-builder tells them what class of construction he wants:
whether the rock-bed system, the terrace system, or the ridge-and-bay system, they will supply him with appropriate material. This method of getting stone is not, perhaps, the cheapest, but it is eminently safe; and after all an extra shilling or half-crown per ton may not be a vital consideration.

An amateur who is buying stone without expert guidance should take texture, size and shape into consideration. A soft stone is not suitable, however well it may look at first, because after a winter of hard frost it will break into chips, and even crumble to powder. It is necessary to be particularly careful with limestone on this account. No stone varies more than this. Some kinds go in a year or two, others are quite durable. An idea of its probable stability may be obtained by examining the stone. If it has a dull, powdery appearance it should be rejected, but if bright and sparkling it may be used. Limestone should be regarded with particular suspicion in the case of town gardens, as it is readily affected by sulphuric and other acids.

In some counties limestone is very abundant, and there is a natural temptation to use it if it is quarried within a few miles, as the cost is low. It may be possible to get it right on to the place for seven or eight shillings a ton. One great thing in its favour is that most plants like it. The roots cling to it with an intimacy which suggests active favours. Some Alpines are more markedly lime-lovers than others, but there are few that do not appreciate limestone.
THE BEST STONES AND SOIL.

Good gardening may be expected in districts where sandstone is abundant. Sandstone may be said to be compacted sand, and quartz is the principal ingredient. It is enormously hard, and is therefore not crumbled by frost like limestone. The white and yellow sandstones are the hardest. In fact some of them are used for grinding-stones and firestones. The porous sandstone of Devonshire and the old red sandstone of Herefordshire are good garden stones. Reddish ferruginous sandstone may always be bought with confidence if the opportunity of acquiring it occurs. It has an excellent appearance, is durable, and suits almost all kinds of plants remarkably well. It is often purchasable in flattish, smooth-edged pieces, and in such a form presents almost ideal material for rockery making. Gray argillaceous or calcareous sandstone is neither so hard nor so pleasing in appearance as red stone, but it is quite suitable and it is particularly useful for some classes of rockwork, as it comes in flattish slabs.

What is known as "Derbyshire stone" among many hardy plantsmen is a carboniferous limestone, and it is in every way admirable for rockeries. While less durable than sandstone it is relatively hard, and most plants like it. Those who live in or near districts where this stone is quarried should never look beyond it, as it will not only serve their purpose admirably, but may be bought cheaply. It is only when it has to be transported to a considerable distance that the cost becomes serious. The question of freight is, indeed, the vital matter in connection with rockwork.
All stone is cheap at the quarries, but the freight may double or quadruple the first cost.

There is one advantage in buying stone locally—a personal inspection can be made, and influence exercised to get it of a suitable size and shape. It is only in very large constructions that heavy blocks are wanted, and when ambitious work is being done it will be wise to employ experts to carry it out. The average rock gardener should work with rather small stones. In "feeling the way," it is convenient to have stones that can be handled easily, because then change after change can be made, if necessary, until just the right effect is secured. With stones exceeding a quarter of a hundredweight much shifting makes the task very laborious and fatiguing. It will probably be found that good effects can be secured with stones weighing less than half this, especially if they run flattish, and as the work goes on there will be a brisk demand for stones weighing only a few pounds each.

The rounder the rock runs the less suitable it will be in the main. Rounded stones are not easy to make firm. Rectangular blocks, on the other hand, can be bedded securely with very little trouble, and generally speaking the flatter the stone is the more readily it fits in with the scheme of work. It is not suggested that paving-stone shape is the ideal. Dressed stone would look too stiff. It is merely hinted that stone which tends to flatness rather than roundness is the most suitable.

When rockwork is being built over water, some of the stones may be fitted so that they overhang the
GENTIANA PUNCTATA.
AND RHODODENDRON FERRUGINEUM.

See Chapters VII. and XIII., Part IV
edge. Thickish stones with a flat base are the most suitable for this purpose.

In the body of the rockery it should be a cardinal point to set the stones in such a way that rain can find free admission between them.

Those who have rock walls, which potentially present the driest conditions under which Alpines are likely to live, are pleasantly surprised at the vigour of many of their plants, and there can be no doubt that plants which are able to send their roots well back into the soil of a bank are capable of getting along with very little help from rain, most of which flies off from the face of the stones. Where, however, the plants have no such extensive root run they will be helped by all the rain they can get in summer. In winter some of them would get too much if glass was not fixed over them to throw it off.

Some Alpines will grow in anything—nay, they will grow in a crack or crevice in a large stone, or on its face where there is no soil at all, but others are not equally accommodating, and in view of the fact that practically every species is the better for good soil it is worth while to consider whether the natural soil of the garden, should it be available, is good enough. When a considerable body of soil is wanted for a rock garden it can only be drawn from the garden by reducing the general level or making a hollow. Given a fairly large kitchen garden, the soil of which has been trenched and manured, thus raising its level considerably, a few cartloads could perhaps be withdrawn without spoiling the subsequent crops.
If aquatics are wanted, and there is no natural hollow which could be puddled or lined with concrete in order to form a watertight pool, an excavation can be made for the double purpose of providing soil and forming a receptacle for water. If the workmen go down three feet—and that is a very suitable depth—they will bring up a good deal of soil for every square yard of surface that they break; in fact, they will remove a quantity equal to a cartload. Should the soil be either very light on the one hand, or very heavy on the other, it would be prudent to import some medium loamy soil to serve as a top layer for special plants. Even six inches of such compost is a great help, as it gives the plants a good start.

It is not necessary to dwell at great length on the question of soil, because the majority of Alpines will thrive in ordinary earth, and most certainly there is no need to alarm the amateur of slender means by hanging a heavy outlay for compost over his head in addition to the charges for stones and plants. It should be remembered, however, that loam from decayed turves is a most useful standby.

Granite chips or crumbled limestone may be sprinkled round plants that suffer from damp in winter, and may also be used freely for the strong-growing plants, which in rich soil would spread too much. When, as in my own garden, Rock-cresses, Snow-in-summer and some Rockfoils spread into broad masses in poor, chalky soil entirely devoid of humus, there is no difficulty in imagining what would happen if they were provided with rich soil. They would
spread to such an extent that weaker things would be smothered. There are certain plants, undeniably beautiful and valuable, which so dazzle the grower by their brilliant masses, that he is apt to overlook their deleterious effect on less vigorous neighbours.

In the subsequent remarks on select Alpine plants, hints are given with respect to their habit, vigour and soil likings. These, taken in conjunction with the foregoing general observations, should enable a balance to be struck between the strong and the weak.
CHAPTER III.

Planting and Propagating Alpines.

When the flower-lover sees, in examining a rockery, plants clinging to the very face of the stones, and rambling over them as moss will ramble over the bole of an old orchard tree, he realises that Nature can do a great deal more than he in establishing plants. She learned the business before man appeared on the earth at all, and she will very likely be engaged in it long after he has left. Nevertheless, when a rockery is made in a garden the flower-lover will not leave Nature to choose the plants for covering it, and he will take care to keep it well in hand from its very inception. Otherwise, he will find it overgrown with coarse plants, and in a year or two many of his choicest plants will have perished.

There are no more beautiful spring flowers than the Rock Cresses, and the Aubrietias in particular are charming and valuable to a degree. But their beauty largely consists in their habit of throwing out long, blossom-covered streamers, and this renders them dangerous companions for delicate things, which often suffer severely from being over-hung, apart altogether from the fact—by no means a negligible one—that the cover affords a congenial home for
POLEMONIUM CONFERTUM.
Photo by E. J. Wallis, Kew.
slugs. Arabises are even more luxuriant that Aubrietas. Bearing this in mind, the planter should not put the Rock Cresses in positions near the top of a rockery where they can spread downwards over choice plants. It matters little how poor the soil may be: a couple of years will see them broad, widespread masses, and if other plants are not to suffer, and slugs to enjoy a perfect covert, they must be dressed back. It is safer to put them on lower sites, where they can spread over the face of large stones and do no harm to anything, or give them a separate section.

The first thing, then, in putting in rock plants is to take into account the habit and vigour of the plants. A dense, low, clinging little plant like *Hutchinsia alpina* should not be put a foot below the Snow-in-summer, and both left to look after themselves. The latter is a glorious plant, and makes the most beautiful snowy masses, falling like a silvery cascade over the rocks, but it is an even worse encroacher than the Rock Cresses. One might fancy that it dripped plants, for fresh ones come up all around and beneath it, so that beautiful as it is in its snowy purity, and with its exquisite silvery foliage, it actually becomes almost a pest. The Rockfoils and Stonecrops (*Sedums*) do not throw out the long, dependent streamers of the luxuriant trio named, but many of the species spread laterally into broad, close masses, which are inimical to less virile kinds. The perennial Candy-tufts (*Iberises*) may be quoted as another instance of really beautiful and desirable plants which are apt to prove too vigorous on small rockeries.
The flower-lover will not, of course, exclude Rock Cresses, Snow-in-summer, Rockfoils, Stonecrops, Houseleeks (Sempervivums) and Candytufts from his rock garden because they are given to trespassing. Plants like these, free in growth, charming in blossom, pretty in habit and full of vitality, have a value of their own. It is simply a case of finding the best place for them. There may be some flower-loving reader of these remarks who is in the happy position of having more than a small made rockery. He may have natural rocky declivities and slopes, giving much freer scope for effective planting than a special construction. Here cheap, showy, virile plants which can be bought or raised in quantity are a real boon. Where the area and the configuration of the ground permit it is worth while to take them into special consideration, and have whole waves and swells of flowers. By placing small groups of stones to form mounds, colonies of special plants may be established, and such effects are produced as one sees in Nature.

This kind of rock gardening is essentially different from the formation and planting of "rockeries." It is gardening for general effect, just as bedding-out, and planting with flowering shrubs, are. The difference is that its effects conform more closely to those seen in Nature, where the colony system is general. Where a plant feels itself at home it spreads if it has sufficient inherent vigour, and therefore we find groups. No doubt all plants were originally annuals, increased only by seeds; then some kinds learned to form offsets, or buds on their roots, thus acquiring a
new method of increase. Where we find colonies a natural vegetative system of propagation has often been at work, but many perennials increase themselves by seeds. Thus, if the flower-lover examines the huge tufts of Rock Cresses and Snow-in-Summer, often spreading over an area of several square yards, he finds that they have one rootstock. They have not increased by offsets. The young plants around them have sprung from dropped seeds.

Nature-planting carries its own commendation. While the flower-lover is willing to play the philosophic part of finding interest and pleasure in a small rockery and single plants if he has nothing better, he will scarcely hesitate to take advantage of any local circumstances with which he may be favoured. He is quite ready to garden imperially. Nothing will rejoice him more than to have the opportunity of forming charming colour-pictures, affording some slight reminder of the glories of those which he meets with in the Alps and Pyrenees. There are many gardens in which Alpines could be grouped. If the site is dry and the soil poor, the stronger kinds must be grown, but with moisture and suitable soil species of more delicate habit may be chosen. Wherever a steep bank exists an opening presents itself for liberal treatment. It is not necessary to cover it with stones arranged in tiers, and so make a formal "rockery" of it. That would entail an immense amount of labour, plants and expenditure. But a few groups of fairly large stones may be formed to give the desired diversity of contour.
As most of the rock plants flower in spring it is well to plant them in autumn, in order to give them a good opportunity of getting sufficiently well established to bloom really well, but they may be planted at almost any period of the year, even in summer, except on very hot, dry sites. It would not be safe to put them into parched soil, and leave them unwatered and unshaded, with the sun to beat down upon them fiercely. One is often surprised to find what the plants will put up with. One thrusts a tuft with a little moist soil squeezed round the roots into a crevice in an almost vertical wall or bank, where there hardly seems room for a mouse to turn, in summer, and finds that it takes hold, makes itself thoroughly at home and begins to spread. But if planting in such circumstances it is wise to give the plants a daily syringing or hosing for a week, in order to keep them fresh, and give them an opportunity of making roots. A great many of the choice Alpines are grown in pots by tradesmen in order to facilitate planting in late spring and summer.

Where it is a question of planting groups, the question of cost becomes a consideration, and home propagation has to be considered. Several useful plants can be raised in quantity from seed at a trifling cost, and among them may be named Rock Cresses, Gold Dust (Alyssum saxatile and compactum), Alpine Forget-me-not (Myosotis alpestris), Snow-in-summer and coloured Primroses. Every large seedsman sells these, and there is no trouble in raising them, even in the open ground, although I prefer cold frame
PRIMULA ACAULIS.

See Chapter XI, Part IV.
culture, particularly for the Rock Cresses and Primroses. It often happens that a frame becomes vacant in May, and all that is necessary is to prepare a fine, gritty compost, moisten it and sow. By sowing thinly broadcast the trouble of pricking-off could be saved, but experience teaches that the sowing is rarely done thinly, and what is worse, in the pressure of other work thinning out is overlooked, with the result that the plants grow into a tangled mass, and are very poor material for transplanting when autumn comes. This being so, it is advisable to sow in drills in boxes. There is a feeling that plants sown in boxes are more important than those sown in the ground, and consequently they receive more regular attention. It is, too, essential to prick them off, and this enforced treatment is greatly for their good, as when put out in the garden, a few inches apart, they have room to develop into sturdy stuff.

Coloured Primroses may be sown a little later than the others, in order to get the current season's seed, which should be asked for specially. The Primulas come slowly from old seed, and those who sow it should be prepared to keep their pans and boxes in hand for several months.

Fresh Rock Cresses ought to be raised annually as regularly as Wallflowers and Sweet Williams. It is apparently a very easy thing to propagate old clumps by division, but when the flower-lover attacks them he finds that the spreading mass of growth which he proposed to divide really consists of loose tufts on long fibres springing from a common root-
stock, and that sub-division is practically impossible. On the other hand seedling plants put out in rows nine inches apart in summer from spring-sown seed make splendid little clumps by autumn, when they will come in very useful for naturalising and for setting amongst bulbs. They will begin to grow fast directly the grip of winter relaxes, and they will keep on growing until early summer. As the new growth flowers as fast as it forms, there are soon broad masses of bloom, all the result of a few seeds.

The double white Arabis is propagated by taking off young side growths with a few fibres, and inserting them in moist, sandy soil as cuttings. They may be rooted out of doors, but it is better to put them in boxes of gritty soil in a frame, because then they can be kept quite under control, and given such attention in the way of shading and watering as is needed. This is an extremely useful plant, and one which ought to be grown in quantity.

When the flower-lover has “got his hand in” at raising hardy plants from seed he will probably be so impressed with the merits of this method of propagation as a means of getting large numbers of plants at a low cost as to be desirous of extending it. There is no reason why many beautiful things should not be increased thus. In the selections of Alpine plants given in a later chapter a list of kinds that come readily from seed is included. Although some might be sown out of doors there can never be any mistake in sowing in a cold frame, using pans (wide, flat, earthenware saucers) or shallow boxes. A soil which
PLANTING AND PROPAGATING ALPINES.

contains a liberal admixture of leaf mould and abundance of sand is best, and it should be of fine texture and agreeably moist. A quarter to half-an-inch is deep enough to sow. A square of glass may be placed over each receptacle and shaded with paper, but both should be dispensed with after germination has taken place. In the absence of frame accommodation seed may be sown in pots or pans and placed on a shelf, or otherwise near the glass, in a greenhouse.

In places where there is no glass of any kind a special bed should be prepared in the garden. The soil must be broken up thoroughly and crumbled into a perfectly fine state. It should be soaked with water a few hours before sowing. The seed may be sown in drills far enough apart to permit of a hoe being used between them to keep down weeds. Timely attention should be given to thinning and prickling out.

Flower-lovers will not find the raising of hardy plants from seed irksome; on the contrary, they will find a great deal of pleasure in the close intimacy which they will form with the plants from their earliest stages. Moreover, when the plants are raised in a greenhouse active work can be kept up even in bad weather, which brings outdoor gardening to a standstill.

Other methods of propagation come under consideration when the garden is partly furnished and extension is desired. Certain plants will reproduce their kind from cuttings or division more readily than from seed. In most cases they will give an indication
by their method of growth as to the best course to pursue, but in view of a possible difficulty in deciding in some cases the method of propagation has been noted for every plant chosen for special remarks in the later pages. This will remove any uncertainty. Broadly speaking, plants with succulent stems springing from a constricted rootstock may be propagated by cuttings, and plants with a rootstock which tends to spread by means of tufts, outgrowths or offsets by division. It is generally best to propagate by cuttings in the summer, and by division in the winter. Tufts of many of the Rockfoils will strike even in the summer if they are drawn away from their parents, pressed into moist soil, and shaded from hot sun until re-established. So will the yellow Fumitory (*Corydalis lutea*), which, pretty though it undeniably is with its ferny foliage and yellow flower-spikes, is almost a weed on my chalky ground, and has to be restricted severely. The Stonecrops may be divided and put out quite late in the spring.

One may say of the propagation of Alpines, especially in propagation by seed, that it is a matter for attention in advance of the actual arrangement of the stones. The flower-lover who begins to sow directly he contemplates a rock garden is likely to reap the reward of foresight, for by the time his rockery is in being he has a lot of useful material wherewith to furnish it, and that at a trifling cost.
CHAPTER IV.

General Remarks on the Culture of Alpines.

Few, probably, among the flower-lovers who read these remarks belong to the class which looks upon rock gardening as a trouble-saving system. They do not contemplate making a rock garden for no better reason than that when it is complete it can be left alone, thereby differing from the bedding system, which entails periodical changes.

There is no class of ornamental plants which can be left alone entirely without suffering, and I am not sure that the majority of us would care much for it if it existed. There might be moments when it appealed to us, but in the main it would be so devoid of interest and charm that we should care little for it.

There are, however, many flower-lovers to whom rock gardening appeals because the routine work which it entails is light. They have not the physical vigour, even if they had the taste, for laborious work, but they can do, and benefit by, light operations in the open air. I have already spoken of the peculiar charm of lowly Alpine plants—how their minuteness, not less than their beauty, appeals to us strongly. The more that the flower-lover works among them,
the more intimately he knows them, the stronger their influence becomes. It is, therefore, a constant pleasure to minister to their wants and to guard them.

The increasing number of people who practise the Simple Life give many recruits to Alpine gardening. These thoughtful souls develop a passionate love for Nature, and they abhor seeing plants grown in stiff, formal, unnatural ways. They love sunshine, the song of birds, the open air; and these gifts of Nature are marred for them if her other great dower—the flowers—is refused the same spontaneity. They appreciate, however, the difference between informality and neglect. The plants must be given the necessary conditions for graceful natural growth, but not left to look after themselves.

Let us consider the directions in which cultural attention may be most needed by plants.

**Weeds.**

It is rather difficult to define a weed, more especially when one sees the kind of plant that enthusiastic, but ill-informed people sometimes admit to their rockeries. Personally, I would rather have one honest Geranium than a dozen plants which have no distinction either of leaf or bloom, and serve no specific purpose. We may, however, accept the rough and ready definition that any plant in our rock garden is a weed for which we have no use, and which we cannot conscientiously give to our friends. This would condemn as weeds many plants other than plain groundsel and crowfoot. Certainly some plants
will spread far more than we want them to do on our rock gardens, and others will appear that we did not put there. Once a year at least our rock garden should be gone over carefully and thoroughly for the express purpose of cleaning. There is no benefit whatever in leaving thick masses of Rock Cresses, Snow-in-summer and Gold Dust unpruned after they have finished flowering. They should be cropped in hard with the fingers, reducing them to small patches from which they will extend again the following season. On chalky ground the yellow Fumitory must be watched closely. It establishes itself in every nook and cranny, where its thick, fleshy stems get a tight hold, and are only dislodged with difficulty. The Valerian, showy as it is, must be curbed too, on chalk, which it loves. It is not a true Alpine, and should only be tolerated in strict moderation. Of weeds proper crowfoot is one of the worst. It loves to fix itself in deep, narrow crevices, as well as in the smallest chinks, where it is difficult to get hold of. It is no use merely pulling off the leaves, the crown must be got out, or else broken off, otherwise the plant will soon throw more foliage. Chickweed, groundsel and grass seeds are common, but they are not so dangerous as crowfoot.

It would sound faithless in the extreme to speak of bulbs as weeds, but it cannot be gainsaid that after they have bloomed they play very much the part of weeds, and when the foliage begins to turn yellow they are really unsightly. This is a point which must be borne in mind when considering what bulbs, if any,
shall be planted in rock gardens. The case is not quite on all-fours with that of planting bulbs in beds and borders, for there they can be lifted after flowering and planted in a reserve garden, while this is not always easy in a rockery. Perhaps as good a plan as any is to twist the foliage into a neat loop, stir the soil a little or add a handful of fresh, and sprinkle in a few seeds of Portulacas or Violet Cress (Ionopsidium acaule), both of which are annuals. The Portulaca is a brilliant and beautiful plant. It grows about six inches high, and bears a profusion of glowing, sparkling flowers late in summer. Both single and double strains are sold by the seedsmen. The Violet Cress only grows an inch or two high, and though less showy than the Portulaca, is pretty and interesting.

ENEMIES.

Slugs and snails are the worst enemies of Alpines, and the more the rockery is overgrown by coarse things the more difficult it is to keep these pests down. Protected by the long matted shoots, which also provide the shade and moisture that they love, slugs increase rapidly, and work much havoc with the weaker things. A cascade of Aubrietia is exquisitely beautiful when in full bloom, but the grower's pleasure in it is a little damped if he puts the streamers aside and finds a whole colony of fat, slimy slugs in a crevice where he had put a cherished plant, all trace of which has disappeared. It is wise to look over the rockery at frequent intervals, and never omit to push the big masses aside in order that the search shall be thorough.
PRIMULA FARINOSA
AND GENTIANA ACAULIS.

See Chapters XI. and VII. Part IV.
REMARKS ON THE CULTURE OF ALPINES.

A jar of brine should be placed handy, so that any of the pests that are found may be disposed of expeditiously by simply dropping them into it. Another simple plan of reducing slugs is to dash freshly-slaked lime among the plants at night, when the slugs are most active. It kills those that it falls on and does not injure plants. When small, choice plants are first put in it is a good plan to lay a few fresh brewers' grains near them as a bait. Slugs are fond of choice Alpines—the dearer the plant is to you the more likely slugs are to devour it—but they are even fonder of rich, aromatic grains straight from the brewery. If the heaps are examined at night many slugs may be found feeding, and can be given a change of diet in the form of brine. Toads should be encouraged, as slugs form part of their food, and the rapidity with which a crawling slug disappears under the lightning-like flash of the long, thin, white tongue of a toad is very comforting to an infuriated flower-lover smarting from the loss of a cherished plant.

**Top-dressing.**

It has already been pointed out that grit is of great benefit to the plants. It is good in summer because it checks the evaporation of moisture, and in winter because it prevents damp from lodging round the collar of the plants. In case it should seem strange that what is good for holding moisture in summer is good for parting with it in winter it may be well to offer a word or two of explanation. Stones remain cool and moist at a period of the year when evaporation
is active, and hence roots make for them and cling to them. Many plants will run a network of roots and even stems over the cool, damp surface of stone. Agriculturists find that in districts where the ground is stony, moisture-loving plants like turnips will often thrive in dry seasons, while on fine soil they will fail. For this reason small stone chips may be mixed liberally with soil in making a rock garden. In winter evaporation is less active, and finely pulverised soil becomes sodden in wet weather. If damp, pasty soil sticks closely to the "collar" of the plant (the "collar" is the point between root and leaves which is in contact with the top layer of soil) the latter is apt to decay. With plenty of gritty soil round the collar this binding does not take place. The water drains through to the roots. For this reason top-dressing with grit in autumn is good practice, and it is calculated to be of special advantage in heavy soil, and where sufficient care has not been taken to make the compost gritty at the time of establishing the rock garden.

In respect to this most important matter of soil and top-dressing, one of the most successful of all rock-gardeners, the late Rev. C. Wolley-Dod, may be quoted: "Good loam, with a little humus in the form of leaf mould or peat, and half or three-quarters of the bulk composed of stone riddlings from the nearest quarry, and varying in size from that of rape seed to that of horse beans, make up a good soil with which most Alpines are quite contented. Rough surface-dressing is a thing in which all Alpines delight, as it keeps the top of the soil sweet and moist, and prevents
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their leaves being fouled. Use for this purpose the same riddled stone as described above, which is better than gravel, as round pebbles are easily washed off the slope by rain or in watering.” By a “sweet” state of the soil the writer doubtless means freedom from stagnancy. There is a sweet state of moisture and there is a sour state. Moisture is good, but it should not be stagnant. Gritty soil is wet, and pasty soil is wet, but there is a great difference between the two as far as plant growth is concerned. The reader will not fail to note the very large proportion of stone chips recommended for the main compost of the rockery. Those of us who have had experience of the way in which many Alpines grow in very poor chalky soil, will not consider it excessive.

It will be gathered that the necessity for top-dressing is likely to turn on the way in which the compost is made up, and that is certainly so. With abundance of grit in the mixture from the first little mulching is likely to be required, but it is always prudent to look over a rockery when winter approaches, and if the soil is inclined to “pan” into a close mortar to stir it up well and sprinkle on some small chippings.

**Watering.**

The watering of a rock garden is apt to be a tedious and troublesome business, and the necessity for it should be obviated as far as possible by good construction and wise selection of compost. It has been pointed out already that with a good depth of soil containing abundance of grit the roots have an oppor-
tunity of finding all the moisture they need. With a proper provision at the outset the labour of watering can be saved in the main, and a few of the choicer plants can always be nursed, specially at the start, when they have still to get established. For the rest it is a great source of refreshment to the plants in long spells of drought, and very little trouble to the grower who has a length of hose, to give the rock garden a thorough drenching once a week through the rose. If done in the evening the moisture lingers round soil, stones and plants in a cool, refreshing vapour. Enough water should be given to penetrate the crevices and pockets, as then the plants will be encouraged to push fresh roots.
CHAPTER V.

Alpines for Walls, Steps, Edgings.

From the time walls were first built to enclose and shelter gardens, some horticultural use has been made of them. They were either planted with fruit trees, as in the kitchen garden; or with climbers and creepers, as in the flower garden. Tall brick walls are probably serving their best purpose, so far as supporting plants is concerned, when they give crops of Pears, Cherries, Peaches and other choice fruits. But in some gardens low stone walls exist which are not suitable for strong-growing plants, and which, as a consequence, are left entirely bare.

In parts of the West country where there is abundance of stone, walls are often built up without mortar, and Nature at once proceeds to clothe them with plants. She produces some very pretty effects, and when we see them we are struck with the fact that we have neglected our own opportunities sadly. That steep chalk bank which has gone so long with a mere covering of scrubby grass, and which in hot summer is almost bare through the dwindling and browning of the turf, could be made, we now see, into a delightful home for lime-loving Alpines (selections of which will be found in Chapter XIV.), if stones were built up
against its face. I used the word "built" advisedly, for it is in no sense the laying of stones in position as in an ordinary rockery. They are practically in contact with each other from top to bottom, but being irregular in shape they do not form a close wall like mortared brickwork. There are crevices between them and there are spaces between the ends, thus affording suitable openings for plants.

Such walls may be furnished with plants both during and after construction. Some plants may be laid between the stones as they are placed in position, and others squeezed into the end spaces subsequently.

Another plan of enlivening a bare, low wall is to make a border along the top, and plant pretty things which will droop over. I have recently cut a yard out of chalk, and instead of walling the sides I have fitted in old railway sleepers. These useful articles are solid, quickly put into place, and inexpensive, but they are not, strictly speaking, gardenesque. In order to brighten them and rob the yard of its bareness I have set some vigorous plants, such as Rock Cresses, yellow Fumitory, Nasturtiums (for summer) Snow-in-summer, and Rockfoil at the top. It cannot be expected that the Rock Cresses and Snow-in-summer will ramble as freely down the face of the timber as they would over a stone surface, but at least they will do something to rob the baulks of their ugliness.

There are few gardens, perhaps, in which there are no bare ridges and ledges which could not be made attractive with plants. Even garden yards should be considered worth beautifying by such simple means.
as those suggested. One sometimes sees common Stonecrops growing in the niches of a cottage wall, and they should stimulate us to plant the tops of our own low walls, although with better plants. Aubrietias will grow in almost anything, and they are beyond compare the best plants to establish in any position where they can droop down over the face of stones. They are not only closer and neater than Arabises, but flower later and longer, while the warmer colours give a richer effect. The Snow-in-summer is a delightful companion to the Aubrietia. It comes into bloom when Arabises are going out, and in early summer is a fleecy sheet of silvery leafage and snow-white blossom.

The whole of the closest wall existing can be covered with flowers if the amateur is prepared to go to the extreme of fixing stones on the face, partly with long spikes and partly with mortar. I have seen such walls. The spikes are first driven well in, and then flat stones are placed on them with their mortar-coated inner edge in contact with the wall. With a little soil placed on the stones a considerable number of plants can be grown. The plan is somewhat more artificial than the Nature-lover cares for, and may perhaps be reserved for emergencies.

Another direction in which the amateur may look for the utilisation of Alpine flowers is to fringe the steps that may have to be formed in the garden. Such steps may be of various kinds. They may be as plain and uncompromising as the staircase of an infirmary, they may be straight, stiff and flowerless, or they may be winding, informal, and graced with
pretty Alpine plants. When the garden proper is planted tastefully it is not desirable that the steps connecting one part with another should go bare. If an existing flight of steps is formal, and some more economical plan of beautifying it must be found than pulling it to pieces and making it anew, pockets may be made at the side with loose stones, and filled with plants. Rock Cresses, coloured Primroses, Forget-me-nots, Gold Dust and other things will brighten it in spring.

Such sites are apt to be dry in summer, and it is perhaps wise to rely on annuals, which may be sown in May. Portulacas, Violet Cress, Candytufts, Abronias, Calandrinias, Linarias, Alyssum and Leptosiphons are a few of the best. I find the Toad Flaxes (Linaria) particularly good on a dry, chalky soil, and they are summer flowers.

If the steps are near the house perfume should be thought of, and a few seeds of Night-scented Stock sprinkled about. The plant is not a particularly pretty one, especially in the day time, when its flowers are closed, but it will thrive in poor soil, and it has a delicious odour in the evening. Another fragrant plant is Schizopetalon Walkeri. It is not well known, but it can be found in the catalogues of most of the large seedsmen. It grows a few inches high and has white flowers.

In case of probable failure with the better things, such as Portulaca, when sown out of doors, a few seeds might be sprinkled in a box of prepared compost and set in a frame to give strong seedlings for transplanting. Although this plant will grow on a dry
PRIMULA INTEGRIFOLIA

See Chapter XI., Part IV.
site when it is once established I have known repeated sowings fail in poor rough soil. The seed is very small, and the seedlings are so frail that they fail to fight their way to full flowering vigour. When good seedlings are set out with a moist ball of soil and roots, and watered till they are established, they have a much better chance. It is worth a little extra trouble, for it is a most beautiful plant, well fitted to vie with the choicest Alpines. It has many colours, all beautiful. No small part of the value of this little known but exquisite annual is that it is at its best in August and September, when most perennial Alpines are out of bloom.

It has been pointed out in a previous chapter that a charming pathway may be made by using flat stones which are not placed in exact juxtaposition, but are set unevenly and planted with Alpines. Some may like this idea, but already have paths of gravel, which they hesitate to break up, especially if the place is not their own. This is only one of many directions in which the flower-lover may find his impulses checked by mundane considerations. Perhaps a compromise can be effected by keeping the main paths in gravel, and forming by-paths with stones. Another plan is to skirt the stiff path with a border of stones, and thereby rob it of its formality. It is not necessary to raise a mound and make an orthodox "rockery." The edging may be flat, and it will suffice if it is from two to three feet wide. With pretty plants set between irregularly-placed stones, the walk will have an interest which it never knew before.
CHAPTER VI.

Aquatic Adjuncts of a Rock Garden.

It will have been gathered from the not infrequent references to the association of Alpine and water plants that it is regarded as quite permissible in a garden. One will not see a colony of Ladies' Slippers, or a group of the exquisite white Wood Lily (*Trillium grandiflorum*), or a circle of *Nymphaea*, growing in close proximity to Alpine plants on a Swiss mountain, but that need not debar one from enjoying the beauty of all in a garden.

The flower-lover who can command the use of water is missing a great deal of the pleasure and interest of gardening if he does not take advantage of his opportunities and bring moisture-loving plants into his scheme. Water, and the surroundings of water, have a charm of their own. Aquatic plants have a beauty that distinguishes them from all other classes of flowers.

It is especially in the summer time that the water garden exercises its undoubted sway. It needs a truly enthusiastic flower-lover to find pleasure in it when the water lies dull and metallic under a cold gray sky, and when piercing winds set the melancholy reeds rustling. The strenuous spirit who can fish a highland tarn in a blizzard, and sleep under canvas
with one side open to a raging snowstorm, will perhaps enjoy it rather more than on a day of blazing summer heat, when the water sparkles joyously in the sun, the dragon-flies expand their brilliant wings, and the Water Lilies open their exquisite flowers on the surface; but the ordinary mortal will like it best under genial conditions. Just as the holiday maker flies to the sea when the thermometer rises to 85° in the shade, so the garden-lover turns his footsteps towards the bog-garden or Lily pool when heat oppresses the garden.

The bay system of making a rock garden has been referred to. The earth is ridged round an enclosure, and stones placed in position. The central space in the bay provides the most favourable place for making a bog garden. Poor chalky soil will not do here. Leaf mould and peat are required. If the soil is dry, and of a character unsuitable for development into a damp "mould," it will be necessary to remove it to a depth of some eighteen inches, and substitute the other ingredients named. If the natural soil is a good loam it will suffice to add peat or leaf mould liberally. This soil must be kept moist by some means or other. I have myself arranged matters by forming a cemented pool to take the roof water, and utilising the overflow from this for a bog bed. The plan has necessitated cutting a trench across a drive and carrying it through a border to the lowest site, but the expense entailed was very small, for it does not take a couple of navvies long to open a few yards of trench, and piping costs little.
Taking the overflow alone means, of course, dependence on a full pool, and in places where there is any fear of scarcity of water it would be well to pierce the feeding pool at a lower level, and lay a main controlled by a tap, so that water could be drawn or checked at will.

When roof water is depended on it is important to conduct any cleaning operation that may be necessary fairly early in spring, so that there may be no doubt as to a further supply of water from the clouds to replenish the pool. If such a task is left until very late a long period of drought in early summer might mean a quarter or half-filled pool, with no overflow for the lower bog garden.

Flower-lovers living quite in the country remote from a water-system have a natural apprehension of shortage of water, and frequently make elaborate provision for trapping all the roof water and carrying it to underground reservoirs, from which they can draw for household, and in seasons of great scarcity, even for drinking, purposes. The provision, indeed, is often absurdly exaggerated, and a quarter of the water which lies unused in huge subterranean tanks would suffice to form a beautiful and uncommon feature in the garden.

If a properly concreted pool is made in the autumn, on the lines suggested in a previous chapter, and a pipe led to it from the house guttering, it is practically certain to be full long before spring. The winter and spring rains must be kept in view in everything connected with water gardens. Given the bulk of the
ROCK AND BOG GARDEN.

Photo by E. J. Wallis.
water-supply which is needed from this source secured by April, all anxiety may be at an end for the year, as the summer wastage is so slight as to be easily made up by occasional showers.

Assuming that the pool is to be given up to Nymphaeas they may be planted in spring. In preference to putting them indiscriminately about the pool I advise planting in a ring, the clumps a yard apart, and half a yard or so from the sides. This arrangement provides plenty of room for each plant. The leaves will spread gradually until they meet, and the pool will be well furnished with foliage, but without any crowding. It is not necessary to put soil at the bottom, although it may be done if desired. It is sufficient to make a bundle of each plant by tying the roots up in some lumps of turfy soil in a piece of old sacking, or in moss or bracken. The covering will soon rot away. It will be necessary to weight the bundles with pieces of stone in order to keep them down. If reeds are admired—and the slender green growths have a pleasing effect when rising above the water—roots may be tied up with the Nymphaeas. The drawback to reeds is their brownness throughout the winter. They have so tight a hold of the roots that it is impossible to pull them away without tearing up the whole clump, and the best plan is to cut them off as low as possible until the time comes for overhauling the whole contents of the pool, which should be done every second or third year.

It is a very slimy and singular looking mass which will come up when the cleaning out is done. Roots
of reeds and roots of Nymphaeas will be interwoven into an inextricable tangle, and it is not worth while to attempt to separate them. The clumps may be reduced by cutting away a good deal of the outside and reducing the withered shoots of the reeds to stumps. Afterwards the masses may be re-attached to the stones and again placed at the bottom.

The opportunity may be taken of cleaning the sides of the pool of the green slime which will have accumulated on them, and of overhauling the rockery margins. Crowfoot loves to establish itself here, and will penetrate the smallest crevices. It seems able to exist with scarcely a particle of soil if its roots can keep in contact with moist stone or concrete. Every scrap of it should be pulled out, and any vacant spaces filled with tufts of water Forget-me-not (*Myosotis palustris*), Rock Cress (*Aubrietia*) and other pretty moisture-loving things.

There will not be much room for anything but half-a-dozen Nymphaeas and a few reeds in a small pool, but in a larger basin, or as a substitute for Water Lilies if they are not cared for, other aquatics may be grown, such as Water Hawthorn (*Aponogeton distachyon*) which is not quite hardy, but often thrives; the Water Violet (*Hottonia palustris*), the water Soldier (*Stratiotes aloides*), the Marsh Trefoil (*Menyanthes trifoliata*), the narrow-leaved Reed Mace (*Typha angustifolia*), flowering Rush (*Butomus umbellatus*), water flag (*Iris Pseudacorus*), the Arrowhead (*Sagittaria sagittifolia*) and the Loosestrife (*Lysimachia thyrsiflora*). In a sheltered, sunny place nothing is more delightful
than the Water Hawthorn, for it spreads over the water in a graceful sheet and is pleasantly perfumed. Most of the plants named will be comfortable in a pool a foot to eighteen inches deep. The Nymphaeas may have two to two-and-a-half feet of water.

If a pond already exists in the garden there cannot be a better plan of beautifying it than to throw weighted roots of hardy Nymphaeas into the water a few feet from the edge, and leave them to establish themselves and spread. Other things can be planted near the margin, such as Willow Herbs (Epilobiums), Japanese Irises (Iris laevigata or Kaempferi), and smaller things such as Marsh Trefoil, Bog Bean (Parnassia palustris) and Water Forget-me-not. These will thoroughly enjoy having their toes in the water. Two beautiful dwarf things which can be grown quite near are the charming hardy Primroses, Primula rosea and P. japonica. The former is a very low-growing plant, the latter grows to fifteen or eighteen inches high. A healthy colony of the Japanese Primrose, carrying its blooms in tiers or whorls in June, is a sight not easily forgotten. Both of these delightful plants can be grown from seed quite readily.

As an example of how a small piece of marshy ground can be made beautiful with water plants I would mention the little pond which the visitor to Kew Gardens may find who, having passed through the Rhododendron dell, turns his steps towards the pagoda at the Richmond end of the gardens. Once upon a time this was no more than a weedy bog: it is now an exquisite little picture of flower and water
beauty, where artists love to set their stools and paint.

It ought not to be forgotten that some of the hardy ferns attain to their noblest proportions by the water, notably the magnificent Royal Fern (Osmunda regalis), and the Ostrich Fern (Struthiopteris Germanica). With abundance of humidity they are totally different things from those we see in dry soil.

The great thing that flower-lovers should keep before themselves is this: a piece of water, artificial or natural, large or small, is a delightful addition to a rock garden. It may be a lake of considerable extent, it may be a cemented pool, it may be only a bit of bog; whatever it is it will permit of a type of plant being grown quite different from, and in its way equally as beautiful as, Alpines. If water exists, utilise it. If it does not exist make provision for it. In the heat of intense summer days, the sight of beautiful blue, pink, yellow and white Nymphaeas nuzzling the surface of the water amid an attendant bevy of flat brown, rosy and green leaves, over which the shadows of overhead plants sway slowly, is deliciously cool and refreshing. The water-corner becomes a much haunted spot. There the flower-lover drinks in the joy of Nature. There he makes plans for the coming year. There his mind is full of pleasant and fruitful reflections.
PRIMULA INTEGRIFOLIA
AND RANUNCULUS ALPESTRIS.

See Chapter XI., and Section B. Part IV.
PART IV.

Descriptive and Selective.

SECTION A.

Special chapters on the most important Rock Plants.
CHAPTER I.

The Androsaces.

These beautiful little plants are amongst the first and most precious of Alpine plants. They are typical of their class, and have all the winning grace and charm which distinguish the best mountain plants. Whoever loves Alpines must love the Androsaces, so exquisitely are they dowered with the most pleasing attributes of hill flora. They are small, tufty, evergreen plants, and generally will be found to be villose or hairy, this being particularly marked in the charming species called *villosa*. Most are of European origin, and visitors whose earnestness carries them to the higher ranges of the Alps and Pyrenees will have made acquaintance with several of the species. The plants carry their love of pure air down with them to lowland gardens, and soon suffer from the sulphuric acid in the neighbourhood of large towns. Although Androsaces are not among the cheap, free-growing, easily managed plants which fit the resources of the beginner, they are certainly among the first that ought to be taken up when the time for specialising comes. The species cannot very well be lumped together and given similar treatment, like the varieties of some everyday vegetable, inasmuch as they have
different tastes. Nevertheless, most of them can be grown in good loamy soil containing a liberal admixture of grit, if they are planted on sites where the roots can get abundant moisture. They luxuriate in intimate contact with stones, where there is no stagnant moisture to lodge about the collars, and should never be planted in wet places. In short, root moisture and plenty of it, but no surface stagnancy, must be the rule. It is best to wedge them into deep crevices, preferably in positions where overhanging stones will give them a little shelter from the midday sun, and where the roots can ramble afar. They are propagated by seed and division. The former may be sown in pans in early summer and set on a greenhouse shelf or in a frame. Division may be effected in Autumn.

*Carnea* is one of the most popular. It is a pretty, free-blooming plant, with pink, yellow-eyed flowers in late spring and early summer, and pointed leaves. It does not care for limestone, and is almost certain to perish on poor chalky soil, which is much too dry for it. It is best suited by a soil which contains a liberal admixture of peat and sandstone chips.

*Chamaejasme*, alluringly named the Rock Jasmine, is a well-known and admired species, bearing crimson flowers in spring. Unlike the preceding it enjoys limestone, but it shares the love of moisture which distinguishes its congeners, and must not be left to look after itself in thin, dry, powdery soil. Loamy soil, with a plentiful scattering of limestone chips on the surface, suits it admirably. Young plants ought to be watered in hot dry weather, but when they are
established in a deep fissure, with their roots at home in moist soil, a good way from the surface, they will give no trouble. This useful species may be propagated by division in Autumn.

*Glacialis.*—A dwarf Alpine with pink flowers (see coloured plate), difficult to grow. A moist sub-soil is required, but the leaves need to be kept fairly dry, hence a position should be provided where surface moisture will dry up quickly.

*Laggeri* is an extremely pretty little species and should not be omitted from a collection. It has pink flowers, and foliage in small rosettes. It is not difficult to grow, and will succeed in loam with plenty of grit if it is fixed in a crevice along which it can send its roots into moist soil. It can be raised from seed in late spring or early summer.

*Foliosa* is a beautiful and vigorous species, with rose-coloured flowers. It is larger than any of the preceding, soon spreading into an effective mass. It likes limestone chips, and with these provided on a base of loamy soil it is almost sure to thrive.

*Lanuginosa* is very popular, and deservedly so, for it is an exceptionally beautiful plant. Unlike the majority of the Androsaces it is not a European species. It comes from the Himalayas. The flowers are rose, with a yellow eye, borne in unbels on branching stems in summer. The foliage is villose or hairy. It enjoys loamy soil with a surfacing of limestone chips, and it is by no means a difficult plant to grow, provided it has sufficient root moisture. It may be propagated by cuttings.
Pubescens is a charming species. It takes its name from the down or pubescence on the leaves, which form a close cushion. The large white flowers have a yellow eye and are borne in early summer. It is a native of the European Alps, and is a lover of limestone, so that chalky chips may be sprinkled round it with the certainty of their being appreciated. It may be raised from seed.

Pyrenaica is an interesting Androsace from the Pyrenees, downy like pubescens, with grey leaves, and also having white flowers centred with pale yellow. It likes peat and sandstone grit in the soil. Propagation is by seeds.

Chumbyi is grown as a species, but is really a variety of sarmentosa (see photograph), and like that well-known species, sends out runners in a somewhat similar manner to the Mother of Thousands, Saxifraga sarmentosa. It is a most charming little plant, well worthy of a little care, but indeed it is not very difficult to manage so long as damp soil is kept away from the foliage, and this is easily done by scattering limestone chips, in which it delights, over the surface. Without this provision it is apt, like the species, to suffer from damp in winter. During periods of heavy rain in winter it is wise to fix a small square of glass a few inches above it. The flowers are brilliant rose in colour, and as they are borne in great profusion the plant is a really precious one. The species may be grown to make up a complete collection, but otherwise preference may be given to the variety. Propagation is by division.
THE ANDROSACES.

Villosa is one of the most familiar of all the Androsaces, being a great favourite with lovers of Alpine flowers. It has grey leaves densely covered with fine hairs ("villose"), hence its name. The pink flowers are borne in umbels. This species is a lime lover, and thrives in loam broken up with limestone grit. Propagation is by seeds. It is a European plant.

Vitaliana is also a native of the European Alps, and as it is yellow-flowered it has distinction of colour, but that is by no means its only charm, inasmuch as it is a very close, low grower, and a most exquisite object when nestling cosily in a crevice. It is not a lime lover, and had better be grown in sandy loam. If the soil is at all heavy, sandstone grit and chips, mixed with leaf mould, should be used liberally, especially in autumn, as it is impatient of surface moisture. It may be raised from seed, or when well established and strong may be divided.

Wulfeniana is a pretty plant with deep rose flowers borne in spring. It is a very close grower, and looks charming on a sandstone ridge. The treatment advised for Vitaliana will suit it. It does not appreciate limestone, and is not much good in poor chalky soil.
CHAPTER II.

Anemones and Hepaticas.

Although many of the Windflowers are rarely thought of in connection with the rockery, having almost attained to the dignity of florists’ flowers and come to be cultivated in beds like Roses, Carnations and Paeonies, the genus gives us numerous species and varieties which are of the utmost value for the rock garden, and we cannot afford to pass it over. From the first thought of spring, indeed, long before that season has opened, we get Anemones. One of the earliest in bloom is the lovely Hepatica, but we cannot look on this as the help which it might be from its compact growth and beauty of bloom, unless special provision is made for it, because it is a pronounced shade lover, and will quickly die away from the sunny parts of the rockery. Nevertheless, it has great uses. Apennina is a delightful little plant. It has the hardiness of the toughest Alpines, and gives us a colour—blue—which is not common in rock flowers, or indeed, in the whole of nature. Then, too, there is the exquisite blanda, a winter gem of the purest quality, with large flowers of a deep, rich blue. The scarlet fulgens, with its brilliant pointed petals, dwarfness, profusion of flowers, hardiness and vigour, is a grand plant, of
PRIMULA MINIMA
AND SOLDANELLA PUSILLA.

See Chapter XI., and Section B. Part IV.
which there are now several good varieties. The Pasque flower, *Pulsatilla*, with its flowers of silky purple, and its liking for poor limestone soil, is abundant but never seen too often, for it stands apart in form and colouring. *Coronaria*, from which the crown or Poppy Anemones have sprung, is a good plant, and perhaps more suitable for beds and borders than for the rockery, where, however, it may be grown if desired. The genus also includes the beautiful Wood Anemone, *nemorosa*, and its several varieties; but these, like the *Hepatica*, are too dependent on shade and moisture to be perfect rockery plants.

Every lover of hardy flowers loves the Anemones. He likes to put them in large patches, where they will give a radiant break of colour while the spring days are still young, or, indeed, yet unborn. They are not rare and precious plants that need nursing, but are full of a rich, spontaneous virility. Coming from many different climes, they yet, in most cases, succeed in British gardens.

The rock gardener may mark the Windflower genus as one that possesses all the attributes of greatness, and give some of the best species prominent places. Many are bulbous, or rather tuberous, and best propagated by division, but they also come readily and fairly quickly from seed. The majority thrive in ordinary garden soil, and practically all in a good loam, but a few, which shall be mentioned, are lime-lovers.

The following notes will give an idea of the value of the genus, and of the requirements of the various species.
Alpina is a mountain plant, and although less brilliant than many of the species, is worth a place on the rockery. It blooms in spring, when it bears white flowers with a bluish exterior. It is a decided lime-lover, and is one of the numerous plants which thrive best when limestone grit or broken chalk is mixed with the soil. It may be raised from seed in spring, or old plants may be divided in autumn.

Angulosa is a large blue species with quinate (five-lobed) leaves, resembling the familiar Hepatica. It thrives in ordinary soil, blooms in spring, and may be propagated by division. Apennina is often met with in a wild state in Britain, but that makes it none the less desirable as a cultivated plant. It is truly Alpine, and its beautiful blue flowers, produced early in spring, make it a real gem of the rock garden. It is, of course, quite hardy, and will thrive in ordinary soil.

Propagation is by division in autumn.

Blanda, a Grecian plant, is as much to be coveted as Apennina, which it generally precedes in flower. It is quite a dwarf species, and there are few plants better adapted to rockery culture. It is, indeed, a floral jewel of the closing stages of winter and the early days of spring. It is not a fastidious plant, and may be grown successfully on the limestone. It does not care for a stiff wet soil. It may be planted, or propagated by division when occasion arises, in autumn. A special mark might be set against this delightful little plant as one that should have a place of honour everywhere.

The Poppy or Crown Anemone, coronaria, is assuredly one of the most beautiful of all the Windflowers, and,
counting in with it, as it is only fair to do, the numerous beautiful varieties which have been raised from it, we cannot but look upon it, from the general flower garden point of view, as the most important of the whole genus. This high praise tends to crumble away, however, when we consider it as a rock plant pure and simple. It is really too vigorous to be a perfect rockery plant. The lover of Poppy Anemones might raise a batch from seed, and pick out a few of the neatest and brightest varieties for the rockery. It comes from seed so readily that there is no difficulty in getting a large stock of plants to choose from. It may be bloomed in autumn by sowing seed in a frame the previous winter, and may be flowered in summer from tubers planted out of doors the same spring, but autumn planting is preferable to keeping the tubers stored in a bag in a dry place all the winter through, as it may be found that they have lost their freshness by spring. The foliage is deeply cut and very pleasing. The plant is quite good enough for a lawn bed, and if planted in autumn will flower late in spring.

Fulgens is a brilliant species, its scarlet flowers lighting up the rockery in spring. Like coronaria, it is easily raised from seed, but to get flowers quickly tubers should be planted in autumn. It has been used a good deal by the florists, and many varieties are available. The most popular is King of Scarlets, a semi-double flower of the richest colour, of which tubers may be bought cheaply in autumn. The fulgens varieties do very well in ordinary soil, and will suit the rock gardener who wants inexpensive, easily grown,
and at the same time brightly coloured and vigorous plants, as well as any.

_Hepatica_, which is frequently listed under "H" in the catalogues, as though it belonged to a separate genus, is Alpine, and a lime-lover, but it is often disappointing purely on account of its hatred of sun-exposure. It will grow in the poorest of soil, bloom with the Snowdrops and Crocuses, and cover its neat little frame with beautiful flowers, always provided that it has shade. It follows from this that it is not an ideal rock plant, nor is it. To succeed it must have a special position, where it can have protection from the fierce heat of the sun. Failing this it will fade away, and that speedily. One should buy the _Hepatica_ varieties, of which there are several, from bulb dealers quite early in autumn, and plant them at once, then there will be bloom the following spring. Although they like chalky ground, they are not marked stone-loving plants, and will do perfectly well in the border. One may sometimes see a patch in full beauty on a cottage garden border, when one's own plants are dwindling. Shade is more likely to be the explanation than anything else. There are several varieties, both single and double, and all are beautiful. They may be propagated by division in Autumn.

_Nemorosa_, the charming Wood Anemone, is a wilding and thrives in the dense undergrowth of the chalk hills. It need hardly be grown on the rockery, but the beautiful form _Robinsoniana_ is well worthy of a place, as it is not only a strong, hardy plant, but free in bloom and of a lovely colour. The type is variable.
PRIMULA ALPINA (RHETICA) AND PRIMULA VISCOSA.

See Chapter XI., Part IV.
in colour, but this form is constant, blue with yellow stamens. It will stand the sun, and thrive in ordinary soil. It does not object to limestone. Planting and divisional propagation may be done in autumn.

*Pulsatilla*, the familiar Pasque flower, is a great treasure, as in addition to its handsome and distinct flowers it has the merit of growing almost anywhere, and thriving in poor limestone soil. It does not care for a stiff, damp soil, and is oftenest met with as a wilding on chalk downs. The large silky purple flowers differ from any other member of the genus. It may be planted or divided in autumn. See coloured plate.

*Ranunculoides* is interesting as a yellow-flowered species. It blooms in spring and likes limestone. Propagate by division.

*Sulphurea* (see coloured plate) shows about a foot high, and bears yellow flowers in May.

*Stellata* or *Hortensis* is the popular Star Windflower, and there are several forms of it. The type has reddish flowers with white centres. It enjoys a warm spot, and good loamy soil with plenty of grit. *Sylvestris*, the Snowdrop Windflower, has large and beautiful white flowers, and is a most attractive species, but it is hardly a typical rock plant, being over vigorous and partial to shade. It might be grown where there is plenty of room, in a not entirely exposed spot. It may be planted or propagated by division in autumn.
CHAPTER III.

Aquilegias (Columbines).

Amongst the most beautiful and valuable of all hardy flowers, the Columbines are yet open to the same criticism as the Snapdragons—that their stature is too great for the rock garden. It may not be desirable to grow them on a small rockery, where there is only room for a limited number of plants, and it is desired that these should be of the best low Alpine type; but a few of the choicest sorts might be included in large rock gardens. Some, it must be remembered, are smaller and neater in growth than others. Soil, too, has its influence, but the amateur must not expect to curb the vigour of Columbines by putting them on thin, chalky ground, for they are such pronounced lime-lovers that with a little encouragement in the form of spring showers they are likely to grow into big masses. Some of the noblest individual plants that I have ever had grew on thin, fibreless soil over chalk, and after two years' establishment were two feet through, and threw sheaves of flowers over a yard high. In such a condition they were more suited for the herbaceous border than the rockery. Their foliage alone makes them attractive, resembling as it does some of the Maidenhair Ferns.
on a large scale. The Columbines come so readily from seed sown in a frame in spring that there is no necessity to look further as a means of propagation, except in the case of some particularly beautiful seedling, which may be kept true by division when it spreads freely enough at the root to form distinct outgrowths, but this it may not do until it has been established a year or two. Such separation should be effected in the winter or early in spring. It is not possible at any age of the plants or any season of the year in some gardens, because the plants will not make sufficient growth at the root, rather tending to dwindle away than to spread. This has led some writers to advise that the plants be treated wholly as biennials—that is, sown every spring to flower the following year. Certainly the plan is simple and inexpensive, and so far as human power applies makes certain of a stock of plants.

Lacking entirely the deep rich soil which we often read to be needful for the Columbines, and yet seeing them grow with great vigour and appear spontaneously in many parts of the garden, I can only conclude that they are somewhat capricious. That they love limestone, and possibly a saline air, appears to be well-proven by their success in many gardens which lie near the chalk cliffs of the coast. They are true Alpine plants, and are very widely spread over the mountain ranges of the world, appearing in North America as well as in Europe and Northern Asia.

The following are a few of the best of the Columbines; except where otherwise stated seed is
procurable and may be sown in boxes in spring, the seedlings pricked off when they become crowded and planted out in showery weather in summer or early autumn where they are to bloom.

*Alpina* is a European species, dwarf as Aquilegias go, bearing blue flowers, but it is sometimes seen as a blue-flowered form with a white centre. This is not so vigorous as the American sorts, and may have a better soil, containing a good deal of loam.

As its name implies, *Californica* is an American species. It is a brilliant plant, with showy orange flowers, but it is almost too vigorous for the rock garden, and may be kept for the herbaceous border. It comes true from seed, but has been crossed with other species, and may be bought as Californica hybrids. These are very beautiful Columbines with long spurs and make noble plants.

*Canadensis* is another Western species, and being only moderately strong is suitable for the rockery, where its scarlet and yellow flowers are very cheerful.

*Chrysantha* is the noble yellow Columbine growing a yard high or more in congenial soil, with which we are all familiar. It is not at all the plant for a small rockery, but may be included in large rock gardens. It is hardy, a true perennial, vigorous, will grow in almost any soil, and comes true from seed, so, fine plant though it is, no more need be said about it.

*Caerulea* is one of our most beautiful Columbines, having large, erect, blue and white flowers. It is not too large for a moderate-sized rock garden, lacking the robust nature of *chrysantha*. It has long been a
PRIMULA VISCOSA.

See Chapter XI., Part IV.
great favourite. It is an American plant, but hybrids have been raised by crossing it, and seed of them is procurable. It is best raised from seed every year, as it does not spread much at the root and often dies out.

_Fragrans_ has pale yellow, scented flowers. It is not a well-known species, and lacks the importance of those already named. It has downy leaves.

_Glandulosa_ has long been a precious species with lovers of hardy plants. Its blue and white flowers are of most exquisite beauty and it is admirable for the rock garden owing to its neat habit. It is known as a short-lived plant, but that is not so serious as it might be, since it is easily raised from seed. It enjoys loamy soil with an admixture of sand and peat.

_Stuarti_ is another charming Columbine well suited for the rockery. It is similar to _glandulosa_, of which it is a hybrid. It is a more accommodating and longer-lived plant than the parent, and none need grieve over ill-success with _glandulosa_ if they have _Stuarti_ in reserve.

_Vulgaris_ is the common native Columbine, and too vigorous a plant for any except large rock gardens. Some of its selected forms are very beautiful, notably the white, which I find to seed itself freely on the limestone. There is a splendid form of it called Munstead White. _Leptoceras_ is probably a white form of _caerulea_.

AQUILEGIA (COLUMBINES).
CHAPTER IV.

The Campanulas or Bellflowers.

These form one of the most important genera of hardy plants, some members of which are practically indispensable to the rock gardener, giving, as they do, compact habit and abundance of beautiful flowers, mostly blue. Few genera vary more in habit, some of the species growing several feet high. These, handsome as they are, may be set aside from the rockery point of view. So, too, may the popular Canterbury Bell, which may be very well reserved for the border. There remain, however, a large number of purely Alpine species, some of which can hardly be excluded. Such species as Allioni, carpatica, garganica, muralis, pulla, Raineri, and rotundifolia are real gems. In several cases charming varieties are now available, some of the best of which shall be mentioned.

The Campanulas are not troublesome plants, and the beginner will find them among the best that he can take in hand. They are not, as a whole, fastidious as to soil, and will thrive on the limestone, on which their colours are brilliant and rich to a degree. The majority seed freely, and are procurable from seed dealers. They may be raised by sowing in cold frames in late spring, and planting out in showery
weather when strong. Those of tufty habit may be increased by division between autumn and spring.

The following are a few of the best rock species:

*Abietina*, purplish flowers, six inches to a foot high, very pretty.

*Allioni*, one of the very best for the rockery, owing to its low, tufty habit and large blue flowers. It is a genuine Alpine. It enjoys a loamy soil with plenty of grit.

*Carpatica*, the popular Carpathian Harebell, is one of the most familiar of all, and its white variety is also well known. There are other forms in cultivation, although seed of them is not so easy to get as it is of the blue and the white. Nurserymen offer a paler blue called *pallida*, and a richer blue—almost a violet—in *Riverslea*. The latter is a lovely form. The *carpaticas* grow about nine inches high, and bear relatively large flowers.

*Caespitosa* is a good Harebell and a true Alpine. The habit, as the name implies, is tufty, and it can be easily increased by division. There are white and pale blue forms of it, the former called *alba*, the latter *pallida*. *Campanula pumila* is the same as *C. caespitosa*. There are few more pleasing rock plants than this dwarf, free-blooming, bright little Harebell.

*Garganica* is a well-known species, dwarf in growth and with violet, white-centred flowers, which are borne freely in summer. There are several forms of it, notably a white (*alba*) and a hairy-leaved (*hirsuta*). They all enjoy good soil, such as loam with sandstone grit, but are not really fastidious in this matter.
G. F. Wilson is a hybrid, a good dwarf plant with deep blue flowers.

*Isophylla* is often grown in pots, for, owing to its trailing habit, it droops gracefully down in a spray of beautiful blue flowers and green foliage. The white variety is almost more attractive, and might be given the preference for pots, as it is exquisitely lovely when in full bloom, and graces the window of many a suburban gardener in a way that few other plants can equal. The *isophyllas* are, however, quite suitable for the rock garden; in fact, few species are more attractive. They like a loamy soil with plenty of grit, and if planted in a crevice from which they can droop over a large stone they look their best. It is well to give them a fairly sheltered position where they get plenty of sun without exposure to cutting wind.

Passing over *persicifolia* and its varieties, beautiful though they are, as more suited for the border than the rockery, we come to *Portenschlagiana*, which is often grown under the name of *muralis*, or the wall Harebell. It is of very close, tufty habit, forming a compact carpet of dark green leaves and large, cup-shaped, light blue flowers. This is a very useful species, as it will grow almost anywhere. There is a large form of it called *Bavarica*, which many prefer to the type.

*Pulla* is one of the most popular of the small Harebells. It is a charming little plant, the deep violet flowers of which are borne singly on the stems. It only grows two or three inches high, and spreads into
masses as many feet across. It likes a sunny spot and a peaty soil.

*Raineri* is a nice Harebell, and quite worth adding to a collection. It is a tiny plant, yet bears large flowers of a bright blue colour. It likes a loamy soil with abundance of grit.

*Rotundifolia* is the common Harebell. It is a familiar plant. There is a white variety of it (*alba*), and likewise a pale blue (*pallida*), but the type varies.

The true *turbinata* is a charming little plant, with purplish blue erect flowers. It is a very low grower, and thrives in ordinary soil if not very heavy and damp. There are white (*alba*) and lavender (*pallida*) forms.

*Thyrsoidea*, the subject of one of the coloured plates, is not often met with in cultivation. It is a lime-lover with yellow flowers, grows about a foot high, and is best treated as a biennial.

While the foregoing represent the most useful of the Harebells for the purpose in view they by no means exhaust the list of Alpine kinds. Those who want to form a collection will find others in the large nurseries.

*Barbata*, the subject of one of the coloured plates, takes its name from the beard at the mouth of the flowers. It is a native of the European Alpine meadows. It grows from six to nine inches high in the mountains, more in the lowlands, and has sky blue flowers. It is not a common plant in cultivation, and is not listed by a good many dealers.
CHAPTER V.

The Crocuses.

It has been pointed out in connection with the cultivation of bulbous plants in the rock garden that the principal drawback is the unsightly appearance of the foliage in spring, when it begins to wither. This militates against the Crocuses, yet it is hard to forgo so beautiful and interesting a genus.

Those who only know the Crocuses through the popular Dutch kinds, which are cheap enough to be bought in thousands, have but an imperfect idea of the beauty and diversity of the genus. There are scores of charming species and varieties which are never seen in borders or turf. Some bloom in autumn, others in winter or early spring. It is not surprising that they escape the attention of many flower-lovers. They are overshadowed by their "Dutch" congeners. People get into the way of thinking of Crocuses in thousands. They can only see the plants in masses or in long lines. If they did feel an interest in the species it would probably be only for such time as it takes to prove that the latter are not suitable for putting into comparison with the cheap kinds. Neither their habit nor their price encourages such rivalry. They are, in the main, smaller plants, and
few are abundant enough to be cheap, as cheapness goes with Crocuses. They are, however, dainty little flower gems, and some are beautiful to a degree. The individual flowers are large and the colours are extremely pleasing.

The rock garden is the ideal place for the best species of Crocus. Here they do not fail in effect because they are planted only in half dozens. A small clump has not the "lost" appearance which it has in a border. Moreover, it can be kept well in hand. It is not broken up by widespread cultural operations, such as digging. The flowers show up well among stones, especially if surrounded by a dwarf carpeting plant. The spring unsightliness can be reduced by tying the withering leaves into neat knots, and the summer bareness corrected by the spreading of the carpeter or the planting of a suitable annual, such as Portulacas.

The Crocuses like a sandy loam, but they are not fastidious, and the ordinary soil of most gardens will suit them. They might be planted according to their season of flowering, the autumn bloomers in summer, the spring bloomers in autumn. They are not stocked by the rank and file of bulb-dealers, but the large firms can supply them. Amateurs who buy early bulbs, such as Roman Hyacinths, for forcing, should order the autumn Crocuses, Colchicums and any other autumn-flowering bulbs at the same time. They can be divided any time after they die down. Those to whom the sight of fading leafage is a real eyesore may, if they think it worth while to take the trouble,
lift the Crocuses when they begin to wither and plant them out in a reserve garden, where they will finish their growth just as well as they would on the rockery. Some Crocus lovers like to grow the best of the species in pots. They look charming in a cool greenhouse. Half-a-dozen may be grown in a six-inch pot.

The following are a few of the best of the species and varieties, and might form the nucleus of a collection:—

*Biolorus*: An early spring-bloomer with white flowers in pairs. There are a great many forms, of which *Adami, estriatus, Leichtlinii, nubigenus, Pestalozzi* and *Weldeni* are a few of the most noteworthy. They differ in colour markings.

*Chrysanthus*, orange, blooming in spring, is one of the greatest favourites, owing to its large size and rich colour. It has many forms, including a white (*albidus*) and a pale yellow (*Canary bird*).

*Imperati* : a fine species, blooming very early in spring and producing purple flowers. It is a variable plant, like most of the Crocuses, and several of the forms are well worth growing, notably *albus* and *longiflorus*.

*Iridiflorus*: an autumn bloomer of great beauty, bearing large flowers of a rich blue. It is certainly one of the most beautiful Crocuses that we have. There is a large variety of it called *major*. The Iris-flowered Crocus is well worthy of pot culture.

*Longiflorus* : an autumn bloomer with purplish lilac, fragrant flowers. It is sometimes grown under the name of *odorus*. There are several varieties of it.
SAXIFRAGA AIZOON.

See Chapter XII., Part IV.
THE CROCUSES.

Nudiflorus: an autumn-flowering purple species opening when bare of leaves. There is no more showy Crocus than this, and it is a free grower.

Pulchellus: a charming autumn bloomer with lavender-coloured flowers.

Sativus: this is not one of the most beautiful of Crocuses, but it is bright, and has an economic interest, inasmuch as it is the flower from which the saffron of commerce is obtained. The saffron is got from the orange style. It likes warm, sandy soil. Where it is not suited by soil it is a shy bloomer. There are several forms of it, of which Elwesii and Pallasii may be quoted as giving different colours from and flowering more freely than the type.

Sieberi: an exquisite little spring bloomer, with lilac flowers. It is one of the first to bloom, and one of the prettiest. It likes a warm spot and sandy soil.

Speciosus: this is a brilliant autumn bloomer, with purplish lilac flowers. It is generally one of the first to flower. There is a good form of it called Aitchisoni.

Vernus: a spring bloomer, ranging in colour from white to purple. It is the parent of some of the Dutch Crocuses, and is represented by many forms.

Versicolor: a spring bloomer, white striped with purple; often grown under the name of Cloth of Silver, although biflorus is also known by that name. There are several forms of versicolor.

This list of species may seem rather long, but in reality it is only short. Another dozen could easily
be chosen little less attractive. However, the average rock gardener may not care to grow a very large collection of a plant which is bare most of the summer. If, in addition to the species, he grows several of their forms he will perhaps have as many as his space permits.
CHAPTER VI.

Dianthuses (Pinks).

There is no flower-lover who does not look on the Dianthuses with gratitude, for in addition to the charming Alpine species which they give us, they embrace the Carnation, Picotee, garden Pink, Sweet William, Mule Pink and Japanese Pink—a galaxy of beautiful gems.

Grace, perfume, brilliancy and diversity of colour—all these are given by the Dianthuses. They are combined, as is well-known, in the Carnation, that glorious plant which for hundreds of years has charmed and delighted florists, and which may be expected to give flower-lovers pleasure for hundreds of years more.

The dwarf hardy Pinks, species of Dianthus, which are suitable for the rock garden, are not fragrant in every case, but they have neat habit, pretty flowers and bright colours to commend them. The flower-lover whose rockery is quite small must content himself with a limited number of the best species, such as Alpinus, caesius, deltoides and superbus; but those with abundant accommodation may have the great privilege of forming a collection of species, hybrids and varieties fairly representative of the genus. Few
genera will prove more tractable and of greater real worth. For many weeks in late spring and summer the rock Pinks will produce their sparkling flowers.

*Dianthus caryophyllus* gave us the modern Carnation, and *D. plumarius* the border Pink. Picotees are merely differently-marked forms of Carnations. Cloves are Carnations with the rich, spicy odour which gave the plant its specific name. With all of these we have nothing to do here. We pass them over with reluctance, because we are fully sensible of their beauty and importance, but they are plants for the garden beds and borders, not for the rockery. *Dianthus barbatus*, the Sweet William, that dear old favourite which we think of with tenderness and affection, familiar to us from our earliest days, ever bright, cheerful and happy, is also a border and bedding plant, and the only sort which could be admitted to the rockery appropriately is the dwarf salmon, which is low, neat and compact in growth.

Beautiful though these grand old plants certainly are, we need not regret their unsuitability for the rock garden in view of the fact that we have at hand charming material from Alpine regions. They will meet all our wants, and meet it well. We shall find from experience that they are as well qualified to beautify the rockery as their larger congeners are to grace the border.

The Pinks are easy to grow. They enjoy sunshine and good soil. Loam with abundance of stone chippings to retain moisture suits them well. *Alpinus* is a great lime-lover, and enjoys a mulching of lime-
SAXIFRAGA ASPERA BRYOIDES.

See Chapter XII., Part IV.
DIANTHUSES (PINKS).

Stone chips. The majority are of tufty habit, and can therefore be propagated by division between autumn and spring, but they also come readily from seed, and this affords an economical means of working up a stock of plants, the more so as seed can be bought at a low price. It is a good plan to sow it in shallow seed pots, called pans, in April or May. A compost of loam, leaf mould and sand is suitable. This should be in a fine, moist state when used, and should be pressed firmly into the pans. The seeds should be set in clear of each other, covered with soil gently pressed down, and then put in a frame or greenhouse with a covering of paper to check evaporation until germination has taken place. When the seedlings begin to crowd each other they may be pricked off a few inches apart in boxes, and planted out during showery weather in summer or early autumn. This plan makes practically certain of success, but many busy flower-lovers save time by sowing outdoors where the plants are to bloom.

The Alpine Pinks all love root moisture, but they are impatient of wet soil round the collar, and it is wise in the first place to plant them in crevices between stones where the roots can work their way down into damp soil, in the second to place stone chips round them to check evaporation, and in the third to top-dress them with sandy leaf mould twice a year. The mulches should be well pressed round the tufts. This treatment generally has a good effect, preventing the plants suffering from drought and keeping them healthy.
When the body of a rock garden is made up of soil from a freshly broken pasture it generally contains wireworms. Growers of Carnations know from bitter experience how fond this pest is of their favourites. Alas! it is also partial to the Alpines. Loam ought to be in stock for several months before it is used, and lime may be added liberally when it is made up. The florist often uses baits formed of pieces of Potato or Carrot impaled on stout stakes and thrust into the soil near the plants, but this plan is not so simple on a rockery as in a bed. If any plants dwindle they should be taken up, and such wireworms as are found around them destroyed.

The following are beautiful Pinks, well suited to the rockery, and admirably calculated to adorn it:

**Alpinus**: this delightful little Alpine Pink is much in favour with flower-lovers, and it may well be, for it is a real rockery gem. Growing only about four inches high, it has dense foliage and brilliant deep rose flowers two inches or more across, borne singly on the stems. It particularly enjoys limestone chips and frequent top-dressing. Florists offer a white variety (*albus*). *Alpinus* blooms in June.

**Arenarius**, the "Sand Pink," forms dense cushions and produces white fringed flowers with crimson spots an inch across in summer. It grows about six inches high.

**Caesius**, the "Cheddar Pink," is an exquisite native plant with pale rose, scented flowers in summer, growing about six inches high. It is a great lover of limestone, and will grow on old walls, as well as in the border.
DIANTHUSES (PINKS).

Visitors to the Cheddar rocks in Somersetshire may have seen it growing wild there.

*Calizonus*, growing about six inches high and producing rosy pink flowers in July, is a pretty species, which may be propagated by cuttings.

*Cinnabarinus* is somewhat taller than the majority, growing to nine inches high. It produces red flowers in July.

*Cruentus* is also rather tall, growing to fifteen or even eighteen inches. It bears fragrant crimson flowers in July. A showy Pink, it is also very easy to grow.

*Deltoides* is the popular "Maiden Pink." It grows about six inches high, comes into bloom in early summer, and lasts a long time. It bears abundance of bright pink flowers. A native plant, it is very easy to propagate and grow. Trade florists offer a white variety (*albus*).

*Glacialis* forms tiny tufts and produces numbers of rosy flowers in June. It is not quite so tractable as some of the species, and does not care for limestone, though it likes granite. Peat, leaf mould and granite grit should be added to the soil for this species.

*Neglectus*, growing only three or four inches high, and producing carmine flowers in June, is one of the most brilliant of the Alpine Pinks, and quite easy to manage.

*Petraeus* grows about six inches high and bears rosy flowers in July. It is very easy to grow. There is a double variety of it.

*Seguieri* is one of the stronger growers, rising a foot high, and bearing rosy purple flowers late in summer.
Superbus, the "Fringed Pink," is a splendid plant, bearing heavily fringed pink and white fragrant flowers in August. It grows a foot high or more. It is a short-lived plant, and is generally treated as a biennial, being raised from seed every year.

In addition to the above species there are many pretty hybrids, notably Fettes Mount and Cyclops, which may be used for the rockery. The flower-lover will make acquaintance with these in the hardy plant nurseries, in the rock-gardens of specialists, or at the shows. They are not so widespread as the best of the species, and not easy to get.
ARNICA MONTANA
AND MYOSOTIS ALPESTRIS.

See Section B, Part IV.
CHAPTER VII.

Gentians.

Great interest attaches to these beautiful Alpines, for they give us blues of a richness and intensity equalled by few plants of any class. Further, they stimulate the flower-lover by little eccentricities of behaviour, in some cases requiring a certain amount of study before they will give of their best.

In their native homes on the European, American and Himalayan mountains, the Gentians form brilliant pictures of floral beauty, growing in broad masses, covered with vivid blue flowers. Those who have the opportunity of seeing them there are full of admiration for their richness of colour, and covet the dwarfer kinds for their rock gardens. The Gentians differ greatly in habit. One of the best known is the Gentianella, acaulis, a dwarf plant, bearing large, rich blue, stemless flowers in spring. It is easily raised from seed sown under glass in spring. It is admirably suited for the rockery, and is often pressed into service as an edging plant. It likes a light well-drained soil, pressed quite firm. It will grow in heavy, damp ground, but I find it very liable to cast its flower-buds in such soil. There is a white variety called alba, besides other forms. Acaulis is a native of the European Alps, and is shown
in one of the coloured plates associated with *Primula farinosa*, and in another with the Edelweiss.

*Andrewsii*, the "Blind Gentian," so called because of its closed flowers, is a much taller plant and blooms in summer. The purplish blue flowers are borne in clusters. It is a North American species, throwing stems a foot to eighteen inches high. It will grow in most soils that are not very dry, but likes damp peat. There is a white variety called *alba*.

*Asclepiadea* is one of the most beautiful of the taller kinds. It is a European Alpine, growing naturally in the shade of woods. The blue tubular flowers are borne in the axils of the leaves on stems that range from eighteen inches to two and a half feet high, so that a healthy plant in full bloom is a very beautiful object. It likes a moist, shady site with lime in the soil. There is a white variety called *alba*.

*Bavarica* is a charming little species, with flowers of a lovely rich blue, produced in July. A European Alpine, it is not very abundant, and needs care. It likes moist, peaty soil. The habit is tufty. There is a rare variety of it called *Rostani*.

*Brachyphylla* is a European Alpine, fond of granite. It is not often seen in cultivation. This beautiful blue Gentian is shown in one of the coloured plates, growing in nature in association with *Primula farinosa*, in another with *Dyrras octopetala*, in a third without the company of other plants, and in a fourth with *Silene acaulis*.

*Clusii*, a dwarf Alpine Gentian, with dark blue flowers in summer, is associated in one of the coloured plates
with *Primula longiflora*. It is not often seen in cultivation, and is probably a form of *acaulis*.

*Cruciata* is a popular species, bearing blue flowers on stems about a foot high in June. The specific name is in allusion to the cross-setting of the leaves. It is a European plant, and likes loam with limestone chips.

*Decumbens*, growing about nine inches high, and bearing blue flowers in terminal spikes in June and onwards, is an exquisite plant. It is a Siberian species.

*Freyniana* is a July bloomer with immense deep blue flowers on stems about six inches high. It is one of the finest of the Gentians. It likes peat and loam.

*Kurroo* is a Himalayan species, growing about six inches high, and bearing blue and white flowers in August. It likes peaty soil, and plenty of water in summer.

*Lutea*, which yields the Gentian of commerce, is hardly suitable for the small rockery, as it grows three to four feet high. It is a fine plant, but not an abundant bloomer. It may well give place to some of the choicer blues. See coloured plate with *G. punctata*.

*Pneumonanthë* is the pretty Marsh or Heath Gentian, and gives blue flowers in spring. It is a British plant, and a very beautiful one, well worth cultivation in the rock garden. In nature it favours boggy places, and should be planted in moist peaty soil. There is a white variety of it called *alba*.

*Punctata*, a native of the European Alps, has purple flowers, thickly spotted with yellow, on stems two to
three feet high, in July. It forms the subject of one of the coloured plates, in association with *Rhododendron ferrugineum*, and in another is associated with *Gentiana lutea*.

*Przewalskii* is a July bloomer, rich blue in colour. It thrives in peat and loam.

*Pyrenaica* is a dwarf spring-flowering species, with blue flowers and narrow, pointed leaves. It likes loam with plenty of grit, a sunny position, and abundance of water in summer.

*Septemfida* is a lovely little blue species from the Caucasus, growing about nine inches high, and blooming in July. It likes a peaty soil, with abundance of sandstone grit. There is a fine variety of it called *latifolia*.

*Verna*. One of the choicest of rockery gems, forming dense tufts of glistening foliage, and bearing flowers of a rich intense blue, with white eye, in April. There is a white variety called *alba*, and a large form called *grandiflora*. The vernal Gentian enjoys a sunny spot with a very gritty soil. It must not suffer from want of water in summer, and limestone or sandstone chippings will help to keep the soil moist by checking evaporation. Failures with it are frequent, and have given it the reputation of being a troublesome plant to grow, but they generally arise from drought. Top-dressings of sandy peat are good when flowering begins.

*Walujewi* is a distinct Gentian, producing white flowers, spotted with blue, in dense heads during June.

There are many other Gentians besides those named, but only the collection-hunter will want a larger number. Those named, demanding, as the hints about soil and
situation attached to each show that they do, considerable diversity of soil and situation, they will suffice to stimulate the activities of the flower-lover. If space permits he may very well form colonies of some of the dwarf free-growing species like acaulis and verna, when he has learned their requirements, for few plants can give more delightful groups, or provide such captivating breadths of gleaming blue.

Most of the Gentians come readily from seeds sown under glass in spring. Acaulis and verna are offered by nearly all seedsmen, but seeds of other species are only offered by a few firms who specialise in Alpine flowers. Fine, friable, very sandy loam is the best sowing compost. The seeds should only be lightly covered, and pricking-off should be practised directly the seedlings begin to crowd each. They should be planted in summer or early autumn.
CHAPTER VIII.

Irises.

To those who only know Irises through the stately members of the Flag section, or through the giant Japanese kinds that give beauty to the waterside, the idea of using them as rock plants savours of the ludicrous. There are, however, many species admirably adapted for the rockery. Few genera of hardy plants are, indeed, more varied in habit than the Irises. Some are tall and massive, others dwarf and lightsome. They also differ in their tastes. Some love the bog and others the sun-scorched sandy bed.

It would be a pity to exclude some of the smaller and choicer Irises from the rockery. If this were done the only place for them—short of special beds—would be the border, where there would be a risk of their being overgrown by coarse things. On the rockery those sorts which are precious by reason of their diminutive beauty or rarity can have the special attention which they need.

Nearly all the Irises, large and small, have flowers of beautiful form. They differ from all other denizens of the rock garden in structure. In most of the species the flower is composed of two well-defined parts: the upright petals, called "standards," and the drooping
IRIS SIBIRICA AND OTHER WATER-LOVING PLANTS AT KEW.

Photo by C. P. Raffill.
ones, termed “falls.” Though in many cases the flowers are large this arrangement of the corolla prevents any suspicion of heaviness. With respect to colours, the Irises embrace a wider range than the great majority of hardy flowers. Almost every hue is represented in them, and in many cases the combination of colours is very beautiful. Several species are fragrant.

The root system of the Irises differs. Some of the small kinds have rhizomes, a kind of thickened root or gnarled tuber, like the great German Irises; others are purely bulbous, as in the case of the cheap but pretty English and Spanish sections. The majority thrive in ordinary garden soil, provided it is not wet in winter. A sandy loam suits them admirably. A few like a moist peaty soil. The hardy bulbous Irises are best bought and planted early in autumn, the half-hardy ones in December, the rhizomatous kinds any time between autumn and spring. They are easily propagated by division at those periods. Seed of several good kinds is procurable, and may be sown in spring or summer, in the former case under glass, in the latter out of doors. The cushion Irises are better for light protection in winter.

The following are a few of the best Irises for the rockery, with notes on such special treatment as they require.

*Bakeriana.* A charming little bulbous species, only growing about six inches high, blooming in winter, when it produces flowers the standards of which are blue and the falls white, with purple spots. It is agreeably scented.
Bismarckiana. A “cushion” Iris, growing about nine inches high, the standards blue, veined with purple, the falls yellow, veined with red. It should have a sunny sheltered place in sandy loam, and should not be planted till early winter, in order to avoid precocious growth, which might be badly nipped by frost.

Cristata. A “flag” Iris, which only grows about six inches high, and bears its beautiful flowers in May. The standards are lilac, and the falls light blue crested with yellow. It has a creeping root-stem, which protrudes through the surface of the soil. It is not quite hardy, and ought to have a warm, sheltered place. An annual top-dressing of rich sandy loam is good for it. It is an American Alpine, and one of the choicest gems of the whole beautiful genus.

Danfordiae. A winter or early spring bulbous species with yellow flowers, perfectly hardy, growing only a few inches high.

Gatesii. A tiny cushion Iris, with silvery flowers in June. It is hardy. It likes sandy loam and a sunny spot. It is a most precious flower.

Histrio. A bulbous species, growing about a foot high, one of the earliest of all to bloom, as it is generally in flower in February. It has blue flowers marked with purple and yellow. Perfectly hardy.

Iberica. A cushion Iris, growing about six inches high, and with charming flowers in May. The standards are lilac and white, the falls brownish with purple blotches. Likes a warm place.

Korolkowii. A cushion species, growing about a foot high, and flowering in June. The flowers are white,
ARONICUM GLACIALE
AND MYOSOTIS ALPESTRIS.

See Section B., Part IV.
Iris. Preferences a sunny spot and sandy loam.

*Lortetii.* A cushion species, growing a foot high, with creamy white flowers in spring. Likes the same treatment as the preceding.

*Orchioides.* A bulbous Iris, with yellow flowers in April. Height about nine inches. It is hardy and not fastidious as to site or soil.

*Pavonia.* The Peacock Iris, now called *Moraea Pavonia* by the botanists. It is an exquisite little gem, producing small white flowers, each petal with a blue spot. Height about a foot. It is not quite hardy, and must have a warm, sheltered spot with sandy loam if grown out of doors. There is a yellow variety called *lutea.*

*Persica.* The charming Persian Iris only grows a few inches high, and blooms in winter. The flowers are light blue, marked with purple and orange. It is fragrant. There is a precious variety of this called *Heldreichii,* lavender coloured, the falls dark, veined with white and crested with yellow; and a deep rose form called *purpurea.* *Heldreichii* should have a very warm, sheltered place.

*Pumila.* A small flag Iris from the Crimea, hardy, and not particular as to soil. It only grows a few inches high. It bears violet flowers, with a white beard, in spring. There are several varieties, such as white (*alba*) dark purple (*atrocaerulea*), sky blue (*caelestis*), and yellow (*lutescens*). The plants sometimes bloom in autumn.

*Reticulata.* Perhaps the most popular of all the
bulbous Irises, other than the English and Spanish. A precious plant, blooming in February and March, when it produces exquisite violet flowers, crested with yellow, and with a scent as of Violets. *Krelagei* is a beautiful dwarf variety, but not sweet. The reticulatas are nominally not quite hardy, but they often thrive in the open, in sandy loam.

*Rosenbachiana*. A pretty bulbous species, the violet flowers of which are marked with purple and yellow; scented.

*Sibirica* (see photograph). Is a tall, graceful species with lavender flowers in May.

*Sindjarensis*. A charming early spring flowering bulb, with lilac flowers, height about one foot.

*Sisyrinchium*. A bulbous species, purple, spotted with yellow, flowering in May. It likes a firm soil and a sunny situation.

*Stylosa*. A beautiful flag Iris, bearing its charming blue, gold-banded, fragrant flowers in winter. There is a white form called *alba*. These Irises have glossy leaves. They are hardy, and do best in sandy loam in a sunny spot.

*Susiana* (*MOURNING IRIS*). A large and singular cushion species with great swart flowers. It likes a warm sheltered place, with a good roasting in autumn. Light, friable soil is required.
CHAPTER IX.

Narcissi.

It would ill become flower-lovers to neglect the beautiful Daffodils, when considering the plants wherewith to furnish their rock gardens, on no better ground than that many of the species are wildings, and among the commonest flowers of beds and borders in spring; or even for the more complimentary, but still unconvincing reason that they are one of the highly specialised flowers of florists. Neither of these points of view is a practical one. There is more reason in the objection that the plants are bulbs, which leave the ground bare for several months in autumn and winter, and the foliage of which begins to decay and become unsightly soon after the flowers are over.

Narcissi are the great flowers of spring, and though some are common, others are specialised, and all are subject to the objection of early leaf decay, still we must study them and devise means of utilising them for the adornment of rock gardens.

Those who grow this splendid plant in the florists' way, give most of their attention to producing fine examples of modern sorts which possess certain points of superiority over the older kinds when considered as individuals. This is entirely beside the object and
purpose of the rock gardener. He requires neat, dwarf, free-blooming varieties, and the production of monstrous flowers is a negligible consideration. There are several sorts admirably adapted to fulfil the requirement indicated.

In choosing Narcissi for the rock garden we do not turn to the huge robust kinds which make showy beds in the public parks and large gardens generally; because they are too expensive for the positions. Nor do we select the most recent productions of the hybridists, because they are too costly. We choose the smaller, neater sorts that do not take up a great amount of room and are abundant enough to be planted in fair quantity.

No plants are easier to grow than these little Narcissi. Absolutely hardy, they will thrive in ordinary soil, and bloom in a few weeks from autumn planting. They multiply steadily by means of offsets.

The objection that the soil in which they are planted is bare for a considerable time is one that calls for consideration, but it need trouble no one who has had opportunities of seeing how capable the plants are of pushing their way through any green covering. The uplifting force behind their apparently weak spears, drives them through dense turf, and this suggests that they may be planted in combination with dwarf carpeting plants that are green or silvery throughout the autumn and winter. *Arenaria caespitosa*, the *Thymes*, *Herniaria glabra* and the mossy *Saxifrages* are such plants.

With respect to the matter of leaf decay, it is also a real consideration, but, as has been remarked in the
ARTEMISIA MUTEELLINA.

See Section B., Part IV.
chapter on Crocuses, it is possible to cope with it successfully. The foliage can be turned into neat knots, and directly it begins to decay—at which stage it has done all the good it is capable of to the bulbs beneath—it can be removed. The green leaves break off much more readily than those of Crocuses, and more care is required in coiling them. It is certainly not desirable to leave the foliage to droop and spread in an unsightly mass on its way to maturity.

Although Narcissi revel in a rich, moist soil, they are so thoroughly under the subjection of a strong root system as to be at home in almost any soil. A wet summer is a great help to them on a thin, hot, dry, soil; it strengthens the bulbs, and insure abundance of roots. But under a carpet they do not suffer from drought as they would in hot, exposed soil. The loamy soil of the average rockery suits them admirably—the more so if it contains abundance of grit.

Unless the clumps are becoming much crowded it is not necessary to interfere with the bulbs after flowering, but if disturbance becomes necessary it should be done in early summer, rather than in the autumn. At the former season the plants have ripened off and shed—or at all events arrived at the stage to be independent of—the old roots; at the latter they have formed new roots, which they will require for the coming season. Late lifting does no harm if the bulbs are replanted immediately, or if they hold tight to a good ball of soil, but it does if they are left quite exposed for any length of time. The earlier lifting is the safer. When it is done
the small bulbs may be taken away and replanted in a nursery bed.

The huge "trumpet" Narcissi, like Emperor, maximus, and Van Waveren's Giant are not suitable for rock gardening, but small trumpets such as minimus, minor, Bulbocodium (Hoop petticoat), Johnstoni Queen of Spain, Cyclamineus and triandrus are admirable. So too, are Macleai, moschatus, nanus and juncifolius. In several cases variety can be imparted if desired, by growing different forms. Thus, of bulbocodium there is the large sulphur (citrinum) and white (monophyllum), the latter enjoying a much warmer and drier soil than its congeneres. Of triandrus there is the white (albus) and also the large and beautiful calathinus, but this is rather dear. These are all beautiful and nearly all inexpensive things. If desired, medium trumpets such as Golden Spur and Horsefieldi might be introduced, but they are too large to be ideal. Poeticus can be added for late bloom if desired, but it is a strong plant, and is better in grass.

It is quite at the option of the flower-lover whether he introduces varieties from other sections or not. There are scores of small, neat varieties which could be used at will. The Leedsii, Barrii, Nelsonii and Burbidgei groups all contain nice varieties, and there are many refined flowers among the "star" or incomparabilis varieties; but those already named ought to be enough for most growers, and they are all of the low, graceful, refined type that is appropriate for the rockery.
CHAPTER X.

Phloxes.

Those magnificent ornaments of the border, the herbaceous or half-shrubby ("suffruticose") Phloxes, are hardly more valuable for the purpose they fulfil than the dwarf Alpine species are for the rockery. These plants are all distinguished by profusion of bloom and brilliant colours. They are not fastidious as to soil, and they are easily increased by division between autumn and spring, or by cuttings inserted in gritty soil under glass, in early summer. This reduces culture to simple proportions and suggests that whoever has a rockery may expect to succeed with the Phloxes.

They will flourish on the limestone, and may be used for walls. They do not care for cold, heavy soil, and damp shady places. Well-drained soil and sunshine are their principal requirements, and these can be provided in most cases. The annual Phloxes, varieties of Drummondii, are, of course, excellent plants for summer beds and borders, rivalling Verbenas.

The following are some of the best Alpine Phloxes:

Amoena. A most charming spring or early summer plant, bearing umbels of pretty rosy flowers at a height of about six inches; it is absolutely hardy and will thrive in dry places. There is a variety with variegated foliage.
Divaricata (also grown under the name of Canadensis). A Canadian plant, growing about a foot high, bearing lilac flowers in spring. There are several varieties of this popular species, such as alba, white; Beauty, lavender; Lapham's Variety, bluish violet; Perry's Variety, lavender; and Violet Queen, deep violet.

Ovata. Evergreen foliage and purplish red flowers; height, twelve to eighteen inches; a spring bloomer. There is a variety called Caroliniana, with paler flowers than the type, and a little taller.

Pilosa. This pretty species produces its purplish red flowers in early summer. It has erect stems, twelve to fifteen inches high. It likes a warm spot.

Reptans. A creeping species, and one of the most useful, for it bears numbers of its purplish flowers in spring, only a few inches above the ground. An American species, it will thrive in almost any soil, and is easily propagated. It is also grown under the name of verna.

Procumbens. A trailer, producing lilac, dark-eyed flowers in great abundance in early summer.

Setacea. This is very close to subulata, although kept apart by some botanists. I deal with these as one species (see below).

Stellaria. An American trailer, producing bluish white or white flowers in May, graceful and free-blooming.

Subulata (setacea). The "Moss Pink" is the most useful of all the Phloxes. It is a prostrate evergreen, and covers itself with flowers in spring. It is a tufty, vigorous grower, thriving in almost any soil, but liking
ASTER ALPINUS.

See Section B., Part IV.
a very sandy loam best. The type has pink flowers with a dark centre, but there are many varieties, such as *Brightness*, rose; *Daisy Hill*, rose with carmine centre; *frondosa*, rose; *G. F. Wilson*, mauve; *Grandiflora*, rose, crimson eye; *Lilacina*, lavender, *Nelsoni*, white; *Newry Seedling*, lilac; *The Bride*, white, and *Vivid*, rose.

Wherever there is room a collection of the Moss Pinks should be grown, for they are brilliant flowers, and will give charming patches of colour.
CHAPTER XI.

Primulas (Primroses).

It would be difficult to exaggerate the beauty and value of the Primroses. When we think of the magnificent Chinese Primulas which adorn our greenhouses in winter, of the lovely natives of our woods and of the numerous brilliant Alpine species collected from various parts of the world, we see in the genus one of the most remarkable of any at the service of the flower-lover.

The hardy Primulas are numerous, and they are of great beauty. There are considerable differences among them, both of structure and requirements. Some are close, tufty gems of the accepted Alpine type, others moderately tall. Some are sun-lovers, others shade-lovers. Some love lime, others granite. These variations do not rob the genus of its interest, to many people they augment it. They mean that it needs detailed study if it is to be grown to the greatest advantage.

The hardy Primulas are mostly spring bloomers, coming into flower at the same season when the wild Primrose is making the banks and dells gay, but a few flower in summer.

The rock gardener will pay special attention to this
most charming genus, and so far as his circumstances permit, give the various species the particular conditions which they require. He will certainly reap a rich reward. Some of the species are among the most precious gems of the Alpine flora, and will delight him with their radiant beauty.

Most of the Primulas thrive in ordinary garden soil if it is not very dry, and practically all in sandy loam. Those that like lime and peat are specially mentioned. Drought is their great bane. Some refuse to thrive in dry soil, and are merely a shadow of their true selves. This especially applies to *Japonica* and *rosea*. The pronounced moisture-lovers like a peaty soil.

Propagation may be effected by seeds or division. Practically all come readily from seed provided it is sown directly it is ripe, but they are apt to germinate slowly, if at all, when old seed is used. Those who use the previous season's seed should keep the pans in hand several months unless they get enough plants for their purpose quickly. The pans may be put in a cool greenhouse or frame after sowing, and shaded with paper.

The tufty Primulas may be divided after flowering, and the portions are soon re-established if kept moist and shaded.

In the following remarks on the principal species of Primulas such cultural hints as are needed to get the best results with the different kinds are given.

*Acaulis* (*vulgaris*) is the common yellow Primrose of the woodland. It is so abundant in nature that the
flower-lover can well afford to pass it over, but he may like to grow some of the beautiful varieties of it which are now available. There are both single and double. Two of the former class are *Harbinger*, white; and *Miss Massey*, crimson.

Of doubles, there are *alba flore pleno*, white; *Croussei plena*, purple or plum, edged white; *lilacina plena*, double lilac; *Cloth of Gold* or *lutea flore pleno*, double yellow; *rubra plena*, double red; and several others. These are best propagated by division. Many flower lovers will not care to grow the coloured Primroses under names, but will prefer to raise a stock of plants from seed of the splendid mixed strains which seedsmen offer, and increase any special sorts that come in them by division. Any selected variety thus procured may be grown in the rock garden, but it is common to make spring beds of the best mixtures. While these beautiful hardy coloured Primroses luxuriate in a moist soil and in a cool position they will grow well on poor chalky ground if given water in dry weather. *Primula acaulis* forms the subject of one of the coloured plates.

*Aupcula* is the yellow Alpine parent of the plants which we grow under the generic name of *Auriculas*. All Auriculas are Primulas. To deal with the culture and varieties of florists' Auriculas would be outside our present scope. They are a florists' flower, cultivated in pots in frames. But attention must be called to the border Auriculas, which are well worthy of being grown in spring beds with the best of the Primroses. Beautiful lemon and pale yellow shades
PRIMULA LITTONIANA.
See Chap. XI., Part IV.
Photo by Bees, Limited, Liverpool.
are found in them, and the flowers are of great size. Moreover they are sweet scented. Several seedsmen specialise these lovely hardy Auriculas, which are much finer and bolder, though admittedly not more refined, than the show sorts. Good varieties can always be perpetuated by division.

**Bulleyana.**—A new species from China, very distinct and beautiful, with flowers borne in whorls a foot to eighteen inches high like those of the well-known species *Japonica*, but orange yellow in colour. It will be expensive during its early years in cultivation. It thrives in gritty loam and likes a cool position.

**Cortusoides.**—A Siberian species growing nine to twelve inches high, with purplish rose flowers, easily raised from seed. Leaf-mould is a good addition to the soil, and shelter is advisable.

**Denticulata,** which produces heads of lilac flowers on a stem about nine inches high in spring is a popular Himalayan Primrose, and the variety of it called *Cashmeriana*, which has golden meal on the under side of the leaves, is much liked. The flowers are deeper in colour than the species. *Alba* has white flowers with a yellow centre. This set should have light loamy soil in a sheltered spot.

**Cockburniana** is not yet well-known in cultivation, but it is likely to become popular. It bears scarlet flowers, fading to orange and mealy flower stems in whorls. It is a biennial, and should be raised from seed every year. Loam and leaf mould will suit it.

**Farinosa** is the charming little "Bird's Eye Primrose," and is shown in one of the coloured plates in
association with *Gentiana brachyphylla*, and in another with *G. acaulis*. It is a native of Britain, and has deep lilac flowers with a yellow eye, borne on a stem six inches to a foot high in summer. There is a larger form called *Warei*, and a white variety called *alba. Scotica*, which bears purple, yellow-eyed flowers in early summer, is another variety. It is the Scotch Bird's Eye. These like moist, cool soil. If grown on a dry rockery mix leaf mould and chips of sandstone with the soil. There is a stemless form of *farinosa* called *acaulis*.

*Forresti* is a modern Chinese species that is likely to become very popular. The strong stems rise twelve to fifteen inches high, and bear deep yellow or orange flowers, very sweet.

*Floribunda* and its varieties hardly come within our range, although they are beautiful, as they are greenhouse plants. The same remarks apply to *Kewensis*, which is a hybrid between *floribunda* and *verticillata*.

*Integrifolia* is a gem for the rockery, as it forms dense low tufts, and bears its purplish rose flowers in great abundance in late spring. It is a native of the European Alps. It is the subject of one of the coloured plates and appears in another with *Ranunculus alpestris*. This Primrose is sometimes grown under the name of *Candolleana*. It is an easy plant to grow, thriving in sandy loam, with lime.

*Alpina (rhetica)* is a May bloomer, with purple flowers, growing six to eight inches high. It is shown in one of the coloured plates in association with *viscosa*. 
Japonica.—One of the grandest of the Primulas, producing tall stems of bloom in whorls, ranging in colour from rose to purple. There are, however, several distinct varieties of it, such as *carminea*, carmine; *salmonea*, reddish salmon; and *sanguinea* or *splendens*, bright crimson. The Japanese Primrose is easily raised from seed. It thrives in moist peaty soil in a cool damp place near the base of rockwork.

*Littoniana*, a new Chinese species (see photograph), flowers in pyramidal heads, stems 12 to 18 inches high, colour lilac to purple, with red calyx.

*Longiflora*, an Alpine species growing a foot high or a little more, and bearing purplish flowers in May with mealy calyx, resembles the Bird’s Eye Primrose both in character and requirements. It is shown in one of the coloured plates with *Gentiana Clusii*.

*Marginata*, an Alpine species only growing a few inches high, blooms in April, when it produces charming, perfumed, rosy crimson flowers. It gets its name from the silvery margin of the leaf. It likes a loamy soil with stone chippings. There are several varieties.

*Minima* is a pretty little European Alpine, with rosy flowers only an inch or two above the ground. It appears in one of the coloured plates in association with *Soldanella pusilla*. Although very dwarf it has large flowers, which it produces in summer. It should be grown in a sunny spot, and well watered in dry weather in summer.

*Pulverulenta* is a handsome and striking Primrose. It bears a considerable resemblance to *Japonica*, and when it becomes abundant may be chosen by some
growers in preference to that kind. The flowers are violet and the stems nearly white. Seed is procurable. Gritty loam suits the plant, and it likes a cool position.

Rosea.—One of the brightest of the dwarf, spring-flowering Primroses, and one of the most useful for a cool, shady place. It cannot endure heat and drought. It only grows about six inches high, and covers itself with brilliant rosy flowers. There is a large variety called grandiflora. It is easily grown from seed.

Sikkimensis.—A handsome species, growing about eighteen inches high, and bearing pale yellow, drooping, fragrant flowers in summer. It does best in a boggy spot at the base of the rockery. Seed is procurable, and it may be treated as a biennial, fresh stock being raised every year.

Sieboldii.—A splendid kind, growing about eight inches high, and bearing long heads of bloom in spring, with fringed petals. It is rose-coloured, but there are many varieties of different colours, such as white, crimson, lavender, heliotrope, lilac, magenta and carmine. Some are sold under names. They like gritty loam, with good drainage.

Variabilis is the Polyanthus, the coloured varieties of which may be considered in connection with what has been said about coloured Primroses. They can be bought in separate colours if desired, and raised from seed.

Veitchii is a Chinese species of modern introduction, with large leaves, woolly underneath, and bunches of rosy flowers. It resembles cortusoides, but is finer. It will succeed in gritty loam.
BELLIDIASTRUM MICHELII.

See Section B., Part IV.
Viscosa is a charming little Alpine species only growing three or four inches high, and bearing rosy purple flowers with white eye in summer. It is shown in one of the coloured plates with *P. alpina* and in another alone. It is a native of the European Alps, and thrives in very sandy loam between stones. There are several varieties of it. *Villosa* is the same thing.

The foregoing are but a few of the members of this large and interesting genus. Others that are in demand are *Allioni*, mauve with white centre; *capitata*, violet; *Carniolica*, blue with white centre; *ciliata*, yellow, silvery foliage; *Clusiana*, crimson, white eye; *frondosa*, rosy lilac flowers and mealy foliage; *glutinosa*, purplish flowers; *hirsuta*, rosy purple; *involucrata*, white; *Kerner*, a hybrid between *Auricula* and *viscosa*, rose with yellow eye; *luteola*, yellow; *nivalis*, lilac; *pubescens alba*, white; *Parryi*, purple; *Poissoni*, purple; *spectabilis*, rosy purple; and *Wulfeniana*, purple. Most of these will be found in the catalogues.
CHAPTER XII.

Saxifragas (Rockfoils).

The dense, mossy growth of many of the Rockfoils makes them admirable carpeting plants for the rockery, and this, combined with the charm of their flowers, causes them to become great favourites with flower-lovers. Alpine Pinks, Primulas, Aubrietias, Androsaces and other low gems of the Alps exceed the Rockfoils in brilliancy, but there is really nothing to equal them for clothing stones with a close, even mat of green. They are not only pretty in themselves, but they also form a suitable ground work for bulbs, hiding the bare earth at a period when the latter are dormant.

It is not all of the Saxifragas that are suitable for carpeting. Some of the species have a totally different habit, possessing broad, leathery leaves and strong upright growth. The leafage differs in colour as well as in form. One Rockfoil is like a green moss, another forms silvery rosettes, a third has reddish leaves almost as large as Cabbages.

The flowers are rarely brilliant, but invariably pretty, indeed, when a broad cushion is covered with numbers of white or pink flowers in spring, or when the long slender sprays rise from a cluster of grey tufts, few things in the rock garden are more admired.
Most of the Saxifrages thrive in ordinary garden soil, and are propagated by seed or division in spring.

The difference in the habit of the Saxifrages has led to some attempt at classification. The botanists have formed more than a dozen different sections, each with its distinctive title, but the average flower-lover and hardy plant dealer is satisfied with the more rough and ready plan of throwing the mossy section into one group, the encrusted species with foliage in rosettes into a second, and the broad-leaved into a third.

The following are a few of the best of the Mossy Saxifrages.

**Guildford Seedling.**—This precious little Rockfoil forms a dense mass of green mossy foliage, from which rise large numbers of pretty rosy flowers. It blooms in spring.

**Hypnoides.**—This is the typical Mossy Saxifrage, a British plant, forming the closest of carpets, and never fresher in its lively green than in winter, when most plants are dingy. It will thrive in almost any soil, in sun or shade, spreads fast, bears transplanting at almost any season, and is easily increased by division. The flowers are white, but there are several varieties of it, such as *purpurea*, with red flowers, and *rosea*, rose. They bloom in spring.

**Decipiens.**—Bears flower stems about six inches high, and abundance of white flowers in May. There is a variety called *grandiflora*, and there are others.

**Muscoides.**—This pretty little species has yellowish flowers, and the brighter varieties, such as *atropurpurea*, deep red; *Rhei*, rose; and *Rhei superba*, deep
rose, are generally grown in preference to it. All form cushions of dense green foliage.

_Trifurcata_ has somewhat larger flower stems than the preceding, and may therefore be used for cutting. The flowers are white, produced in the spring. _Ceratophylla_, the stagshorn Rockfoil, so called owing to the form of the foliage, is a popular form of _trifurcata._

_Wallacei (Camposii)._—This has much larger flowers than the other short-stemmed Mossy Saxifrages, and is much in request. It is white, and blooms in spring. It is a splendid sort.

The following are some of the best in the encrusted section. They produce pretty silvery rosettes, and long, slender panicles of bloom. They do not, of course, spread as fast as the mossy section, still, they grow quite freely in a dry sunny position. They are at their best in gritty loam between stones.

_Aizoon._—Cream flowers spotted with red produced in panicles six to ten inches long in June. There are many varieties, amongst the best being _Carinthiaca_, white; _La Graviana_, white flowers on red stems; _Malyi_, white; and _Sturmiana_, cream, dwarf habit.

_Cotyledon._—Produces beautiful white sprays in May. The variety _pyramidalis_ bears lovely plumes, and is much better than the species. Both are about eighteen inches high.

_Hostii._—White flowers on reddish stems nine to twelve inches high, produced in May.

_Lingulata._—Long sprays of white flowers in May, produced very freely from silvery rosettes. _Lantoscania_ (see photograph) and _superba_ are good forms of it.
CHRYSANTHEMUM ALPINUM
AND LINARIA ALPINA.

See Section B., Part IV.
SAXIFRAGES (ROCKFOILS).

Longifolia.—A precious species, throwing up lovely white plumes eighteen inches high in June. It likes limestone.

Macnabiana.—Long sprays of white flowers spotted with red in spring.

Among the remaining Rockfoils the following are some of the best:—

*Apiculata.*—A charming little species growing about four inches high, and having pale yellow flowers in spring.

*Aspera bryoides.*—A small dense tufty plant with roundish rosettes of leaves, bearing creamy flowers in May. It is shown in one of the coloured plates.

*Burseriana.*—A lovely little plant, only about three inches high, and with white flowers towards the end of winter. There is a large variety called *major*.

*Granulata Flore Pleno.*—The double meadow Saxifrage, which grows about a foot high and has white flowers in spring. It will thrive in shade.

*Hirculus (Marsh Rockfoil).*—A British species with yellow flowers, suitable for the bog garden.

*Oppositifolia.*—Prostrate stems with rose flowers in spring. The large variety *major* is a great favourite, and the white, *alba*, is also very popular. The variety *splendens* has brilliant crimson rose flowers.

*Sancta.*—Forms dense cushions of leaves, and bears bright golden yellow flowers in April. Very dwarf.

*Sarmentosa (Mother of Thousands).*—There are few who do not know this old plant, with its mottled roundish leaves and numerous runners. It is
often grown as a window plant, but may be grown out of doors in sheltered places. There is a charming variety called *tricolor superba*, which is almost entirely grown in pots and baskets.

*Sibthorpii (Cymbalaria).*—A low close grower which thrives in damp shady spots. It is a biennial, reproducing itself from self-sown seeds.

*Umbrosa (LONDON PRIDE).*—Abundant sprays of pinkish flowers in spring on stems about nine inches high. A dense grower.

A section of the large-leaved Saxifrages are sometimes called Megaseas. Among them may be named the following:

*Cordifolia.*—Pink flowers in spring on stems about a foot high. There is a dark variety called *purpurea* and a white one called *alba*.

*Crassifolia.*—A spring bloomer with pink flowers, about a foot high.

*Ligulata.*—Purple flowers in spring on stems a foot high. There is a pink variety.

*Stracheyi.*—Pink flowers in spring on stems a foot high. There is a white variety.

The foregoing is a brief survey of the genus *Saxifraga*, and will set the beginner in the cultivation of Alpine plants on the path towards knowledge of the principal Rockfoils. It is, however, little more than a glance, and those who already have some acquaintance with the genus may be glad to have further notes, embracing some of the rarer species. These shall be given in alphabetical order:
**SAXIFRAGES (ROCKFOILS).**

*Aizoides.*—A native of Britain, forming low tufts of thick leaves and bearing yellow flowers dotted with crimson in summer. It is a lover of moisture, and may be planted in cool soil near water. There is a deeper coloured variety called *aurantiaca.* Height about six inches.

*Aizoon* (see coloured plate) is a native of the Alps of Europe and America, and one of the best of the encrusted section. It forms tufts of silver grey, which can be divided if propagation is desired. There is no trouble in its culture, as it will thrive in ordinary soil on a sunny spot. The following are twelve of the best of the many forms of it which are grown:

- *Atropurpurea.*
- *Malyi.*
- *Carinthisca.*
- *Pectinata.*
- *Churchilli.*
- *Robusta.*
- *La Graveana.*
- *Sempervivoides.*
- *Major.*
- *Stabiana.*
- *Cultrata.*
- *Sturmeana.*

*Ajugaefolia* is one of the mossy section, a native of the Pyrenees, with creamy flowers on stems about a foot high. It may be included in a select collection.

*Andrewsii* is generally supposed to be a garden hybrid, the result of a cross between the species *Geum* of the London Pride section, and the encrusted species *Aizoon,* which is described above. It is a green-leaved species, with large white flowers dotted with red. It enjoys moist soil, and may be propagated by division.

*Aspera* is a Pyrenean species belonging to the aizoides class, growing in low tufts of leathery leaves
and bearing creamy white flowers in May. It forms runners as it grows. *Bryoides*, which is also found on the Pyrenees, is regarded as a dwarf, non-stoloniferous form of it. (See coloured plate.)

*Aretioides* belongs to what botanists call the Kabschia section, which is of low tufty habit, and includes such popular kinds as *apiculata*, *Burseriana*, *Boydi* and *Valdensis*. *Aretioides* is a native of the Swiss mountains, and is a precious little encrusted plant, with bright yellow flowers on short stems in spring. There is a paler variety of it called *primulina*. They do best in loam with plenty of limestone grit in a rocky chink.

*Biflora* belongs to the Porphyrion section, the most prominent representative of which is *oppositifolia*. They are dwarf plants, but in the case of the two-flowered Saxifrage not dense. It bears its purplish flowers in May, will thrive in gritty soil, and is readily increased by division.

*Boydi* is an interesting plant of the tufted Kabschia class to which we have seen that *aretioides* belongs. It is supposed to be a hybrid between the latter and *Burseriana*. It bears its yellow flowers in spring on stems only two or three inches high. There is a variety called *alba*, which flowers very freely.

*Burseriana* and its variety *major* are gems of the Kabschia section. The former is a native of Carniola, and bears its creamy flowers on stems only three or four inches high in winter or early spring. Its charm is enhanced by the pink-tinted stems. The plant spreads quickly into broad grey tufts. It likes gritty limestone or loamy soil, and a little shade in a
CIRSIUM SPINOSISSIMUM.

See Section B., Part IV.
position where it will not receive drip in winter. Loam and limestone grit should be applied in autumn.

*Caesia* is a silvery species from the Swiss Alps, bearing creamy flowers in May. It belongs to the same section as the preceding, and its grey tufts are among the dwarfest of all, being quite moss-like in their density. A larger-flowered variety of it called *major* is offered. They like a sunny place with loam and limestone grit.

*Camposi*, see *Wallacei*.

*Cordifolia* is a Siberian species, wholly different from the mossy and encrusted species already mentioned, in that it has large, roundish, leathery, shining leaves on tall, strong stalks. The flowers are purplish rose. There is a variety called *splendens* with crimson flowers, and others named *purpurea* and *alba*. They will grow in ordinary soil.

*Cotyledon* is a valuable species from the European Alps. The leafage is produced in large, loose, silvery rosettes, and the flowers in pyramidal spikes. It belongs to the encrusted section, but has a habit and a beauty of its own. The variety *nepalensis* is good, and *pyramidalis* still better. The latter is very robust, and bears splendid pyramidal spikes of white, red-dotted flowers. They all thrive in ordinary soil and are easily propagated by division (see coloured plate).

*Crassijolia* belongs to the Bergenia (Megasea) section. It is a Siberian species, with thick shining leaves and red flowers in April. It may be associated with *cordifolia*.

*Geum* is a member of the Robertsonia (London
Pride) section, and resembles the London Pride in habit, although the leaves are rounder. It is a native of Ireland, and bears its white, spotted flowers on stems about a foot high in June. There are several varieties of it, notably dentata, elegans and minima. They all enjoy moist, cool soil.

*Grisebachii* is a precious species from Macedonia, with grey-blue rosettes, and drooping spikes of carmine flowers in early spring. It enjoys a warm spot. Sandy loam with abundance of limestone grit will suit this exquisite little plant.

*Hypnoides*, the typical mossy Saxifrage, has not the beauty of the encrusted section, but it is an invaluable plant for carpeting. It is a British native, and is called the Dovedale Moss. It will thrive in sun and shade, and should be planted extensively to cover bare ground in the rock garden. The white flowers are borne on stems a few inches high in March. The following are a few good varieties.

*Juniperifolia* is an interesting species from the Caucasus, with yellow flowers in July. It is quite distinct from other kinds, for the masses of pointed leaves give the plants the appearance of tiny Junipers, and hence the name of Juniper-leaved.

*Kotschyi* is a species from Asia Minor, with bright yellow flowers. It belongs to the tufted Kabschia section, of which we have seen that *Burseriana* is one of the most popular representatives. It is a gem of this
SAXIFRAGES (ROCKFOILS).

pretty class, and loves a warm spot in a chink of limestone with loam and limestone grit.

*Ligulata*, a species from Nepaul, with purple flowers in spring, belongs to the Megaseas, and ranks with *cordifolia*, *crassifolia*, and other large-leaved kinds. The thick, shining foliage is evergreen. The variety *ciliata* is very popular.

*Ligulata*, very close to the preceding in name, is widely different in habit, for it is one of the precious encrusted section, known to botanists as Euazoonia. It is a native of Switzerland, and forms charming rosettes of silvery leaves, from which the flower-stems rise to a height of fifteen or eighteen inches in spring. The flowers are white with rose spots. *Lantoscana*, described by some authorities as a species, is probably a large form of it (see photograph). *Superba* is another. These beautiful encrusted Rockfoils will thrive in gritty loam in rocky fissures.

*Longifolia* belongs to the same class as the preceding, and is a lovely plant, forming silvery rosettes, from which arise in June graceful stems a foot or so high, carrying white flowers spotted with red. None of the encrusted Rockfoils is more beautiful than this. It should be planted in a slanting position, so that water does not lodge. It likes loam with limestone grit, and will thrive in a moist fissure of the rocks, preferably on their northern face.

*Maweana* is a species from Morocco, belonging to the mossy group of which *hypnoides* is the principal type. The white flowers are borne on stems a few inches high in May, and overhang the dense cushion
of leaves. It will thrive in ordinary soil. Over-
shadowed, perhaps, in recent years by Wallacei (Cam-
posi) it remains a fine and desirable plant.

Muscoides is a dense, moss-like species, a native
of Britain, bearing its pale yellow flowers on stems
three to four inches high in May. It is a pretty and
useful plant, but is often passed over in favour of some
of its varieties, of which atropurpurea, bright red; Rhei, rose; and Guildford Seedling, deep rose, are
three of the most popular. These varieties of the
mossy Saxifrage are among the most precious of all
the Rockfoils, for they combine close, dense, carpeting
habit with great charm of blossom. They will thrive
in sandy loam.

Oppositifolia is also a British plant, with small,
densely-crowded leaves on prostrate stems, and bright
purplish-rose flowers on stems only a couple of inches
high in April. Its blossoms are borne so abundantly
as to gem the plants quite over. Major, with large
flowers; and major splendens, with larger and brighter
blossoms, are charming varieties of it. There is also
a white one called alba. These little Rockfoils are
very easy to grow, for they will thrive in almost any
soil in town or country gardens, although they enjoy
a mixture of loam, limestone grit and sand. They are
not long-lived, and should be divided every year or
two.

Peltata is a fine Californian species, entirely distinct,
and put by botanists into a separate section, of
which it is the sole member. It throws up strong,
hairy flower-stems to a height of three or more feet
in April, which are followed by the large green leaves. The flowers are white. This species loves a moist, sheltered spot and makes a fine ornament for the bog garden.

**Retusa.**—A dwarf species from Piedmont, with purple flowers on stems an inch or two high in May. The habit is close and tufty, like that of *oppositifolia*, with which it is classed. *Wulfeniana* is considered to be a deep purple variety of it by some authors. These make charming cushions on the rockery. They will thrive in loamy soil, and may be increased by division. *Wulfeniana* is a precious plant, and likes a hot sunny spot.

**Rocheliana** is an Austrian species, a little tufty plant of the Kabschia section, and therefore of the same class as *Burseriana, caesia, Boydi*, etc. Its silvery rosettes of foliage are very pretty, and the flowers, which are white, and borne on stems about three inches high in spring or early summer, are also attractive. There is a variety of it called *coriophylla*, which has smaller leaves. These precious little Rockfoils thrive in sunny parts of the rockery in gritty loam.

**Stracheyi** is a fine species of the Megasea group, a native of the Himalaya, with pink flowers on strong stems a foot or more high in spring, and large leaves. It may be associated with *cordifolia, crassifolia* and *ligulata*.

**Valdensis** is a tufted Alpine, with large white flowers on short stems in spring. It is suitable for association with *Burseriana* and others of the Kabschia group, forming neat, close cushions starred with blossom.
This precious plant thrives in gritty loam in a sunny spot, and may be increased by division.

*Wallacei* (syn. *Camposi*)—A Spanish species, moss-like in structure, and the finest of the *Dactyloides* section. It does not surpass *hynoides* as a carpeter, but the flowers are much finer and a broad mass is a beautiful object when in full bloom. The flowers are white, and are borne on short stems in May. It will grow in ordinary soil, may be increased by division, and readily takes its place as one of the most useful and beautiful of the Saxifrages.

Notable Rockfoils which may be added to the above if there is room for a larger collection are:—

*Caespitosa*, mossy section.
*Cochlearis*, encrusted section, forms silvery tufts.
*Cuneata*, mossy section.
*Crustata*, encrusted section.
*Diapensioides*, tufty section.
*Hirculus major*, bog-loving section.
*Hostii*, encrusted section.
*Paradoxa*, encrusted section.
*Trijurcata*, mossy section.
*Umbrosa variegata*, London Pride section.
PART IV.

Descriptive and Selective.

SECTION B.

A brief description of the best Alpine plants in alphabetical order, with selections for various purposes.
CYPRIPEDIUM CALCEOLUS.

See Section B., Part IV.
Introductory

The flower-lover who begins to study the plants which, following the standard of habit and character already given, may be fairly described as Alpine, is astonished to find that the number of species is so considerable as to elevate them into one of the most important sections of cultivated plants. Not only is this so, but the rising popularity of Alpines has led to a good many genera being specialised by florists, who have obtained varieties of them, just as others have of Roses and Sweet Peas.

The few will be attracted, the many repelled, by the task of making personal and intimate acquaintance with the whole of the Alpine Flora. Life is short, and there are many calls on time and attention. Many of us would gladly, if we could, give this one section of plants alone all our thought. But others call insistently, and we must content ourselves, willy-nilly, with a knowledge of the best of the Alpines, leaving the rest to those people who find no pleasure in discrimination, no satisfaction in compromises, but can be content only with the most thorough and painstaking investigation of every subject which they study.

There is no pretence that every Alpine plant which may be seen in nature, or whose name is discoverable in a plant dictionary, is included in the following lists. But an attempt has been made, not without thought and care, to describe all the best plants, and so to give
the flower-lover an opportunity of becoming acquainted, as far as is possible on paper, with the principal members of this charming class.

Beginners might do well to concentrate their attention on a limited number of the best genera, such as are given in selections at the end of the present section. Many people begin the culture of Alpines with a small rockery, and they are likely to do better by taking, say, twenty-five or fifty really good kinds, and doing them well, than by dallying with several hundreds, which they cannot accommodate properly, and the particular requirements of which they have not had opportunities of becoming acquainted with.

ACAENA MICROPHYLLA.—A small plant that is often planted for trailing over poor sandy ground. It is the most generally useful of a small genus that cannot be given a very prominent position. Microphylla is noteworthy for its heads of reddish spines. They are not remarkable for beauty, but they have an interesting and distinctive appearance, and they are present throughout the summer. The plant may be propagated by division in winter.

ACANTHOLIMON GLUMACEUM.—The most popular member of a fairly large genus of pretty dwarf evergreen plants. It forms numerous tufts of narrow leaves, and bears spikes of rosy flowers in summer, when rock plants are mostly out of bloom. Propagation can be effected by selecting young shoots, removing them with a "heel" of old wood after flowering,
and inserting firmly in moist soil. In view of not improbable failure a few shoots should be layered in damp gritty soil, first partially severing them and then pegging them down. Another pretty species is A. venustum, which has pink flowers and glaucous leaves.

ACHILLEA (Yarrow).—Most of the Yarrows are too vigorous in growth for the rock garden, although extremely useful in the herbaceous border. Achillea Ptarmica The Pearl, for example, is a splendid white-flowered variety, and makes beautiful clumps in the mixed border, but it is too large for a small rockery. A. Clavennae may, however, be used with advantage. It is a dwarf, neat grower, and has silvery foliage. The white flowers are borne in summer. The Rock Yarrow, A. rupestris, is worth growing. It has white flowers, which are produced in May. Both species enjoy a loamy soil, but will grow in a poorer medium. Propagation by division in winter. Other Yarrows worth mentioning are A. tomentosa, downy foliage and yellow flowers; A. Huteri, green foliage and white flowers; and A. Aegyptiaca, with yellow and silvery leaves.

ACIS AUTUMNALIS.—A small bulb, with drooping pink flowers, borne, like those of the Autumn Colchicum, Sternbergia lutea, certain of the Crocuses and other bulbous plants, in autumn, after which the foliage appears. It is not a really high-class rock plant, but is one of those precious flowers which connoisseurs love to cherish. It ought to be given a warm site and a prepared soil of sandy loam, for it could not be relied on in cold or poor soil.
ADONIS VERNALIS.—A useful and showy plant, with finely cut whorled leaves and large yellow flowers. This is in no sense a choice flower, but it is one that the rock gardener is very glad to have, because it is one of those cheerful, breezy, hardy things that will thrive almost anywhere, and when full of bloom it makes a very bright patch, for the flowers are both numerous and large. It is easily propagated by seed, which may be sown late in spring. Pyrenaica is a finer plant than vernalis, but too large for small rockeries.

AETHIONEMA PULCHELLUM.—A charming plant, well worth planting on any rockery to bloom in May, when its purplish flowers are very pretty. It is one of the most charming things of its season in the rock garden at Kew. It thrives in sandy loam and may be propagated by division in winter. The Aethionemas are a somewhat numerous genus, widely distributed in nature. A. grandiflorum is a good plant, resembling pulchellum, but with larger flowers, and is worth adding to a collection. It has glaucous leaves and pink flowers.

AJUGA REPTANS (Creeping Bugle).—A British plant, not of the first rank, but useful owing to its dark foliage. It may be given a place on a large rockery, where it will thrive in ordinary soil, and may be increased by division. There is a variety with variegated foliage which is good for carpeting.

ALYSSUM SAXATILE COMPACTUM (Compact Rock Madwort or Gold Dust).—This is a close-growing variety of one of the most popular of our hardy perennials. It is grown in almost every rock garden, and is often planted in the border, where
DRYAS OCTOPETALA
AND GENTIANA BRACHYPHYLLA.

See Section B. and Chapter VII., Part IV.
it forms dense round tufts covered with bright yellow flowers in spring. Other forms of the Rock Madwort are *Citrinus*, pale yellow; Silver Queen; *Sulphureum*, sulphur-coloured; *Plenum* (double) and variegated-leaved. They are pretty, but not better than the original, and need only be grown where a different shade of colour is wanted. There are few more useful rock plants than the yellow Madwort. It grows vigorously, yet it has not the often embarrassing luxuriance of the Snow-in-Summer and the Rock Cresses. It spreads within limits, but does not go off on a roving expedition from top to bottom of the rockery. It is a slow ripple, not a turbulent cascade. It will grow in ordinary soil and does not disdain poor chalky or sandy ground, indeed, it prefers a rather dry to a damp soil. As a perennial this most serviceable plant will grow from year to year, but it comes so readily from seed that many treat it as a biennial, sowing it with the Wall-flowers in the late spring. On this account it may be utilised if something is wanted for a wall or to cover a bank. Of the other Madworts by far the most useful is the Sweet Alyssum, maritimum, which is generally treated as an annual, being grown from spring-sown seed and discarded after blooming. It is a low, dense plant, thickly covered with white flowers. The variegated form often grown under the name of *Koniga variegata* is greatly prized for forming edgings.

**ANDROMEDA POLIFOLIA.**—A shrub, this beautiful plant must not, however, be considered in the same school with luxuriant things like Laurels and Aucubas. It is of neat, close, dwarf habit, and
grows slowly. It is in its greatest beauty when about a foot high and through, and well-covered with its pinkish flowers, which are in full beauty in August. The colour is uncommon, and somewhat difficult to describe. There are several varieties of it. These little Andromedas prove their utility when a few plants of permanent beauty are wanted in a peat bay. Propagation is by cuttings.

**ANDROSACE.**—See Chapter I.

**ANEMONE.**—See Chapter II.

**ANTENNARIA TOMENTOSA.**—A silvery, low-growing plant that comes in useful for carpeting, but has no particular charm of bloom. It will grow in ordinary soil. Propagated by division in winter.

**ANTHEMIS (Camomile).**—A large genus of hardy flowers. The majority are too coarse and lacking in distinction to be worth growing in the rock garden, but one or two may be included, notably *Aizoon* and *Biebersteinii*. The former is chiefly attractive in its foliage, which is white and downy. It is a low, close grower. The plants are hardy, will grow in ordinary soil, and may be increased by division.

**ANTHERICUM (St. Bernard’s and St. Bruno’s Lilies).**—These beautiful and graceful plants are Alpines, and have the elegance and grace of Lilies. *Liliastrum*, the St. Bruno’s Lily, is the most popular. It bears white flowers on long spikes in early summer. There is a large variety of it. *Liliago*, the St. Bernard’s Lily, is a somewhat smaller plant. It also provides white flowers in summer. Both of these handsome
plants enjoy a good loamy soil, and are propagated by division in autumn.

**ANTHYLLIS MONTANA** (Mountain Kidney Vetch).—A useful Alpine, which produces downy leaves and pink flowers in summer. It is a distinctly lime-loving plant, yet will thrive in clay, and with its perfect hardiness becomes a really useful thing, if not of the first rank in beauty and merit. It may be propagated by division in winter.

**ANTIRRHINUMS** (Snapdragons).—With the improved forms of these plants that are now available we have learned to look on them as florists' flowers, to be grown under varietal names in beds, and are apt to lose sight of their usefulness for other purposes. There is no reason why colonies of the intermediate forms should not be grown in large rock gardens, especially on the limestone, which they love. They may be given the poorer chalky spots, not because they are unworthy of anything better, but because there will be no excess of vigour in them, and they will flower profusely. No summer blooming plants will prove more useful for dry banks. They are easily raised from seed, which, if sown under glass in spring, and the seedlings pricked off, will give flowering plants soon after midsummer. If a colour that is particularly desired should appear, it might be well to make sure of it by taking a few cuttings and striking them in a frame, in case it should not reappear in the next batch of seedlings. Yet some of the florists' selections, sold under varietal names which indicate their colour, come true from seed. They have been fixed by several years' careful selection.
The intermediate section is recommended as a happy mean between the old majus section and the Tom Thumb. The former is too vigorous in growth for the rock garden, the latter somewhat stunted. The intermediates grow about a foot high. The dwarf, creamy species _asarina_ is worth growing.

*AQUILEGIA.*—See Chapter III.

*ARABIS* (Rock Cress or Mountain Snow).—In the many references already made to this useful plant in the present work, emphasis has been laid on its somewhat straggling habit. With its common associate the _Aubrieta_, and with the pure white Snow-in-Summer, it does splendid service, but it is apt to overgrow weaker gems. The double is more compact than the single, and in every way a better plant, but even that must be prevented from encroaching on weak things. If planted on the top of a rockery—and they never look better than rambling down the face of a rock—they ought to have a reservation of their own, unless, indeed, their neighbours are vigorous things like Fumitory and Valerian, which are quite capable of looking after themselves. There are two largely grown species of Arabis, _albida_ and _alpina_. The former is the better, and the double is a variety of it. There are also forms with variegated leaves, of which _argentea variegata_, with silver variegation, is perhaps the best. _Lucida variegata_ has green foliage edged with yellow. There is a species, _aubrietioides_, with pink flowers. Those of the Arabises of which seed is not procurable may be increased by division, the double by cuttings.
EDELWEISS (LEONTOPODIUM ALPINUM).

See Section B, Part IV.
ARENARIA (Sandwort).—These are useful as carpeters, being quite moss-like in habit. The best known species is balearica, which creeps over the face of stones, covering them with a green carpet, studded with white flowers. It is not a showy or beautiful plant, but serves a useful purpose. Propagation is by division, and ordinary soil will do. Caespitosa of gardens is the verna of botanists. It is moss-like in growth and has white flowers. A yellow-leaved form is offered under the name of aurea. The species montana is perhaps the finest of the Sandworts. It is very similar to grandiflora, but blooms earlier.

ARMERIA (Thrift or Sea Pink).—We cannot pass over this charming little plant even though we sometimes see it as an edging to a cottage border. We find it on the granitic rocks of our southern coasts, where its neat tufts of grassy foliage and bright rosy flowers make it an object of considerable attractiveness. Cephalotes (or mauritanica) is one of the finest of the Thrifts. It has rich rosy flowers. It enjoys good soil, and comes readily from seed, which is well, for it is not a durable plant. Maritima (or vulgaris) is the common Sea Pink. There are three varieties of distinct colour: alba (white), rubra (red), and Laucheana (crimson). All can be propagated by removing side shoots and inserting them in moist sandy soil in a frame.

ARNEBIA (MACROTOMIA) ECHIOIDES (Prophet Flower). An interesting plant, remarkable for the five dots on the yellow flowers, and which,
black at first, gradually fade away. The Arnebia is not only interesting but pretty. It is easily propagated by cuttings or pieces of roots. It enjoys good loam. The annual species *cornuta* and *Griffithi*, both yellow, are worth growing.

**ARNICA MONTANA** (See coloured plate).—A yellow-flowered Alpine. Propagated by division. It likes a loamy compost, with peat.

**ARONICUM GLACIALE**.—A European plant, now called *Doronicum glaciale*, six inches to a foot high, with yellow flowers (see coloured plate with *Myosotis alpestris*). Likes gritty soil, but is a difficult plant to grow.

**ARTEMISIA** (Wormwood, Southernwood).—This is not a genus of outstanding importance from the rock gardener’s point of view, but it includes one or two interesting plants. *Abrotanum* is the well-known aromatic plant commonly called Southernwood, and *Absinthium* is the common Wormwood. Neither is of much use for rockeries. *Mutellina*, which is shown in one of the coloured plates, is suitable. It only grows about six inches high, and bears pale yellow flowers in August. It is a lime-loving plant. *Sericea* is dwarf, and is a pretty silvery-leaved plant. It is apt to suffer from heavy rain in winter, unless protected with glass. It is an evergreen, and is best propagated by cuttings.

**ASPERULA** (Woodruff).—Pretty, but not of the first importance. *Odorata*, the sweet Woodruff, is a hardy perennial with white flowers, and may be raised from seed. *Azurea setosa* is a hardy annual with blue
flowers, and may be sown in spring to bloom the same year, or in early autumn to flower the following spring.

ASTER (Michaelmas Daisy).—Of the first importance as border plants, on account of their vigorous growth, late blooming and brilliant colours, the Michaelmas Daisies are only of secondary interest for the rockery, as the finest species and varieties are much too large. Alpinus (see one of the coloured plates) is the most popular for this purpose, as the habit is dwarf and neat, the flowers of the species are blue, and there is a white variety. They will thrive in ordinary soil, and are easily propagated by division between autumn and spring.

ASTRAGALUS (Milk Vetch).—A useful leguminous (Pea) genus, but not of outstanding merit. The species are hardy, and will grow in ordinary soil. Monspessulanus, an evergreen trailer with purple flowers, is perhaps the best. It comes rapidly from seed.

ASTRANTIA MAJOR is a useful old European Alpine, with Anemone-like leaves and flowers borne in an umbel. The variety Carniolica is good. They thrive in sandy loam and may be propagated by division.

AUBRIETIA (Purple Rock Cress).—This beautiful plant should be regarded as quite indispensable by the rock gardener, for in habit, hardiness, ease of culture and beauty it is almost unequalled. There is nothing better for poor limestone soils, and it will come in useful alike for covering the face of large stones with a carpet of charming flowers, or for making beautiful patches in borders. Much closer and neater in growth
than the Arabis, it spreads even more, growing later in spring and flowering on every bit of new growth. It has the defect of its qualities, sometimes rambling so far and growing so densely as to smother small things. It never looks better than when streaming down the face of a steep rockery, and if there is no small and precious gem in its course it should be allowed to pour along at will. *Deltotidea* is the most important species, and with its purplish-blue flowers brightens many a rockery. There are many varieties of it, and some of them have been given preference. *Campbellii*, violet; and *Leitchlini*, rose, are special favourites. *Grandiflora* is much like the former. *Dr. Mules*, with rich purple flowers, is one of the most brilliant. *Fire King*, crimson, is perhaps the richest of all. They come readily from seed when procurable, and if it is not, plants may be bought and increased by division in autumn. *Aubrietias* are the plants *par excellence* for dry banks, poor soil and exposed places. Nothing can quench their vigour or kill their beauty.

**BELLIDIASTRUM MICHELII (Aster Bellidiastrum).**—This pretty plant, which is shown in one of the coloured plates, is classed by modern botanists with the Asters, and called Aster Bellidiastrum. In cultivation it grows about a foot high, and bears white flowers in summer. It is not a common plant. It is not particular as to soil, and might be added to a fairly large rockery if procurable. Propagation by division.

**BULBOCODIUM VERNUM.**—A useful little winter-flowering bulb, with purplish flowers, quite cheap and easy to grow. It generally blooms in advance
of the Crocuses and the flowers precede the leaves. It can be got from bulb dealers in autumn and planted an inch deep in ordinary soil. If it is desired to increase it divide in late summer.

*Calandrinia Umbellata.*—A brilliant perennial trainer, hardy, easily grown from seed, and not very particular as to soil. Few brighter flowers can be grown. By sowing early under glass it can be flowered the same year.

*Calla.*—The beautiful Lily of the Nile, now called by botanists *Richardia Africana*, is extensively grown under the name of *Calla aethiopica*. It is not hardy, but sometimes endures our winter in shallow water in mild places, and is thus not entirely out of consideration as a garden aquatic. The species *palustris*, the Bog Arum, is quite hardy, and may be pressed into service where plants are wanted for marshy ground.

*Caltha* (Marsh Marigold).—The native Marsh Marigold, *Caltha palustris*, which bears yellow flowers in spring, is doubtless a familiar plant to many readers, and may hardly be considered good enough for inclusion in a selection of marsh plants for the garden. It is, however, showy. The dwarf double form called *minor plena* may give more satisfaction, or if a larger one is wanted, *monstrosa plena*. All like the waterside, and are easily increased by division.

*Campanula.*—See Chapter IV.

*Cardamine* (Ladies’ Smock).—The place for the members of this genus is the bog, as they are moisture-lovers. It is hardly likely that the common
pratensis will be grown, but it is a pretty plant. The double (flore pleno) may be preferred for garden culture. "Coral-root" is a large species familiar to visitors to Switzerland.

*CERASTIUM (Snow-in-Summer).—Several references have been made to this genus, in which it has been spoken of as beautiful, both in foliage and bloom, but as so rampant as to be a dangerous neighbour for choice things. If the flower-lover can plant it on a high part of the rockery, where it can have a clear run, he will be able to enjoy its beauty to the full, and need harbour no fears of ulterior mischief. The Cerastiums are very accommodating plants. They make light of poor soil, and will thrive in a thin layer of earth over chalk. After being established a year they begin to spread rapidly, and self-sown plants will appear in many parts of the rockery. Some at least of these will have to be removed, and if desired they can be transplanted and used to form a broad margin. The fact that they sow themselves in this way suggests that they are readily raised from seed, and that it may be sown out of doors. A strong plant will make such rapid growth in spring as to spread a broad stream of silvery foliage and snow-white bloom down seven or eight feet of rockery. The two species offered by seedsmen are Biebersteinii and tomentosum. There is little, if anything, to choose between them, but a slight preference may be given to the former. Alpinum and tenuifolium are offered in some of the plant catalogues. Neither need be chosen before Biebersteinii, and this is hardly a genus of which flower-lovers would care to make a collection.
CHEIRANTHUS (Wallflower).—The rich and fragrant old Wallflower is, of course, a prime favourite for spring bedding, and for this purpose it may be reserved, but one or two of the other species, notably Alpinus and Marshalli, may be grown in the rock garden. They have much of the brilliance, but not the rich fragrance, of the lighter-coloured Wallflowers. The former has pale yellow flowers, which it bears in spring. It is, as its name implies, Alpine, and may be increased by division. The latter is of hybrid origin. It is neither so free-growing nor so long-lived a plant as the other, but even Alpinus tends to die out on damp soil. Marshalli is best propagated by cuttings. Both species share the love of the Wallflower for light, dry soil. They enjoy limestone, and will thrive, like the Wallflowers, on dry chalky banks. If it comes to growing plants actually on walls the Wallflowers themselves may be given preference. It is only necessary to give a reminder of how readily they come from seed sown out of doors in spring. They make the best plants when transplanted during showery weather in summer, but seeds may be scattered where they are to bloom if more convenient. A yellow should always be sown in addition to a dark variety.

CRYSANTHEMUM ALPINUM.—A very dwarf and compact Ox-eye Daisy (see coloured plate); thrives in gritty loam and may be increased by division.

CISTUS (Rock Rose).—These little shrubs are admirably adapted for rock gardens, and have the advantage (a considerable one in the case of a great
many flower-lovers) of thriving in hot, dry, places. They revel in the most sun-baked spots, and a soil devoid of humus and moisture has no terrors for them. They will thrive on sandy banks, and vie with Wall-flowers on walls. These considerations are important, and it is satisfactory to feel that the plants are far removed from weeds, having large and brilliant flowers. It is true that the blossoms fade quickly, but successive crops of them maintain the display. Some of the *Cistuses* are too large for small rockeries, but several good species are sufficiently small to be available.

Most of the *Cistuses* are best propagated by means of seeds, which may be sown out of doors in a frame in spring. Some are propagated by cuttings inserted in a frame in early autumn, or by layers after flowering.

The principal defect of the Rock Roses is a want of perfect hardiness, which may not be apparent in a mild winter or in a sheltered garden, but may show itself all too plainly in severe winters and in exposed places. They should be given a warm, sheltered position.

Dealing with the principal species and varieties in alphabetical order, *albidus* may be first mentioned, but it is quite large enough for most rockeries, and too large for some, growing two feet and more high. The flowers are rose-coloured, and the foliage downy. *Incanus* is a purple variety of it. They have large flowers, which they produce in early summer. *Clusii* is handsome with its large white flowers, but somewhat too vigorous. *Crispus*, with dark rose flowers, is very good and not so large as the preceding. It is one of
ONOBRYCHIS MONTANA.

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DESCRIPTIVE AND SELECTIVE.

the most useful. *Florentinus*, with white flowers, is one of the most compact. *Hirsutus* (or *laxus*) has white flowers and is fairly compact. Its specific name derives from its hairiness. *Ladaniferus*, the Gum Cistus, is one of the most handsome of all, and it is unfortunate that it is too large for most rockeries. It has white flowers, but there is a spotted form called *maculatus*. *Monspeliensis* is a handsome Cistus. It varies a good deal in height, but is generally too tall. It is white with yellow blotches. Three of the most important of the remaining species are *salvijolius*, (Sage-leaved) with white flowers; *vaginatus*, with rose flowers in spring; and *villosus*, rose; but they are all rather too large for small rockeries.

*CNICUS* (*Cirsium*).—This is a genus of Thistle-like plants, some members of which are used for bedding. The plant often sold in seed shops and nurseries as *Chamaepeuce Casabonae*, and popularly called the Fish Bone Thistle, is now classed with the Cnicuses by botanists, while *Chamaepeuce diacantha*, the Ivory Thistle, has become *Cnicus diacantha*. Again, *Cirsium spinosissimum*, the subject of one of the coloured plates, is now called *Cnicus spinosissimus*. It bears yellow flowers in summer. The Cnicuses are not front-rank rockery plants. Most of them, indeed, are too large. They thrive in ordinary soil, and come readily from seed.

*COLCHICUM* (*Meadow Saffron*).—As an autumn-blooming plant, with bright purple flowers, the Meadow Saffron arrests the attention of rock gardeners, for bloom is scarce at its season. It is a Crocus-like flower,
but larger than that pretty favourite of late winter, and differs in coming in advance of its leaves, which only begin to grow when the flowering is complete. The disadvantage of this leaflessness at the blooming season can be overcome by planting it in a dwarf carpenter. The flowers not only look better thus than on the bare soil, but are kept cleaner. The Colchicums grow from bulbs, or rather corms, which are poisonous. These should be procured in summer, so that they can be planted early. They should not be left so late as Crocuses and Tulips. They may, however, be raised from seed sown in spring, and in the case of autumnale at all events this is easy to get. If it is desired to increase existing plants the clumps may be lifted and divided as soon as the foliage has decayed. They enjoy a substantial loamy soil.

By far the best known species of Colchicum is autumnale, which is often called the Autumn Crocus. It is a European plant, and is naturalised in many places. There are a considerable number of varieties of it, some single, others double. Flower-lovers generally prefer some of the best of these to the type. Of the singles there is a white (album), a very dark (atropurpureum); a striped (striatum); a pale rose (pallidum); and a variegated-leaved (foliis-variegatis). Of doubles there are white (album plenum); purple (purpureum plenum); rose (roseum plenum); and striped (striatum plenum).

A pretty species that one rarely sees is Bornmülleri, purple with white zone. It grows about a foot high. Byzantinum is also attractive, but comes close to
autumnale. *Sibthorpii* is a Grecian species with tessellated flowers, the colour being purple chequering white. It is one of the best. *Speciosum* is, next to *autumnale*, the best known of the Meadow Saffrons. It is a large-flowered species, purplish lilac or purplish rose in colour, and comes from the Caucasus. A little taller than *autumnale*, it is nevertheless quite suitable for the rockery. There are several varieties, of which the most precious is a pure white (*album*). It is a most beautiful plant. A very large variety called *maximum*, and a red (*rubrum*) are also worth mentioning. This set enjoy a loamy soil with plenty of sand. *Variegatum* is a fairly popular species. It is white or pale rose chequered with purple. *Parkinsoni*, which is often grown as a distinct species, is now classed as a variety of *variegatum*. There are several other chequered species besides those named.

**COLUMBINE.**—See *AQUILEGIA*.

**CONVALLARIA (Lily of the Valley).**—The great plant in the genus *Convallaria* is *majalis*, unfamiliar to most people under its botanical name, but familiar and dear to all under the popular name of Lily of the Valley. It would savour of the imaginative to speak of this as a rock plant, nevertheless it is an Alpine. When we find it in Great Britain it is in the heart of the shady wood, not on sun-scorched hillsides, and so we have grown to regard it as anti-Alpine. This exquisite and fragrant little flower cannot be grown successfully on the average sunny rockery, and if it is to be included in the rock garden at all it must be in a spot where it escapes the ardent attentions of the
summer sun. Although a pronounced shade-lover, however, it does not care for heavy, damp soil, such as is beloved of the bog and marshy plants. Those who find it in nature will often notice that the soil is dry and heathy. It never does better in cultivation than when planted in sandy, well-drained, friable loam. Given this, and shade, it will thrive in most places. When established it grows into thick matted colonies, and its flowers, though abundant and sweet, are not of the quality which satisfies the trained eye of the flower-lover. The bloom can be improved greatly by thinning the clumps every year or two, and spreading a dressing of sandy loamy soil and leaf mould among those that are left.

As most flower-lovers know, it is necessary to procure special crowns of Lily of the Valley if forcing under glass is required, but this is not desirable for the garden. It is better to begin with what the bulb-dealer calls "clumps," and these may be bought and planted in autumn. They may not give many flowers the first year, but they will give plenty in future seasons.

There are many varieties of Lily of the Valley, some much finer in bloom than the type, and not less sweet. Fortin is one, and Victoria another. The flower stems of the former are a foot long under favourable conditions.

.Convolvulus (Bindweed).—While one must be careful in admitting the Bindweeds to the garden, since the more common kinds are apt to become extremely troublesome, there is no denying the great beauty of some of the species, and their complete
PAPAVER ALPINUM
AND LINARIA ALPINA.

See Section B., Part IV.
suitability for large rockeries. Their chief use is for trailing over large stones, which they cover with a charming mantle of brilliant flowers. The blue rock Bindweed (*mauritanicus*), a North African plant, is particularly beautiful, and the flower-lover who sees it for the first time draping a large rock is enchanted with its exquisite beauty. The Bindweeds will thrive in ordinary garden soil.

The following are a few of the species best suited to the wants of the rock gardener: *althaeoides*, a twiner with pink flowers in late spring, hardy and quite easy to grow, may be propagated by division or by seeds if procurable; *Cneorum*, with silvery foliage and charming pink flowers, a delightful plant, but not perfectly hardy, it should, therefore, have a warm, sheltered spot; *Incanus*, silvery leaves and white flowers, not hardy; *Lineatus*, almost a carpeter, with purplish-red flowers and silky-grey leaves, not a very free bloomer; *Mauritanicus*, the most beautiful of all, a really exquisite flower, rich blue in colour, and blooming very abundantly. It is not absolutely hardy, but as seed is plentiful and the plant is easily raised, it may be treated as an annual. The seed could be sown on a greenhouse shelf, or in a frame in March, and the plants put out in a warm place early in summer. It likes a sandy soil. Owing to its graceful, dependent, yet not rampant, habit, it is often grown in baskets and vases.

*COPTIS TRIFOLIATA* (Gold Thread).—This little plant is listed in some of the catalogues. It is a tiny evergreen, producing large numbers of slender
stems bearing white flowers in spring. The specific name comes from the division of the leaves into three and the popular one from the yellow roots. It is a great lover of moisture, and may be planted in peaty soil in the bog or marsh garden. It is propagated by division between autumn and spring, or by seeds sown in spring. There are several other species, but the only one that need be considered is *ocidentalis*, which produces white flowers in May. It is taller than *trifoliata*. They should have a sheltered place.

**CORIS MONSPELIENSIS.—**A pretty but not largely grown Primulaceous plant, bearing lilac flowers with orange anthers in June. It enjoys a warm, sunny spot, and sandy, well-drained soil. It may be raised from seed under glass in spring, and is best treated as a biennial, being sown afresh every year.

**CORONILLA IBERICA (Iberian Crown Vetch).**—This is the most popular rockery species of a rather large genus. It is now called *cappadocica* by the botanists, but is generally listed as *iberica*. It is of trailing habit, and is therefore suitable for the rock garden. It bears yellow flowers in umbels in July. The foliage is glaucous. It will interest lovers of the Pea family. It is not safe in an exposed place. It likes a good loamy soil, the more if a little peat is added. Propagation is by seed. *C. varia*, with rosy flowers, is also grown, but this is a stronger plant, not suited for small rockeries.

**CORTUSA.—**A small genus of Primulaceous plants, of which two species are offered in the catalogues: *Matthioli* and *pubens*. The former bears crimson
flowers in late spring or early summer, and grows a foot high, the latter purple flowers. It grows about a foot and a half high, and has downy leaves. If seed can be procured, it may be sown in a frame in Spring, and propagation may also be effected by division between autumn and spring. Sandy loam, with a little peat, suits them.

**CORYDALIS (Fumitory).**—As already stated, this genus contains members of great value owing to their graceful foliage, bright flowers and freedom of growth, but which are apt to become troublesome if left unchecked. A notable instance is the yellow Fumitory *C. lutea*. This is an undeniably pretty plant, with a store of vitality which few plants can equal, but in congenial places it becomes an undoubted weed. This is particularly the case on limestone. It loves to establish itself among stones, whether in the rockery or on walls. It will settle down comfortably in the mouth of a drainpipe. The stems are thick and succulent, able, apparently, to make their own moisture. I allow it to grow under strict supervision, making drastic reductions at frequent intervals. It sows itself everywhere and needs more curbing than encouraging. It begins to bloom in spring, and goes on spreading and flowering all the summer. *C. nobilis* is a finer plant. It also has ferny foliage, and the yellow flowers are marked with chocolate. It blooms in late spring. It does not spread like *lutea*, and may have a little cultural care, such as the provision of light loamy soil and propagation by division. *Cheilanthifolia* and *thalictrifolia* are also pretty, but the latter could only
be grown on the rockery in a sheltered place, as it is not hardy. Both have yellow flowers in summer.

**COTYLEDON.**—Under this genus of succulents the botanical authorities have now classed Echeverias and Pachyphytums. They are not important to the rock gardener, although the British Wall Navelwort, *C. umbilicus*, is sometimes grown. The Echeverias are useful plants, but they are more in demand by the bedder-out than the rock-gardener, being used a good deal for planting the raised edges of flower beds. *C. umbilicus* grows about six inches high, and bears yellow flowers in June.

**CROCUS**, see Chapter V.

**CYANANTHUS.**—A small genus, of which two species, *incanus* and *lobatus*, stand out as the most prominent. The former has light blue flowers with a white throat, the latter purplish blue blossoms. They are dwarf Himalayan plants, which bloom in August, and enjoy a peaty soil with plenty of grit in it. They love sun. Propagation may be effected by seed, sown in spring, or by cuttings made of the young shoots in spring. Both should have the protection of a frame.

**CYCLAMEN.**—Those who only know the various forms of the tender Persian Cyclamen, which is grown by florists into such beautiful specimens for warm greenhouse and conservatory decoration in winter, exclaim in mingled surprise and pleasure when they see a happy colony of hardy Cyclamens, such as the species *Coum, Europaeum, Neapolitanum* and *Vernum*. They are attractive both in foliage and bloom.
RANUNCULUS GLACIALIS.

See Section B., Part IV.
DESCRIPTIVE AND SELECTIVE.

They are admittedly not plants for sunny rockeries, because they love shelter and shade, nor are they suitable for marshy ground, as they do not care for wet soil; but it often happens that a sheltered spot, not exposed to the fierce heat of the midday sun, exists in or near a rock garden, and here Cyclamens could be grown. One sometimes sees them thriving on a raised rock bed on the north side of a hedge, or under a tree. Cold winds and heavy hailstorms are liable to injure the foliage, which should be in full beauty, in the case of several species, in winter. There is, too, the bloom to consider, and most of them flower in autumn or winter. In mild places one may see them full of flower at the end of September, and remaining in beauty for several months. In other localities they will begin to bloom in winter and give flowers till spring.

It will be seen that the Sowbreads are different in their habits from most rock plants, and call for special treatment, of which they are well worthy. The flower-lover would be wise to prepare a little rockbed for their particular accommodation, choosing the site with care, and setting the stones in a bed of good loam well lightened and enriched with leaf-mould, dried cow manure and sand. Mortar rubbish may be added to supply lime. The tubers may be obtained with the earliest bulbs. The florists often grow them in pots, so that they can be planted at almost any period, but August is a good time. The tubers should be covered with about an inch of soil. In no case should they be left about to get dry, for they will be a long time
recovering from the shock this will give them. Even when in a dormant state they should be kept in the soil.

The hardy Cyclamens, like the tender varieties, are best raised from seed, which may be sown in pots or pans in spring, and shaded to check evaporation until germination has taken place. The plants will be best on a bed of ashes in a frame throughout the summer. It is quite likely that they will grow slowly, and that they will not be strong enough to put out till the following summer, because they have to make their corms. They must be watered as required, and kept in a half-shady place, where the conditions are cool and moist.

The following are a few of the best of the hardy Cyclamens: *Coum* is a winter-flowering Grecian species, with round, smooth tubers, green, heart-shaped leathery leaves, and crimson or purplish-red flowers. It grows about four inches high. A variety called *album*, white with purple eye, is offered by hardy plantsmen. *Atkinsii* is listed in some cases as a distinct species, and in others as identical with *ibericum*. It is probably a garden hybrid of *Coum* parentage; at all events it belongs to the *Coum* section. It has purple and white flowers. *Hederaefolium* is the Ivy-leaved Cyclamen, and has the great merits of being hardy and an abundant bloomer. It forms a large tuber, from the upper surface and edges of which the roots push. The flowers are purplish-red, and are produced in autumn. A white variety (*album*) is listed. The leaves are handsomely marked. *Ibericum*, with red
flowers in winter, resembles *Coum*. There are several varieties of it in the lists, such as *album*, white; *purpureum*, deep purple; and *Whittallii*, white to pink. *Europaeeum* is a pretty species with purplish-red flowers, which are borne in autumn and winter. It is a lime-lover. *Repan*um of the plant catalogues is probably the same as *vernum*, which is a spring bloomer with purplish-red flowers, and marbled leaves. It must have a sheltered place, or the foliage will suffer severely from cold winds.

**Cypripedium (Lady's Slipper).—**These lovely Orchids are among the most precious plants of the rock garden. They are denizens of the woods, and are hardy enough to thrive in our climate. That they do not always succeed is probably due to dry soil. Their great value lies in their suitability for adorning moist bays in the rock garden. Here, with shelter from boisterous winds and abundant moisture, they are quite at home. We have no other flowers in any way like the Lady’s Slippers, and certainly none more beautiful. Alike in form, colour, and habit they are delightful.

In most places it will be desirable to prepare a special compost. Close, dry soil is unsuitable. What they enjoy best is a mixture of peat and leaf mould, and the grower should not hesitate to provide it in case of doubt. He should also see that it is kept moist. Partial shade is desirable, but not absolutely essential so long as the soil is moist and flaky. The plants are propagated by division, but frequent disturbance is bad. Care should be taken to keep the roots cool and moist at all times when they are being planted or propagated.
The following are the most admired species: *Calceolus* (see plate) is a British plant, growing about eighteen inches high, with yellow flowers in summer. It is not rarely met with wild, so that there is an additional inducement to grow it. *Guttatum* is the spotted Lady’s Slipper, which grows about eight inches high, blooms late in spring, and produces white flowers marked with purple. It is a Siberian plant. It likes a shady place. *Macranthum* is a splendid species, growing a foot high and producing rosy purple flowers in summer. It thrives in coarse loam and leaf mould. *Spectabile* is about the finest of all. It grows about two feet high and bears rose and white flowers of great beauty in summer. It is a North American plant, thriving in coarse loam, leaf mould and peat. There is a white variety of it called *album*. Other species which might be grown by those who want to form a collection are *acaule*, with rosy-purple, fragrant flowers in May, growing only about six inches high; *candidum*, with white flowers in June, one foot high; *californicum*, eighteen inches high, yellow and white flowers, blooming in late summer; *montanum*, purple and white flowers, one foot high; *parviflorum*, an American species, purple, with yellow lip; and *pubescens* (*hirsutum*), which grows about two feet high and produces yellow flowers spotted with brown in summer; a Canadian and Nova Scotian kind.

*Daisies* (*Bellis*).—The modern varieties of Daisies are generally used as bedding and edging plants, but there is no reason why they should not be included in a large rock garden where there is room for a consider-
able variety of plants. They make neat clumps and bloom profusely. They thrive in ordinary soil, if not dry, and are easily propagated by division after flowering. The best known species is *perennis*, but the flower-lover should get good varieties, such as *Rob Roy*, crimson; *Bridesmaid*, rose; *Snowflake*, white; and *Alice*, light pink. He might also grow the curious and pretty *Hen-and-chickens*.

**DAFFODIL.**—See Chapter IX.

**DAPHNE.**—The Daphnes are shrubs, but in some species so small as to be suitable even for a small rockery. They are neat, close growers, and in most cases deliciously sweet. They are not fastidious as to soil, thriving in gritty loam. They may be planted in autumn, and will give flowers before the spring opens. They can be propagated by seeds, but the process is slow, and it is preferable to take cuttings in autumn, and put them under a bell glass in a greenhouse. If they do not go away quickly in spring they can be accelerated with heat. They should be planted out as soon as they are nicely established, and should be given a sheltered place.

The following are the best Daphnes: *Alpina (candida)* a European Alpine, has creamy-white flowers in spring, and comes into full leaf in summer. It bears red berries in autumn. It is a lime-lover, and grows about two feet high. *Blagayana* is a low Alpine trailer, rarely growing more than a foot high. It bears fragrant white flowers in spring. Its habit furthers propagation by layering, which is effected by pegging the shoots down in spring, notching them, and separa-
ting them from the old plants when they have formed roots. This species is one of the best for the rockery. *Cneorum* is one of the most popular, and deservedly so, as it is an abundant bloomer and is deliciously sweet when in full bloom in spring. It likes a limestone soil. It is quite dwarf, growing from six inches to a foot high, and is therefore suitable for the rockery. The flowers are pink. It may be propagated by layers. *Mezereum* is the well-known "Mezereon," a splendid shrub, blooming before winter has passed, and filling the air with fragrance. It grows somewhat stronger than the others, and is not suitable, therefore, for small rockeries. The species has red flowers, but there is a white variety (*alba*). *Odora (indica)* is a delightful species, being both pretty and sweet, but it is not hardy, and is generally reserved for indoor cultivation, together with its varieties, of which *alba* and *Mazeli* are very popular. *Striata* (see coloured plate with *Trifolium Alpinum*) has purple flowers in June.

**DARLINGTONIA** (CALIFORNIAN PITCHER-PLANT).—An interesting and handsome plant, with tall, cylindrical, hollow leaves, terminating in a kind of hood, the whole forming a pitcher. There is only one species, *Californica*, which grows about eighteen inches high, and bears greenish-yellow flowers in spring. It likes a moist atmosphere and peaty soil, intermixed with chopped sphagnum moss. The plant is not quite hardy, and must have a sheltered, though sunny place, in a moist bay at the base of the rockery.

**DELPHINIUM** (PERENNIAL LARKSPUR).—One of our noblest genera of hardy herbaceous plants, but too
tall for the rockery. One species may, however, be used for our purpose, and that is the scarlet nudicaule, which grows about eighteen inches high and blooms in July. It may be raised from seed, either sown in winter under glass to be pushed on for blooming the same year, or in a cold frame in May. A good loamy soil is liked. There is an orange variety of it called aurantiacum.

**DIANTHUS**, see Chapter VI.

**DICENTRA** or **DIELYTRA** (Bleeding Heart or Lyre Flower).—Many owners of greenhouses buy with their bulbs in autumn clumps of curious gnarled roots and dormant crowns of the singular and beautiful plant generally known as *Dielytra spectabilis*, but now called by botanists *Dicentra spectabilis*. Although much used for forcing it is nearly hardy, and other species of the genus are entirely so. They are extremely graceful and beautiful plants, having elegant fern-like foliage as well as charming pendent flowers, arranged almost like earrings on the arching stems. They are fleshy, free-growing herbaceous plants, suitable for planting on the lower slopes of large rock gardens. They are easy to grow, as they will do in ordinary garden soil if planted between autumn and spring. They should not be put in places swept by cold, cutting winds in spring. They may be propagated by division while dormant. The shade and partial shelter of shrubs are grateful to them.

The following are the principal species: *Canadensis*, the Canadian Fumitory, has glaucous, ferny foliage,
and white flowers, borne in spring. It only grows about six inches high. *Eximia* is a splendid North American species with beautiful foliage and showy purplish-red flowers, which are borne in May. It grows about a foot high. This is the most useful of all, as it is quite hardy and will grow in almost any soil. The foliage is suitable for cutting. *Formosa* grows about six inches high, and bears purplish-rose flowers in May. *Spectabilis* is the famous "Bleeding Heart" or "Lyre Flower." It is one of the most distinct and beautiful garden plants that we have, worth growing in sheltered places in any border, but somewhat too large for some rockeries. It bears its lovely flowers in May. Florists offer a white variety (*alba*), and there is also one with variegated leaves, but the species should be preferred to either.

*Dodecatheon (American Cowslip).*—There are few more graceful rock plants than these charming American plants. They have a grace quite their own, although the flowers give a reminder of Cyclamens. The petals are reflexed. The American Cowslips are related to the Primulas, but bear little external resemblance to the popular species of Primrose. They are suitable for parts of the rock garden which are more or less shaded, and may be grown very successfully in a moist bay where the soil is peaty or contains a good deal of leaf-mould. In such a position they will establish themselves readily and soon increase so much as to call for division, which may be done about mid-winter. A stock may be raised from seed in the first place, sowing in spring in pans and placing in a cold frame.
SEMPERVIVUM FUNCKII.

See Section B., Part IV.
Much the most important species is *Meadia*, a somewhat variable plant as to colour of flower, but typically rosy-purple, and blooming in spring. It grows about a foot high. There are many varieties, notably *album*, white; *giganteum*, a larger plant than *Meadia*, varying in colour; and *integrifolium*, smaller than the type and with rosy-red flowers. The last is described as a distinct species by some authorities. It is a native of the Rockies, and a charming little plant for the rockery. *Lancifolium*, with narrower leaves, is probably also a variety of *Meadia*, but it is grown as a distinct species by some experts under the name of *Jeffreyanum*. It is somewhat larger than the type and a fine plant. The flowers are rose with yellow markings. *Clevelandii*, growing about a foot high and producing blue flowers is also a variety of *Meadia*, but enjoys a drier soil.

**DOG'S TOOTH VIOLET.**—See *ERYTHRIONIUM*.

**DONDIA EPIPACTIS** (*Hacquetia*).—A very early blooming plant, dwarf and tufty in habit and bearing yellow flowers. It grows vigorously and is easily propagated by division in autumn. Ordinary soil.

**DRABA** (*Whitlow Grass*).—These useful Alpines form close cushions, thickly studded with small spikes of bloom in spring, yellow or white in the case of most of the species. They are such low, weak growers that they are smothered if planted near coarse, aggressive things. They should be planted in the sunniest crevices. They are not fastidious about soil, so long as it is gritty and well-drained. Propagation may be
effected by sowing seed under glass in spring, or by division in autumn or winter.

The following are the principal species: *Aizoides* is the most popular of all, it forms dense carpets studded with yellow flowers in March; a really charming little plant. *Aizoon* is also very dwarf, and bears yellow flowers early in spring; it is not a fast-spreading plant like the preceding. *Alpina* is an Arctic species, dwarf, and with yellow flowers. *Cinerea*, a Siberian plant, is one of the best of the white species. *Cuspidata* is a Spanish Alpine, yellow flowered. *Glacialis*, a Swiss Alpine, with yellow flowers, is pretty. *Pyrenaica*, with white and purple flowers, is also good.

*Dracocephalum* (Dragon's Head).—Most of these are rather too large for many rockeries, but several are suitable, as, if rather tall, they are not of coarse, spreading habit, and may be admitted. The flowers are not only pretty but quite distinct. They are of easy culture, succeeding in almost any soil. I find that they do well in chalky soil. Propagation may be effected by seed sown under glass in spring. *Austriacum*, *grandiflorum* and *Ruyschianum* all have blue flowers. *Grandiflorum* is the dwarfest, but a place should be found for *Ruyschianum* if possible, for it is a beautiful plant.

*Drosera* (Sundew).—This is a small genus of curious plants, having the power of catching and absorbing flies and other small insects. They are, therefore, insectivorous. There are several hardy species, of which *rotundifolia*, a British plant, the well-known "Sundew," is the most familiar. It is a pretty
as well as an interesting plant, growing about six inches high. The white flowers are produced in July. *Filiformis* is a pretty North American species with rosy purple flowers, which it produces in summer. It has slender, threadlike leaves. The Droseras are bog plants and not easy to grow. They like a moist atmosphere as well as moist soil, and this is difficult to provide in some gardens. Peat is the most suitable soil, and sphagnum moss should be encouraged to grow in it. Propagation is by seeds, or division.

**DRYAS (Mountain Avens).**—Handsome dwarf shrubs, suitable for the rock garden. *Octopetala* is the best known species. It is an evergreen trailer, spreading freely in peaty loam with plenty of sand in it, and bearing numerous white flowers in July. It likes moist soil and a cool site. See coloured plates with *Gentiana brachyphylla*. There is a variety with woolly leaves, called *lanata*, and a small one called *minima* or *minor*. *Drummondii* is the most familiar of the others, and it bears yellow flowers in early summer. They may be propagated by seeds in spring, division between autumn and spring, or cuttings under a handlight.

**EDELWEISS (Leontopodium Alpinum).**—A Swiss Alpine, with woolly foliage and silvery flowers, much sought after by the public, but not of outstanding value in the rock garden. It is hardy, and thrives in most soils. I have used it for a rock wall on poor limestone soil, where it thrives. In wet places it ought to be protected with a square of glass in winter, or it will suffer from the rain. It is easily raised from
seed which may be sown under glass in spring. It forms the subject of one of the coloured plates, and appears in another in association with Gentiana acaulis.

**EPIGAEA REPENS** (May Flower).—The visitor to summer flower shows where hardy plants are well represented sometimes has his attention attracted by a small trailing plant with racemes of white, pink-tinted flowers which emit a delicious spicy odour. It is *Epigaea repens*, the North American “May Flower.” It is an evergreen plant, pretty as well as fragrant. It is not much grown in Great Britain, probably because flower-lovers find it apt to die away from their rockeries. This is due to sun and drought as a rule. The May Flower likes coolness and shade. Those who wish to grow it should give it shade and peaty soil, well lightened with sand.

**EPILOBIIUM** (Willow Herb).—Flower-lovers who see the Willow Herbs rising three or four feet high at the waterside have no temptation to think of them as rockery plants, and certainly so far as such popular species as *angustifolium* and *hirsutum* are concerned they are quite out of the question. There are, however, two dwarf species which could be pressed into service, namely, *Dodonae* and *obcordatum*. The former grows a foot to eighteen inches high, and the latter about nine inches. The former has purple, the latter rose flowers. *Obcordatum* is an excellent rockery plant, and thrives in ordinary soil. It is a true Alpine. Propagation may be effected by division between autumn and spring.
DESCRIPTIVE AND SELECTIVE.

**EPIMEDIUM (Barrenwort).**—This is a somewhat numerous genus of low, spring-blooming, shade-loving plants, which rapidly carpet the ground when in a congenial position. They are graceful alike in foliage and bloom. Towards the end of summer the leaves assume pretty tints and are used in floral decorations. They are among the few Alpines that enjoy shade, and will thrive under trees. Loam and peat, with abundance of grit, make a suitable compost for them. Propagation may be effected by division in early spring, or by seeds sown under glass in spring. The following are the best species: *Alpinum*, crimson and yellow; *macranthum*, blue and white; and *pinnatum*, yellow.

**ERANTHIS (Winter Aconite).**—Few of the very early flowers of the year are so pretty as the charming little "Winter Aconite," *Eranthis hyemalis*, which bears large pale yellow flowers, surrounded by a green "ruff." It will grow in almost any soil, but prefers a moist one, and is procurable at a cheap rate from bulb dealers in autumn. There is a less familiar and somewhat later-flowering species called *cilicica*, also yellow.

**ERICA (Heaths).**—There is room for a selection of the best dwarf mountain shrubs in many a rock garden, and few are so suitable as the Heaths, which are compact in growth, and profuse and beautiful in bloom. Several of them are British plants. They enjoy a peaty soil. *Carnea*, one of the most popular, likes limestone. Some bloom in autumn, others in winter and spring. Those with a tufty habit of growth may be propagated
by division between autumn and spring, but this plan is not suitable for the upright sorts, which must be increased by means of cuttings inserted in sandy peat in a frame in autumn. The following are the most suitable kinds for rockeries: *carnea (herbacea)* produces its beautiful rosy purple flowers in February, and only grows from six inches to a foot high. It is a European plant. There is a white variety called *alba*. *Cinerea*, the Scotch Heath, is somewhat taller than the preceding one, yet not a strong grower. It bears reddish-purple flowers in summer. There are many varieties of it, such as *alba*, white; *atropurpurea*, dark purple; *atrosanguinea*, dark red; and *rosea*, rose. *Ciliaris* is a late summer bloomer, with purple flowers. *Lusitanica (codonodes)*, the Portuguese Heath, is too tall for many rockeries, but it is a beautiful plant, bearing pink flowers at mid-winter. *Mediterranea* is also too large for some, but a fine plant, with purple flowers in spring. There are several varieties of it. *Tetralix* (Bell Heather) bears light red flowers in late summer, and grows about a foot high. There is a white variety (*alba*), and a red (*rubra*). *Vagans* (Cornish Heath) grows from a foot to three feet high and bears purplish flowers in summer. There are several varieties of it. The “St. Dabeoc’s Heath,” sometimes offered under the name of *Erica polifolia* and also grown as *Daboecia polifolia* and *Menziesia polifolia* is a beautiful plant, with distinct purple flowers. There is a lovely white variety. They are natives of Ireland and bloom late in summer, when there are few small shrubs to equal them in beauty. They like a peaty soil.
ERIGERON (Fleabane).—There are few more useful border plants than Fleabanes. They have flowers much resembling those of the Michaelmas Daisies, but the majority of the species are dwarfer. This makes them more suitable for the rockery, and a few selected sorts may, indeed, be grown in the Alpine garden with great advantage. They are bright, pretty flowers, and the foliage of the plant is graceful. The Fleabanes are among the most easily cultivated of all plants, as they succeed in most soils and are easily raised from seed in spring and increased by division in spring. The best known species is undoubtedly speciosus, otherwise Stenactis speciosa, and a fine, handsome, desirable plant it is; but it is better suited to the border than the rockery. Alpinus and its varieties are the best. The species has purple flowers, as also has its larger variety, grandiflorus. Roylei, long grown as a species, is now classed as a variety of alpinus, under the name of semi-barbatus. It is a beautiful sort, with its purplish-blue, yellow-eyed flowers. The species aurantiacus, orange; and its fine variety superbus, varying in colour, are also suitable. These Fleabanes all bloom in summer.

ERINUS ALPINUS.—A charming little Alpine growing but a few inches high and covered with rosy purple flowers in May. It is a pronounced lime-lover, and will grow on old walls, which it covers with a moss-like growth. A light dry soil suits it better than a heavy damp compost. It can be raised from seed in spring, sown where the plants are to bloom, and left to its own devices. There is a
white variety called *albus*, and a carmine one called *carmineus*.

*Eritrichium nanum.*—This beautiful Boraginaceae, with its blue flowers borne only a few inches high in June, is a charming addition to any rockery, but it is not an easy plant to grow. It reminds one of the Forget-me-nots in bloom, but is by no means so accommodating as those free-growing plants. It is not a lime-lover, yet likes the neighbourhood of stones. It should be provided, if possible, with granite chips intermixed with peat, loam and leaf mould. A suitable compost will not avail, however, if it is subjected to much wet in winter, and it had better be put in a position where it stands a fair chance of escaping such an ordeal, and protected with a square of glass in winter. It may be raised from seed sown under glass in spring, and subsequently increased by division.

*Erodium* (Heron's Bill).—The Heron's bills resemble the hardy Geraniums, but are more suitable for the rockery, as they are more compact in growth. They are easy to manage, and they will thrive in ordinary soil if not very wet, and may be raised from seed, or propagated by division, in spring. *Chamaedryoides* (Reichardi) is one of the prettiest. It is quite a minute plant, with white, pink-veined flowers. *Macradenum* has violet flowers, and *Manescavi*, which is taller, purple. Both are worth growing. The Heron's bills come into flower late in spring.

*Erysimum.*—A small genus, one member of which, *Perovskianum*, is grown as a hardy annual for summer blooming. One or two of the perennials are
SILENE ACAULIS
AND GENTIANA BRACHYPHYLLA.

See Section B. and Chapter VII., Part IV.
suitable for the rockery, although not plants of marked value. *Hieracifolium alpinum* and *rupestre* are two of the best. Both bear yellow flowers in May. They thrive in ordinary soil, and may be propagated by seeds sown in spring, or by cuttings.

**ERYTHRAEA.**—Pretty plants allied to the Gentians. *Diffusa* (*Massoni*), with pink flowers in late spring; and *Muehlenbergi*, also with pink flowers in spring, are two of the best. The former likes peat, with partial shade in summer. They may be raised from seed sown under glass in autumn or spring.

**ERYTHRONIUM** (Dog's Tooth Violet).—Most beautiful little bulbous plants, admirably adapted for the rockery. They bloom in spring. Not the least pleasing feature of them is the handsome spotted foliage. Every bulb dealer of standing offers them at a cheap rate in his autumn catalogue, and as they are easily grown, no hesitation need be felt with regard to trying them. It is well to include them in the first bulb order that is sent off, as they are best planted early. They will thrive in ordinary soil if it is friable and well drained; they do not care for damp, heavy ground. Propagation is easily effected by taking offsets when the plants have died down. The best known species is *Dens-Canis*, which grows about six inches high and produces its purple and white flowers in March. There are several varieties of it. *Americanum*, common to the Eastern United States, bears yellow drooping flowers in spring. *Grandiflorum* is the finest of all. It is an American plant with yellow
flowers of large size, the leaves free from mottling. *Hartwegi* is a very early bloomer, flowers yellow. *Revolutum* is a Californian species with pink flowers, and has a charming variety called *Bolanderi*, which has white flowers. *Johnsoni*, classed by some authorities as a variety of *revolutum*, has pink flowers, and is extremely pretty. *Giganteum* is often confused with *grandiflorum*, but it has mottled leaves, while those of the latter are plain green. Both have yellow flowers. *Giganteum* is one of the tallest and has the merit of blooming freely.

**FRITILLARIA** (Snake’s-head Lily).—The most familiar of the Fritillarias is the “Crown Imperial,” a noble plant, but unsuitable for the rockery, on account of its large, spreading habit. *Meleagris* is also well known. It has curiously chequered flowers, and is a quaint, though not showy, plant. It grows about a foot high, and could be put on the rockery, but many flower-lovers will prefer to give the space to more interesting kinds, such as *armena*, with purple flowers, and its yellow variety, both quite dwarf, flowering in April; *aurea*, with yellow flowers in May; *tubaeformis*, a June bloomer with purple and yellow flowers, and its varieties *Burneti*, purple and yellow, and *Moggridgei*, brown and yellow; and *recurva*, scarlet and yellow. All of these are beautiful Snake’s-heads. The common Fritillary grows wild in moist places, but all of those named will thrive on friable soil in the rock garden. They may be increased by offsets, removed while the plants are at rest, or raised from seed sown under glass in spring.
DESCRIPTIVE AND SELECTIVE.

GALAX APHYLLA (Blandfordia Cordata.)—A pretty plant growing three to six inches high and bearing white flowers in July. The leaves are used in floral decorations. It is a North American perennial evergreen, of tufty habit, and easily propagated by division in autumn. It does best in leaf mould, loam and grit.

GAULTHERIA PROCUMBENS (Creeping Winter-green or Partridge Berry).—A creeping evergreen shrub, which bears white flowers in July, and red berries as large as peas throughout the winter. The oil expressed from the latter is used by perfumers. It is a North American plant of tufty habit. It likes moist peat, and is apt to die out on light dry soil. It may be propagated by seeds or layers.

GENISTA (Rock Broom).—The Genistas are often confused with the Cytisuses, C. racemosus, for example, the neat, dwarf, yellow-flowered shrub so much used for greenhouses, is often called G. racemosa. They are particularly useful for hot, dry, sandy soils, where many plants will not thrive; but they can, of course, be grown on better ground. They do not care for damp clay soil. Propagation may be effected by seeds or cuttings under glass in spring. Hispánica, with yellow flowers in June; and its dwarfer variety nana, are as good as any for the purpose in view. Tinctoria, which bears yellow flowers in early summer, is also suitable. There is a double variety. Elatior is a tall, Caucasian form of tinctoria.

GENTIAN.—See Chapter VII.
GERANIUM (Cranesbill).—The name "Geranium" has been so thoroughly usurped by the brilliant bedding plants called Zonal Geraniums, which are really Pelargoniums, that its association with rockery plants may strike uninitiated amateurs as surprising. The hardy species under consideration now are the true Geraniums. Several species are British plants, and they are very showy, but they are such vigorous growers that they are unsuitable for the rockery. The Alpine species are not so rampant, and may be introduced with safety. They are not particular as to soil. A gritty loam suits them very well. They are propagated by division between autumn and spring, or by seeds sown out of doors late in spring. The silver-leaved Cranesbill, G. argenteum, is one of the most beautiful. It bears rosy flowers in early summer, on stems only three or four inches high. It is the better for having a square of glass set over it in winter. Cinereum has pink-veined flowers in summer, and grows six to nine inches high. Sanguineum, magenta, has a good variety in lancastriense, which produces rose-veined flowers in June. There is also a white variety (album), which many people like. Both are suitable for the purpose. Wallichianum is a trailing Himalayan species, which bears purple flowers in summer. The Geraniums are hardly plants for very small rockeries, but they are worth including whenever there is a fair amount of room.

GEUM (Avens).—The Geums are popular plants for the border, growing in almost any soil, and particularly useful because they begin to produce their
bright orange flowers in spring, with early herbaceous things like Leopardsbanes, Feverfews and Columbines. The Alpine kinds are suitable for the rockery, although some of the others are too large. *Montanum* is one of the best, and it has several pretty varieties, such as *grandiflorum*, which is larger; and *maximum* or *luteum*, with large yellow flowers. *Aurantiacum*, said to be a hybrid between *montanum* and *Heldreichii*, resembles the mountain Avens, but has deep orange flowers. *Reptans* is a dwarf high-Alpine species with yellow flowers in June, liking plenty of sun. The Geums thrive in chalky soil. They are easily propagated by division between autumn and spring, or by seeds sown in a frame in spring.

*GLOBULARIA.*—The Alpine species of these pretty plants form evergreen carpets only a few inches high, and thrive in sandy peat or loam if they can get plenty of moisture. They like limestone. They are easily raised from seed in spring, and may be propagated by division between autumn and spring. *Cordifolia* and *nudicaule* both have blue flowers, and there is a white variety of the former. *Nana*, is, however, dwarfer. This also has blue flowers.

*GYPSOPHILA.*—One species of this useful genus, namely, *paniculata*, the "Gauze flower," is very popular for mixing with cut bloom, on account of its lace-like delicacy and grace of appearance, and another, *repens*, is a useful thing for growing among stones. It grows about six inches high and has white flowers. It is a lime-lover, and is easily propagated by cuttings towards the end of winter. There is a large variety of
it called *monstrosa*, and one with pink flowers called *rosea*. The species *prostrata*, which has white flowers in summer, is also suitable for the rockery.

**HABERLEA RHODOPENSIS.**—A pretty plant, somewhat resembling the Pyreanean Violet (*Ramondia*) with pale lilac flowers in spring. The plant grows in dense tufts, and the flower stems are only an inch or two high, so that it is quite a rockery gem. It likes peat, and may be given a position between stones where it is not exposed to the full sun. It may be raised from seed in spring, or increased by division in late winter.

**HELIANTHEMUMS** (Sun Roses).—These tough and wiry little shrubs enjoy considerable favour with rock gardeners, because they will thrive in dry places, and bear brightly coloured flowers with much diversity of hue. They are evergreens, and possess a tenacity of life which enables them to exist in hot, sandy soils where most plants would perish. There are very few species, but there are a large number of forms of the common yellow trailing species *vulgare*, both single and double, all having the habit and taste of their parent, and only differing in colour and form of flower. They are somewhat too vigorous for the small, select rockery. The Sun Roses may be raised from seed sown out of doors late in Spring.

**HEPATICA.**—Referred to in its proper genus *Anemone*.

**HERNIARIA GLABRA.**—A useful carpeting plant, forming a dense mass of vivid green. The flowers are of no importance, but the plant is worth
growing, if only to form a groundwork for bulbs. It is evergreen and is bright both in Summer and Winter. There is a yellow-leaved variety called *aurea*. The *Herniarias* thrive in almost any firm soil, and may be propagated by division in Autumn.

**HIERACIUM.**—Of the Hawkweeds one of the best is *gymnophalum*, which has downy leaves and bears loose spikes of yellow flowers in July. The Hawkweeds thrive in almost any soil, and may be increased by division.

**HOUSTONIA CAERULEA (Bluets).**—A dainty little American Alpine forming a close carpet of verdure, studded with little bluish flowers only an inch or two above the soil in Summer. It is suited by a loamy or peaty soil, and may be propagated by division between Autumn and Spring. It is apt to suffer if grown near luxuriant things like the Rock Cresses, and should be protected from their encroachments.

**HUTCHINSIA ALPINA.**—A pretty Alpine of low growth, which produces a sheet of snowy blossom in Spring only a few inches above the ground. It will thrive in ordinary soil if not smothered by coarse plants. It may be raised from seed in a frame in Spring, or by division between Autumn and Spring.

**HYPERICUM (St. John’s Wort).**—Most of the *Hypericums* are too large for small rock gardens, although most useful for planting in dry hot borders. A few are suitable, however, and among them may be named *reptans*, a Himalayan species, which bears prostrate masses of yellow flowers in June. *Nummularium* is also a trailer, and *Olympicum*, which is of
upright habit, but only grows a little over a foot high, is suitable. The latter bears large yellow flowers in Summer. They are propagated by cuttings of ripe shoots in Summer, struck under glass. Sandy loam is a suitable soil.

**IBERIS (Candytuft).**—Few things make a more pleasing feature of the rockery than a broad patch of one of the free-growing perennial Candytufts, such as *corifolia* or *sempervirens*. It is true that they have not brilliant colours to recommend them, but they produce large numbers of pretty white spikes of bloom. In congenial quarters they spread into broad masses, covering the face of large stones. These Candytufts are not fastidious as to soil; they thrive in gritty loam, but any fairly light and friable garden soil will suit them. The evergreen perennial kinds are the most suitable for the rockery, and these may be raised in the first place from seed sown out of doors late in Spring, andincreased subsequently by cuttings struck in sandy soil in a shaded frame. The following are a few of the best perennial Candytufts:—*corifolia* is a small evergreen species, producing white flowers in May or June; it is a most abundant bloomer. *Gibraltarica* is a larger but less hardy kind; it cannot be relied on to pass the Winter in cold, exposed places. It bears white or pink-tinted flowers in May. There are several good varieties of it, notably *Garrexiana*, which is superior to the type; *Little Gem*, very low and dense; and *superba*, which has very large spikes of bloom. *Tenoreana* has purplish flowers, which it bears in June, and therefore gives diversity of colour.
SOLDANELLA ALPINA.

See Section B., Part IV.
DESCRIPTIVE AND SELECTIVE.

INCARVILLEA.—A genus of modern introduction, natives of China. The first species was Delavayi, and it made considerable stir, for its foliage is distinct and handsome, and the flowers, which somewhat resemble a small Gloxinia, are bright crimson. It was, and is, a grand plant, but the newer grandiflora is better still, for the flowers are finer, and on shorter stems. It may be expected to grow in favour rapidly; the colour is carmine. It is probably a variety of Delavayi. The Incarvilleas are not coarse or spreading plants, and although the flower spikes are rather long, they are quite suitable for the rockery. They like a friable, gritty loam. Propagation is easily effected by sowing seeds under glass in spring, or by dividing the crowns. A mulching of dry grit is good in autumn. Manure should not be used as it might injure the crowns.

IONOPSISIDIUM ACAULE.—One of the smallest of flowering plants, growing only an inch or two high, it is nevertheless really beautiful, for it forms a dense cushion which it covers with pretty violet flowers. It is an annual, and may be sown out of doors in spring to cover any bare patches of soil on the rockery. It will bloom in a few weeks, and form a dainty carpet.

IRISES.—See Chapter VIII.

LEONTOPODIUM ALPINUM.—See Edelweiss.

LEUCOJUM (Snowflake).—The pretty Spring and Summer Snowflakes are charming bulbs and may be introduced to the rockery if desired, associated with a carpeter such as the Herniaria or a mossy Saxifrage. The Spring Snowflake (L. vernum) resembles the Snow-
drop, but it is later and larger in bloom, and tipped with green. *Vagneri* is a fine variety of *vernum*, with yellow spots. The Summer Snowflake (*L. aestivalum*) blooms a little later than *vernum*, and also has large Snowdrop-like flowers tipped with green. It has the charm of fragrance, and the scent is reminiscent of Violets. The Snowflakes like a sandy loam. The Summer may have a moister site than the Spring species. They are increased by taking the offsets when the plants have died down.

**LEWISIA.**—A small genus of pretty and interesting plants, of which only two or three species are offered in the catalogues. *Redivivua* is a beautiful plant with remarkable powers of recuperation when apparently dried up, hence its name. It has a thick woody rootstock and stem, on which it bears Rosette-like fleshy leaves, surmounted in summer by large glistening rose flowers, produced only during sunshine. Although very tough and tenacious it is quite dwarf, and forms an interesting rockery gem. It likes a warm, sunny spot. Loamy soil suits it, but a little leaf mould and grit may be added. It is easy to get a stock of plants by sowing seeds in a frame or greenhouse in spring. The plant resembles a Mesembryanthemum. The newer species *oppositifolia*, which also has large satiny rose flowers, may be grown as well.

**LIBERTIA.**—With their narrow, Iris-like leaves, green alike in summer and winter, and charming spikes of bloom, the Libertias are extremely pleasing plants. *Formosa* is the dwarfast species, and the one most suitable for the rockery. They are not of the hardiest,
and should be given a sunny yet sheltered place, with a sandy loamy soil. A stock may be raised by sowing seed under glass in spring, wintering the plants thus raised in a cold frame, and planting out in spring. When established they may be increased by division in spring.

**LINARIA (Toadflax).**—The *Linarias* are a rather large genus, and they comprise some very pretty and useful plants, both annual and perennial. The dwarfer perennial species should be made good use of by those who have to plant dry rockeries, for they are as accommodating as Sun Roses. They will thrive in ordinary garden soil, and do not mind poor chalky ground. A stock of plants can be raised by sowing seeds in fine prepared soil out of doors at mid-spring. Afterwards farther propagation may be effected by division in spring. *Alpina* (see coloured plate) is a charming species. It comes from the European Alps, and bears violet flowers marked with orange, in summer. It is generally biennial, but by sowing itself serves the purpose of a true perennial. There is a variety of it, differing in colour, called *rosea*. *Cymbalaria*, known as the Kenilworth Ivy, is a pretty trailer with lilac flowers, and will grow on old walls. There is a pink variety called *rosea*, and a white called *alba*. Another useful species is *hepaticaefolia* (Hepatica-leaved), a trailer with purple flowers.

**LINNAEA BOREALIS.**—A pretty evergreen trailer, about four inches high, with perfumed pink flowers which it bears in June. It likes a cool place and a moist peaty soil. Propagation may be effected by division.
LINUM (Flax).—The Linums are useful and popular plants, giving in several cases bright blue flowers. The dwarfer kinds are charming for the rockery, notably Alpinum, which only grows a few inches high, and bears its lovely flowers in July. They are of a rich, intense blue. Gritty loam, with a little peat, suits it, and it may be raised from seed in spring and propagated by division between autumn and spring. Arboreum is a shrub, growing about a foot high and bearing yellow flowers in spring and early summer. It is a handsome little evergreen, but it is not quite hardy and should have a sheltered, warm place. It may be propagated by cuttings in spring, which should be inserted in gritty soil under glass. Flavum is a popular herbaceous species, growing about a foot high and bearing yellow flowers in summer. The treatment advised for Alpinum will suit it. Monogynum is a beautiful New Zealand species, with large white flowers, a foot high or a little more. It should have a warm, sheltered place. Narbonense is a very popular kind with blue, white-centred flowers, much used in herbaceous borders. It grows about two feet high and blooms in May. Treatment of the last two species as for Alpinum. Perenne is the well-known blue perennial Flax. It grows a foot to eighteen inches high, and bears blue flowers in June. Its white variety, album, is a popular plant for rockeries and borders. These will thrive in ordinary garden soil, and may be propagated in the same way as the other herbaceous kinds.

LITHOSPERMUM (Gromwell).—Dwarf shrubs, best represented in most gardens by the low, rambling
species, *prostratum*, which is covered with dark blue flowers in early summer. In density of growth and profusion of bloom few dwarf shrubs can vie with it, while it has a Gentian-like richness of colour. There is a variety offered in the catalogues called *Heavenly Blue*, which differs in shade, the flowers being sky blue. The prostrate Gromwell is not particular as to soil, and it may be propagated readily by cuttings, inserted in sandy soil under glass. It is best planted in a position where it can droop over stones. Other species sometimes grown are: *graminifolium*, pendent blue flowers in early summer, foliage grassy; and *petraeum*, a small shrub with violet flowers in summer.

*LYCHNIS (Campion).*—The Campions form a large genus. Some of the species are annuals, others perennials. The best known of the latter is the tall *Chalcedonica*, which makes so bright a clump in the border in June; but it is too large for the rockery. There are several, less showy, perhaps, yet bright, which are suitable for the rock garden. *Alpina*, for instance, is a low, tufty plant; it bears pink flowers in summer. *Lagascae* is a very pretty Alpine, growing a few inches high, and with brilliant rose flowers in summer. *Viscaria*, the German Catchfly, and its varieties; likewise *fulgens* and *Haageana*, are handsome plants, but perhaps better suited for the border than the rockery. The Alpines may be raised from seed sown in a cold frame, or even out of doors, in spring. When established they can be divided between autumn and spring if necessary. They will thrive in gritty loam in sunny spots.
MECONOPSIS.—This genus is closely allied to the Poppies, and *M. Cambrica* is the well-known pale yellow Welsh Poppy, a hardy perennial growing about a foot high, and blooming in summer. The florists offer a double variety of it called *flore pleno*. This cheerful plant is not particular as to soil and situation. It will thrive in poor, chalky ground, and will grow on old walls. *Integri folia* is a fine newer species with yellow flowers. *Aculeata* has purple flowers in summer. Like most others of the genus it is a biennial, needing to be raised afresh each year. *Nepalensis* and *Wallichii*, the former yellow, the latter blue, are magnificent kinds, but they are somewhat too large for the rockery.

MEGASEA.—See Saxifraga.

MENYANTHES.—Reference has already been made to the Buckbean, *Menyanthes trifoliata*, as suitable for cultivation in a collection of aquatic or bog plants. It has charming white fringed flowers on procumbent stems in May. It does well in moist soil at the water-side, and may be propagated by cuttings.

MENZIESIA.—One species often included with the *Menziesias*, namely, *polifolia*, has been referred to in this work under the names of *Daboecia* and *Erica polifolia*. Of the others the best known is perhaps *empetriformis*, now called by botanists *Bryanthus empetriformispetri*. It is a charming little Alpine shrub, with purplish rose flowers in summer, and is quite suitable for the rockery. It likes peat, with plenty of moisture. It may be propagated by cuttings struck in spring under glass.
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**MERTENSIA (Lungwort).**—The best known member of this genus is that commonly called *Virginica*, but also known as *pulmonarioides*, the Virginian Cowslip. It is a charming American plant, a little spreading, but not gross in habit, with arching stems carrying blue flowers tinted with rose. It will grow freely in cool, moist clayey or peaty soils, especially if partially shaded; it does not care for hot, dry places. It may be increased by division in autumn. Less familiar, but a very good plant, is *sibirica*, which has glaucous leaves and produces pale blue flowers in May. There are several varieties of it, notably a white, *alba*. These will thrive in ordinary garden soil, and are increased by division.

**MITCHELLA REPENS (Partridge Berry).**—This pretty little American evergreen is worth growing for the sake of its scarlet berries, which are abundant in autumn, following white, scented flowers. It likes moist soil in a partially shaded position, and may be propagated by division in spring.

**MODIOLA GERANIOIDES.**—A tuberous-rooted trailer, allied to the Mallows, with crimson flowers. It thrives in gritty loam, and may be increased by division.

**MORISIA HYPOGÆA.**—A pretty little Alpine, with deeply cut leaves, which form a dense carpet, and yellow flowers in early summer. It does well in gritty loam, and may be raised from seed, sown out of doors late in spring, or by pieces of the root.

**MUSCARI (Grape Hyacinth).**—The charming Grape Hyacinths make lovely colonies in the rock garden or on shady banks, especially if the soil is cool
and moist. They are bulbous, and need to be planted in autumn. The flowers form a neat cone on short, stiff stems, a few inches above the foliage, which keeps close to the ground. Perhaps the most attractive variety is *Conicum Heavenly Blue*, which has bright sky blue flowers and forms a lovely group.

*MYOSOTIDIUM NOBILE*.—The New Zealand Forget-me-not has aroused a good deal of interest among flower lovers, partly from its undoubted beauty, partly from the difficulty which attends its culture. It is a herbaceous perennial, with blue, Forget-me-not-like flowers, borne on stems about eighteen inches high in spring. The glistening green leaves are heart shaped. It likes shady places and moist soil, such as peat and leaf-mould, with abundance of sand. It may be propagated by careful division in spring.

*MYOSOTIS* (Forget-me-not).—The Forget-me-nots are among the gems of the springtide, and, common though they are, they must not be despised, for their tufty habit and dense masses of exquisite blue flowers make them charming alike on the rockery and in the garden. Easily raised from seed, a stock of plants can be raised every year where bedding is the object in view, and the old plants thrown away when they become dingy after flowering. Perhaps the most intimate associations of Forget-me-nots are with the waterside, but some species will thrive in light, dryish soil on hillsides, and do not object to chalky ground, on which the flowers are rich and sparkling to a degree. The following are the principal species and varieties: *Alpestris*, which is shown in one of the coloured plates with *Aronicum glaciale*
TRILOFIUM ALPINUM
AND DAPHNE STRIATA.

See Section B., Part IV.
is an Alpine, and it is of the true desirable tufty habit. The flowers are blue, with yellow eye, and are produced in abundance in May and June, the plants flowering as fast as they grow. Many varieties, differing in colour, are offered by the seedsmen. Dissitiflora is the earliest, and certainly one of the most popular of the Forget-me-nots. It is a true Alpine, of low tufty habit and with charming light blue flowers. There are several varieties of it. Palustris is the Marsh Forget-me-not, and one of the most beautiful of low growing water plants. One may thrust a few bits between stones on the margin of water in spring, and in a month or so the plant is rambling over the stones and aglow with light blue flowers. It is not tufty in habit like the others. There are several varieties of it. Sylvatica, the wood Forget-me-not, is also taller and looser than the Alpine species. It has blue flowers, but there are varieties with white flowers and with yellow leaves. Stabiana bears lavender flowers in July. The different species of Myosotis come true from seed, which may be sown in a box in a frame in summer, or in prepared soil in the open.

NARCISSUS.—See Chapter IX.

NIEREMBERGIA.—The most popular member of this genus is gracilis, but it is not suitable for the rockery. Rivularis is available, as it is of creeping habit. It bears long white flowers over a considerable period in summer. It likes moist soil, and is easily increased by division in spring.

NYMPHÆA (Water Lily).—The Nymphæas are the most beautiful of the aquatic plants, and are
dealt with in a special chapter. It is unnecessary to repeat the cultural remarks, but it may be well to give the names of a few good sorts. *Marliacea Albida* is a good white; *M. chromatella* a desirable yellow; and *Wm. Doogue* a good red. *Odorata* is a fragrant white species. All these are hardy, and suitable for a garden pool. There are many beautiful hybrids.

*ENOTHERA* (Evening Primrose).—Every flower lover knows the Evening Primroses, whose large yellow or white blossoms produce such a beautiful effect. The larger species are not compact enough for the rock garden, but there are several admirably adapted for it. They are American plants, hardy, and very profuse in blooming. They revel in a cool, moist soil, but they are not really particular, so long as the soil is not poor and dry. The majority can be raised from seed, which may be sown in a frame in spring, or even out of doors. The perennials may be propagated by division between autumn and spring. One of the best species for our purpose is *caespitosa*, which is also known as *marginata* and *eximia*. It grows nine inches to a foot high and bears white, scented flowers in summer. *Fruticosa Youngii* is a fine variety with rich yellow flowers, which it bears in succession for many weeks in summer and autumn. It is a day bloomer. Taller than the preceding, it yet does not exceed two feet high. *Taraxacifolia* is a fine trailer, with large white flowers. It is not quite so hardy as some of the species and needs a sheltered place and warm loamy soil.

*OMPHALODES.*—Charming little plants, resembling Forget-me-nots, well worth growing on the
rockery, where they will thrive in loamy soil on a sunny site. They can be raised from seed sown in a frame in spring, and subsequently increased by division in spring if desired. *Luciliae* is a pretty little Alpine, with glaucous leaves and blue flowers in summer. *Verna* is better known. This flowers in spring, and has blue flowers with a white centre. There is a white variety of it called *alba*.

**ONOBRYCHIS.**—This is a genus of the Pea order of very little use for the rockery, and yet containing a variety which, as one of the coloured plates shows, is a good Alpine plant. This is the mountain form of the common Sainfoin, *O. sativus montana*. It is of low growth, and has purplish rose flowers. The Sainfoins thrive in loamy soil, and are easily raised from seed sown in spring.

**ONONIS (Rest Harrow).**—The British Rest Harrow, *O. arvensis*, with pink flowers in summer, and its white variety *alba*, are well suited to the rockery. They are of tufty habit, grow in ordinary soil, if it is not wet and heavy, and are easily propagated by division in spring. *Rotundifolia* makes a small neat bush about eighteen inches high and produces rosy flowers in summer.

**ONOSMA TAURICUM (Golden Drop).**—An exquisitely beautiful rock plant, with grey-green tufts of foliage a few inches high, and sprays of fragrant yellow flowers. This grows with me on the face of a rock wall in poor chalky soil, and seems quite at home. On a wet place it is better for protection with a square of glass during winter. It is propagated by seed, sown
under glass in spring. The newer species, *albo-roseum*, is also charming. The foliage consists of silvery rosettes, and the rose and white flowers are borne on stems about six inches high in summer.

**ORCHIS (BRITISH ORCHIDS).**—The searcher for wild flowers in the chalky uplands in spring often comes upon dwarf stiff plants with spotted leaves and orchid-like flowers. In cultivation these hardy orchids are mostly suitable for the bog garden, loving moist soil. One of the best species, however, is not British; this is *foliosa*, which has purple spotted flowers in late spring or summer. The stems rise eighteen inches or even two feet high in moist peaty soil. *Latifolia* is the British Marsh Orchid, of which the Glasnevin variety is good, it has purple spotted flowers. There is also a white variety, *alba*. These also like damp peaty soil. *Mascula*, with purple flowers in spring, will grow on chalky ground; and *maculata* is also often found on poor soil in shady spots, such as the undergrowth of the woodland, but is far better in peat and loam in the bog garden. The latter has purple flowers. The variety *superba*, with mauve flowers, is excellent. Other interesting kinds are: *hircina*, the Lizard Orchis; *Militaris*, the Soldier Orchis; *Morio*, the green-winged Meadow Orchis; and *papilionacea*, the Butterfly Orchis. The Bee Orchis is *Ophrys apifera*; the Spider Orchis *O. aranifera*; and the Fly Orchis *O. muscifera*. These are all British.

**ORNITHOGALUM UMBELLATUM.**—The "Star of Bethlehem" (see photograph) is a well-known and easily-grown bulbous plant.
OURISIA COCCINEA.—A lovely and most distinct little plant. Thriving in a cool, moist, half-shady place, and producing its little spikes of scarlet flowers in great abundance in late spring, it is an uncommon plant, well worth growing. It may be increased by division in early spring. It does not need special soil, but enjoys peat.

PAPAVER (Poppy).—The great scarlet Poppies of the border have no place in the rock garden, but the Alpine and Iceland Poppies are well adapted for, and well worthy of, culture there. The former, Papaver Alpinum (see coloured plate), six inches high, has white, yellow-centred flowers. There are several forms in cultivation, and they can be bought in various shades, such as white, pink and rose, orange and scarlet, and yellow. They will thrive in ordinary soil in a sunny spot. It is well to make regular sowings of seed if the plant is a cherished one, as it is at the best a biennial. The seed may be sown out of doors. The Iceland Poppy, Papaver nudicaule, is a great favourite. It has yellow flowers, but there are several forms, such as fringed white and orange. It will grow in almost any sunny place. It is not a long-lived plant, and seed should be sown every year or two where the plants are to grow.

PARADISEA.—See Anthericum.

PENTSTEMON.—This magnificent plant has now become a florists' flower, and glorious strains of it can be obtained. Long lists of named varieties are offered. There are no more beautiful flowers for the border in late summer and autumn, and it is not surprising that the thoughts of rock gardeners turn to so fair a genus,
more especially as the plants are not particular as to soil and are easily propagated. Several of the old species are suitable, although the modern varieties are too tall. *Azureus*, one foot high, with blue flowers in August, and its fine blue variety *Jaffrayanus*; *glaber*, one foot, with purple flowers in August; *Menziesii*, with purple, lilac and red flowers in early summer, and its lilac variety *Scouleri*, which is better than the type, forms a pretty evergreen shrub, and may be propagated by cuttings of the young shoots in a warm frame; *pubescens*, with lavender flowers in July; and *Hartwegi*, with scarlet flowers in July; are all good. All can be raised from seed sown in a frame in spring, and are hardy.

**PHLOX.**—See Chapter X.

*PHYTEUMA (Horned Rampion).*—The species *comosum*, which grows about six inches high and bears blue flowers in summer, is a pretty and popular rock plant. It thrives in loam with plenty of limestone grit, in a sunny place. It may be raised from seed in spring, and increased subsequently by division if required. There are several other species.

*POLEMONIUM.*—A genus containing several good plants, notably *Richardsoni*, which bears blue flowers a foot high in summer. It could be used for the rockery together with *humile* and *reptans*, both Alpines growing about six inches high and with blue flowers in summer. They all like gritty loam, and may be propagated by seeds or divisions in spring. *P. caeruleum* is the well-known Jacob’s ladder. *Confertum* (see photograph) is a good dwarf plant, with blue flowers in summer.
DESCRIPTIVE AND SELECTIVE.

POLYGONUM.—The flower-lover who sees a snowy mantle of the lovely Polygonum Baldschuancium spraying itself over an arch or round a pillar is little likely to associate the genus with the rockery. There are, however, some Alpine species. Affine, sometimes called Brunonis, is quite dwarf, and a very pretty plant, with rosy flowers in late summer or autumn. It will thrive in gritty loam, and may be propagated by seeds or division in spring.

POTENTILLA (CINQUEFOIL).—Most of the Cinquefoils are too strong for small rockeries. They are handsome plants, with foliage resembling that of the strawberry. The rock gardener whose space is very limited should leave the florists' hybrids alone, in spite of the great beauty of their flowers. He should content himself with one or two of the Alpines, such as ambigua, with yellow flowers in summer; and nitida, of which there are several varieties, with white, pink or rose flowers. They are not at all particular as to soil, thriving in gritty loam. Propagation is by seeds or division in spring.

PRIMULA.—See Chapter XI.

PULMONARIA.—See MERTENSIA.

PUSCHKINIA.—This is a small genus, and only one variety is grown, namely, scilloides ("Scilla-like"), sometimes called libanotica. It is a low-growing bulb, bearing white, blue-striped flowers in spring. This charming little plant is well worth a sunny nook in the rock garden. It will thrive in almost any gritty soil, and may be increased by division every third or fourth year.
RAMONDIA (Pyrenean Violet).—Few rockery plants have grown more rapidly into favour during recent years than *Ramondia Pyrenaica*. It is a most beautiful plant, of tufty habit, with hairy, crinkled leaves close to the ground, and spikes of violet flowers with orange centres on stems a few inches high in summer. It looks best when planted in a little colony, and if the site is moist and shady it will form lovely clumps. There is a white variety called *alba*, and a rose one called *rosea*. They like a good deal of peat in the soil, and limestone chips may be added freely. The newer species, *Serbica*, is distinct from *Pyrenaica*. It bears rich mauve flowers in summer. *Nathaliae* is a variety of it, with mauve flowers in which the orange stamens are prominent. This beautiful variety may be grown in loam and peat, with sand instead of limestone chips. The *Ramondias* are best raised from seed sown under glass in spring, for although they are somewhat slow in getting to the flowering stage, propagation by division is dangerous. Leaf-propagation may be tried. The leaf-stalk should be made firm in gritty soil containing a good deal of peat, and covered with a bell glass to exclude air.

RANUNCULUS.—A large and varied genus, containing some plants of great beauty, and some that are the worst of weeds. Two Alpine species, namely, *alpestris* and *glacialis*, are shown in coloured plates, the former with *Primula integrifolia*, and are good, but *acris*, the common Buttercup, and *bulbosus*, the Gold Cup, are dangerous in the garden, for they spread fast, have great tenacity of life, and become weeds of the most
VIOLA CALCARATA.

See Section B., Part IV.
troublesome kind. The *Ranunculuses* like a cool, moist soil, containing peat and leaf mould, and may be propagated by division in spring. The following are a few of the best species: *alpestris*, the Alpine Buttercup, grows but a few inches high, and bears white flowers in June. It is shown in one of the coloured plates in association with *Primula integrifolia*. A diminutive variety of it called *Traunfellneri* is grown, it also has white flowers. The double bachelor’s button (“Fair maids of France”), is *R. aconitifolius plenus*; it has white flowers and is a pretty plant, but perhaps better suited for the border than the rockery. *Amplexicaulis* is a good Alpine, bearing white flowers with prominent yellow stamens on stems a foot high in June. It likes sandy loam. *Anemonoides*, white flowers tinted with pink, is an early bloomer. *Glacialis* grows a few inches high and bears its pretty white flowers late in spring. It grows on the high Alps of Europe and in the Arctic regions. *Lyallii* is a fine and interesting species, but too large for the rock garden. *Parnassifolius* is a beautiful dwarf plant with white flowers in June.

*Rhexia Virginica*.—This charming American plant is delightful for the bog garden, thriving in moist peat. The flowers are purplish rose, with prominent golden anthers, and are produced in summer. It may be propagated by division in spring.

*Rhododendron*.—See special chapter on Shrubs. *Ferrugineum* and *hirsutum*, which are shown in the coloured plates, the former in association with *Gentiana punctata* in one case and alone in another, the latter
in association with *Pinus Cembra*, are the famous Alpine or Alpen Roses.

*SANGUINARIA CANADENSIS* (Bloodroot).—An American plant, with white flowers on stems about six inches high in April, followed by grey, toothed leaves. It likes a peaty soil with plenty of grit, and a partially shaded place, with abundance of moisture. The popular name derives from the red juice which the leaves contain. The plant may be propagated by division of the root in autumn.

*SANTOLINA* (Lavender Cotton).—Small hoary, shrubby plants, with scented foliage. The most popular kind is the variety of *Chamaecyparissus* called *incana*, which has small yellow flowers, less attractive than the foliage, which is covered with dense white down. It is much in demand both for the rockery and border. It likes sandy loam and may be increased by cuttings.

*SAPONARIA* (Soapwort).—One species of *Saponaria*, namely, *Calabrica*, is a well-known hardy annual, and is much in use for bedding, both in spring and summer. It is the only kind known to many flower-gardeners, who overlook the fact that there are several Soapworts which are admirably adapted for the rockery. They are tufty in habit, and their flowers are brilliant. Two well worthy of culture are *caespitosa* and *ocymoides*. The former is a Pyrenean Alpine, with rosy flowers in summer. It grows about six inches high, and is charming for chinks in the rockery. It may be grown successfully in sandy loam, preferably with a little peat or leaf mould, and may be
propagated by division in spring. *Ocymoides* is better known, and is offered by most seedsmen, as well as by plant dealers. The seed could be sown out of doors in spring, and later on established plants could be propagated by division in spring, or by cuttings in summer. It is of trailing habit and is a really charming rockery plant. The same soil as that recommended for *caespitosa* will grow it, but it will thrive in almost any gritty soil. There are several varieties of it, notably *splendens*, which is deeper in colour than the species. The fine Soapwort *officinalis flore pleno* is both beautiful and fragrant, but it is rather too large for the rockery, and had better be kept for the border.

**SARRACENIA.**—The visitor to the larger flower shows who sees rock and bog gardens arranged in the open air, and who takes note of the principal plants grown among them for his own guidance, sometimes sees *Sarracenia* among them. As natives of North America one might expect them to be hardy in Great Britain, but they are not always successful in the open air, and are generally grown under glass. Those who admire their remarkable pitchers may try them out of doors, but they should provide a moist, sheltered place, plant in peat, and cover with bracken in winter. *Purpurea* is perhaps the hardiest species; the pitchers are veined with purple. It is popularly known as the Huntsman’s Cup. *Flava*, yellow, is called the Trumpet Leaf, and is also fairly hardy. Propagation is not likely to be necessary, as increase will not be rapid, but if required, the plants should be divided in spring,
restarted under glass, kept close, then hardened and planted out in June.

*SAXIFRAGA.*—See Chapter XII.

*SCABIOSA* (Scabious).—A most useful genus, although the finest members of it are not ideal rockery plants. *Atropurpurea*, for example, is an annual, and from it have been obtained the beautiful and perfumed flowers often called German or Sweet Scabiouses, and treated as annuals, being sown with Asters, ten-week Stocks, *Phlox Drummondii*, and other useful things, under glass in spring, hardened, and then planted out in borders. The next most important species, *Caucasica*, is not suitable for small rockeries, although quite appropriate for large rock gardens. It is a splendid plant, with large pale mauve flowers in June. This is a perennial on suitable soils, and hardy, growing a foot to two feet high. It may bloom from June to October. There is a white variety called *alba*; a semi-double called *perfecta* is also offered by some seedsmen. The beautiful *Caucasica* likes a warm, friable soil, on cold, stiff soil it is apt to die out, and needs frequent renewal from seeds sown in spring, preferably in a box, with the seedlings pricked off. When established as a hardy perennial in a suitable soil it may be increased by division in spring. *Graminifolia* ("Grass-leaved") is one of the best of the Alpine Scabiouses; it has light blue flowers in early summer, on stems about a foot long. It likes light, sandy soil.

*SCHIZOCODON SOLDANELLOIDES.*—A charming little Alpine from Japan, and the only species of
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the genus in cultivation. As the specific name indicates, it resembles a Soldanella. It bears fringed, rose-coloured flowers in March, and is well worth a place on the rockery, where it should have a compost of very sandy peat, with partial shade and abundance of moisture. It is not likely to extend very rapidly, but if it should do so it may be propagated by division.

*SCHIZOPETALON WALKERI.*—An annual, which may be sown in spring where it is to bloom for the purpose of filling any bare spot on the rockery. Its little white flowers are prettily fringed and are pleasing in appearance, but its principal virtue is its truly delicious perfume, which makes it desirable for sowing near windows, so that its fragrance may enter the house.

*SCHIZOSTYLIS COCCINEA* (Winter Gladiolus).—It is remarkable that this beautiful plant is not used more by flower-lovers, for it has handsome and brilliant flowers, and is as likely as not to be in bloom at mid-winter. It has long spikes of scarlet flowers, and has quite a Gladiolus look. It will be found hardy in most places where the soil is gritty, loamy and well-drained. It can be bought from bulb-dealers. Although not the plant for a mere chink on a small rockery it may be planted to form a group in a large rock garden.

*SCILLA* (Squill).—Few of the smaller early bulbs are more familiar than the little blue *Scilla Sibirica*, the Siberian Squill. It is a bright and cheerful flower, and so cheap as to be available in large quantities. It is not only suitable for planting in bulb and other spring beds, but also for naturalising. Hardy, not
ALPINE FLOWERS AND ROCK GARDENS.

particular as to soil so long as it is friable and gritty, remaining for a considerable time in bloom, almost indifferent as to weather, it is a really useful plant. There are, however, several other useful Squills, and they are equally suitable for forming patches of colour on the rockery, growing from a carpet of Herniaria, mossy Saxifrage or other close green plant. *Bifolia* is particularly good. It is as pretty as the Siberian species, and earlier in bloom, but not quite so suitable for exposed places. The flowers are dark blue, and are produced freely. There are several forms of *bifolia*, differing in colour. There is a white, called *alba*; an early blue called *praecox*; a large handsome form called *Taurica*; a rose called *Pink Beauty*, and others. *Italica*, light blue, is a larger and later species than the preceding. It may be added that there is a white variety of *Sibirica*. All the Squills may be obtained from bulb dealers in autumn, and planted double their own depth in gritty, friable soil. They may be increased by division every three years or so.

*Scirpus*.—Those who like to see reeds and rushes on the margin of water may plant the Bulrush, *Scirpus lacustris*, and other species. It will thrive in moist peat, and may be planted in autumn or spring. It may be propagated by division.

*Scutellaria* (Skull Cap).—A large genus, but only one or two species need be considered. *Alpina* is perhaps the best for the rockery. It grows about nine inches high, and bears purple flowers. There is a variety of it with yellow flowers called *lutea* or *lupulina*; a red named *sanguinea*; a white called *alba*; and a rose
called _rosea_. They are true Alpines. _Caicalensis_ (syn. *macrantha*) is popular. This produces blue flowers in August. _Indica_, with mauve flowers in July, is worth including. The plants will thrive in gritty loam, and may be propagated by division in spring.

**SEDUM** (*Stonecrop*).—Those who see an old barn or other building, shambling and huddled, its walls stained with time, its roof at various angles, will admit that the yellow-flowered plants which cluster on its tiles are well in keeping with its mellow colours. The Stonecrops are the most useful of plants for such places, also for old walls, dry rockeries and arid spots generally. They have been endowed by nature with fleshy foliage, which enables them to withstand drought. They form carpets of succulent leaves, varying a great deal in tint. The flowers are also pretty and varied in colour. In the old days of "carpet bedding" gardeners made considerable use of them in elaborate designs. They will grow in poor, dry soil, and the ordinary soil of the rock garden will suit them, especially if it contains lime. They may be propagated by division in spring, or by cuttings in summer, left to dry for a few hours before being put into sandy soil. The following are a few species selected from a large number, all are summer bloomers: _acre_ is the well-known yellow Stonecrop; it has several varieties, two, _variegatum_ and _aureum_, having yellow-tipped leaves. In _elegans_ the tips are silvery, and this variety was a great favourite with carpet-bedders. _Album_ is the white Stonecrop. _Brevifolium_, white or pinkish flowers, foliage mealy,
is very pretty, but is not quite hardy, and should be planted in a sunny sheltered position. *Ewersii* is one of the best, for it is small and neat in habit, with silvery leaves and pink or light purple flowers. *Glaucum*, otherwise *hispanicum*, another favourite of the carpet-bedders, forms glaucous grey tufts; it has pink flowers, but they are not striking, and it is only grown for its leaves. *Kamtschaticum*, a prostrate grower with orange yellow flowers, is grown a good deal. *Rupestre* forms glaucous tufts and bears yellow flowers. *Sieboldii* is a Japanese species grown rather for its flowers than its leaves. It is about a foot high, and of graceful habit. The pink flowers are borne in round heads. *Spectabile* is one of the most familiar of autumn flowering plants with its broad glaucous leaves and large heads of pink flowers; it will grow almost anywhere, and may have a place in the rougher parts of the rock garden, but it is not good enough for the best parts of a small rockery. Of the remainder, *caeruleum*, with small blue flowers in July; *hybridum*, yellow, July; and *sexangulare*, yellow, July, are perhaps the best.

*SEMPERVIVUM* (Houseleek).—These succulents are as useful for dry places as the Stonecrops. They are very desirable plants, for they are neat and pretty in foliage, have charming flowers, and will grow in the most arid places. Flower gardeners use selected species for the sides of ridges in beds, placing them close together. They will grow between the stones of a rough wall, and even on the face of the stones. Poor soil is really better than rich for plants like these,
RHODODENDRON FERRUGINEUM.

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because it fosters close, neat growth. Most of the Houseleeks like lime. They are easily propagated by the offsets which they form in late summer; these may be taken off and pressed close together in the sides of a small, firm mound of soil, and will root in time to be planted out the following spring. If a few of them are pressed into pellets made of cow manure and moist soil, they can be established almost anywhere. They all like sunshine, and flower in summer. The following are a few of the best species: *arachnoideum*, the “Cobweb Houseleek,” so called on account of the downy threads which over-run the rosettes; it is a European Alpine, with red flowers; there are a good many varieties of it, of which *Hausmanni* and *Laggeri* are two of the best. *Montanum* is an Alpine with rose flowers. *Tabulæforme* and its variegated form used to be a good deal used for making the divisional lines of designs by carpet-bedders, and are still planted a good deal; they form flat plates; not quite hardy. *Tectorum*, with light red flowers, is the common Houseleek; there are several forms *Funckii* (see coloured plate) has purplish flowers.

**SENECIO.**—The fact that the common groundsel is a *Senecio* hardly tends to commend this genus to flower-lovers, but it contains several good garden plants. The best of them are better suited for the bog garden than the rockery proper. This applies to the new Chinese species, *Clivorum*, and to the magnificent *macrophyllus*, both of which have yellow flowers and handsome foliage, green in the case of the former, glaucous blue in that of the latter. Of the Alpine
species proper *argenteus*, a small hoary plant with yellow flowers in summer; and *incanus*, also with yellow blooms in summer, are two of the best. They like sandy loam, and may be raised from spring-sown seed in the first place, afterwards being propagated by division. The two first species should have moist peat and a sheltered place. *S. pulcher* is a splendid border plant.

**SHORTIA.**—A small but interesting and beautiful genus. The best known species is *galacifolia*, which is a real rock gem, having creeping tufts of evergreen foliage, which assumes a warm colour in the winter, and is then quite showy. The pretty fringed flowers are white to pink, and are borne in spring. It is a North American plant, and is quite hardy. Although it is sometimes advised to be grown in moist peat, I have had it very good on the face of a rock wall on a poor chalky soil. Loam with a little peat and some limestone grit certainly suits it. When established it may form offsets, and if so they may be taken off, and struck in sandy soil. The other species is *uniflora*, which bears pale pink flowers in spring.

**SIBTHORPIA EUROPÆA** (*Cornish Money-wort*).—A pretty creeper for the bog garden, where it thrives in moist sandy peat, or leaf mould, and bears pink flowers in summer. It may be propagated by division in spring. The variegated-leaved form is very distinct, but it cannot be grown in the open, and is generally used for hanging pots or baskets.

**SILENE** (*Catchfly*).—A very popular genus. Every flower-gardener knows the little pink annual
pendula or its variety compacta. These are sown in spring to flower in summer, and often in August to bloom in spring, when their sparkling flowers are very cheerful. There are, however, several perennial forms, and very pretty they are. The popular name Catchfly originates from the sticky sap on the stems. The Alpines will thrive in sandy loam, especially if a little peat is added. Seed of several is procurable, and may be sown out of doors in spring. When the plants are established they may be increased by division between autumn and spring. Acaulis, the Cushion Pink, or Moss Campion, shown in one of the coloured plates with Gentiana brachyphylla, is charming. It forms thick cushions and bears pink flowers in early summer. The flowers are all but stemless, hence the specific name, the flowers seeming to rest on the foliage. This is still more marked in the variety exscapa, which is dwarfer than the type. There is a white variety, alba; a larger, taller, darker one named grandiflora; and a double called plena. Alpestris is a pretty European Alpine, growing about six inches high, and producing sheets of white flowers in May. It is quite hardy, and loves a sunny site with gritty soil. Eliza-bethae is a little known but exquisite species, quite distinct from the others. It has glistening foliage, and large brilliant rose flowers, with white centre, which are produced as late as July. Maritima is the British Sea Catchfly. The double form is a pretty trailer, which produces its large double white flowers in June, over a dense carpet of foliage. Pensylvanica, the American wild Pink, is an early bloomer, bearing
its charming deep pink flowers in April. *Schafta* is largely grown, in part, perhaps, because it is a late bloomer. It bears its pretty purplish flowers in August. It is somewhat taller and looser in habit than the rest. *Virginica*, the Fire Pink, is taller still, the flower-stems rising a foot high or more. It is a most brilliant plant, the scarlet flowers being remarkably vivid.

*SOLDANELLA.*—Lovely little Alpines; well worthy of special attention. In their natural wild state on the Alps they push their way through the mantle of snow, and open their flowers without waiting for the general thaw of spring. They form close cushions of thick, round leaves, and bear charming, deeply cut, bell-shaped flowers. They belong to the Primula order, and have all the refined grace of the best Prim-roses, with, perhaps, a greater degree of lightness. They do best in cool, moist places, and must not be set on high arid spots. Loam with abundance of sand suits them. They will appreciate watering in summer during dry spells, and a mulch of sandy peat or leaf mould in autumn. If seed can be procured it should be sown in pots or pans in spring, and set in a frame or on a greenhouse shelf. Well established plants can be divided after flowering. The best known species is *Alpina*, one of the most refined and graceful of all rock plants, which is shown in one of the coloured plates. It produces its blue flowers in spring, on stems four or five inches high, and has kidney-shaped leaves. It is a native of the European Alps. *Pyrolæfolia*, often grown as a distinct species, is probably a form
of it. *Montana*, with purple flowers, has rounder leaves than *Alpina*; it is a pretty kind. *Pusilla* is smaller; it is a charming little Alpine with violet flowers. This is shown in one of the coloured plates with *Primula Minima*. *Minima* is the smallest of all, and has lilac flowers. Most of these are offered by the principal trade hardy plantsmen, and a collection would prove deeply interesting.

**SPIGELIA MARILANDICA.**—A North American plant of great beauty and distinctiveness, with tubular flowers an inch or more long, crimson and yellow in colour, and borne on stems in thick tufts a foot high or more in summer. It loves moist peaty soil. Propagation is by division between autumn and spring.

**STATICE (Sea Lavender).**—The best of these, such as *incana, latifolia* and *sinuata*, are spreading in habit, and better suited to the border than the rockery, where, however, they may be planted if there is plenty of room. *Minuta* is quite suitable for the rockery, growing less than six inches high; it produces its lilac flowers in July. It thrives in sandy loam, and may be increased by division in spring.

**STERNBERGIA.**—This small genus includes at least two beautiful and valuable species, namely, *lutea* and *macrantha*. The former is the better known. It is an old and much esteemed plant, producing quantities of bright yellow flowers in autumn. Bulb-dealers supply it, but it ought to be bought early, with Roman Hyacinths, Madonna Lilies, Belladonna Lilies, and other early things. The drawback to it for use on the rockery is that it is dormant and bare in summer, but
this can be met by planting carpeters near. It loves a light sandy loam, and generally thrives above chalk. When the clumps get thick some of the offsets may be removed and planted for fresh stock, but otherwise it need not be disturbed frequently. This plant differs from the autumn *Colchicum* in producing leaves and flowers together. *Macrantha* has the peculiarity of producing flowers and leaves at different seasons, the former appearing in autumn, the latter in spring. The flowers are larger than those of *lutea*, and are also yellow.

*Thalictrum* (Meadow-rue).—The best known member of this genus is probably *aquilegifolium*, and it is a fine plant for the border but too large for the rockery. There are several smaller species, notably *adiantifolium*, or *minus* to give it its modern botanical name. The flowers are yellow, and are produced in June; but they do not constitute the chief beauty of the plant, which lies in the fern-like foliage. This gives it a graceful appearance. The foliage is often used with cut flowers as a substitute for Maidenhair fern, and is superior, as it will last for several days. It is easily grown in light soil, and may be propagated by division. *Anemonoides*, otherwise *Anemone thalictroides*, is also worth growing. Peat may be added to the soil for this species.

*Thymus* (Thyme).—The chief use of the Thymes on the rockery is to form carpets, a purpose for which their dense growth well adapts them. The best known species is *serpyllum*; there are several varieties of it and one, *lanuginosus*, so called on account of its woolly
leaves, is more popular even than the type. It forms dense cushions of grey downy leaves in almost any soil and in hot sunny places. While not exactly a rampant plant it spreads fast enough to endanger fragile plants, and should be kept under restriction. *Variegatus*, which has variegated leaves, is also a useful variety. The Thymes may be propagated by division or cuttings in spring.

*Tiarella (Foam Flower).*—*Tiarella cordifolia* is a graceful plant, with dense, dwarf green foliage that becomes bronzy, and tall stems of pink buds and creamy bloom in April. It is not particular as to soil, but enjoys some peat in the compost. It may be propagated by division in autumn.

*Trifolium alpinum* (Alpine Clover).—A genus which includes the clovers is of great importance to agriculturists, but it is not necessarily valuable in the garden. Most of the Trefoils are useless to the flower-lover, but the Alpine Clover is, as one of the coloured plates shows, a pretty plant in Nature. It grows about six inches high, and bears its pink flowers in June in the garden. Ordinary soil will suit. The species may be raised from seed sown in spring, and divided when established if desired.

*Trillium.*—The best plant of this genus is *grandiflorum*, the Wood Lily, a beautiful American plant, which produces its large pure white flowers on stems about a foot high in May. When planted in peat in a moist, shady place, in sufficient quantities to form a colony, it makes a beautiful picture. One may see it thus in the gardens of the Royal Horticultural
Society at Wisley, Surrey. The petals are borne in threes, hence the name *Trillium*. This lovely plant can be procured from bulb-dealers in autumn at a moderate price. It may be propagated by division. There is a form called *roseum*. The only other species much grown is *erectum*, which has purple flowers.

*TROLLIUS* (Globe Flower).—This genus gives us several species which are quite worthy of culture in any garden, coming into bloom early in the year, and producing large brilliant yellow flowers. They are a little too robust in growth for small rockeries, but may be used for larger ones in damp places. I find them good on rather poor chalky soil, but they reach their best in loam or peat. They are best propagated by division at the end of summer. The two most popular species are *asiaticus* and *europaeus*, the former with orange, the latter with pale yellow flowers. There are several varieties of each.

*TULIP.*—Although one of the most important of bulbous flowers the Tulip is not of special value for the rock garden. The early Dutch varieties are not really worth special sites, as they do perfectly well in beds and borders; and the late sorts known as "Cottage" and "Darwin" Tulips are too large. Some of the smaller and more interesting species may, however, be grown on the rockery. The bulbs can be bought in autumn, and planted in sandy loam for preference, but they are not fastidious about soil. When the foliage has decayed it may be removed, and if propagation is required the offsets may be removed and planted afresh. The following are dwarf and
RHODODENDRON HIRSUTUM
AND PINUS CEMBRA.

See Chapter XIII., Part IV.
DESCRIPTIVE AND SELECTIVE.

pretty species well adapted for the rockery; Batalini, yellow; Clusiana, red and white; Greigi, red, very brilliant; Kaufmanniana, red, white and yellow; patens (persica), yellow; Leichtlini, pink and white; linifolia, scarlet; and primulina, red and yellow.

TUNICA SAXIFRAGA.—A tufty little Alpine, bearing white or pale pink flowers for a long period in summer. It will grow in almost any soil, and in dry places. It may be raised from seed in spring.

VERONICA.—This immense genus of herbs and shrubs comprises a few useful Alpines, but the great majority of the species are far too large and coarse for the rockery. Some are shrubs which, growing on suitable soil (and they love limestone) will become several feet through in a few years. Alpine species will thrive in ordinary garden soil, and may be increased by division in spring. The following might be used: corymbosa, blue, flowers in autumn; gentianoides, blue, flowers in early summer, there is a variegated variety (variegata); and spicata, blue, flowers in summer. There is a prostrate kind called repens, which carpets the ground, and bears blue flowers in spring. The handsomest of all the herbaceous species is longifolia subsessilis, but it is rather too large for the rockery, and ought to be grown in the border. Veronica Chamaedryss is the Germander Speedwell, a British plant not unworthy of a place in the rockery. Incana, which forms a silvery carpet and bears violet flowers in July, is good. Cupressoides is an interesting shrubby species.
VINCA (Periwinkle).—Attention must be called to this genus because of its usefulness for carpeting the ground under trees. The two popular species are major and minor. Both flower in spring and summer. There are several varieties, including a good form of major with variegated leaves. They are evergreen and spread fast in ordinary soil. They should not be planted in good positions in the rockery or near choice plants.

VIOLA.—It would be difficult to overrate the beauty and charm of this genus, giving, as it does, the sweet Violet of the hedgerows, the huge florists' Pansies, the bedding Violas or tufted Pansies, and in addition several charming species admirably adapted for the rockery. The various members extend from the cool pastures on the sea level of Britain to the high Alpine ranges. The delicious Violet of the hedgerows carries its perfume into the giant flowers of ennobled garden forms, which flower-lovers put into good earth over a heap of manure and leaves in autumn, and protect with a glass frame in order to insure winter bloom. All the Violas are distinguished by neat growth and profusion of bloom. Some, though not all, have a tufty habit. They love cool, moist soil. Where special varieties of Pansies, Violets and florists' Violas are being grown in gardens, it is best to choose a cool site, and feed the ground liberally with cow manure. So far as the rock garden is concerned it will suffice to provide good loam. The plants are worthy of it, and will produce far better results in such soil than in poor chalky ground, especially in a dry season. All the
kinds are easily raised from seed sown under glass early in spring, and most of them can be propagated by cuttings put in gritty soil in a cool frame in Autumn. The following are the most important and beautiful of the Violas: *Biflora* is a true Alpine, bearing its pretty yellow flowers in pairs (hence the specific name) in late spring; it loves a cool, moist, partially shaded spot; may be propagated by division; as it is a small plant, care must be taken that it is not overgrown by rampant neighbours. *Calcarata*, which is shown in one of the coloured plates, is also an Alpine, and bears blue flowers in May; there are several forms of it, including a white (*albida*); a double lavender (*pallida plena*); and a yellow (*flava*). *Cornuta* is the horned Pansy, a Pyrenean plant, flowering from spring to summer in gardens, and bearing blue fragrant flowers; there is a white variety (*alba*). It is to *cornuta*, crossed as the female parent with selected garden Pansies, that we owe the florists' Violas or tufted Pansies, which are now among the most precious of dwarf garden plants; when grown in cool, moist soil, dressed over and mulched occasionally, and kept well picked, they form beautiful edgings and carpets to beds. *Cucullata* is an American species, and bears its purplish blue flowers in spring. *Gracilis* is a beautiful kind, the flowers having the rich plum blue colour with which we are familiar in that grand tufted Pansy *Archie Grant*; it grows three or four inches high and blooms in June. *Munbyana* is an Algerian species, and an extremely pretty one, with violet flowers in late winter and spring. *Odorata* is the common sweet
Violet; everybody knows and loves this precious little plant, with its pretty modest flowers and delicious scent, although in choosing sweet Violets for gardens they buy large single varieties like *La France*, *Wellsiana* and *Princess of Wales*; and the grand doubles *Marie Louise* and *Comte de Brazza*. *Pedata* is the Bird’s-foot Violet, an American species of much charm, and well suited to rockery cultivation; it is distinguished by its deeply-cut leaves; the dark blue flowers are provided in spring; there are several varieties. *Rothomagensis* is the Rouen Violet, a Sicilian plant with bright blue flowers, marked with black, in summer; it is none too hardy, and should have a warm spot. *Tricolor*, yellow, white and purple, is the common Pansy or Heartsease; it is pretty, and interesting as the parent of some of the most rich and brilliant flowers which adorn our gardens, but the old species tends to lose its place, and is often passed over except by those who form collections. It is hardly likely that florists’ varieties of tufted Pansies will be wanted for the rockery. Nevertheless it may be noted that the following are splendid varieties: Blues in various shades—*Archie Grant*, *Rolph*, *Blue Gown*. Lilac and Mauve—*J. B. Riding*, *Wm. Neil*, *Duchess of Sutherland*. White—*Countess of Hopetoun*, *Marchioness of Tweeddale*, *White Empress*. Yellow—*Ardwell Gem*, *Bullion*, *Royal Sovereign*. Bicolor—*W. P. A. Smith*, *Duchess of Fife*, *Goldfinch*. Crimson-purple—*Councillor Waters*. *WAHLLENBERGIA.*—The best Alpine members of this genus somewhat resemble the small hairy Harebells, which have been dealt with under *Campanula*. 
DESCRIPTIVE AND SELECTIVE.

They are pretty Alpines, worthy of good positions, and will do well in loam if well drained. They may be raised from seed sown under glass in spring. *Dalmaticus*, violet flowers in large clusters in early summer; *Kitaibelii*, blue flowers in summer, a vigorous tufty species; and *Pumilio*, silvery leaves, and lilac flowers in early summer, are three of the best kinds.

**WALDSTEINIA.**—A small genus, but containing a very pretty plant in the species *trifolia* (three-leaved), which grows about six inches high and bears yellow flowers in April or May. It grows strongly, and throws out runners like a Strawberry. The same trait distinguishes the species *fragarioides* ("Strawberry-like") which bears yellow flowers in early summer. They thrive in ordinary soil in sunny places, and may be propagated by division in spring.

**WALLFLOWER.**—See Cheiranthus.

**WULFENIA.**—Two species of this genus are grown, namely, *Amherstiana* and *carinthiaca*, both of which produce blue flowers in July. They will thrive in moist but well-drained loam, and may be propagated by seeds or division in spring.

**ZAUSCHNERIA CALIFORNICA.**—A graceful and brilliant American plant, well deserving the name of Californian Fuchsia. It produces its scarlet flowers on stems a foot to eighteen inches high in Summer. It is not perfectly hardy, and should be given a warm position, and sandy, well-drained loam. It may be raised from seed sown under glass in summer, and the young plants kept in a frame through the winter.
ZEPHYRANTHES (Zephyr Flower).—Pretty North American bulbs. The finest species is *Atamasco*, which produces its large, white flowers in early summer. It thrives in sandy loam. It can be obtained from bulb merchants in autumn, and increased by division when established.
CHAPTER XIII.


The lover of flowers who has only a small rockery may feel a slight tremor at the mention of shrubs, and yield to the common temptation of supposing that a system of rock gardening which embraces them is too elaborate and extensive for him. There is little doubt that many people have been deterred from cultivating Alpines by the ridicule that has been heaped upon amateurs’ rockeries by owners of large places. An injudicious reference to the use of shrubs in the present work would add to the unfortunate effects of many an ill-considered and disdainful reference to “made rockwork.”

So far from small gardens being unsuitable for the cultivation of Alpine plants, it is precisely in them that the need for rockeries is most felt, because the area available for plant-culture is increased by making provision for surfaces of soil above the ground level. There is nothing whatever ridiculous or contemptible about a small made rockery, so long as it is built up of honest stone and good soil on a suitable site. There is, however, much that is absurd in the heaping
together of huge stones in many large places in un-skilful attempts to reproduce Alpine scenery, and it is accentuated in many cases by a marked absence of flowers.

There is but one reason—other than the provision of rubble for paths—for using stones in gardens, and that is to form suitable homes for beautiful flowers. The rock serves several purposes. It affords shelter, it holds moisture, it provides a background. The fact that it is not built up on a large scale need not necessarily prevent it from serving all these purposes.

It will not be difficult to show that shrubs may be brought into use with good effect. The reader may have formed an herbaceous border, and he may have done it in two ways. He may have made a border by the use of herbaceous plants alone, and he may have made one with the aid of pillars (of Roses let us say) and shrubs. It is probable that the latter will have given him much the greater degree of satisfaction, because the pillars and shrubs will not only have formed permanent features, preventing absolute bareness even in winter, but will have prevented uniformity, and formed suitable backgrounds for flowers. Here, for example, is a mass of scarlet Chalcedon Campion (*Lychnis Chalcedonica*) in front of Lawson’s Cypress (*Cupressus Lawsoniana*). The flowers shine with a new brilliance against the dusky green of the feathery pyramid behind them. Many evergreens are of small stature, grow slowly if not injudiciously fed with rich soil and manure, and thus are suitable even for small borders.
SHRUBS FOR THE ROCK GARDEN.

Just as a person who has made up an herbaceous border with shrubs will always wish to use them in future, so one who introduces them among stones in a rock garden learns to appreciate their value so much as to extend their use. We have learned a good deal from the Japanese in this matter. They make great use of shrubs in their designs. A Japanese gardener who had a small area to furnish would not fill it with a mound of soil stuck over with stones like currants in a pudding. He would contrive to get in a bridge, a temple, and some water in addition to shrubs and rocks. Judging by some specimens of Japanese garden art displayed in England we need feel no impulse to imitate it, but we may learn one valuable lesson from it, and that is that variety is possible even in a small garden, and that we should not tie ourselves to one stiff feature.

We might distinguish between a rockery and a rock garden by looking on the former as one item only, built up above the ground level with stones and soil; and on the latter as a series of items—rock-work, pool, bog, shrubs—more or less closely connected. But it is a very small "stone-pie" example of rockwork that does not admit of a few shrubs. They could be set on the ridge, and in small groups near the ends. Especially could they be brought into effective use where the rockery was something more than a plain body of stones and soil, and built in bays. There the crest of the horn of each crescent would form a suitable site for small shrubs, as one sees the scarp of a hill hung with pines. A colony of shrubs on the top would strengthen the natural effect thus aimed at.
In selecting kinds for this purpose it is necessary to consider the size of the stones, ridges and bays, and take care that suitable proportions be maintained. The Japanese are fully alive to this point, in fact, their mastery of it is the secret of their success in landscape gardening on a small scale. Thus have come into being their famous dwarf trees. They do not put strong-growing shrubs into rich soil when they are laying out small pieces of ground, they put slow-growing kinds into poor soil, and so guard against the general effect being spoiled by too large shrubs.

With the larger area and more numerous items of the rock garden the use of shrubs becomes still more important. The approach to a rockery may be flanked by groups of shrubs. Others may be planted behind the rock-lined border of the pool. A large border, such as is often given up to herbaceous plants, might be made beautiful by dividing it into a series of bays with shrubs, and laying fairly large flattish stones in the bays to form a rocky groundwork for plants. Where stone comes out naturally on the place the flower-lover will, of course, avail himself of it eagerly by grouping shrubs round or near it, and planting it with suitable things.

It is difficult to give in a chapter an adequate description of the many beautiful shrubs which may be used in association with rock plants, but they must not be ignored entirely. Given a fair amount of space, and soil free from lime, particular attention will be given to Azaleas and Rhododendrons. These are no longer regarded as separate genera by botanists, who have
merged them into one, but it is convenient to regard them as distinct for garden purposes, inasmuch as they are almost invariably kept distinct in books and catalogues.

The glory of the sun, both at dawn and eve, shines in the colours of the hardy "Ghent" Azaleas (Belgian only in breeding, not in origin, for they come from the North American species *calendulacea, nudiflora, speciosa* etc.); and in the offspring of the Japanese species *mollis*. Beautiful tones of cream, lemon, primrose, salmon, orange, pink, rose and cinnabar prevail in them. The colour of that superb variety *Anthony Koster* is almost unmatchable among shrubs. The varieties of *mollis* are not perfectly hardy in the gardens of northern Europe and America, but they endure most winters in congenial soil and in sheltered places. They should not be planted in rich, alluvial, highly-manured loam or clay where hardy growth is wanted, but in sandy peat.

The Rhododendrons proper do not give the exquisite sunshades of the Azaleas, but they are larger and more brilliant. There is no shrub to vie with the tender tint of Pink Pearl, the dense red of John Waterer, or the glowing crimson of Michael Waterer. Their greater size puts the Rhododendrons at a disadvantage with Azaleas for small gardens, but in larger places the reverse holds good. They love sandy peat, they like gritty loam, they tolerate friable clay, they loathe limestone.

The coarser evergreens, such as Aucubas, Laurels and Hollies, will not be needed for the rock garden, but the
Heaths (see Part IV. Section B under Erica), Berberis Darwinii, Kalmia glauca, Olearia Haastii, the Per- nettyas, the Rock Roses (see Part IV. Section B under Cistus), the Sun Roses (see Part IV. Section B under Helianthemum), Daphnes Cneorum and Blagayana, the Brooms, such as Cytisus Andreanus and C. praecox, and the neat little Veronica cupressoides, will prove suitable. Although hardy, Berberis Darwinii is poor in exposure, but one of the most beautiful of shrubs in a sheltered place, where it assumes handsome form, glossy leafage and a wonderful profusion of bloom in spring. It loves loam and peat, but it will thrive in poor limestone ground if it has shelter from cutting winds. The Brooms will thrive in poor sandy soil, and wreathe their long stems in brilliant flowers.

Deciduous ("leaf-losing") shrubs need not be omitted. Certainly one might not plant in small places very vigorous things such as Flowering Currants (Ribes), Mock Oranges (Philadelphus), Buddleias and Weigelas, beautiful as they all, and particularly the last, are. But there are certain smaller things of great charm, such as Cornus (Dogwood), Japanese Pear (Cydonia Japonica Maulei), Brooms, Mezereon (Daphne), Deutzias, Snowdrop Tree (Halesia), Star Magnolia (Stellata), Meadow Sweet (Spiræas arguta, Anthony Waterer, Aitchisoni and Douglasii) tree Pæony, Viburnum plicatum, and Rubus deliciosus; all of which might be used. In a not over-rich soil, and with annual pruning after flowering, to get rid of the old wood, the Weigelas (Diervillas) are admissible anywhere, and there are few shrubs to vie with them in
beauty. If the young wood is left thin after the old has been removed in summer it will ripen and bloom almost from ground line to tip the following spring. A few shrubs such as this set behind small conifers lend richness and brilliancy. With the judicious use of the knife they can be kept shapely and in bounds.

With pruning the beautiful Buddleia called Veitchiana might be used. It is inclined to straggle and needs restriction, but it is a most beautiful shrub. The Japanese Pear is not a rapid grower, and will need little pruning, as it blooms best on the old wood. It is an early and abundant bloomer, bearing large Apple-blossom-like flowers almost of the colour of sealing wax all along the stems. The Mezereon is also a slow grower, and needs no restriction. It is not a brilliant plant, but it is neat and pretty, and has the charm of delicious scent. Of the Deutzias the most suitable is that called crenata flore pleno, which becomes a mass of small double white flowers in early summer. The old wood should be pruned out after flowering, as in the case of the Weigela. The Star Magnolia is the most precious of deciduous shrubs for the rock garden. It produces its large pure white flowers on the bare wood in spring, and makes an exquisite picture before the leaves come. It is best in a sheltered place. A slow grower, it will not call for much restriction. The lovely Meadow Sweets named are all neat growers, and as they do not spread much the only consideration in pruning is to get a sufficient quantity of the best flowering wood. The shoots which have bloomed should be cut out at the base in summer. Viburnum plicatum, a
relative of the Guelder Rose, is one of the most glorious shrubs of Rhododendron time. It enjoys a moist, peaty soil. The habit is naturally neat and compact, so that very little restriction is needed.

Broadly speaking, the value of the flowering shrubs lies in their suitability for making charming pictures around the rock garden rather than for planting actually on rockwork. For this purpose the smaller evergreens are better. Of the Pines, the Swiss Stone Pine, *Pinus Cembra*, is one of the best, as it is a very slow grower, and does not therefore get out of bounds quickly. It has green foliage streaked with white, and erect cones. It is shown in one of the coloured plates, in association with the hairy Alpen Rose (*Rhododendron hirsutum*). A form of it called *pumila* is much smaller. Few things are better than the Junipers, and of these *Sanderi*, and the small forms of *Sabina* called *procumbens* and *prostrata*, are the best. Another capital little plant is the glaucous Spruce Fir *Picea* (often called *Abies*) *pungens glauca*. Nurserymen stock plants of these and other small trees, such as *Picea excelsa pygmaea* (see photograph), *Cupressus Lawsoniana alba* *spica nana*, *C. L. erecta viridis*, *Retinospora obtusa nana* and *aurea*, and *Thujopsis dolabrata aurea*, of a suitable size for planting on rockwork. They will all thrive in ordinary soil.

The famous dwarf trees of the Japanese are, of course, well adapted for the purpose. They have become pretty familiar to most people interested in gardening by this time, in great part because of the displays of them which have been made by nurserymen at some of
the horticultural shows. Representing, as many of the
trees do, pigmy examples of large species, they are
highly interesting, but as the cost is not trifling those
who cultivate a collection may prefer to keep them in
the vases in which they are generally sold.

With ample space many a rock gardener who is
also a Rose-lover will plant some of the free-growing,
hardy Roses, such as Fellenberg, the Dawson, and the
Wichuraianas Alberic Barbier and Dorothy Perkins.
Good though the last two are for pillars they never look
better than when rambling over banks and rocks. They
will grow in the poorest soil, need no pegging down,
and bear profuse crops of white and pink flowers among
the shining, almost evergreen leaves. All the pruning
they will need is an occasional thinning out, directed
mainly at the old wood. Whoever has a stony bank,
the covering of which with verdure and blossom causes
him anxiety, will find the Wichuraiana Roses a priceless
boon.
CHAPTER XIV.

Selections.

I.—Sixty Good Plants with which to Start a Collection of Alpines.

The beginner in rock-gardening has been advised in a previous chapter to turn his attention to certain free-growing, easily-managed yet beautiful kinds in the first place, and introduce the rarer, more difficult and more precious species when he has gained knowledge. The following are sixty of the best kinds with which to make a start. They will all thrive in gritty loam. Full descriptions of them have been given:

- **Alyssum saxatile** (Gold Dust)
- **Anemone fulgens**
  - **pulsatilla**
- **Antennaria tomentosa**
- **Aquilegia alpina**
- **Arabis albida flore pleno**
  - (Double Rock Cress or Mountain Snow)
- **Arenaria Balearica**
- **Arnebia echiioides**
- **Aubrietia Leichlinii**
  - **Dr. Mules**
  - **Fire King**
  - **Prichard's Ar**
- **Campanula carpatica**
  - **alba**
  - **garganica**
  - **muralis**
  - **pulla**
  - **rotundifolia**
- **Corydalis nobilis**
- **Dianthus caesius**
  - **cruentus**
  - **deltoides**
  - **superbus**
- **Erigeron Roylei**

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THE STAR OF BETHLEHEM (ORNITHOGALUM UMBELLATUM).

Photo by C. P. Raffill.
SELECTIONS.

Geum montanum
Geranium Lancastriense
Helianthemum (Sun Rose) in variety
Heuchera sanguinea
Iberis corifolia
Iberis Garrexiana
Linum alpinum
" flavum
Lithospermum prostratum
Myosotis alpestris
" dissitiflora
Narcissus bulbocodium
" Johnstoni Queen of Spain
" minimus
" triandrus
Omphalodes verna
Papaver nudicaule (Iceland Poppy)
Phlox amoena
" divaricata (canadensis)
" reptans
" subulata (setacea)
Ramondia pyrenaica (peat)
Saxifraga aizoon
" Burseriana (likes lime)
" cotyledon
" hypnoides
" longifolia
" oppositifolia
Primula marginata
" Sieboldi
" viscosa
Saponaria ocymoides
Sedum acre
" glaucum
Silene acaulis

II.—A SELECTION OF CARPETERS.

The following are dense, low plants, suitable for carpeting the surface of the soil:

Antennaria tomentosa
Arabises
Arenaria balearica
Aubrietas
Cerastiums
Gypsophila repens
Herniaria glabra
Houstonia caerulea
Hutchinsia alpina
Iberises (perennial Candy-tuft)
Linaria cymbalaria (Kenilworth Ivy)
Omphalodes verna
Phlox subulata
Saponaria ocymoides
Saxifragas (moosy)
Sedums
Sempervivums
Silene acaulis
Thymus lanuginosus
III.—A Selection of Plants that will Thrive in Shade.

Adonis vernalis
*Anemone alpina*
  ,, blanda
  ,, hepatica
  ,, Robinsoniana
*Armeria cephalotes*
*Campanula Hendersoni*
*Corydalis nobilis*
*Cyclamen coum*
  ,, europaeum
*Dodecatheon* (American Cow-slip)

IV.—A Selection of Plants for Limestone.

*Aethionema grandiflorum*
*Androsace chamaejasme*
  ,, villosa
*Anemone alpina*
  ,, hepatica (with shade)
  ,, pulsatilla
*Arabises*
*Aquilegia alpina*
*Aubrietias*
*Campanula thyrsoides*
  ,, pulla
*Cerastium Biebersteinii*
*Corydalis nobilis*
*Daphne cneorum*
*Dianthus alpinus*
  ,, aizoides
*Draba tomentosa*
*Edelweiss*
*Erica carnea*
*Erinus alpinus*
*Gypsophila repens*
*Hutchinsia alpina*
*Onosma tauricum* (Golden Drop)
*Primroses*
*Primula integrifolia*
  ,, marginata
  ,, viscosa
*Saxifraga aretioides*
  ,, aizoon
  ,, Burseriana
  ,, caesia
  ,, longifolia
  ,, valdensis
*Sempervivum arachnoideum*
  ,, Laggeri
  ,, tectorum
*Silene acaulis*
V.—A Selection of Plants that will Grow under Trees.

Ajuga genevensis
Anemone apennina
„ hepatica
„ Robinsoniana
Asperula odorata
Campanula macrantha
Cardamine pratensis
Corydalis nobiles
Cyclamen coum
„ europaeum
Dodecatheons (American Cowslips)

Epimedium alpinum
Hellebores (Christmas and Lenten Roses)
Meconopsis cambrica (Welsh Poppy)
Saxifraga cordifolia
„ umbrosa
Thalictrum minus
Tiarella cordifolia
Trillium grandiflorum
Vinca major (Periwinkle)
Waldsteinia trifolia

VI.—A Selection of Plants that will Grow on Walls.

Alyssum saxatile
Arabises
Arenaria montana
Aubrietas
Campanula garganica
Cerastium
Cheiranthus alpinus
Dianthus caesius
„ deltoides
Edelweiss
Geranium Lancastriense
Gypsophila repens
Linaria cymbalaria (Kenilworth Ivy)

Onosma tauricum
Saponaria ocymoides
Saxifraga cotyledon
„ „ pyramidalis
„ longifolia
Sedums
Sempervivums
Silene Schaffta
Thymus lanuginosus
Veronica rupestris
Valerian
Wallflowers

VII.—A Selection of Bog Plants.

Acorus calamus
Boutomus umbellatus

Iris pseud-acorus
Menyanthes trifoliata
Caltha palustris
Cardamine pratensis
Carex pseudo-cyperus
" riparia variegata
Cyperus longus
Cypripedium Calceolus
" spectabile
Hottonia palustris
Iris laevigata (Kaempferi)

Myosotis palustris
Primula japonica
" rosea
Sagittaria sagittifolia (Arrow-head)
Sarracenia purpurea
Stratiotes aloides
Trollius europaeus
Typha latifolia

VIII.—A Selection of Ferns.

The use of ferns might strike the beginner as fanciful, inasmuch as it is a recognised point about the rock-work that it must be in sun, and of ferns that they must be in shade. Given a small, made rockery, occupying only a square rod of ground or thereabouts, fully exposed to sun, ferns may be left out of consideration; but in those cases where the culture of Alpines extends to a real garden there will be spots at the side of paths approaching the rockery, on shady banks, in dells or under trees, where ferns would grow, and where their cool and shady verdure would be a great charm.

It is a fact that most ferns love shade and moisture, and the exceptions are few. But those who see them growing in the stony banks and on the roofs of caves in Devonshire and Cornwall know that so long as they receive abundance of humidity they do not need the bed of peat which is supposed to be another of the essentials of their culture. I find many thrive in a few inches of poor soil on a chalk bank where they have only shade to help them.
The following are beautiful kinds:

*Adiantum capillus veneris* (British Maidenhair)

*Asplenium adiantum nigrum* (Black Maidenhair)

*Athyrium filix-foemina* (Lady fern), many beautiful forms

*Ceterach officinarum*

*Cystopteris fragilis*

*Lastrea filix-mas* (Male fern), many varieties

*Osmunda regalis* (Royal fern)

*Polypodium dryopteris* (Oak fern)

*Polystichum angulare*

*Scolopendrium vulgare* (Hart’s tongue fern), many forms

*Struthiopteris germanica* (Ostrich fern)

*Woodsia alpina*

*Woodwardia virginica*
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