GARDENING
FOR
BEGINNERS

E. T. COOK

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GARDENING FOR BEGINNERS

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Autochrome by

MIXED BORDERS OF HARDY FLOWERS.

Russell & Sons, Baker St., W.

GARDENING *for* BEGINNERS

A HANDBOOK TO THE GARDEN

BY

E. T. COOK

SIXTH EDITION, FULLY REVISED, WITH ADDITIONAL
CHAPTERS BY

F. W. HARVEY

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E. T. COOK

FIFTH EDITION, WITH REVISIONS, WITH ADDITIONAL
CHAPTERS BY

F. W. HARVEY

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PREFACE

ALTHOUGH books on gardening are now many in number, there has scarcely as yet been one quite suitable for beginners—that is, both fully illustrated, and so plain and easy that it does not either alarm or discourage the absolute novice. There are many now who wish to learn, and a simple book that will put them in the right way, and be truly a beginner's book, telling all about gardening in the simple language that all can understand, and describing garden methods and practice in detail, can hardly fail to be welcome and helpful.

For the best of all gardening is always the simplest. Sometimes, in a little wayside cottage strip, that is tended by labouring folk who love flowers, there may be seen some combination of one or two or of two or three kinds of plants that is of so high an order of beauty that one may look in vain for anything as good in many a large place where skilled labour is abundant and expense is not considered.

Those who are growing old among the flowers become more and more aware that all the best things that can be seen or enjoyed in the garden are the simplest things, done in the simplest ways. One may even venture to say that this admirable quality of simplicity is the beginning and end of all good things in gardening. For instance, a child might be taught, as a first lesson in planting, to make a little edging of white Pink or of Thrift or of London Pride, and would be rewarded by seeing the result of its work a year after in its full beauty of young strength of bloom. Thirty or forty years later, the same child, now grown to full years of experience, will look at such a little two-year-old border, and will see that it is always a thing perfectly good of its kind, and a living

source of satisfaction and delight. But, meanwhile, by slow degrees, and by learning and watching little things, each perhaps of slight importance in itself, but with some bearing on other matters that will distinctly help to build up knowledge, the outlook will have grown wider, and the once beginner, now a master of his craft, has learnt both to know his plants with all their wants and ways, and how to fit them, by placing the right plant or group of plants in the right spot, to all the widely varied conditions and demands of many gardens.

It is easy to go wrong, especially at first, by trying to use too many things at a time. It is true that the good gardener has to learn the ways and needs of a great many plants ; it is a part of his training to work through a widely varied collection, and to obtain an intimate knowledge of all, but it is only when he has gained a close acquaintance with individuals that he can then select and combine, and rightly use his knowledge for the direct service of each special purpose. And then, if he have the divine gift of a right perception, refined and strengthened by humble searching and unwearied labour, and by training his mind to the modest level of regarding himself always as a beginner, he will in the end acquire that ultimate power which will enable him to use all his material with an aim as true and an attainment as sure as the child with his simple edging of one well-known and well-loved little flowering plant.

GERTRUDE JEKYLL.

PREFACE TO THE SECOND EDITION

IN this edition many things have been added which I hope will make the work even more useful to the beginner than the first impression. I have received many letters from beginners expressing their gratitude for the simple advice given in its pages upon almost every phase of gardening, and I hope, as the years go on, to bring the work to still greater perfection.

I must again thank many friends for their kind help and suggestions.

E. T. C.

PREFACE TO THE THIRD EDITION

MANY illustrations have been added to this edition to help the beginner in gardening. The book is sufficiently large, but by careful revision it has been kept to the size of the former editions. Many good plants have been added, especially in the chapters upon trees and shrubs and roses, to bring the information as much as possible to the present time.

E. T. C.

April 1904.

PREFACE TO THE FOURTH EDITION

It is a great joy to me to know that a fourth edition of this simple gardening book has been asked for, and such a wish enables the author to bring the work, as far as possible, to the present time. The various lists of plants in this edition contain the most worthy of recent introductions, and several new illustrations have been added. If this book has helped to spread a love of gardening, and make our homes brighter and happier, I have been well repaid.

E. T. C.

November 1905.

PREFACE TO THE FIFTH EDITION

It is a source of much pleasure to find that a fifth edition of this book is desired. It enables me to correct the various lists of flowers, substituting the more beautiful recent acquisitions for those which have been superseded. Although only two years have elapsed since the fourth edition was published, several lovely flowers have been raised since ; these are included in the present volume.

E. T. C.

December 1907.

PREFACE TO THE SIXTH EDITION

THE demand for this book continues unabated, and the preparation of another edition affords an opportunity of including several new chapters, such as The Heath Garden, The Wall Garden, The Paved Garden, The Bog Garden, Replanting or Renovating Borders, &c. In addition a large number of new illustrations have been added to the present edition, together with some coloured plates. It is gratifying to realise that for over thirteen years the popularity of this book has been consistently maintained.

F. W. H.

June 1914.

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PART I

GARDENING FOR BEGINNERS

GROUPS OF GARDEN FLOWERS

TABLES of good garden flowers, with concise cultural hints, appear on pp. 542 and 555 ; it is therefore unnecessary to refer to them all in this chapter. There are, however, some groups of plants, notably Delphiniums and Phloxes, which are of the greatest importance. These are, therefore, dealt with in the following pages at greater length.

Anemones.—The Anemones, or Windflowers as they are called, are a race of showy plants whose value in the best garden cannot be over-estimated. They include some of the choicest alpine flowers, a few invaluable border plants, and the section that may be described as blue Star Anemones. *A. blanda*, *A. apennina*, and their forms are effective when planted in broad belts amid natural surroundings, while the Hepaticas and Wood Anemones, if tastefully associated with Ferns, Trilliums, and kindred plants in cool, shady situations, will thrive infinitely better than when planted in the open border.

One cannot expect the whole group to thrive in one garden, for their natural distribution extends throughout the Northern Hemisphere, and they are found in nearly all possible conditions of climate ; the higher Alps, the cool woodland and moist valleys, have their representative types, but such a widely-distributed group of plants must contain at least a few species that would thrive in every garden, while other species may be induced to grow well by selecting sites for them.

The alpine section proves more difficult to grow than any of the others, but even these are less exacting in their requirements than many high mountain plants, as, once established, one may treat them more liberally with excellent results. Any soil freely dressed with leaf-soil or plenty of sharp grit, particularly that from country roadsides, will grow Anemones well, but one must, for their more convenient treatment, divide the genus into six groups, individuals of which would be likely to succeed together.

Anemone alpina and its Allies.—The alpina group is nearly ever-green. The majority have thick rootstocks and smaller fibrils, the leaves are generally hairy, often quite silky, and branching stems of varying

height. They prefer a deeply-tilled soil composed of road grit and good fibrous loam, freely impregnated with limestone chippings in the case of *Pulsatilla* and *A. vernalis*, and non-calcareous stone chips for the remainder, aggregated around the collars of the plants, for their chief fault is liability to decay at the base of the leaf-growths. The importance of securing young established plants in pots to start the colony cannot be over-estimated. One may waste much time and incur considerable expense in attempting to grow newly-imported plants without any appreciable success. They should be planted either when in full growth or in March; the season does not matter provided the plants can be established before winter and the soil readily worked at the time of planting. If good seeds are obtainable—and this is a difficult matter—quantities of good plants can be raised with a little care. Use leaf-soil and road-grit as a potting compost, sterilised by baking, or sow the seeds in broad pans, plunging them in the open up to the rims, and leave them out all the winter. Should snow fall heavily during the winter, stack several feet of the cleanest obtainable over the pans, and beat it down hard so that it will not melt quickly. Germination is more rapid after such treatment, and the seedlings quickly appear. A thick tile laid over the soil is also of use in helping germination. The first season's growth is very short in duration, and in some cases seedlings may not appear for a year after sowing.

The chief members of the alpine Anemones are as follow :

A. alpina.—A native of European mountains; varies from a tiny tufted plant to specimens 2 feet high. It bears handsome white flowers on branched stems, slightly tinged with blue on the reverse of the petals, and furnished with a cone of yellow anthers in the centre of each. The leaves are soft, but not silky, and in shape resembling miniature Fools' Parsley. It is a grand plant, apparently more easy to grow in an old gravel path at the foot of a rockery than high up on a rockery slope. It flowers in May.

A. decapetala, a North American plant, grows 9 inches high, forming a tuft of small leaves and taller stems bearing pale sulphur yellow flowers under 1 inch across, and very freely produced. It flowers in May.

A. dichotoma (syn. *A. pennsylvanica*) is a free-growing plant midway between *A. sylvestris* and *A. alpina*. It makes a thicket of slender growths 1 foot high, and bears quantities of white flowers arranged in a loose corymb, the pedicels varying in length. It is an excellent border plant, preferring a deep rich loam, in which it makes excellent growth. It flowers in May.

A. Halleri.—One of the *Pulsatilla* section, and a very charming plant that will thrive apace in a rather dry, gritty loam. The root-stock assumes massive proportions with age, and yields a multitude of flowering crowns that produce greyish-violet nodding flowers surrounded by silky verticels. The plant has a looser habit than the native Pasque Flower (*A. Pulsatilla*), but is very close to many cultivated forms of it. May flowering.

A. Pulsatilla (*The Pasque Flower*).—A native of our upland pastures

ANEMONE BLANDA, ONE OF THE EARLIEST TO FLOWER.

THE APENNINE
WINDFLOWER

THE APENNINE WINDFLOWER (*ANEMONE APENNINA*) IN A ROCKY BANK.

overlying chalk. The cultivated plant grows 9 inches high, the leaves of which are deeply lobed and silky, the flowers 2 inches to 3 inches long, bell-shaped, nodding or erect, and varying in colour from pale blue (the best form) to a reddish purple, entirely covered with grey, silky hairs externally, and furnished with a soft, silky, ruff-like calyx. The wilding, as found on the Surrey Downs, is a low-growing plant, 1 inch or 2 inches high, the flowers of which are pale blue or purple, and nearly stemless. When sheltered it grows much taller, but it never reaches the fine size of the cultivated plant. It may be effectively used with many of the winter-flowering shrubs in the form of a carpet. The wilding requires a rockery, but the *Pulsatilla* of gardens must have the deeper loams of the cultivated border to maintain its free-flowering qualities and greater vigour. Spring-flowering.

A. rivularis is a choice Windflower from the Himalayas. It grows 12 inches high, and bears freely-branching stems of white flowers 1½ inches to 2 inches across the petals, which are tinted blue on the reverse, and the anthers are blue, purple, or lilac, varying in different specimens. The root-stocks are very stout and vigorous, and the plant's constitution is generally stronger than most of this group. April-flowering.

A. sylvestris (*The Snowdrop Anemone*) is a general favourite that everyone can grow. It forms dense tufts of *Ranunculus*-like leafage, and bears quantities of white, saucer-shaped flowers, each singly on a long wiry stem and quite 1½ inches across the petals. The plant is unduly prolific in offsets, which will need to be removed occasionally if the plants are to maintain flowering strength. Every particle will grow well if severed from the parent plant and carefully treated for a few months. This species will grow where any plant has a chance to exist, and one can recommend it for furnishing the many odd corners that occur in most gardens. It thrives well in grass, and is not particular as to shade, provided it can get plenty of light. Its double form is a capital garden plant with flowers somewhat resembling a large white florist's Daisy, but it does not bloom so freely as the single type plant. It flowers in May, June, and July.

A. apennina and its Allies (*Apennine Windflower*).—The group of *Anemones* most like *A. apennina* inhabiting countries immediately north of the Mediterranean are well adapted for grass planting and more or less informal gardening generally. Their greatest use is for clothing rockery slopes, in planting the higher banks of waterways, and they are charming when grown in small pans for the alpine house. The shade-loving kinds—*nemorosa*, *trifolia*, and *intermedia*—can be usefully employed in carpeting open copses, while their rarer varieties will prove worthy of the care generally bestowed upon shade-loving alpine. The whole group revels in leaf-soil—no matter what the sub-soil may be, a layer of leaf-soil or well-tilled garden soil is necessary as a covering. They do not root deeply, and in planting it is only necessary to cover the curious twig-like underground stems with an inch or two of soil. All flower in spring.

A. apennina (*The blue Apennine Anemone*) is a well-known plant,

widely used for grass planting. It thrives in almost any soil, and for purposes of naturalising it is a better plant than *A. blanda* in damp or wet soils. It has slender stems, bearing solitary blue flowers with paler centres quite an inch across. Old-established clumps are remarkable for the yield of flowers, which literally cover the leafage. Its white variety is valued as a contrast, but its uses are more limited. Several intermediate forms occur among seedlings. Height 6 inches to 9 inches.

A. blanda is closely allied to the last species, and one may select forms indistinguishable from it. It is mainly of stronger growth, bearing blue flowers above an inch across, with a ring of white around the anthers. It thrives best in dry soils in elevated gardens. The roots decay wholesale if very wet in early winter. As a "grass" plant it is inferior to *apennina*, but in light soils likely to dry out in summer this will prove the better plant to grow. White, lilac, and pale blue forms occur in collected batches from Asia Minor, and some of these are now being selected and grown. The Grecian plant is coloured blue. The variety *Scythinica*, from Kurdistan, is a very distinct little plant of great value for the rock garden. It has silvery flowers 1 inch across, the reverse of each petal is tinted a dark steel blue, the leaves are narrower and nearly prostrate. It flowers later than any other *blanda*. *Taurica* is the Cilician form of greater vigour, varying in colour tint from white to blue. It excels all others for border planting, and particularly for pot or pan culture in cool frames for the decoration of apartments in spring. *Intermedia* is a pretty natural hybrid between *A. nemorosa* and *A. ranunculoides*, found growing as a wilding intermingled with its parents. Its habit is that of *nemorosa*, and the flowers are sulphur-coloured and fragrant. A native of Silesia.

A. nemorosa (*Wood Windflower*) is one of our daintiest native flowers. It has slender stems and white saucer-shaped flowers borne singly. It delights in the open copse, preferring a root-run of leaves, moss, and vegetable debris. It makes stronger growth in soils overlying clay, and it is generally found in its best character in Oak woods in partial shade. Its forms are numerous, but all are exceedingly pretty. *Flore pleno* resembles an old-time florist's Daisy in shape and size. It is good enough for any garden use, appearing to better advantage in the hardy fernery and the coarser kinds of rockwork. *Bracteata* is a curious form with a ruff-like, ragged calyx. *Robinsoniana* is one of the most beautiful flowers we have. Its growth is more vigorous, and the flowers are opal-coloured and as large as a florin. It is worthy of the best place the garden affords for its well-being, and it is becoming somewhat scarce. All the *nemorosas* prefer slight shade and a cool rooting medium of vegetable debris. *Bracteata flore-pleno* and *rosea-pleno* in white and rose colourings are the only remaining double forms of worth. Height 6 inches to 10 inches.

A. japonica (*The Japanese Windflower*) is an old garden favourite. The older varieties, *alba* (*Honorine Joubert*); *hybrida*, rich silvery pink; *Lady Ardilaun*, a many-petalled white variety; and *Whirlwind*, which has a collar of greenish bracts around the flowers, require no extended description; but some of the newer ones are greatly-improved forms,

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POPPY WINDFLOWERS (*ANEMONE CORONARIA*). (See Page 8.)

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JAPANESE ANEMONE, QUEEN CHARLOTTE, GROUPED FOR EFFECT.

and of real interest to those who value and require autumn flowers. Of these, elegantissima is a multi-petalled hybrida, the petals narrow and strap-like near the centre, and broadest in the outer row. It is vigorous and easy of increase, refined in colour and shapely. Mont Rose is a less vigorous form with silvery pink, irregularly double flowers, somewhat tasselled in appearance like a Japanese Chrysanthemum. It makes a neat tuft 2 feet high when established. Queen Charlotte is a variety that improves on acquaintance. Its first flowers are always suffused with a slaty colouring, but later blooms are a pure silvery pink, very large and of considerable substance. Its great vigour and freedom in flowering are excellent features in so good a border plant. It is regrettable that these Japanese Anemones wither so quickly as cut flowers. All like good rich soil, and will thrive in almost any position. Usually take a year to establish.

A. fulgens and its Varieties.—The fulgens group of border Anemones being widely cited as exceptionally easy to grow anywhere has led planters to attempt their cultivation in all soils and situations, and the frequent result is failure. One cannot grow *A. fulgens* well in very dry and poor soils, and but little increase is obtained unless the roots are liberally treated. They prefer a rich loam, well drained and of good depth, and the site should not be baking hot in summer so that the roots ripen too early, or they will start again at a corresponding early season, and the new growth will perish in winter. Any exposure, save dense shade or hot sunshine combined with drought, will suit these plants, and the addition of very old manure, buried deeply, and leaf-soil as a surface dressing during growth, will help to make stout rhizomes that will flower freely. A wet soil, on the other hand, is equally unsuitable, and the carefully dried rhizome as received from vendors should never be planted in a wet soil or it will decay forthwith. It is often better to start the roots in boxes under glass, transferring them to their flowering quarters when the weather permits of the soil being readily worked. They are not so generally used as bedding plants as the varieties of *A. coronaria*, as their flowering season is shorter, but they might be used more plentifully in beds of shrubs and in masses in the forefront of plant borders.

A. angulosa and *A. Hepatica* comprise this group. They are well-known plants of great garden worth, and their newer forms bid fair to excel the older ones when available in sufficient quantity to justify their free use in gardens.

The Great Hepatica grows best in a damp, well-tilled soil under slight shade. Like its congeners it is partial to leaf-soil, and if old-established clumps show signs of wearing out, a liberal dressing of grit and leaf-soil will help them round again. It has hairy and lobed leaves in dense tufts, and large deep lilac flowers borne just above the foliage. Its varieties alba, grandiflora, and g. lilacina, are exceedingly fine forms which, when grown into strong clumps, prove very showy. Height 6 inches.

The Common Hepatica is one of the finest of spring flowers. It is available in white, blue, rose, and red colourings, both single and double, and their usefulness in brightening the plant border or rockery slope

early in the year cannot be over-estimated. The commoner sorts are so free in growth and flower that one may suggest a wider use for these little plants in furnishing the soil at the bases of shrubs, in planting ferneries and the drier sites of the bog garden, thus helping to brighten these places in the dull season. They prefer slight shade, and may require to be freely watered in very dry and hot months, otherwise there is no difficulty in their culture. Height 4 inches. All the Anemones of this group may be planted at any time during autumn and winter until leaf-growth recommences.

Florists' Anemones.—These are derived from *A. coronaria* and forms of fulgens type collectively called *A. hortensis*, descendants of which are known as Poppy Anemones, Chrysanthemum Anemones, Peacock Anemones, Caen Anemones, St. Brigid Anemones, and Riviera Anemones. There is endless variation in them; almost every colour is represented, and many types also, ranging from the starry Peacock Anemones to the massive yet refined St. Brigid race. Named varieties of select strains are numerous, but there is no standard nomenclature of sufficient stability to warrant its use here. Regarded solely for their brilliancy as bedding and border plants, or for their great yield of cut flowers, one can only describe them as a variedly beautiful group, in which there are flowers for everyone's tastes. Their cultivation is simplicity itself. A light, rich soil freely dressed with leaf-soil, shade from strong sunshine, and frequent attention as regards water in dry seasons are all they require. If used for spring bedding, roots of various sizes should be planted together, so that the smaller roots may succeed the larger in their season of flowering, and a few should be held in reserve till the others are in growth to carry the display still further. Grown for cut flowers at all possible seasons, one must plant at intervals of six weeks, weather permitting, from September till April, and if the earliest planting is top-dressed and a few more seedlings are introduced, and the site shaded, a pretty display may be had *ad infinitum*, with the exception of the Peacock Anemones. Height 9 inches to 18 inches.

Antirrhinums (*Snapdragons*).—Although the Snapdragons, as we are pleased to call the flowers that the botanists class as Antirrhinums, have been known in our gardens since the days when Gerard wrote his famous *Herbal*, it is only during recent years that any great improvements in colour, habit, and form have been effected.

Fortunately, the cultivation of the ordinary Snapdragons does not call for any special skill or treatment on the part of the gardener. The word "fortunately" is used advisedly, because these flowers are so useful for so many purposes in our schemes of summer and autumn effects that they should find a home in every garden, no matter whether it be the strip of the suburban villa or the demesne of the mansion. For filling beds or borders, for naturalising in the wild garden, the crevices of dry walls, or inaccessible rocks, the Snapdragons are admirably adapted, and in the latter positions they will usually sow and reproduce themselves freely when given a good start. In the gardens at Hopetoun House, Linlithgow, whole borders are devoted to these flowers, large masses of

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California

LONG-SPURRED COLUMBINES, OR AQUILEGIAS.

one colour being planted, and a wonderful colour effect thus obtained. Although the Snapdragon is really a perennial plant, and in a wild or semi-wild state is usually allowed to grow as such, the gardener generally finds it more convenient to treat it as an annual, or at the most a biennial, for the purpose of filling beds or planting in borders. It is such a good-natured plant that it readily lends itself to this treatment, and the modern varieties have been so carefully selected that most of them can be relied upon to come true from seed.

There are two methods of raising seedlings ; the one is adopted where the plants are to be treated as annuals and the other if their existence is to extend well into the second year, though either would be applicable were it desired to allow the plants to remain as perennials. To treat them as annuals, *i.e.* to raise the plants from seed, allow them to flower, and discard them all in one year, it is necessary to sow the seed early in the year, and the latter part of January or the early days of February is usually selected as the most appropriate time. By sowing the seed so early a long period of growth is secured, a feature that is necessary with these plants. The actual sowing of the seed and raising of the seedlings present no serious difficulty. A quite cool greenhouse or frame is essential, and the boxes or pans in which the seed is to be sown must be well drained, as Snapdragons are greatly averse to excessive moisture. The soil for filling the boxes ought to consist of good loam two parts, coarse grit one part, with a little leaf-soil and some old mortar added. A similar mixture, except that a little old, well-decayed manure should be substituted for the leaf-soil, may be utilised for transplanting the seedlings into when they are large enough to be conveniently handled. Thin sowing of the seed, early transplantation of the seedlings, and, above all, cool, airy treatment throughout the whole of their career, are the passports to success in the raising of Snapdragons from seed early in the year. If kept near the glass and freely ventilated, as advised, the young plants should be sturdy and branching by the end of May, at which time they may be planted in their flowering quarters.

If we desire to treat Snapdragons as biennials, *i.e.* raise them one year to flower the next, the seed may be sown in June in the open garden, and the seedlings subsequently transplanted to where they are to flower. Thin sowing and prompt transplantation are essential. So far as soil is concerned, these delightful flowers are not at all fastidious, but it must not be heavy clay that is water-logged. Thorough drainage, and a fair depth of loam to which has been added a goodly proportion of well-decayed manure, will give large spikes of glorious flowers. But, on the other hand, dry, starved soil will produce bushy plants that never seem to tire of flowering, and for this reason the Snapdragon is an excellent plant for growing in the warm, dry borders that are usually found surrounding the dwelling-house, for dry walls, or for rockwork where there is very little soil. In such situations it is best to sow the seed in June where the plants are to grow and flower, and allow them to remain as perennials. This also applies to dry and open spots in the wild garden, where it is desirable to allow the Snapdragons to become naturalised.

There are three distinct types, viz. dwarf, medium, and tall, varying in height from 1 foot to 4 feet. The beautiful art shades of pink, gold, terra-cotta, and bronze have created a great deal of interest in recent years, and are all well worth growing in masses in beds or borders. For walls, rockwork, and the wild garden, however, the self colours, such as good crimson, yellow, and white, are best.

Aquilegia (*Columbine*).—A garden without its Columbines is bereft of dainty and pretty flowers. There are, of course, species, and by intermingling them the present race of spurred and other garden forms has been obtained. Aquilegias may, indeed, for the garden go into two groups—those with spurs and those without these appendages, which impart to the flower characteristic beauty. To the short-spurred class belongs our native Columbine, with its blunt spurs arching over together towards the insertion of the stalk. From this wild plant (*A. vulgaris*) come the older garden forms in varieties of purple, dull red, pink, and white colourings. Of these a rather more modern development is a very strong growing kind with white flowers, much larger than in the type. The more modern garden Columbines are nearly all long-spurred, and though the older varieties of *A. vulgaris* have an unending charm both of their own beauty and of association with the gardens of old times, yet some of the long-spurred kinds are undoubtedly more graceful plants. For dainty loveliness and grace of carriage no plant of this family can rival the long-spurred, pale yellow Californian *A. chrysantha*, looking its best and happily thriving in some cool, half-shaded portion of the garden. To this beautiful plant a host of garden hybrids owe their origin. Many of these are tinted or suffused with pale pink, probably due to the influence of *A. canadensis* and species of red and yellow colourings. The Rocky Mountain Columbine (*A. cœrulea*) is a very long-spurred kind; with its blue and white flowers and shorter growth it suggests a like garden use to the large-flowered Siberian *A. glandulosa*, which has a short spur. But of garden Columbines one of the most important is the beautiful blue and white *A. Stuarti*, raised by Dr. Stuart of Chirnside, N.B. Columbines should be considered biennials; they are true perennials, but often die out during the second year. Seeds are easily raised. Sow them as soon as ripe in a box of light soil, and place in a cold frame. Sow very thinly, and when the seedlings are of fair size transplant them to the place they are to beautify, remembering that well drained soils are most helpful to their growth. The double Aquilegia is a monstrosity. It is the beautiful series of spurred forms that are most welcome in the garden, and are the most useful for cutting. Columbine flowers are excellent for table decoration. Aquilegias are useful for pots, too, for the cold greenhouse. Height 18 inches to 3 feet.

Aster (*Michaelmas Daisies* or *Starworts*).—This is a delightful group of perennials for the beginner. They are hardy, free, and vigorous, making clouds of colour in September and October, even lingering into November, when the Christmas Aster (*A. grandiflorus*) is a bunch of purple bloom. For fully three months Asters brighten the garden. The plants are cheap, and strong tufts put in during winter, or when new

A BORDER OF MICHAELMAS DAISIES IN THE GARDENS AT ALDENHAM HOUSE, ELSTREE,
HERTS.

MICHAELMAS DAISIES EFFECTIVELY GROUPED IN THE WOODLAND.

growth is just commencing, will flower the same year, while their use for decorations is great; graceful sprays put into vases are a pleasure to look at. We dislike to see the Starworts bunched up like a sheaf of corn. They are plants of exquisite grace, which must not be destroyed, and for this reason a pretty way to use them is as flowers for breaking up level masses of evergreen shrubs. When Asters are planted amongst such things as Rhododendrons, they throw their sprays of flowers over the shrubs when these are without bloom. When a walk runs through a little wood, or some grassy path cuts into an old orchard, a rich colour picture comes in autumn when Starworts are planted at the sides. But they want careful "staking," not to show the stakes or to leave holes. One must try to get a surface of bloom without a break, a succession of colours so placed that each one helps the other. It is quite easy to make a sad hash of an Aster border unless the colour association is carefully considered. Asters, although so vigorous and hardy, should be given good cultivation—a rich, well-prepared soil, and give water freely in dry weather. Asters get ragged and worn out unless divided every other year and replanted in freshly made-up ground. The beginner in gardening, who is really interested in the pastime, should raise some seedlings. It is delightful to watch seedling plants flower; and how pleasurable is it when some beautiful thing opens out, born into the world through your efforts. Of course there are more blanks than prizes; that is the same in all walks of life. Sow the seed in pots when it is ripe, which will be, of course, in the autumn. The seedlings will then be large enough to plant out in the spring and flower during the autumn. There is this advantage in raising seedling Asters, the plants soon flower. One has not time to get weary with waiting.

The list in the table (see p. 556) has been prepared by Mr. Beckett, of Aldenham Park Gardens, Elstree, who grows Asters well and has raised many beautiful varieties. It is a long list, but all are good.

Auricula (*Primula Auricula*).—*Early History*—This is what is termed by fanciers the "Show" Auricula, or, more properly, the Exhibition Auricula, because it has been grown for many generations by a class of amateurs whose great delight was to exhibit these plants in competition on a certain date, which was fixed in the south of England about the 20th of April, and in the Midland Counties about the 27th of that month. They seldom fixed the date in May, although the Auricula in the north has sometimes been in its best form in that month; but there is an old saying that, "The Auricula in May has had its day."

In the years following the publication of John Gerard's *Herbal* in 1598, we cannot tell how the Auricula was cultivated, nor in what manner the improvement of this flower was carried out; evidently it was a slow process, the art of cross-fertilisation not being understood. We know but little of the garden Auricula as a finely-developed flower by the art of the gardener until the beginning of the nineteenth century. The Lancashire weavers cultivated it as their favourite flower early in the century, and it is owing to the care bestowed upon it by these worthy old florists, and the rivalry excited by the annual competitions, that the

Auricula has arrived at its present state of perfection. The inception of the work was theirs, yet it has been nobly carried out by the present-day fanciers. The interest excited by an Auricula exhibition is great even at the present time, and the National Auricula Society annually holds an exhibition of all classes of Auriculas, under the auspices of the Royal Horticultural Society, every year about the end of April.

The history of the Auricula has frequently been written, but little is known, except that the original parent is the *Primula Auricula*, an Alpine species with leaves finely powdered with a white farina, and flowers of a primrose colour in trusses. The leaves of the cultivated varieties are sometimes without any powder, others are densely covered with it, the flowers being of the most variable character; and it is probable that these numerous varieties have been developed by the intercrossing of some other species of Alpine *Primula*. The fact that the Auricula is an Alpine plant gives us a clue to the treatment likely to be successful in cultivating it. A close atmosphere is most injurious; whenever it is possible air should be admitted over and under the plants, night and day, summer and winter. The only exception to frames not being open night and day is excessive frost. The plants may be frozen quite hard and suffer no injury.

Classes of Auricula.—The Auricula for garden purposes is divided into four sections—viz. Green-edged, Grey-edged, White-edged, and Sells. This may seem unimportant to the cultivator who does not look too closely into the composition of the flower. It is so difficult to obtain green-edged varieties that unless the fancier had a definite standard of excellence to work up to in this class, it might speedily be ignored altogether, and the green-edged section would drop altogether out of existence. This type of Auricula is always placed first in exhibition schedules and in trade catalogues; probably there is no other reason for this except custom. The “pip” or corolla should be circular, and the petals ought to be free from notches in the margin. Seven to nine pips form a handsome truss; the foot-stalks ought to be stout, and the main stem ought also to stand up erect without the support of a stick.

The corolla ought to have a margin of green; rich dark green forms a beautiful setting for the velvet black ground or “body” colour. This black ground encloses a white centre, and the eye ought to be a clear, rich yellow. The white centre is formed of a dense coating of farina; the eye ought to be round, and the “paste” also circular. The body colour is sometimes angular or irregular; this, of course, is a fault, and the more solid this ground colour is the better is the flower esteemed.

A grey-edged Auricula differs from the green-edged type in the outer margin being slightly dotted with farina. This makes it appear grey; in all other points the standard of excellence is the same as in the green-edge.

The white-edge differs from the grey in the coating of farina being so dense that the edge appears quite white; the farina is never so dense as in the centre of the corolla, but the green margin is covered so thickly that it appears white.

*An old Auricula plant that
needs dividing.*

*A cluster of offsets that may
be divided to make separate
plants.*

Three strong offsets detached from the old plant.

*ALPINE AURICULA ROXBURGH, A BEAUTIFUL
NEW VARIETY WITH PURPLE FLOWERS.*

The selfs are altogether different from either of the above classes. There is the yellow or orange-coloured eye, and the centre of dense white paste, but the margin is merely a solid unshaded colour of dark maroon, violet, red, or yellow.

There has grown up within the last decade or so a section termed Fancies. Of course, when a batch of seedlings is raised by cross-fertilisation from any of the above classes there are varieties outside these classes that are in their way very pretty. These have been cultivated and admired, even more so by many persons of taste than the more formal edged types. The larger proportion of them are merely edged varieties. They have the margin of green, grey, or white, but no ground colour; they are very pretty in the garden, and those who admire them can grow them with the others, as, of course, the cultural requirements are similar.

Cultural Notes.—The Auricula is propagated by seed to produce new varieties, and the named varieties are increased by offsets. These ought to be allowed to remain on the plants until roots are formed at their base; if the offsets are removed before this they take a long time to strike out roots, and sometimes refuse altogether. Some varieties increase rapidly from offsets, others very slowly indeed. The writer has known a stock plant grown on from year to year for six consecutive seasons, and never form even one offset. These unproductive varieties will form long necks in two seasons, and it is best to cut the top of the plant off; when this is done, offsets are sure to be produced, and the top, if planted in sandy soil in a small pot, will also in time form roots. These offsets require careful attention, and must be repotted as they require it. An offset will require about eighteen months to grow into a full-flowering plant; and most of the varieties produce the finest trusses of bloom on young plants. The fine grey-edged Auricula, George Lightbody, is a notable instance of this. And in the self class Horner's Heroine is another favourable example.

Propagation by Seed.—This is the only way to obtain new varieties, as Auriculas do not "sport" into distinct forms, as does the Carnation or Chrysanthemum. In order to obtain good and distinct varieties, it is necessary to resort to cross-fertilisation, and in this case the classes ought to be kept by themselves. Green-edged varieties should be crossed with each other. There are now four very good varieties in cultivation, viz., Abbé Liszt, Mrs. Henwood, Shirley Hibberd, and Rev. F. D. Horner. All these four may be used either as seed or pollen bearers. No Auricula in any class will pass muster with a fancier if it is "pin-eyed"—that is, the stigmatic part of the flower protruding from the mouth of the corolla, with the anthers lower than the stigma. This would be a fatal defect, and however perfect the flowers might be in other respects, this defect would consign it to the rubbish-heap. An Auricula perfect in all its parts has the stigma placed near the base of the tube, with the anthers in the mouth; and to be sure that cross-fertilisation is effected, the anthers must be removed before the pollen is scattered, and should be done when the flowers are not quite half open. This leaves the

tube open, and the pollen can be placed on the stigma with a fine brush.

The Auricula flowers from the middle to the end of April, and if cross-fertilisation is effected at that time, the seed will ripen in July, and as soon as it ripens, it may at once be sown. Use well-drained flower-pots, those about five inches diameter are as suitable as any other. The surface must be made quite level, the seed to be sown thinly, and merely covered with fine soil. Place the flower-pots in a hand-light on the north side of a wall or fence of some kind. The seed will germinate in two or three weeks, at least some of it will. A larger portion will be in the ground until February, when more seedlings will appear, and the remainder of the seed will germinate at intervals for twelve months or more. The seedlings should be pricked out as soon as they can be handled. A medium sixty-sized flower-pot will contain twelve or thirteen of these small seedlings. They must be grown on in hand-lights or frames, and as soon as the plants have grown together, they may be repotted again, this time three plants in the same sized flower-pots. After a time they are again separated, and this time one plant only in a pot. When well established, repot again into a small forty-eight or a 4-inch flower-pot; and in this size the plants will flower. From the sowing of the seed until the time of flowering will be about twenty-two months; and it is needless to think that the time can be shortened, for Auriculas cannot be forced into flower before their time. A close atmosphere and artificial heat are fatal to Auriculas, either when in growth or in flower. If they are flowered in a house, the plants must be placed near the glass roof, and air must be admitted freely both under and over the plants. All through the growing season the plants are kept in frames, from which the lights are removed at every favourable opportunity.

General Culture.—In order to give a clear and concise account of the cultural requirements, we will suppose that it is the month of February. The Auriculas should be removed from the garden frames into the Auricula house. This is a span-roofed structure, say 10 feet wide, and any required length, with a path in the centre, and side stages about $3\frac{1}{2}$ feet wide, which will give a path of $2\frac{1}{2}$ feet. The plants are placed within 18 inches of the glass roof, or even less, and they must also be surface dressed. A portion of the old top soil is removed, and replaced with a compost of one part good yellow loam and one part of decayed manure. All offsets ought to be removed at the same time, and there is no better season of the year for planting them. They seem to do best when removed in February. Plant each offset separately in deep thumb pots, using ordinary potting mould to three parts of the depth, filling up with finely sifted sandy material. Plant the offsets firmly, and place them in hand-lights. It is characteristic of the Auricula after its winter rest to grow away rapidly, and the offsets partake of the character of the parent plants; they also grow freely and form roots more readily than at any other period. In March the trusses will rapidly develop, and to obtain the best results some care is necessary. They should be protected from

the keen cutting east winds we frequently experience in March. It is well to ventilate freely, but disastrous results would follow if the ventilators were freely opened on the east side during these frost winds; and if the frosts are (as they may be) severe, it is as well to have a little heat in the hot-water pipes, for if the Auricula truss is frozen in process of development the flowers seldom open well; but beware of anything approaching to a forcing temperature, which would be sure to cause weakly, drawn-up stems and small flowers. In April the flowers develop, and in that month the Auricula exhibitions are held, and no flowers are more likely to be injured by the sun, therefore it is necessary to shade, and at the same time see that the shading is removed as soon as it is not needed. Those amateurs who intend to exhibit for prizes must have a good knowledge of particular varieties. Some will last in full beauty for three or four weeks, others will go wrong after as many days. The selfs last but a little time in good condition, and it is really necessary to keep them out in the frames three or four weeks longer than the edged varieties, if they are to be in flower at the same time. The plants must be free from green-fly before the flower trusses appear. The amateur who delights in his plants will not fail to give them all the attention they require when they are in flower, such as careful attention to watering, protecting the delicate blossoms from rough winds and bright sunshine.

With the advent of May the blooming season is well-nigh over, and, as the flowers decay, they must be pinched off at the base of the foot-stalks, leaving the main stem to die off gradually; and the plants must be removed to the summer quarters on the north side of a wall or building of some kind, and after being in the frames for a week or two they may be repotted. The Auricula requires to be repotted once a year, and if the best results are to be obtained the sooner it is done after flowering the better.

In repotting, that very troublesome parasite, the Auricula aphid (*Trama Auriculæ*) cannot be ignored. It is to be found in every large collection, and clusters round the roots, principally amongst the drainage, and frequently round the neck of the plants. Apply methylated spirit with a small brush to the affected parts. This will destroy the aphid and will not injure the tender roots. A good portion of the old exhausted soil must be removed, and the plant returned to a well-drained flower-pot, similar in size to the one it was removed from. Young, vigorous plants that may have flowered in smaller pots than are used for full-grown ones ought to receive a larger shift, but the maximum size ought not to exceed 5 inches diameter inside measure—4 inches to 4½ inches would be the most useful sizes. The potting soil should be composed of good, fibrous, yellow loam four parts, decayed manure one part, and one part of leaf-mould. This may not seem a very rich compost; but it is not well to grow the Auricula into mere leaf, as it causes the flowers to lose their highly refined character, so greatly admired by the fanciers. After repotting, the frame lights should be kept over them for a week or so, and they must also be shaded from the sun. Never shut the lights down

altogether, but leave them tilted at the back ; the plants will soon make roots into the new potting material, and when this has happened, air may be admitted freely. This is a point of the utmost importance, as the Auricula seldom does well unless air is admitted freely in all the stages of the plant's growth.

Insect Pests.—The ordinary green-fly is the most troublesome, and it is most easily destroyed by fumigating with tobacco fumes. Nicotine is by far the best ; it is most effectual, and a second dose is seldom required. The Auricula aphid cannot live under this nicotine steam if frequently repeated, but it takes a great deal more to kill it than is sufficient for the green-fly. Slugs are troublesome, and should be killed at night when out feeding ; for this purpose a good lamp is necessary. The leather-coated grub also turns out at night and feeds on the crisp tender leaves of the Show Auriculas. A green caterpillar also feeds voraciously on them ; but this is found easily in the day time. Decayed leaves should be removed periodically, as if allowed to remain they may materially damage the plants.

A list of the best varieties may be useful (raiser's name in brackets). They are as follows :—

Green edged—Abbé Liszt (Douglas) ; Abraham Barker (Lord) ; Hy. Wilson (Simonite) ; Prince Charming (Douglas) ; Diomed (Simonite) ; Love Bird (Douglas) ; Mrs. Henwood (Barlow) ; Rev. F. D. Horner (Simonite) ; Shirley Hibberd (Simonite). Prince of Greens (Trail) was much esteemed a few years ago, but owing to some defect in its constitution, it has gone a good deal out of cultivation. Grey-edged—There are a considerable number of choice varieties in this class. The best is still George Lightbody (Headly) ; although it was in cultivation over forty years ago, it holds its own with the best. George Rudd (Woodhead) ; Lancashire Hero (Lancashire) ; Col. Champneys (Turner) ; Olympus (Douglas) ; Marmion (Douglas) ; Richard Headly (Lightbody) ; William Brockbank (Mellor). In the white-edged class there are some choice and very pretty varieties, and perhaps the best is Acme (Read) ; it is very perfect, forms a handsome truss, and a perfect white-edged corolla. Conservative (Douglas) ; Frank (Simonite) ; Acme (Read) ; Rachael (Woodhead) ; Miss Prim (Douglas) ; Mrs. Dodwell (Woodhead), an old variety, but very distinct, and has a pure white edge ; True Briton (Hepworth). The self-edged class, as previously stated, is distinct from the others. The best of them are :—Black Bess (Woodhead) ; Buttercup (Horner) ; Heroine (Horner) ; Lord of Lorne (Campbell) ; Ruby (Simonite) ; Favourite (Horner) ; Mrs. Phillips' Mikado (Smith) ; Harrison Weir (Douglas) ; May Day (Douglas).

Alpine Auriculas.—These are a different class of plants from the show varieties, and have been produced as garden varieties from a different parentage, probably *Primula pubescens*. They are easily cultivated, and will thrive well in the open border, and they form as handsome rock garden plants as it is possible to conceive. No other plants have that peculiar distinct tint of crimson-maroon and blood-red shaded maroon ; also the lovely lilac and purple maroon tinted colours.

They are really hardy garden plants, and like a medium clay loam, with a moist subsoil in summer. The fanciers grow the finer varieties in flower-pots, and when this is done they require similar treatment to the Show Auriculas, but as neither the foliage nor the corolla has any farina upon it, the plants do not suffer from rain, and they can have what both sections appreciate greatly—abundance of fresh air; and they suffer but little from frost winds. The late Mr. Charles Turner of Slough was the first to produce choice varieties. Other cultivators have further improved the garden varieties, and there are now many choice and distinct kinds in cultivation. The best at the present are as follows:—Dean Hole, maroon, shading to crimson; Duke of York, crimson maroon, shaded crimson; Firefly, fine form distinct, deep crimson, shading to red; Mrs. Harry Turner, maroon purple margin, shaded; Admiration, purple, shading to blue; Argus, dark plum colour, shading vinous red; Claud Halero, centre rich yellow, margin maroon crimson; Dazzle, white centre, shading purplish maroon; Mrs. Douglas, centre round and white, deep purple shading to paler tint; Phyllis Douglas, maroon, shading to reddish purple; Prime Minister, centre round and gold, shading to maroon; Uranie, blood red margin, shaded pale red; Rosy Morn, bronze yellow gold tube.

Auriculas in the Border.—Those who are unable to grow the Show Auriculas in pots, and these are only adapted for this form of culture, should raise seedlings of the alpine varieties. A good selection will give many beautiful forms, and one may regard them in the same way as seedling Primroses, reserving only those of pure, strong colours, and rich fragrance. Deep purple, clear crimson, yellow, orange, and similar shades are those that tell best in the garden. Freedom of growth and bloom must be considered also, and these border kinds when grown in a frame or in the greenhouse, are welcome for their sweet fragrance. In many gardens the Auricula is used with advantage as an edging, perhaps to some shrubby border or in the spring bedding. Seeds may be sown as soon as ripe (early summer) in pans of light soil and placed in a cold frame. When the seedlings are of sufficient size plant them out; they soon grow. Seeds may also be sown in gentle heat in the early year.

Canterbury Bells.—The beginner frequently forgets that the old-world flowers—the Canterbury Bell, Pink, Carnation, and other things, are the most satisfying and ornamental. How rarely is the Canterbury Bell (*Campanula Medium*) grown even in the large garden, where one expects considerable collections of plants. The Canterbury Bells are quite easily managed. The chief point is to obtain good colours. More recent kinds have “cups and saucers” of the breakfast pattern, but these are seldom pleasant. Their size makes them appear coarse and rough. Varieties with bloom of more reasonable dimensions are better, and be wise in the choice of colours. A delicate lavender, snow-white, soft-pink, good purple, or blue are beautiful in themselves, and the Canterbury Bell is a thing to make a group of where there is sufficient space. Avoid the double forms; they are not merely unpleasant, but hideous.

The way to raise Canterbury Bells is from seed, regarding them as biennial. Sow out of doors in June, the great month for sowing biennials, and the result will be sturdy tufts for putting out where they are to flower in the following autumn. Any good soil. Height 3 feet. The great Campanula tribe, to which the Canterbury Bell belongs, is described on p. 551.

Delphiniums (*Perennial Larkspurs*).—This is a noble group of perennial plants, strong, stately, and indispensable. In June or July the tall, handsome spikes give dignity to the garden, and the Delphiniums may be planted almost anywhere, massed or grouped in threes or fours in the mixed border, or planted amongst evergreen shrubs. There is an annual race, which is sown each spring. Many beautiful varieties of Perennial Larkspur have been raised of late years by Messrs. Kelway & Son, and others; indeed, the list has grown so long, and all the varieties possess some merit, that we hesitate to recommend any where all are so good. The best way is to see a collection, if possible, or ask for a strong blue, purple, lavender, or some decided colour. A tall, cylindrical spike, of symmetrical character forms the chief stem, and when this is removed after its beauty is over, side-growths will prolong the display. A very effective type of Larkspur is that in which the centre is blue and outer florets creamy white. It must not be forgotten that there are yellow Perennial Larkspurs—Beauty of Langport and Primrose being two of this kind. Kelway also raised the white-flowered Phyllis Kelway. It must be a poor garden that will not grow Delphiniums. Like the Pæony, it enjoys a very rich soil; and, given this, and attention with regard to water during dry summers, the plants should produce sheafs of blossom. Slugs have a special fondness for Delphiniums during the winter, and where troublesome, strew ashes over the crowns. The way to propagate is by division of the roots, which is best done in spring as the new growth is commencing. Cuttings will root best in spring, and seed may be sown in April under glass. Sow in shallow pans, and prick off the seedlings when large enough to handle where they are to flower. It is interesting to watch the seedlings flower. They are in the nature of a prize packet.

Foxgloves.—The foxglove appeals to the flower gardener. We know it as a beautiful native flower, purpling with colour the woodland or grassy bank. In the small garden as well as in the large domain with woodland walks and large belts of shrubs the Foxglove will rear itself. It is a plant for a shady border where Ferns, Spanish Scillas, Day-lilies, and similar shade-loving things are happy. In many a garden such a border exists, frequently in the suburban garden, where it is impossible to get away from trees and shrubs planted by one's neighbour to overhang the fence and cast a deep shadow across one part of the garden. There the Foxglove is quite content to flower and reproduce itself by self-sown seedlings, in truth to establish a colony. Sow the seed in May or June where the seedlings are to remain, or plant out seedlings in the autumn or in the spring. Get some seed of a strain called *Gloxiniæflora*, which has larger flowers than those of our native

SINGLE HOLLYHOCKS.

BORDERINGS OF GERMAN IRISES BY GRASS PATH.

kind ; it is really an improvement upon it. Many of the forms are very handsome, say a pure white bloom richly blotched inside with chocolate, dabs of dark colour on a snowy ground.

Hollyhocks.—Hollyhocks are noble garden hardy flowers, and grouped freely make picturesque features in the border or arranged against perhaps an oaken fence or grey stone wall. All the garden forms have been derived from *Althæa rosea*, and remember that good living keeps the Hollyhock disease in check. The plants need very rich soil, plenty of manure, and when the spikes are rising liquid manure occasionally will be helpful. Stake the stems securely, and try and get varieties of a good colour. In *Wood and Garden*, p. 105, it is mentioned : "Hollyhocks have been fine in spite of the disease, which may be partly checked by very liberal treatment. By far the most beautiful is one of a pure pink colour, with a wide outer frill. It came first from a cottage garden, and has always since been treasured. I call it Pink Beauty. The wide outer petal (a heresy to the florist) makes the flower infinitely more beautiful than the all-over full-double form that alone is esteemed upon the show table. I shall hope in time to come upon the same shape of flower in white, sulphur, rose-colour, and deep blood-crimson, the colours most worth having in Hollyhocks." There are several ways of increasing Hollyhocks. A very simple one is by seed, but unfortunately one cannot be quite sure that the seedlings will reproduce the likeness of the parent. Frequently single flowers occur, which though showy and beautiful, are quickly past their best, and a dingy magenta or purple is common too, a flower harsh, unpleasant, and unnatural. Seedlings are less likely to perpetuate the disease than cuttings, eyes, or root division, but when named varieties are desired, and there are still some of the old kinds in existence before the visitation of disease, by cuttings eyes or roots is the way to proceed. The time to sow seed is early autumn or in February. Sow it in a cold frame and in a shallow pan filled with ordinary soil. Pot off and transplant in the usual way, and when increasing by division let this be done in spring when new growth is commencing. We do not advise the amateur to raise Hollyhocks by either eyes or cuttings. The following remedy for Hollyhock disease is recommended by Messrs. Webb & Brand, the well-known Hollyhock specialists. Slake one bushel of lime, and, when cool, add one bushel of soot, 4 lbs. flowers of sulphur, and 2 oz. sulphate of copper, finely powdered. Pass the mixture through a fine sieve and dust the plants well over with it three or four times during the growing season and when the leaves are wet with dew.

Iris.—There are two groups of Iris, one bulbous, and the other rhizomatous ; the former is dealt with in the list of bulbous flowers (p. 109). The Flag or Bearded Iris (*I. germanica*) has many forms, which make noble groups in the garden during the early summer, succeeding almost everywhere, even upon a hot sunny dry bank, when the soil underneath is fairly rich. The best time to plant is immediately after flowering, but they may be moved at almost any time. Many a half-shady spot receives its beauty in summer from the massing

together of the blue German Flag, and even when not in flower there is some charm in the silvery-toned, sword-shaped leaves. Of this group choose from amongst the following varieties:—Black Prince, with large, fragrant, and handsome flowers, with light purple standards and darker falls, with yellow markings in the centre—the contrast between standard and fall is most marked; *Asiatica*, a splendid kind, strong, with spikes four feet high, and very large flowers, of which the standards are blue and the falls darker; *Mme. Chereau*, white, with soft bluish edges, much grown for the markets; *Mrs. Darwin*, standards snow white, falls white with violet reticulation, very pretty colouring; *Pallida dalmatica*, a glorious Flag Iris, perhaps the most beautiful of all, with tall stems of delicate blue sweetly-scented flowers, and broad, handsome foliage; *Queen of May*, pink and rose, a very quaint, pretty Iris; and *Victorine*, deep purple and white. The grey white Iris of Florence, or the Florentine Iris, is, except the ordinary blue, the earliest of the race. It should be grown in quite a simple group, perhaps on the lawn, or amongst dark-leaved shrubs. Coming, as it does, with the Oriental Poppies in May, it seems to be the herald of the large flowers of early summer. In the border, if of sufficient size to accommodate many things in one family, may be grown all the best of the flag-leaved Irises, beginning in May with the old blue German. This is quickly followed by the Florentine Iris, the pale yellow *Flavescens*, the magnificent pale blue *Pallida dalmatica*, and the others of the *Aphylla*, *Amœna*, and *Neglecta* families, whose flowers are for the most part of varied arrangements of purple, lilac, and white, and numerous garden kinds, derived from *variegata* and *squalens*, whose flowers are yellow and crimson and of harmonious minglings of these with various tints of purple-bronze and smoke colour. The Flag Irises succeed quite well in town gardens, and in almost any soil.

Noble tall Irises besides these, but not so easily managed are:—*I. aurea*, a tall vigorous kind, with golden yellow flowers; the six-foot *I. gigantea*, ivory white and orange flowers of large size—a stately plant; *I. Monnieri*, primrose yellow, reminding one of *I. aurea*, late, and appreciates moisture; *I. missouriensis*, soft blue, a very free-blooming pretty species; the common-English Flag of the water-side, and its fellow variegated variety; *I. spuria*, deep blue, a tall, graceful kind; the hybrid yellow, *I. monspur*; *I. orientalis*, blue and beautiful pencillings of colour, a delightful Iris, very pure and charming for its blue shades; and the Siberian Iris (*I. sibirica* and *alba*), grassy plants, three feet high, with an abundance of blue flowers, ivory white in the variety named *alba*. *I. fœtidissima*, a native species, has coral seed-pods.

There are other less important groups.

Then there is a group known as the Cushion or *Oncocyclus* Irises, which are not beginners' plants. They come from the East, and require thoroughly ripening off in summer. Many very beautiful kinds belong to this group, and some are strangely attractive, the big *I. susiana*, or Mourning Iris, as an example; but those who wish to know more about this fascinating section, with flowers frequently pencilled in a delightful way and gauze-like in texture, should get Sir Michael Foster's

JAPANESE IRISES EFFECTIVELY GROUPED BY THE WATERSIDE.

GERMAN IRIS OR FLAG IN THE ROYAL GARDENS, KEW.

pamphlet concerning them from the Secretary of the Royal Horticultural Society, Vincent Square, London.

In sheltered nooks the lovely, sweet-scented Algerian Iris (*I. stylosa*, or *unguicularis*, as it is also called) and its white variety flower well in winter, and, where slight protection is afforded, remain uninjured except by severe frosts. A mulching of light material round the clump and an inverted hamper placed over the plant at night generally suffice to preserve the unexpanded buds—in which condition they should be cut for indoor decoration—from injury. They need well-drained soil.

Since the love for water gardening and planting flowers by the stream-side has developed, the Japan or Kämpfers' Iris has become a popular flower, not, of course, to the same degree as the Flag Iris, but in no good garden where there is a stream, pond, or water is the opportunity missed of imparting to the water margin colouring of the most beautiful and varied kind. Plant them by the margin of the water, not with their feet actually in the water; and this may be done in the autumn. The flowers are many inches across, flat patches of colour, and when there is a good selection and well planted the effect is very charming, a surfacing of varied colour, from white through purple to rose, the blooms peering above the grassy leafage. Seedlings may be raised by sowing seed in March, but this is not beginners' work.

Pæonies, Tree, or Moutan.—It is strange that a race so gorgeous and effective as this should remain in comparative obscurity, as if the brilliance of its flowers were not sufficiently startling to attract the beginner, or, for that matter, those who would scarcely feel flattered to be described in this way. The flowers are enormous, big fluttering clouds of petals, sometimes one row, sometimes two, and, of course, many in number when the variety is quite double, a glorious mass of colouring in the opening summer days. The Tree Pæony is a shrub, and should be grouped upon the lawn, but not exposed to easterly winds. Shade from early morning sun is useful, as the young shoots are often damaged by frost in spring if the sun shines on them when frozen. A rich soil is also essential; it must be deeply trenched, well manured, and give plenty of water during the summer. We have seen Tree Pæonies in a hot dry border, and then the owner grumbles that the big flaunting flowers seen at the early shows will not venture forth. Of course not, when the plant demands opposite conditions, moisture and manure. When the border is dry the places where the Pæonies are to go must be specially prepared. Avoid shade, except in early morning, for the reason that full ripening of the growth is necessary to abundant flowering. The time to plant is September or October. Of the many good plants we have had from China, none is of more importance than the Tree Pæony. It is very useful for forcing gently into bloom in pots. Rich feeding is essential, but it is worth some effort to get the beautiful flowers in February and March. After flowering give the plants a year's rest before again submitting them to pot culture. There are so many varieties that it is not easy to make a selection without omitting some kind that deserves attention; but the

following are very beautiful:—Aphrodite, white; Duchess of Marlborough, flesh colour; Eastern Prince, deep scarlet, with golden anthers to intensify the dark colouring; James Kelway, rose, carmine centre; Beauty, rose-lilac; Lord Byron, salmon-rose; Reine Elizabeth, pink; Atalanta, purple-red; Berenice, white-carmine. These are double; and of the singles choose:—Cecil Rhodes, with fringed crimson and cerise florets; Lord Kitchener, blood-red; Countess Crewe, salmon-pink; Queen Alexandra, white; Lord Iveagh, rose; Mr. W. J. Simcox, rose touched with salmon; and the deep crimson, almost waxy-petalled Eastern Queen; Beatrice Kelway, white; Lord Burnham, scarlet, semi-double.

Pæonies, Chinese, or Herbaceous.—Unlike the Tree Pæonies these die down each autumn and reappear in spring. The Herbaceous Pæony is a fine picture in every well-planted garden—the old crimson Pæony tumbling over the border margin or forming groups in the open spaces of woodland, is as sumptuous as anything raised of recent years. The soil cannot well be too rich for the Pæony; and it pays in the long run to make a bed fully three feet deep for the plants, and put in plenty of decayed farmyard manure. The herbaceous Pæony appreciates some shade, and the flowers remain longer fresh and full of colour when not exposed to full sunshine, but planting against hungry shrubberies is a mistake. The best month to plant Pæonies is September. When planted or transplanted at this time, the Pæony quickly becomes established, sends out new roots, and is enabled to go through the winter with safety. A wrinkle when planting is to keep the crowns at least 2 inches below the surface. Also give a surface mulch of well-decayed manure in spring, to prevent parching winds and hot suns drying up the moisture in the soil. Never put a Pæony less than a yard from another plant, as they are so leafy and shrubby that when closer together overcrowding is the result. When a bed entirely of Pæonies is planted the surface has a bare look, but this may be remedied by planting Pansies between, or some evergreen, such as the mossy Saxifrage (*Saxifraga hypnoides*). Frequently four years elapse before the Pæonies attain their full blossoming perfection. The crimson shoots in spring are very charming, and a pretty colour contrast results by putting yellow Daffodils between, whilst Lilies may be used in the same way. There are two distinct classes of Pæonies, the May flowering and the more popular forms of *P. albiflora*. Of the May blooming group, select from the single red-flowered *P. anomala*, which has also very prettily cut foliage, and there are many fine varieties of crimson-shaded colouring. *A. arietina*, and its varieties, are beautiful too, but of the species a list will be found on p. 569.

P. albiflora, the parent of the most familiar Pæonies of the day, has single white flowers relieved by a central tuft of golden stamens. It is in brief a flower of dashing beauty, but the varieties offer a charming colour-range, from white through rose, flesh-pink, purple, red, to full rich crimson. A selection may be made from the following:—Beatrice Kelway, rose; Queen of the West, pink; Eugene Verdier, blush;

A SEEDLING VIOLETTA OR MINIATURE TUFTED PANSY.

The Viola growth on left is hollow and not suitable for a cutting. The one on the right is firm and good.

Cutting on left prepared for planting; on the right, one with a few roots adhering

Seedling Violas or Tufted Pansies ready for planting in beds or borders.

Festiva maxima, pure white ; *Lady Beresford*, pink ; *James Kelway*, white ; *Mme. Furtado*, rose ; *Mme. Calot*, white, rose shading ; *Shirburnian*, maroon-crimson ; *Solfaterre*, sulphur ; *Triomphe de Paris*, white ; and *Whitleyi*, yellowish white, a very beautiful *Pæony*. These are all double varieties. A few good singles are :—*Meteor*, crimson ; *Duchess of Sutherland*, flesh ; *Queen of May*, rose ; *Rose of Silver*, silvery rose ; *Venus*, rose ; and *Bridesmaid*, pure white.

Pansies (*Violas*).—The show and fancy Pansies cannot be regarded as flowers for the beginner's garden, and they are seldom satisfactory in the South of England, but of late years many beautiful varieties have been raised, known collectively as tufted Pansies, the older name for which was *Viola*. These flower over a longer season than the Heart's-ease of our forefathers' gardens ; big, handsome flowers, that seem to smile in the sunshine of summer. By raising seedlings many beautiful forms may be obtained, offering a remarkable range of colouring from selfs through blotched and other forms, some almost bronze, others picturesque mixtures, in shading almost black, so intense is the purple tone.

But to create certain effects, to obtain masses of colour and pretty bouquets for the table, it is better to grow a few of the best-named tufted Pansies. There is nothing in the least degree difficult in their management. Cuttings may be taken in July, inserted in a bed of soil in a cool part of the garden, say a north or east aspect—anywhere, in fact, away from the full force of the midday sun. Cuttings put in during July will root sufficiently to transfer to the places they are to adorn in the following autumn. For spring planting insert the cuttings in the autumn, and protect them with a rough framework of eight-inch or ten-inch boards. Use the ordinary soil of the garden for the cutting bed ; dig it deeply, and well break it up, then spread over it a compost consisting of loam, leaf-mould, and spent mushroom bed manure in equal parts. Add to this an equal part of coarse silver sand or coarse road grit. Mix the compost well together, pass it through a sieve with a half-inch mesh, then spread it evenly over the place for the cuttings. Level the soil and make it moderately firm with a board or back of the spade. An hour or two before the cuttings are inserted water the soil thoroughly with a fine rose watering-can. The cuttings should be made of recent growths, not pithy hollow stems ; let them be about two inches and a half long, remove the two lower leaves, and cut straight across the lower joint with a sharp knife. It is important, if possible, to obtain the cuttings with a few small roots attached, such as may be obtained when taking from the old stools (see illustrations). Put the cuttings two inches apart. Make them firm at the base ; the rows to be three inches apart as a rule, but some varieties, being weaker than others, require less space. When the cuttings are inserted water them gently. In about three weeks the cuttings will have rooted. The large grower cuts back the plants to secure cuttings or new growths, but those who require fewer tufts need not interfere with the free-flowering of the Pansies. As opportunities offer detach young growths from the crown of the

plants and root them, and in many gardens where space is limited a small batch of plants may be raised in wooden boxes three inches or four inches deep, or in pots, placing them in a cool position when propagation takes place in summer, or under a south or south-west wall if propagated in the autumn.

There are two seasons for planting Pansies—autumn and spring. When a very early spring display is required, plant in autumn, say in early October. Choose a warm sheltered spot if possible. Plant them firmly about ten inches apart, well working the soil round the collar of each tuft, and put them a foot apart, not more, and then the intervening space will be quickly covered. Dig deeply the bed or border where the Pansies are to go, incorporating partly-decayed manure, and if the soil can be left rough for rains and frosts to sweeten it, so much the better. Where more than one colour is associated in a bed avoid violent colour contrasts, but secure a pleasing sequence. When planting in spring choose early March, and then the Pansies get established before the hot weather. This does not mean that planting cannot be done in April, or even in May; but March is the most suitable time. Always dig the soil deeply, and remember that the Pansy is not happy in very heavy ground.

Plants sent from a distance usually arrive without soil at the roots, and need careful treatment. If they appear shrivelled stand the little packets in flower-pots (leaves, of course, uppermost), and sprinkle them with water, and place in a shady corner for a few hours to recover. Pansies dislike hot sunny places. They delight in coolness and shade; important points to remember. During the summer, hoe carefully amongst the plants to break up the surface soil, keep down weeds, and always remove spent flowers. When a plant begins to mature seed its blossoming is at an end; it cannot bear the double burden. When the weather is very hot, water the plants thoroughly and spray them occasionally in the evening. It is wise also to mulch the tufts in June, using for the purpose leaf-mould and loam in equal parts with a free use of coarse sand or road grit. Well work the material round the collar of each plant. Two or three times during the flowering season it will be wise to give the Pansies a short rest by pinching off all the buds and blossoms, and within a week another display will reward the attentive gardener. Cut out old, coarse, and elongated growths from time to time. This will promote younger shoots.

Pansies may also be raised from seed, which should be sown out of doors in a shady place in August, pricking the seedlings out to a specially prepared bed in October. The plants will flower during the following spring. The seed may also be sown in gentle heat in the spring, pricking the seedlings off into shallow boxes, and then transfer them to the beds or borders when they attain sufficient size. Remember only to purchase the best seed, *i.e.* that raised from the most beautiful varieties.

Pentstemons.—It would be difficult to select a gayer or more interesting group of garden flowers than the Pentstemon. There is something refreshing in their appearance towards the end of summer,

A BED OF PENTSTEMONS IN A SMALL GARDEN.

Flower stem of Pentstemon. The young shoots at base are suitable for cuttings.

The shoot on left as cut from plant; on the right prepared for planting.

Cuttings planted and placed under a bell glass to facilitate rooting.

when even a weakly plant will attempt a brave show of spikes of bloom, each flower of an open bell-like formation, reminding one of a Foxglove. Remember, however, that the *Pentstemon* is decidedly tender; a hard winter will kill the plants wholesale, but that is of small importance, as seedlings may be raised with great ease; indeed, we may quite regard the plant as a biennial—*i.e.* seedlings flower the year after the seed is sown, in contrast to the annual, which flowers the same year. Remember the seasons for seed sowing—one in June, in shallow pans, the seedlings to be wintered in a frame, and the other, which is the more convenient when space in the little greenhouse is precious, in January. Sow upon a hot-bed or in a temperature of between 50°. The *Pentstemon* is easily propagated by means of cuttings taken during August or September.

For the benefit of the inexperienced grower a typical growth of the *Pentstemon*, showing the flowers with the young growths freely developed on the lower portion of the stem, is shown in the illustration. By cutting away the flower-spike a number of young shoots are always encouraged to develop, and these invariably root quite satisfactorily. That the beginner may better understand the character of such growths, we have given an illustration of such material, the shoot on the left being just as it was cut from the plant.

The preparation of the cuttings next requires to be dealt with, and this is a simple matter. The cuttings should be about 3 inches in length, as shown on the right of the centre illustration. The lower leaves are trimmed off close to the stem with a sharp knife, and the stem of the cutting cut through immediately below a joint, the latter being formed by the junction of the leaf-stalk with the stem of the cutting itself. Cuttings may be rooted in a variety of ways—a cold frame may be requisitioned, a bed of sandy soil prepared, and the cuttings inserted in this where a large number of plants are desired. Where the demands are less, boxes, pots, or pans may be utilised for the same purpose. On the opposite page a number of cuttings are shown inserted in a seed-pan of good dimensions. A suitable compost for propagation purposes should comprise loam, leaf-mould and coarse silver sand or clean road grit in equal proportions, and be well mixed. Insert the cuttings carefully, pressing the soil firmly to the base of each one. Water in, and after leaving to drain for a while, cover with a bell-glass or hand-light, and arrange in the cold frame. Keep the cuttings close for a time till rooted, then admit air. During the rooting process shade from bright sunshine. *Pentstemons* flower in late summer and autumn.

Phloxes, Herbaceous.—For very many years the herbaceous *Phloxes* have been favourites with lovers of hardy flowers. Long before the merits of the bulk of our beautiful herbaceous flowers were appreciated to anything like the extent they ought to have been, these *Phloxes* had claimed the attention of florists, to whose efforts in cross-fertilisation we largely owe the numerous and beautiful varieties that adorn our gardens to-day. From what species these varieties have been derived it is difficult to say, and there is very little reliable data to enlighten us

on this point. In all probability, however, the parents were *Phlox glaberrima suffruticosa*, *P. maculata pyramidalis* and *P. paniculata*. The first of this trio is, as its varietal name implies, of woody habit and early flowering, while the last two are of a more succulent nature, and flower naturally at a later date. The garden varieties were at one time fairly clearly divided into two sections, known respectively as the suffruticose, or early-flowering set, and the decussate, or late-flowering forms; but during recent years intercrossing of varieties belonging to both types has been so frequent that the line of demarcation has been almost obliterated. But this need not worry the would-be cultivator of these beautiful and fragrant flowers; indeed, it is rather useful, inasmuch as the season of flowering of the early set is now blended with, or carried on to, that of the later types, so that we may have our Phloxes in flower from June until well into the autumn.

Fortunately, the cultivation of herbaceous Phloxes does not present any serious difficulties, though it is doubtful whether the best that is possible is obtained in the majority of Southern gardens. In Northern districts, and Scotland in particular, the plants are grown to perfection, and though the more moist climate may account for some of the success, good cultivation is at the bottom of it all.

Although we do not all possess the deep rich loam that is the ideal soil for Phloxes, we can, most of us, make that which we have sufficiently suitable to grow and flower them well. At Kew, for instance, where the sandy soil is the very antithesis of an ideal one, these herbaceous Phloxes are grown, if not to perfection, at least sufficiently well to pass muster in the eyes of serious critics. Deep trenching, liberal manuring with, preferably, pig or cow manure, and copious supplies of water and weak liquid manure during the growing season are the key-notes to success with these flowers where the soil is naturally sandy. On the other hand, where heavy clay predominates, the deep trenching and manuring must also be resorted to; but here let the manure be that from the stables, and mix with the top spit of soil burnt earth, wood ashes, old potting soil, road-scrappings from country roads not much frequented by motors, or, indeed, any other substance that will tend to render the soil porous and warm. Even our ideal loam must be deeply dug and well manured, because it must be confessed that our modern Phlox is a voracious plant and one that likes to live on the fat of the land.

Planting is best done during the early spring months, particularly where young plants, raised from cuttings, have been purchased in pots. For ordinary purposes it is preferable to rely on pieces taken off the old plants, though this is contrary to the methods advocated by some who make a speciality of the flowers. Such pieces will, however, give results equally as good as, and in some instances even better than, cutting-raised plants, so that it is impossible to see the objection to them. In gardening, as in all else, opinions change. It is now generally admitted that to have good Phloxes, frequent division of the old plants is necessary; indeed, where they thrive well, it is better to do it every other

A BORDER OF HERBACEOUS PHLOXES IN A SUBURBAN GARDEN.

AN EDGING OF THE OLD FRINGED WHITE PINK.

year. By carefully dividing the old plants with a fork, and selecting small pieces of the outside growths for replanting, we get several strong basal growths that will give us flower trusses infinitely better not only in size, but in colour and substance, than were old plants allowed to remain and grow as they pleased. This division and replanting may be carried out at almost any time during winter and spring, though February is the best month, as new growth is then usually commencing and very little check is experienced. Mulching between the plants during hot weather with short manure, frequent soakings with water and weak liquid manure throughout their growing season, and careful staking of the shoots, with an early thinning out of the weakest growths, are the main cultural details that need attention after planting has been well done.

Varieties are now so numerous that it is well-nigh impossible to compile a list without leaving out many that are well worth growing.

The following are good: Coquelicot, orange-scarlet; Baron von Didem, orange-scarlet; Countess of Ilchester, salmon-pink; Dr. Charcot, parma violet colour; Iris, crimson-purple; La Madhi, dark violet; Mrs. E. H. Jenkins, white; Sheriff Ivory, salmon; Sylphide, white; Etna, crimson-scarlet.

Pinks.—The good gardener, amateur or otherwise, will make full use of the pink, pure white fragrant flowers inseparable from the old English garden. We confess a strong love for the common white Pink, so indispensable in its pretty modest beauty and its incomparable sweetness. Every year as its flowering time comes round one greets it as one of the old treasures most to be loved and prized. Nothing makes a prettier edging to a walk, for even when the bloom is over its neat tufts of bluish foliage are charming; and it should not be forgotten that in winter the leafy tufts are at their best. This old favourite has been overshadowed by the larger-flowered Mrs. Sinkins, Albino, Mrs. Lakin, Her Majesty, and Snowflake. Mrs. Sinkins is the variety more largely planted, we think, than any other; its double white flowers are filled with perfume. Albino and Mrs. Lakin we appreciate also, and their flowers are less apt to split than those of the more bulky varieties. Every full Carnation or Pink flower generally splits its calyx. Pinks must not be planted in a soil likely to contain wire-worm, otherwise the tufts will disappear wholesale; but ordinary soil that is not wet or badly drained will suffice. The mauve-tinted *Souvenir de Sale* is very pretty, but splits rather badly; and one named *Ledham's Favourite* is more lasting than the others. *Gloriosa* is a large flowered, new variety with rose-coloured and fragrant blossoms. Besides the true garden Pinks a charming group is known as the "laced" kind, an appropriate name indicating that the colour is laced upon the pure white ground. When show Pinks were more fashionable than they are at the present day their merits depended in a large measure upon the purity and perfection of their lacing. Pinks are so quickly and easily propagated by cuttings or pipings that a few words will suffice to dismiss this subject. June is the month for the work. Cut them just under a joint, remove the required number

of leaves to ensure a clear stem for insertion in the soil, and dibble them in a shallow box of light soil, in well-drained pots, or in a cold frame. Put a hand-light over the cuttings if they are rooted in the open ground, and plant out in the autumn. Some growers layer them much in the same way as the Carnation is increased. Another simple way is, in the autumn when the clumps have become matted, to simply part them and replant the best portions (see illustrations). The best laced pinks are : Boiard, Clara, Emerald, Empress of India, Eurydice, Harry Hooper, Modesty, The Rector. The single pinks are very sweetly scented and prettily coloured ; they are easily raised from seed sown in a shallow box filled with light soil. Place it in a cold frame.

Poppies, Oriental.—During recent years considerable attention has been given to the beautiful large herbaceous or Oriental Poppies. These are noble plants for the border and are varieties of *Papaver orientale*. As they are very deep rooting, the soil for them must be deeply cultivated and well manured, and the plants must be given plenty of room to develop. For the front part of the herbaceous or mixed border they are excellent. When once planted they are best left undisturbed for several years. These Poppies may be increased by seeds sown in the open garden as soon as ripe, or by division of the old plants in autumn and spring. The type has large, scarlet flowers, but there are a number of varieties with beautiful salmon-pink blossoms, and others of varying shades of pink and rose. The following are all good : Jenny Mawson, soft pink ; Blush Queen, pale pink ; Princess Victoria Louise, salmon-rose ; Royal Scarlet ; Silver Queen, silver-pink.

Poppies, Iceland, are varieties of *Papaver nudicaule*, and very beautiful they are for rockwork, beds, or the front parts of the herbaceous border. Although perennials they are best treated as biennials ; *i.e.* the seed is sown outdoors about June and the plants thus raised flower the following year, from May till August. If possible sow the seed where the plants are to flower, as they do not transplant easily. Well-drained soil is essential for Iceland Poppies. They are ideal flowers for cutting, and there are many beautiful shades of colour among them. Seeds of separate or mixed colours can be purchased. Brick red, yellow, orange, pink, and white are the most popular shades. Height 18 inches to 2 feet.

Poppies, Shirley.—This fragile and prettily coloured annual race deserves a paragraph to itself. It will interest gardeners to know the origin of this dainty race. They were raised by the Rev. Mr. Wilks, Vicar of Shirley, near Croydon, and secretary of the Royal Horticultural Society—hence the name. Mr. Wilks says : “ My name may have become known throughout the world as secretary of the Royal Horticultural Society, but my Shirley Poppies are even more widely known, and that far more deservedly, for there is no country under the sun (except perhaps Patagonia and Thibet) to which I have not sent seeds gratuitously, and I am told that in the streets of Yokohama and of Rio, of Vancouver and of Melbourne, of Paris, Shanghai, and Berlin, of Cairo, Philadelphia, and Madrid, Shirley Poppies are freely advertised

Growths of Pinks from which cuttings or pipings can be made.

Divided portions of an old Pink, suitable for planting outdoors.

The divided portions planted in an open bed.

*THE PINK-FLOWERED ORIENTAL POPPY, JENNY
MAWSON.*

for sale. They arose in this way: In 1880 I noticed, in a waste corner of my garden abutting on the fields, a patch of the common Wild Field Poppy (*Papaver Rhœas*), one solitary flower of which had a very narrow edge of white. This one flower I marked, and saved the seed of it alone. Next year out of perhaps two hundred plants I had four or five on which all the flowers were edged. The best of these were marked and the seed saved, and so for several years, the flowers all the while getting a larger infusion of white to tone down the red until they arrived at quite pale pink, and one plant absolutely pure white. I then set myself to change the black central portions of the flowers from black to yellow or white, and having at last fixed a strain with petals varying in colour from the brightest scarlet to pure white, with all shades of pink between and all varieties of flakes and edged flowers also, but all having yellow or white stamens, anthers, and pollen, and a white base. . . . My ideal is to get a yellow *P. Rhœas*, and I have already obtained many distinct shades of salmon. The Shirley Poppies have thus been obtained simply by selection and elimination. By 'selection' I mean the saving seed only from selected flowers, and by 'elimination' the instant and total eradication of any plant that bears inferior flowers. . . . Let it be noticed that the Shirley Poppies (1) are single; (2) always have a white base, with (3) yellow or white stamens, anthers, or pollen; (4) never have the smallest particle of black about them. Double poppies and poppies with black centres may be greatly admired, but they are not Shirley Poppies. It is rather interesting to reflect that the gardens of the whole world—rich man's and poor man's alike—are to-day furnished with Poppies which are the direct descendants of one single capsule of seed raised in the garden of Shirley Vicarage so lately as August 1880. Poppy seed should be sown in the autumn or in the spring, sowing very thinly because the seed is small, and thinning out the seedlings to fully six inches apart. Fine flowers in abundance and over a long season can never be expected unless the seed is sown thinly, the seedlings well thinned out, and the dying flowers picked off to prevent seed forming and weakening the plant." Any good garden soil.

Primroses and Polyanthuses.—The Primrose in its many forms is a flower for all gardens. All the varieties are derived from the wild *Primula vulgaris* of grassy banks and copse. Raising seedlings is a very interesting pastime, and the seed germinates readily when sown in March or April in a cold frame, or even in the open ground, but when in a frame the seedlings are more under control. Miss Jekyll, in *Wood and Garden*, alludes to the beautiful bunch Primroses, which are such excellent garden plants, as follows: "The big yellow and white bunch Primroses are delightful room flowers, beautiful, and of sweetest scent. When full grown the flower-stalks are ten inches long and more. Among the seedlings there are always a certain number that are worthless. These are pounced upon as soon as they show their bloom, and cut up for greenery to go with the cut flowers, leaving the root-stalk with its middle foliage and cutting away the roots and any rough outside leaves." And at p. 216, in a charming description of the

"Primrose Garden" at Munstead, this useful type of garden flower is fully described. The Munstead Primroses "are, broadly speaking, white and yellow varieties of the strong bunch-flowered or Polyanthus kind, but they vary in detail so much, in form, colour, habit, arrangement, and size of eye and shape of edge, that one year thinking it might be useful to classify them I tried to do so, but gave it up after writing out the characters of sixty classes! Their possible variation seems endless. Every year among the seedlings there appear a number of charming flowers with some new development of size, or colour of flower, or beauty of foliage, and yet all within the narrow bounds of white and yellow Primroses. Their time of flowering is much later than that of the true or single-stalked Primrose. They come into bloom early in April, though a certain number of poorly developed flowers generally come much earlier, and they are at their best in the last two weeks of April and the first days of May. When the bloom wanes, and is nearly overtopped by the leaves, the time has come that I find best for dividing and re-planting. The plants then seem willing to divide, some about falling apart in one's hands, and the new roots may be seen just beginning to form at the base of the crown. The plants are at the same time relieved of the crowded mass of flower-stem, and, therefore, of the exhausting effort of forming seed, a severe drain on their strength. A certain number will not have made more than one strong crown, and a few single-crown plants have not flowered; these of course do not divide. . . ." Writing of the time of sowing the seed, the author says: "As nearly as I can make out, it is well in heavy soils to sow when ripe, and in light ones to wait until March. In some heavy soils Primroses stand for two years without division; whereas in light ones, such as mine, they take up the food within reach in a much shorter time, so that by the second year the plant has become a crowded mass of weak crowns that only throw up poor flowers, and are by then so much exhausted that they are not worth dividing afterwards. In my own case, having tried both ways, I find the March sown ones the best. The seed is sown in boxes in cold frames, and pricked out again into boxes when large enough to handle. The seedlings are planted out in June, when they seem to go on without any check whatever, and are just right for blooming next spring." These remarks by an authority upon the subject must be helpful to readers. The bunch-flowered Primroses are of many colours, soft and dainty tones, pure white, intense orange, and so forth. The Oxlip is generally supposed to be a natural hybrid between the Primrose and the Cowslip though there is some doubt about this. It is found wild in a few places, notably the Bardfield district of Essex.

The late Mr. Wilson of Weybridge raised a race of blue Primroses, not the blue of the Gentian, but a very beautiful series of colours, sometimes purple blue with crimson eye, and several of the varieties have been named, such as Oakwood Blue, all being well placed against moss-covered stones to bring out the distinctive flower colouring. A deep red or crimson is a good colour to obtain.

The double Primroses are not easy to manage. They are more suc-

POLYANTHUSES AND PRIMROSES BY THE WATERSIDE AT WISLEY.

THE DOUBLE WHITE SWEET ROCKET.

cessful in a moist climate, such as that of Ireland, than in drier positions. The old Pompadour, a perfectly double crimson flower, is delightful ; it is a quaint, old-fashioned Primrose, and happy is he who can get large tufts of it. Unfortunately it is not a success in the south. This variety, more than any other, requires a moist climate and cool soil. Double lilac, lavender, white, and yellow are very charming also.

Pyrethrums.—Among the many denizens of the herbaceous border, few, if any, are capable of giving such a wealth of graceful and beautiful coloured flowers for a small outlay of time and money as the Pyrethrums, yet they are not grown nearly so extensively as their many merits demand. In addition to being first-class subjects for garden decoration, they are splendid for cutting, their long stems and graceful forms rendering them exceedingly attractive when arranged in tall vases. The range of colours now obtainable in these plants is so large that all tastes may be satisfied and both double and single flowers of all colours may be procured.

As regards soil, the Pyrethrum is not at all particular, although, like most other plants, it delights in a deeply-worked, well-enriched rooting medium, and if this is of a rather cool nature so much the better. Where the soil is light and inclined to be sandy it may be rendered suitable by the liberal addition of cow manure, and if the plants are mulched during hot weather they will give good returns in soil of this description.

Planting may safely be done at any time during the winter until the end of February, providing the soil is not frozen or over-wet, and care should be taken to shake some fine soil well among the mass of fibrous roots, otherwise they will get matted together and not take to the new soil so well. In the border a good effect may be obtained by planting triangular groups composed of three plants of one variety, and where they are used for filling large beds, it is best to use only one or two sorts of the same colour.

During the growing season, and especially when the flowers are just beginning to push up from the base, in May, the plants are benefited by frequent waterings with weak liquid manure. Light twiggy stakes will be needed to support the flowers, and these should be so placed that the plant retains its natural and graceful outline. Immediately the flowers have become shabby they should be cut down quite close to the ground, a mulching of well-decayed manure placed round the plants and the waterings with liquid manure continued. If this is done a second crop of most welcome flowers will be produced in the autumn. Propagation is easily effected by dividing the old clumps when they are lifted for replanting in the winter months.

The following are all excellent varieties which may be thoroughly relied upon : Doubles—Aphrodite, pure white ; Carl Vogt, white, early ; Empress Queen, blush ; Ivonne Cayeux, primrose yellow ; King Oscar, crimson-scarlet, and Lord Rosebery, carmine-scarlet ; Singles—Langport Scarlet, rich cardinal scarlet, new ; Cassiope, crimson-purple ; Dorothy, flesh colour ; Edna May, clear pink, and James Kelway, crimson-scarlet.

Rockets, Sweet or Double.—These are delightful, old-world

flowers, filled with fragrance. A famous grower of them in Ireland, the Rev. Denis Knox of Virginian Rectory, says, in *The Garden*: "I at present possess in quantity six varieties: the French white; the Scotch, or Eglinton, as it is often called (this kind has, I may say, always a quaint trace of lilac at the top of its spike); the true old pure double white; the pale lilac, the most vigorous grower of all; the true old lilac, now nearly extinct (I was searching for it for thirty years, and at last discovered it, to my great joy, in an old garden in Westmeath); and the lower-growing, shorter-spiked purple. This, I recollect, used to be called Parkes' Rocket. . . . I have had (in a place I lived at thirty years ago) the old pure white and the old lilac twenty-four inches in spike. Here I have never gone beyond nineteen inches. Many people make the mistake of allowing the side shoots to remain on. This gives the plant rather a weedy appearance, and, of course, takes from the length and majesty of the main spike. Double Rockets are essentially plants for rich, deep, moist soils. They are plants that cannot be left alone, or left long in the same soil. Every third year, at least, they should be taken up and divided, placed in new soil, with which plenty of well-rotted cow manure and some lime rubbish have been incorporated. They strike very freely from cuttings put down as soon as they begin to push in the spring, but they divide so satisfactorily that now that I have plenty of them I do not go to the trouble of making cuttings. They have an enemy in the shape of a nasty white grub, which attacks them and eats out the blossom-spikes when they are about nine inches or so high. It must be searched for and destroyed. The curling of the leaves infallibly shows its presence. It would be, indeed, a pity were such delightful flowers as double Rockets to pass out of existence."

Solomon's Seal.—This graceful plant is always welcome. It delights in partly shaded garden borders, in nooks amongst shrubs, and the edges of woodland. It may be grouped with the poet's Daffodil and such wood-loving plants as Lily of the Valley. Solomon's Seal has a habit of growth and a kind of beauty that are entirely its own. The stem rises nearly upright and then bends over in a flattened arch that admirably displays the clusters of greenish-white bell-flowers that spring from the axils of the leaves. It is quite one of the best plants to put in shady corners. Any ordinary soil. May flowering.

Stocks.—Stocks are amongst the most popular of flowers, and no wonder, when their beautiful colour and delicious fragrance are remembered. Moreover, they are of easy culture, so that amateurs can grow them to perfection. Planted in beds, such choice colours as scarlet, white, rose, and purple, are very telling, and borders, composed of half a dozen or more distinct colours, are also charming, and last in full beauty for a long period.

The *Ten-Week Stock* is the most popular, and is quite easy to grow. The seed may be sown at any time from February to May, March being the best month. Sow in shallow boxes or pans, in a compost of light loamy soil, leaf-mould, and silver sand, covering the seed lightly, and making the surface firm and level. Sprinkle with water from a fine

rosed can, and stand the boxes or pans in a warm moist house or frame. A temperature of 55 degrees is suitable. When the seedlings appear admit air liberally but cautiously, and water them carefully, as if kept too wet they will damp off. When the young plants can be handled, prick them out into other boxes and place them in a sunny frame, shading them from bright sunshine, giving them as much air as the state of the weather will allow, and keeping the soil comfortably moist. Thus treated they will grow quickly and strongly, and will be ready for planting out in open beds or borders early in May.

Stocks require good rich soil, which should be made firm by treading, and the seedlings should be planted nine inches apart, and the soil pressed firmly round the roots. In planting amateurs often err in selecting only the tallest and strongest plants, and discarding the dwarfer ones. The latter generally have the most fibrous roots, and as a rule produce a far greater percentage of double flowers than the former. After planting, mulch between them with very short stable litter or old mushroom bed manure, and well soak the ground with water. The mulching will keep the roots cool and moist in hot dry weather, and this is of the greatest importance. When in active growth water them, say, once in ten days with weak manure water, or sprinkle a little artificial manure on the surface and water it in. For a late autumn flowering batch seed may be sown in a warm frame in the middle of April. Sow the seed thinly, thin out the young plants freely, and encourage a rapid and vigorous growth by a liberal supply of moisture both at the roots and in the atmosphere. There is now a new race of Stocks known as Intermediate, being in habit and appearance midway between the Brompton and Ten-Week Stocks. The treatment is as advised for Ten-Week varieties. They branch freely and flower over a long period.

East Lothian Stocks are very beautiful, and perhaps the most fragrant of all. They require rich soil and good cultivation, but are extremely hardy. Seed for the earliest batch of plants should be sown in May under a hand-light or in a frame in a shaded portion. Sow very thinly, and thin the young plants out to two inches apart when large enough. Keep them well-watered and aired, and when the second pair of rough leaves are formed pot them into small pots in good loamy soil, a little well-rotted manure, and some coarse sand. Stand them on ashes in a sunny, open position, removing them to a cold pit or frame in November, and exposing them fully in fine weather. Protect from severe frost with mats, and keep the soil in the pots on the dry side during winter. Assist with weak liquid manure-water in spring and plant them out in a bed or border in deeply-dug, well-enriched soil at the beginning of April. Mulch and keep the roots moist and they will grow into dense plants, and present a gorgeous appearance throughout June, July, and August. A portion of the plants may be potted into 4½ or 6-inch pots and allowed to bloom there. If kept in a quite cool temperature they will flower profusely and make a brave show in the greenhouse or conservatory in May and June. Seed may also be sown in gentle heat in March or April, and the plants treated as advised for the Ten-Week

Stock. The colours of the flowers are crimson, scarlet, white, and purple.

Giant or Brompton Stocks have the finest spikes of bloom, often from fifteen to eighteen inches in length, and very massive; the plants being quite hardy may be grown by those who do not possess a frame. Sow the seed in fine soil in a cool sheltered place out of doors early in June, prick out the young plants when large enough, and plant them in their final quarters in August. They must have a sheltered nook or corner, and be planted in loamy soil that contains some old mortar. Give them plenty of room, and if the winter is not exceptionally severe they will make a brave show in May.

Sunflowers.—The Sunflower is as familiar in the garden as the crimson Pæony or clove Carnation. A child can grow a Sunflower, because it only wants soil of some kind and sunshine. There are two distinct groups, annual and perennial. The annual Sunflower is *Helianthus annuus*, of which there are many forms, some with huge double flowers, others of the same dimensions but single, and a few quite dwarf in comparison, the bright apple-green leaved, yellow-flowered *H. cucumerifolius* being an example. But one of the prettiest of all annual Sunflowers is called Primrose or Primrose Dame; the flower is not large or very coarse, and the plant is not more than three, or in strong soils three and a half feet high, its colour is clear primrose yellow, set off with an almost black centre. A new variety with a crimson-brown centre has recently been introduced, and is very effective in the garden.

For the quite small garden and larger places to form free graceful groups of colour in the autumn the perennial Sunflowers are of most value, and several varieties have been raised of recent years. This group is conspicuous for its graceful growth, tall willowly stems and yellow flowers; and they are so robust that the roots run here and there and everywhere, leaving one spot when the soil is exhausted to find fresh pasture. Some are more aggressive than others, the variety raised by the late Mr. H. G. Moon, and named after him, not having this characteristic so pronounced as many others. The common kind is *H. multiflorus*, which has long remained a good border flower; and its variety *fl. pleno*, which has quite double yellow flowers, is as well known. These are not so tall or willowly as *H. decapetalus*, which will reach a height of about six feet; *H. giganteus*, *H. latiflorus*, *H. orgyalis*, a very graceful and beautiful flower, and *H. rigidus* Miss Mellish. The last-named is about six feet high, very strong, leafy, and with large flowers. A group of this upon the lawn is very handsome in the autumn. We have seen the perennial Sunflowers made excellent use of for planting in ugly corners, and where more delicate perennials would fail. The plants are easily increased by division of the roots in spring, when new growth is beginning.

Sweet Williams.—These showy hardy biennials are of the easiest possible culture. They are well suited for shrubby borders, masses in beds, the herbaceous borders and, in fact, almost anywhere that the soil is reasonably good. For most amateurs a good mixed strain is best

if purchased from a reliable seedsman ; but for those who desire distinct shades, Pink Beauty (which has delicate pink flowers), Scarlet Beauty, and Dark Crimson are recommended. There is also the Auricula-eyed in variety, which possess rich colours, with a white eye and margin. The seeds should be sown in May either in the open ground, pans, or boxes. Thoroughly drained soil is essential, as the plants are liable to suffer in wet ground during the winter.

Verbenas.—Flower lovers rejoice in a revival of the Verbena, one of those good plants almost annihilated by fungoid disease, the result of weakened growth through over-propagation, or propagation in forcing temperature to insure quick rooting of the cuttings. Of course the Verbena is not a hardy plant, but it is much too good a flower to be allowed to pass into disuse. Some of the old self-coloured varieties are still to be had ; and those with a scarcely defined eye, or very small white eye, are much to be preferred to those of more recent raising with large white centres. The large white eye spoils the plants in the mass—and the Verbena is essentially for massing—giving them a chopped-up look that certainly detracts from their beauty. The danger with the garden varieties is that of getting them too large and coarse. What is wanted is strong constitution and short growth. Seed can be obtained in mixed or in distinct colours—that is, a packet of a certain colour will produce it in the seedling. Always choose as mentioned good selfs, pure clear shades, nothing “spotty” or crude. Seedlings are unquestionably stronger than cuttings. Sow the seed in March thinly in shallow pans, well drained and filled with sandy soil. It is well where seeds are few to make shallow holes equally all over the surface of the soil with the point of a finger and to put the seed into each, as the plants later on get plenty of space. They become quite strong before it is needful to dibble them off into other pans, or shallow boxes, or singly into small pots before planting out in May. A temperature of about 60 degrees is necessary for raising the seed. Of course, in the case of named varieties, it is necessary to raise them from cuttings, and a variety called Miss Willmott, with large rose-pink flowers, must be treated in this way. Warley, also raised by Miss Willmott, is a brilliant scarlet, and very free-flowering. Cuttings of Verbenas should be put in a cold frame in August, or even a bell-glass will suffice. Select young, strong, healthy shoots without flower buds. One may use either a shallow pan or a pot for the cuttings. Put them two inches apart in almost pure sand, and keep them near the glass in a temperature of 45 degrees. Under these conditions and very careful watering, there should be little damping off. Cuttings in a temperature of 60 degrees strike easily in spring.

THE MIXED BORDER

IN the gardens of to-day the mixed border is not forgotten. In it are plants that remain beautiful for a longer period than beds filled with summer-flowering plants, bright for a few short weeks. Moreover, the possession of a beautiful mixed border is not exclusively confined to the wealthy, for the humblest amateur or cottager may produce the most delightful pictures without the aid of a single pane of glass in the rearing or winter-protection of his favourites, whereas in the culture of bedding-plants glass shelter is essential during the winter and spring. Where the larger herbaceous subjects are under-planted with bulbs, clumps of Snowdrops poise their white, drooping flowers above the bare earth in the earliest days of February, followed by the golden Crocuses and blue Glory of the Snow (*Chionodoxa*), spring Snowflakes and Daffodils, yellow and white. As the season advances the border gains in beauty day by day, and loses but little of its attractions in the autumn months, when the perennial Sunflowers, Michaelmas Daisies, Dahlias, Sternbergias, Autumn Crocuses (*Colchium*), and other late-blooming flowers make breadths of colour, followed later by the winter-blooming Algerian Iris (*I. stylosa*) and the Christmas Rose. As regards the dimensions of the mixed border, it must be impressed upon the amateur that want of space should not deter him or her from proceeding with its formation, for even in a plot ten feet by two feet it is quite possible to provide a pretty show of colour and form. Where space is no object, a border twelve feet or fourteen feet in breadth by one hundred yards in length may well be arranged for; but, whether large or small, its formation should be proceeded upon with equal care. There is, unfortunately, a very general impression amongst amateurs that hardy plants, of which the mixed border should mainly consist, can grow anywhere, and are indifferent to such matters as soil, situation, and ordinary attention. This, however, is far from being the case, and where, under this belief, they are planted in shallow, hungry soil, in dense shade, in exposed, wind-

A MIXED BORDER BESIDE A SUNK LAWN.

*A BORDER OF SIMPLE MIXED FLOWERS IN AN OLD
COUNTRY GARDEN.*

swept positions, or are left with their wants unprovided for, failure is certain to ensue. The aim of the true lover of the garden should be the attainment of the fullest perfection of vigorous health in each plant grown, and for this reason the border should be well made and thoughtfully planted.

Soil.—In order to secure the best results the soil must be deep, rich, and well-drained. In shallow soil the roots of the plants are parched in hot summers, in poor soil stunted growth proclaims lack of vigour, and where stagnant moisture lies about the roots in the winter those plants that do not perish lose vitality. To construct a mixed border close to a hedge is courting disaster, for the hungry roots of the Laurel, Privet, Yew, or Thorn, of which it is composed, soon appropriate with their all-pervading fibres the sustenance provided for the herbaceous plants, and thus effectually prevent them from attaining their rightful proportions. The most suitable soil for the border is sound, fibrous loam; but this is, in some localities, difficult to obtain, in which case the best must be made of what is nearer at hand. Both heavy and light soil can be so modified by additions as to render each capable of growing well the bulk of the plants required for the mixed border. Thus heavy soil may be lightened by a liberal addition of road-grit, old mortar-rubbish, burnt earth, wood ashes, and coarse sand, which will tend to render it porous, while light soil can be given greater sustaining qualities by an admixture of leaf-mould, decayed vegetable refuse, well-pulverised clay, and a small proportion of peat. The border cannot well be too deep. Three feet is none too deep for many of the stronger-growing herbaceous plants, which send their roots downwards to a great distance. At all events, a depth of two feet should, if possible, be secured. The early autumn is the best time for making the mixed border, as it is then ready for the reception of the plants during October or November. After seeing that adequate drainage is provided where the soil at the bottom of the bed is of a retentive nature, the border should be filled in with the prepared soil, the lower half being plentifully dressed with fresh manure, farm-yard manure being used in light soils and stable manure in heavy. The upper half of the border should also be given a liberal addition of manure but this, with which the roots will first come into contact, should be well-rotted and not fresh as advocated for the lower half. With herbaceous plants a good start is more than half the battle, and when placed in such a border they will grow vigorously from the first and attain their

fullest development, a result that is not to be anticipated where they are planted in borders not richly stored with food. During the winter a mulch or covering of some light material that is not liable to become sodden or "cake," will help to keep the warmth in the soil about the roots, while a mulch of light manure in the spring, when the root fibres are stirring, will provide them with nourishment when the manurial agents are washed into the ground by heavy rains and tend to keep them cool, and the ground from cracking during the summer heat. A slight sprinkling of earth over the mulch prevents it from being unsightly.

Planting the Border.—Care should be taken that the roots are well spread out and covered with fine soil. This is too often neglected and the plants hurriedly pushed into holes in the ground with their roots in a tangled ball, this naturally retarding the start into growth in the spring, and giving the thoughtfully planted example an advantage which it generally retains during the whole of the first season. After planting, the soil should be made firm round the roots, and during the first winter should hard frosts occur, as these often loosen the soil. If this is overlooked the roots frequently suffer from subsequent severe weather. Mixed borders should not be planted in lines and patterns, but the plants arranged in informal groups varying in size and shape. When treated in this manner the breadths of colour give the border the natural effect that should be aimed at. Tall subjects should as a rule be placed at the back, and those of lowliest growth in the front, but it is well, here and there, to allow a group of taller plants to occupy a forward position among their dwarfer companions since this adds to the charm and informality of the border. Single plants should never be dotted about promiscuously, as is too often the case, as this results in a spotty medley of hues. The question of colour is one that should be considered at planting-time, care being taken to associate only such plants as are harmonious in their tints. Scarlet should be kept away from rose-purple, but scarlet and crimson blend well with orange and yellow, while purple and blue merge into pale lavender and white. Plants that flower early in the summer, such as the Oriental Poppy and the Lyre Flower (*Dielytra spectabilis*), and afterwards become unsightly, should be planted behind later-growing subjects, such as Michaelmas Daisies, Galegas, &c., which soon hide the fading leaves with their vigorous shoots.

Arrangement of Colour and Choice of Plants.—It is not

an easy matter to keep a mixed border well-furnished throughout most months of the year, and to avoid unsightly gaps, but there are always ways of doing it, and even beginners should not be afraid of facing this fact, and of thinking out ways or contriving methods so as to have as few empty places as may be. There are some common-sense considerations that will be a guide to the choice of plants to use. The first and most obvious is that the plant must be in itself handsome and somewhat showy. The next and one of the most important, is that it should remain a good while in flower. Plants that are in flower a few days only and then are done are of little use in the mixed border, unless their foliage is unusually handsome and persistent, in which case this is so valuable a quality that it may redeem the plant.

The choice of kinds being decided on, the way in which they are arranged then becomes the matter of chief importance. It seems a natural arrangement to use the creeping and short-growing plants in front, and the next in stature behind them, and the tall ones at the back. This is obviously a good general rule, but if not varied with judicious exceptions the result will be very monotonous. Now and then some of the tall backward groups should break forward. Think of the way in which the lateral spurs of a mountain chain descend into the valley or plain. They all do come down to the level, but in how varied and beautiful a way. Think of this and then think of the dull and ugly slope of a slate roof, and then think of your border and apply the lesson.

Then try and get hold of some definite scheme of colouring in order to get richness and brilliancy with dignity. It saves much trouble and puzzling at planting-time to have a regular scheme of simple progression of colour from end to end, so that if you have a yellow-flowered thing to plant you put it in the yellow place and so on. In no way can you get so much real power of colour, by which is meant strength, richness, and brilliancy, as by beginning very quietly at the ends of the borders with cool bluish foliage and flowers of tender colouring, white, pale blue, and palest sulphur yellow, and even with these palest pink, beginning quite *piano*, then feeling the way to full, and from that to stronger yellows; then by a gradual *crescendo* to rich orange, and from that to the *forte* and *fortissimo* of scarlets and strong blood-crimsons, and then again descending in the scale of strength to the pale and tender colouring.

In other parts of the garden you may have incidents of brilliant contrast, which are especially desirable in the case

of strong blue flowers, but in the mixed border the way of having the rich and brilliant harmony approached by more delicate colouring can scarcely be improved upon, and so only can the vice of garish vulgarity be avoided.

Plants of the same colouring are intergrouped so that the red group, whether early or late, is always a red group, and so on throughout. There are ways of filling gaps by training plants down to fill the spaces. For this use Everlasting Peas, tall perennial Sunflowers, and Rudbeckias and Dahlias are specially accommodating.

For filling gaps caused by the dying off of spring flowering bulbs there is nothing better than half-hardy or hardy annuals. These may either be sown or planted in colonies between the bulbs, before the foliage of the latter has died down, and will quickly make a good display. Larkspurs, Mignonette, Night-scented Stock, Candytuft, Alyssum, Nigella, Stocks, and China Asters are a few specially adapted for the purpose.

The accompanying plan of a herbaceous border will act as a guide to the beginner in varying plants for effect. The general idea of the arrangement is to group three, five, or seven plants together, and this could be carried out with modifications on a smaller or larger scale.

Nothing is so destructive of good effect in the mixed border as the old unthinking mixed up way. Plants of the same kind, instead of being dotted at equal intervals, should be grouped together, each group dying away into one neighbouring group, or if there is only one plant of a kind there is no harm in its being one alone if only it is in its right place.

Of course there are other ways of arranging the details of a mixed border, and many devices that may be used to enhance its effect at the different seasons, but these suggestions will be a good basis of operation to any one who is without experience and desires general instruction.

A MIXED BORDER IN A SMALL GARDEN (See preceding Page).

RE-PLANTING OR RENOVATING BORDERS

WHERE it is at all possible the whole of a herbaceous or mixed border should be deeply dug or trenched once in three years. This is best done during November. All the plants, with the exception of such kinds as Oriental Poppies, Delphiniums, Paeonies, and Irises, should be lifted and laid on one side whilst the work is being done. Put plenty of well-rolled manure in the lower spit when trenching. In replanting divide all large clumps and select the strong, outside portions of such plants as Phloxes, Michaelmas Daisies, and perennial Sunflowers, as these will give much better results than large clumps.

There are times when it is not convenient to replant herbaceous borders, and when this is so, renovation should take place and stimulating food be provided for the occupants. Such free-growing subjects as Michaelmas Daisies, Polygonums, Bocconias, Helianthus, Chrysanthemum maximum and herbaceous Phloxes are soil-exhausting, and quickly become weak if not fed. When a border is replanted, the weakening of the centre of each clump is avoided; but where replanting the whole is not convenient, then renovation must be resorted to. To do justice to the plants, so that the border, as a whole, does not suffer, some of the weaker plants should be replanted. Choose a few vigorous root growths from the outer portions of each. Before replanting, remove the soil 1 foot deep and as wide, assuming, of course, that the same subject is to occupy the same site; but if not, there will be no occasion to remove the soil. Replace the old soil with fresh. If not convenient to bring in quite new soil to the border, take some from the surface close by, replacing it with that removed from the site, adding a fourth part of manure in a decayed state. The whole of the border should be forked over between the clumps—quite lightly, of course, near the plants, so as to avoid disturbing the roots too much. Where space exists between the plants,

dig the soil over deeply. As the work proceeds, bury a quantity of half-decayed stable manure near such plants as those already mentioned, as they are voracious feeders, and unless constant stimulants are applied, the growth becomes weak, and, naturally, a poor flower crop is the result. When the digging of the border is completed, a mulching, 2 inches thick, of a compost made up of decayed vegetable refuse, old potting soil, leaf-mould, wood-ashes, and road-sweepings should be given. Such a covering not only imparts new life to the plants, but serves as a mulch during the early summer months, when a period of drought is often experienced.

One great fault made in the cultivation of herbaceous plants is that of allowing each specimen to grow to an unwieldy size. It is not an uncommon sight to see Michaelmas Daisies, Pyrethrums, *Chrysanthemum maximum*, and *Heleniums* fully a yard across at the base, with stems half the strength they should be. Supporting the stems of such clumps as these is a difficult matter.

Staking Border Plants.—One of the first things that the beginner who attempts the culture of perennial herbaceous plants learns is that they need some artificial support to prevent their shoots being blown about and badly damaged by wind, a condition that quickly results where the wind is accompanied by heavy rains. Having ascertained this, the novice usually looks about for ways and means of providing this support, and the natural and most simple way out of the trouble is to push a large stake into the centre of the group, and then tightly tie all the growths to it as shown in the illustration. By the end of the season, however, the grower will not feel at all satisfied with the result of his labours—that is if he is imbued with the true gardening spirit. He will find that the leaves that were thus crowded up in the centre of the clump are all dead and decayed, and what flowers are produced will be of a very inferior character.

Apart from this, there is the appearance of the plant to consider. The plant treated in the barbarous manner shown in the illustration is one of the Golden Rods, a spreading, free-growing specimen capable of developing into a mass of gold in the autumn. Instead of tying it up as shown in the first illustration, the beginner should deal with it as shown in the second, which represents the same plant properly staked and tied. It will be noticed that each shoot stands out well by itself and that the stakes used are scarcely visible, one being placed at the inner side of each shoot,

The wrong way to stake and tie a plant. Note how ugly it looks compared with the next illustration.

The right way to stake and tie a plant. In addition to having a better and more natural appearance the shoots have room to develop properly.

THE
CORN
PLANT

THE
GARDEN
STAKE

A MIXED BORDER WITH PLANTS PROPERLY STAKED.

RE-PLANTING OR RENOVATING BORDERS 43

which is in turn securely but not too tightly tied to it with soft garden twine, Raffiatape or raffia. Treated in this way, each shoot has an opportunity of developing a fine head of flowers and retaining all its foliage in a healthy green state. Very little more time was taken in staking and tying the plant as shown on the right than was required to do it in the manner shown on the left, and a comparison of the two should firmly convince every beginner in gardening that the former is better in every respect.

HARDY FLOWERS FROM SEED

FEW pastimes are more interesting than that of raising plants from seed. When a plant is purchased, and the colour of its flower is known, we are exactly acquainted with what to expect, but in raising from seed this is not always so. There is joy in anticipation. Amongst the seedlings may occur a jewel brighter than anything already in gardens. Such prizes occur more amongst some races than others; Carnations, as an example, occasionally giving a prize amidst, of course, many blanks. Even when the flower raised is not likely to startle the world, there is satisfaction in knowing that this good garden plant was "one of my own raising"; it has an especial merit in the raiser's eyes, and prompts him to further endeavours.

In offering a few simple remarks on raising of seedlings, a few groups of the more popular kinds may well serve as general examples. It must be clearly understood that the chances of a seed growing after it is placed in the soil depend upon its vitality. That is to say, a life-long experience in gardening or the raising of seedlings avails nothing if the seed is devoid of the germinating power—viz. the power to reproduce itself.

Some of the most popular plants raised from seeds are Carnations, Auriculas, Polyanthuses, Primroses, Anemones, Ranunculus, and so forth.

Soil is undoubtedly the most important consideration. Where possible there will be a desire to go to the nearest florist to obtain soil of the right sort, but in many cases this is impossible, and the common soil of the garden must be used. Take some of this, pass it through the ordinary cinder sifter, mix with it some finely sifted ashes when no sand is available, and put it for a week in a large box, or other dry and convenient place. If the soil be moist and sticky, it must be fairly dry before it is fit for use, and this is accomplished by spreading it out thinly to allow the moisture to evaporate, or by adding some dry sand. The orthodox compost for sowing fine seeds should consist of

loam, leaf-mould, and sand, the last two being intended to enrich the soil, and render it more or less pervious to moisture. Such a mixture is not always obtainable, though many seedsmen now sell potting soil in sacks for every purpose. Having got the soil into a proper condition of dryness, the next point will be to prepare the boxes or pots for

Sowing the Seeds.—Boxes of a suitable size are easily obtained, those of the chocolate and sweetmeat class being especially suitable. The best class of box is one five or six inches deep, *not more*, and about eight inches or so long. In the bottom make a few holes the size of a halfpenny, or cut out a narrow strip at each side to allow the water to escape. This done, place some rough material, such as small broken coke or cinders, in the bottom to fully an inch deep, and place two or three inches of soil on this. Gently press it down to make it firm and quite level at the same time. Scatter a little sand over the soil before setting the seeds. All is quite ready for sowing the seeds, which should be turned out of the packet on to a sheet of ordinary notepaper, or any sheet of paper that can be folded in half. The seeds run into this fold in the paper, and one may regulate the sowing—an important point. If sown from the seedsman's packet, it is just possible that fifty seeds will drop down in one place, and none in another, and the result will be a fight for existence when the seedlings appear above the soil. Carnation seed is large, and may even be regulated with the fingers if it falls too thickly, but many other seeds cannot be treated in this way. Take time and care in scattering the seeds quite evenly and thinly over the surface, and finally with a little fine and quite sandy soil cover them not more than a quarter of an inch deep. Seeds of *Polyanthus*, *Primroses*, and *Auriculas* do not want quite so much soil to cover them, and a little soil dredged over them, so to speak, will suffice. The covering soil should be carefully sprinkled on so as not to disturb the seeds, and when all is completed will be slightly lower than the top of the box. By placing a sheet of glass over the box the safety of the seed is insured. Give water only through a small fine rose watering-can. Almost all the smaller seeds may be raised in boxes, and in a sunny window where no frame is at hand, but a frame is better. One gentle watering from a fine rose can will suffice for some days after sowing, and if the glass sheet be covered with a piece of sack or old carpet, the growths of seedlings will be promoted. When the seedlings appear through the soil tilt

the glass sheet about a quarter of an inch on the one side to admit air, and discontinue the covering. The larger seeds, as Hollyhocks and Lupins, may all be sown in the open garden.

Raising seedlings of hardy flowers is one of the most interesting of all operations in a small garden. Even a cold frame will suffice for them, simply putting on a "light" when the seed is sown, watching for slugs and woodlice when the seedlings show themselves, and when sufficiently large transferring to a prepared piece of ground in the open. We have known delightful groups of Primroses, Polyanthuses, and Auriculas raised in this way. The beginner in gardening who is keen upon raising new flowers with the simple contrivances at his disposal should choose the three charming flowers named, and many beautiful strains, as the florists call a race of unnamed seedlings, may result. There must be system in the work. In the first place purchase the finest seed in the market. Think nothing of the price. The most expensive seed brings the greatest treasures in the shape of finer flowers for colour and form, and also plants of good habit of growth. When there are no prizes the flowers, with few exceptions, are sufficiently distinct and true in colour to use freely in beds and borders. When seed raising is seriously undertaken with a view to improving an existing race, the seedlings, when large enough to remove, must be planted in a bed by themselves, the individual tufts being far enough apart to develop. The object of this is to remove poor kinds so as to preserve the beauty of the whole race. A muddled, speckled Primrose in the midst of others of clear, telling colours has no right there; its presence will probably, through the agency of birds, bees, or insects, spoil the others by its pollen mixing with that of the other flowers. With a bed of seedlings in front of one, destroy all tints which fail to please, and remember that it is important to know that the attributes of a good garden Primrose, bunch-flowered or otherwise, Polyanthus, or Auricula, is a pure self-coloured flower of good shape, held on a strong stem, and free in every way both in bloom and growth. In this way the glorious Munstead Primroses were created by Miss Jekyll, and rich orange, pure white, yellow, and other shades secured, and not only so, but in large heads supported upon strong stems, to produce an effect of colour when massed in the garden.

Hardy Perennials from Seeds.—Judged by the frequent inquiries which come to hand, there would appear to be

to-day a far greater desire than formerly to raise the best hardy perennials from seeds. At no time in the history of hardy plant gardening have seedsmen in general paid so much attention to this particular branch, and not only are the best-known seed-houses affording increased facilities to purchasers, but new sources of supply are opening up on every hand. This is but the natural outcome of an increased demand, the amateur having realised somewhat of the wealth of beauty and variety such gardening affords. Hence the raising of perennial plants from seeds is calculated to be far more popular in the future than it has been in the past, and where permanent beds or groups are the object in view, nothing can surpass the system we have in mind. A single plant of this or that may cost sixpence, or even twice that sum, while a packet of seeds, even if of equal cost, which is only rarely the case, may yield two or even three dozen plants. Let us take, for example, so useful a subject as the long-spurred hybrid Columbines. No flowering perennial has a more elegant or distinctive grace, we see at once the value of dozens of plants in beds or borders, a value which is only equalled by the utility of the flowers in the decoration of the home or their importance in the exhibition arena. Moreover, the plant so raised, if grown in well-cultivated soil, will give of its best for years—a “best” whose productiveness is increased in proportion to the care and intelligence bestowed in its cultivation.

In like manner the *Gaillardia*, *Hollyhock*, *Larkspur*, and *Coreopsis*, among many others, are each amenable to similar treatment, and alike valuable from the decorative point of view. What is most necessary to impress upon the amateur or beginner in gardening who undertakes such work is the need of starting in season and in reason, and of possessing his soul in patience until such time as a first flowering is secured. That energetic individual should remember, too, that a plant of perennial duration does not often attain to the flowering stage in the first year, and that, should a flowering ensue, it should not be regarded as characteristic of the flower or representative of the group to which it belongs. It is quite true, however, that seeds of the perennial *Larkspur*, among others, may be sown in gentle warmth in January and February, and pushed along with all speed and planted out in May in deeply and richly cultivated soils to give a flowering during the late summer or early autumn ensuing. The fact is interesting rather as the result of intensive cultivation, though it is not general or reliable in all seasons or localities alike.

At the most, then, such flowering in a perennial should be regarded as precocious, the seedling being none other than the child of the parent plant. There is, however, a distinctive gain to the plant thus early set in its permanent home, for by the ample scope afforded for development it will have garnered to itself a strength of crown and rootstock immeasurably superior to that of the seedling which has been permitted to dawdle away its earliest days or weeks minus the attention so requisite to its needs. The moral, therefore, will be obvious to all.

In conjunction with early sowing there must of necessity follow timely transplanting, and if in due season the plant be got into its permanent abode, the cultivator will at least have the satisfaction of knowing that he has played his part. Such work, indeed, is fundamental, an essential that cannot be ignored with impunity. The most successful cultivators or exhibitors of this or any other time are the greatest sticklers for cultural details, and apart from their mastery of these, they adopt the inexorable rule of never putting off till to-morrow work that should have been done to-day. Naturally, the amateur will say, "How impossible for me to emulate this clockwork precision and regularity!" and this, indeed, may be true. At the same time, it might conceivably be his ambition, a goal he is ever endeavouring to reach. This and the ever-present knowledge of the importance of doing the right thing at the right moment will, if he be a true flower-lover, spur him on to further effort in the direction indicated.

To say that seeds of all perennials should be thinly sown and, so far as under-glass cultivation is concerned, lightly covered, is but to repeat what has been said hundreds of times before. Seeds of the Larkspur, for example, are large enough to admit of handling singly, and where this is not the case, a thin distribution of them is very important. Light-weight seeds, as Statice, certain species of Anemone and Gaillardia, may be covered more deeply than seeds of the weight and character of the Columbines or Lychnises, while seeds of the largest size, as Pæony, perennial Pea, Iris, or others like Phlox, Christmas Rose, Adonis, or Hepatica, which remain for a couple of years without signs of vegetating, may be covered fully half an inch deep, and will be further benefited by a protective board or slate covering meanwhile, in order to stay evaporation and prevent the undue souring of the soil.

On the other hand, seeds of a minute character will require but little, if any, soil covering, and these are they that test

the skill of the seedling-raiser most of all. For all such the most careful watering is necessary; better, indeed, that watering as usually understood be dispensed with and that the seed-pot be partly immersed in water for a few minutes now and again in lieu. Not a few species and varieties of *Campanula* appear to dislike a deep soil covering, and the finest of sandy soils only should be used. Soils, too, for seed-sowing should be free of manure, and are best if baked or heated to an extent calculated to destroy all insect-life. Above all, the amateur should remember that there is no necessity to empty the entire contents of a packet of seeds in a single pot. Far better that a part be sown and the remainder reserved for sowing in the open ground in favourable weather in March.

The following are some of the more important groups easily raised from seeds: *Achillea*, *Aster*, *Anchusa*, *Anemone*, *Aquilegia*, *Aubrietia*, *Campanula*, *Chelone*, *Coreopsis*, *Coronilla*, *Delphinium*, *Dracocephalum*, *Echinops*, *Eryngium*, *Gaillardia*, *Galega*, *Geum*, *Heuchera*, *Iberis*, *Chrysanthemum leucanthemum*, *Monarda*, *Lupine*, *Lychnis*, *Polemonium*, *Scabiosa*, *Papaver*, *Primula*, *Pentstemon*, *Silene*, *Statice*, and *Zauschneria*.

ANNUAL FLOWERS

It is unwise to grow too many plants in the small garden, and especially of annuals, which are often unruly in growth, quickly tumbling over everything near to them, or covering many precious perennials with their trails of stems and leaves. There is wisdom in taking up a few groups and growing them thoroughly—*e.g.* the Poppies, Sweet Peas, and similar kinds, which are both charming in the garden and useful to gather for the house.

Amateurs who delight in colour may have a showy border or flower bed at trifling cost and with little delay. There are, broadly, only two classes of annuals, those known as “hardy” and “half-hardy.” The former may be sown in the open border straight from the purchased seed packets, whilst the others require sowing in some warmth, such as a frame or similar contrivance.

The soil requires first consideration. Well dig the beds or borders in autumn, putting in rather deeply plenty of well-decayed manure. If the garden soil is heavy, inclining to close clay, get a load of road sweepings or grit, and either dig this in with the manure or spread on the surface when digging is completed. Do not be afraid to dig deeply even when a little bad-coloured soil comes to the top, for this can always be treated and made better on the surface. Leave the surface quite rough, so that frost and air may play their part in the pulverising and refreshing of the soil. These are the reasons for undertaking this work in winter, and the soil below is in its turn being gradually enriched for the roots. If slugs abound give a good dressing of soot, and six weeks after a small dressing of lime may be of service. In March fork over the ground, break up all rough clods of soil that have not fallen to pieces by the action of the frost, and break down the surface rather finely for the reception of the seeds. Use the large four-tined fork for this work, breaking down, making fine, and raking all in one. Whilst performing this work avoid treading the soil as much as possible, particularly when of a heavy clay. On the other hand, very fine and sandy soils, or

those of light character, may be much benefited by making them firm, which is achieved by treading or by beating with the back of the fork. Very light and warm shallow soils, much drained by sand or gravel beds below, should receive a dressing of cow manure in preference to all others. This is especially recommended owing to its lasting and cooling qualities, cow manure in these cases being especially valuable.

Sowing the Seeds.—This is an important matter, and must be largely left to the amateur, who may perchance require lines, or circles, or diamonds, or many other designs to suit his own desires. But however the seeds are sown, one point must be emphasized, and that is the evil of overcrowding of the young seedling plants.

The following article on annual flowers is by Mr. James Hudson, V.M.H., head gardener at Acton House, Gunnersbury, where annual flowers are grown to perfection.

The Cultivation of Hardy Annuals.—Annuals, in a comprehensive sense, cannot be dealt with in the space of this article; therefore I propose to deal with hardy annuals, embracing such as can be sown outdoors or brought forward in only a cold frame. These types of annuals, it may be noted, but they are not often so alluded to, are lovers of a calcareous soil, thriving better in such than in a soil rich in humus. With a little consideration this may be noted, for most readers will have observed how well annuals thrive in many seaside resorts where lime is in evidence in the soil. In their native habitats this also applies in many instances. Annuals of this description will also grow freely and flower most profusely in somewhat limited borders. This, I think, all goes to prove that cultivators often err in providing too rich soil for their growth.

During the hot summer of 1911 I noted that annuals thrived remarkably well, and were quite in contrast to what many of them were in the previous two or three dripping seasons. There are exceptions to almost every rule, and as an instance I would quote that lovely climbing annual, *Mina lobata*, which in 1911 grew too freely and was not so effective as usual. A few annuals thrive well in quite moist situations, e.g., *Polygonum orientale*, the Persicaire of the French growers; this and a few more may be classed as semi-aquatics. Taken as a whole, it may be stated that hardy annuals revel in abundance of sunshine. My first acquaintance with the Cosmos, as a case in point, was upon the top of a low wall at Cadenobbia, on the banks of the Lake of Como. After seeing them there I grew some the following season, but I failed to

profit as much as I should have done, having been too generous as it pertained to the soil.

In the cultivation of nearly all hardy annuals that are sown where they are to remain, it is a common mistake, first, to sow too thickly, and afterwards to leave the seedling plants too close together. The result of this is an impoverished plant, and its life is consequently quite fugitive in character. As a case in point, we see mistakes made in many gardens where the popular *Matthiola bicornis*, the Night-scented Stock, is grown. Again, in the case of the now universally popular Sweet Pea, this is oftentimes sown much too thickly, and here, again, comes in another mistake, viz. the leaving of the seedpods to develop, which soon exhausts the plants. We should aim at securing as long a life as possible for all annuals, and if this important item of cultivation was borne in mind more often than it is, we should see a much finer display.

Hardy annuals should enter into the floral arrangements of our gardens more than they oftentimes do. This might be advantageously done where the amount of glass at command is all too limited. I well remember having seen the wisdom exercised in using these plants in a large public garden in the North of England on one occasion. I thought at the time that this was a good example of how to make the best of things at one's command. There is a disposition that prevails in some gardens of occupying too much space with bedding plants during the winter months, when the room would be much better utilised with decorative flowering plants, in pots and labour saved.

As a class of plants it cannot be said that hardy annuals are of difficult cultivation, if a due proportion of common-sense be exercised in their treatment. Most growers, I have no doubt, will have noted how well an adventitious seedling will thrive where it has had plenty of room to develop. How well these look, too! A casual plant of the *Nicotiana affinis* hybrids will at times thrust itself upon our notice and thrive well. We have now several annuals that serve a useful purpose as foliage plants. *Kochia tricophylla* is an instance of this. As regards this plant, it may be noted that a mistake is often made of sowing the seed and coddling the plants in pots afterwards until they are planted out. The Giant Hemp makes a fine display as a foliage plant for the backs of borders. From the standpoint of fragrance alone, hardy annuals occupy a prominent position, as in the case of the Mignonette, the Stock, the Sweet Alyssum, the Candytuft, the annual Datura, the Sweet Scabious and, of course, the Sweet Pea.

From among hardy annuals (or those that can be raised in cold frames) we draw a large number of our everlasting flowers, such as the *Rhodanthe*, the *Helichrysum*, the *Acroclinium*, and the annual forms of the *Statice*. Some of the prettiest of the ornamental grasses are also annuals; these are excellent to use with the everlasting flowers just noted. *Briza minima*, *B. maxima*, *Lagurus ovatus*, *Eragrostis elegans*, *Agrostis nebulosa*, and *A. pulchella* are all beautiful, and they also last well. Where a position can be allotted to hardy annuals alone, they make a most attractive feature, and well repay any extra trouble that may be given them. There is such a diversity in form, in habit, and in growth. We have climbing annuals, bush-like annuals, prostrate annuals, annuals for growing upon walls, and annuals that will thrive where scarcely any other plant will grow.

We have hardy annuals also that well repay for pot culture, and I have often been surprised that so little use is made of them in that special way. Nothing in the spring is more delightful than pots of *Nemophila insignis* with the growth completely hiding the pots and studded with its bright blue and white flowers. The *Mignonette* is grown more than the preceding, but its growth in private gardens is not so good as the trade growers produce for our markets. Its requirements are not, I think, so well understood as they should be. The *Viscaria* affords another instance of what may be accomplished in pots with hardy annuals, such as *V. cardinalis*, *V. elegans picta*, *V. oculata*, and *V. oculata cærulea*, yet these are rarely seen so grown. The distinct advantage of annuals in pots is that they may be cast upon the rubbish-heap when past their best.

Grouping Hardy Annuals for Colour Effect.—Very pleasing effects may be made with annuals alone, or in conjunction with other hardy plants, from the standpoint of colour simply. I have seen in two distinctly different gardens very beautiful effects made with varied shades of blue in one case, and that near to the sea; and in another with varied shades of pink and mauve, these latter being kept quite apart, although they might have been blended together. To enumerate what might be done in this way in full would take more space than can be afforded; but the suggestion made may be the means of setting garden-lovers thinking of what may suit their individual tastes, and with a careful selection be suitable to the situation or locality.

Blue-flowered Annuals.—I will enumerate a few blue-flowering annuals that may be so used. *Viscaria cærulea*, a

rather uncommon plant, pale blue in colour and one that lasts well; *Anagallis linifolia cærulea*, a Gentian blue, dwarf in growth, thriving better in poor soil; *Linum perenne*, a lovely shade of blue, flowering for a long period, wants support; *Linaria maroccana*, in the blue shades of colour and varied; *Asperula azurea setosa*, light blue and fragrant; *Aster sinensis*, in the blue shades only; Sweet Peas, the pale blue, lavender, heliotrope, and dark blue shades; *Brachycome iberidifolia*, the blue shades, suitable alike for beds and rockwork; *Centaurea cyanus*, in the blue shades; *Eutoca viscida*, a beautiful shade of blue and of compact growth; *Phacelia campanularia*, an annual well deserving of extended culture; *Nemesia hybrida*, Blue Gem, which I have recently heard well spoken of; and *Nemophila insignis*, bright blue with white eye.

Pink Flowers.—In shades of pink there is also a good choice, but probably not quite so many dwarf-growing plants. Here Sweet Peas will provide a wide range of colour. I have seen these used with a lovely effect in conjunction with *Clarkia elegans*, *C. pulcherrima*, and *C. integripetala*. These, if well cared for, will last a long time in flower. The pink shades of the Candytuft will supply an excellent variation of rather dwarf plants, also lasting well if not grown too thickly. The pink forms of *Aster sinensis* will serve a useful purpose, especially late in the season. There are also varied shades of pink to be found in the Godetias, bordering somewhat on to rose, no doubt, but still admissible. *Lavatera splendens rosea* is a distinctly useful annual of robust growth, better in a poor soil than otherwise. The shades of pink in *Phlox Drummondii* further enhance the list. *Viscaria elegans picta*, as a somewhat dwarf plant, is useful and distinct; *Silene compacta* varieties, as prostrate-growing annuals, are very effective.

Yellow and Orange Flowers.—In varied shades of yellow and orange there is a wide choice, notably among the Calliopsis (or Coreopsis). The dwarf-growing and somewhat prostrate *Zinnia haageana*, in three or more shades, are valuable, not only from the point of effect, but also for their enduring character. The dwarf-growing Marigolds, also the Tagetes, are very effective and last a long time in flower. In *Dimorphotheca aurantiaca* we have an extremely useful yellow annual, and one that rather enjoys a dry situation. Of this annual and *D. pluvisialis* we have also a choice selection of new hybrids, all of which will, I think, blend with the yellows. If they do not quite come up to the coloured plate that I

GODETIAS AND DWARF WHITE ALYSSUM USED AS
EDGINGS TO A PATHWAY. SEEDS CAN BE SOWN
OUTDOORS THE FIRST WEEK IN APRIL.

A BED OF MIXED CANDYTUFT IN A SMALL GARDEN.

have seen, they will still be beautiful. It would be quite possible to add many more annuals in shades of yellow, but any reliable catalogue will supply a further choice.

Crimson-Coloured Annuals could easily be found in a seed catalogue. Among these the *Coreopsis* will be found most enduring, likewise *Linum grandiflorum coccineum* and *Viscaria cardinalis*. In using these, however, I should, personally, be disposed to tone down the colour by using other annuals with white flowers. For fences where rapid growth is needed, nothing surpasses the *Tropæolums* or so-called *Nasturtiums*, from the Canary Creeper to *T. lobbianum*.

Half-Hardy Annuals.—The words “half-hardy” are used to denote those kinds of tender growth; and seeds must either be sown quite early in the year, under glass, or late in the spring when frosts are neither severe nor frequent. The China Aster is typical of a half-hardy annual, and there are many families as showy and as useful in the summer garden. The amateur gardener will probably choose a simple hot-bed for sowing the seeds upon, and with this warmth many things may be raised with a small amount of trouble and expense. Select for the seed a quite shallow pan or pot, and always sow thinly, and usually not before late February, and through March and April. It is useless to sow very early in the year; the plants appear in the dark days, make little progress, and become miserably drawn out and weedy. Only by a steady growth to ensure vigour and “solidity,” so to speak, is it possible to obtain a wealth of flowers true in colour and in form. A mixture of loam, well-decayed manure, leaf-mould, and sharp silver sand will suffice for soil; and in watering immerse the receptacle to the rim, so as to allow the water to soak up through the hole in the bottom. When the surface of the soil is watered, the seed is frequently washed to one side of the receptacle. A hot temperature is unnecessary, and the thermometer should never go beyond 65 degrees. Of course the object of this is to get strong growth, impossible in the stewing heat of a hot-house.

It is impossible in some gardens to afford artificial heat, and in such cases sowing must be deferred until May outdoors. This is not the proper course where means are available for sowing under glass.

A list of annuals, with their height, colour, and time of flowering, is given in the tables on p. 542.

SWEET PEAS

DURING the last ten or fifteen years these charming and fragrant annual flowers have been exceedingly popular, and there are few gardens where some, at least, are not grown. For exhibition purposes some growers go to a great deal of trouble in removing all side shoots from the stems, but for ordinary show purposes such steps are not necessary. The following article by Mr. E. H. Christy, a well-known grower of Sweet Peas, describes their cultivation in a sensible way, and for that reason is quoted here.

"Sowing the Seed.—First of all I am very keen on autumn sowing, so my year begins at the end of September, for the following reasons: I find that seeds germinate much better then than they do in, say, the first week in February. The temperature of the soil is much warmer, the plants showing in a fortnight or three weeks, according to the season. Then, again, autumn-sown plants are far stronger and have more roots than spring-sown ones; they bloom about two weeks earlier, and I am certain give better flowers; and, above all, are more able to resist disease and stand the checks they get by sudden changes in temperature, provided, of course, they have been kept very hardy all through the winter and not coddled in any shape or form. I know that many growers, who sow in the end of January and start their Sweet Peas in a heated green-house, then remove the plants to cold frames before they are at all drawn up and nicely harden them off, have almost as good results; but I have not this accommodation for the quantity I grow, so the autumn is the time for me. The pleasure I get in watching the plants during the dull winter months counts for something also.

"Soil for Sowing.—A week or so before sowing, prepare the soil, which consists of good turfy loam that has been stacked up to mellow, passing it through a coarse sieve, and then mix some good leaf-soil with it and add a small quantity of sand, well mixing the whole together. I do not use any manure, as seedlings do not want it, provided you get the right sort

THE
GARDEN

A FINE ROW OF SWEET PEA KING WHITE.

A BED OF UNSTAKED SWEET PEAS. THESE FLOWERS ARE VERY EFFECTIVE
GROWN IN THIS WAY.

of fibrous loam. I use large wooden boxes, such as Sunlight Soap boxes, so easily obtained from the grocers or oilmen. These are, of course, fairly deep, and are rather heavy for lifting about; but it is important that there should be plenty of room for the roots of autumn-sown Sweet Peas. Do not forget to make holes in the bottom for drainage, and crock the boxes as you would for pots. Press the soil fairly solid; this is necessary, as a loose soil causes the plants to be soft and weak. When sowing the seed I use a handy little tool of my own device, made of wood, something like a rake, with large, blunted teeth half an inch in length. When well pressed down on the surface of the box this makes holes at equal distances and of equal depth, rendering it very easy to drop in the seeds, the holes being about two inches apart. Cover up the seeds with about half an inch of soil, and press down with a block of wood. Label each box, and mark on the back of the label the number of seeds in each, as it is interesting to be able to count the failures or successes, as the case may be. The boxes are now placed in rows with alleys, so that I can get among them easily, putting black cotton over them to keep the sparrows off. Of course, one Pea in a pot is the ideal where possible. I place pieces of carrot about the boxes to attract the slugs, which, unfortunately, are only too plentiful. While they are enjoying the carrot, though not exactly 'improving the shining hour,' at least they are not eating my Sweet Peas. Look out for mice, which are almost certain to visit you. I set the 'break-back' or 'Little Nipper' traps. On the weather becoming cold I fill all the available cold frames with the boxes, and make a temporary shelter for the others with oil sheeting, placed on wooden supports, which is rolled up every morning, or when not required to keep off heavy rain. This also protects them from a certain amount of frost. But frost does not hurt Sweet Peas. I have seen my seedlings laid down flat, like dead men, during a sharp frost; but when the thaw came they stood up, and were as right as ever in a few days. It is the damp and sudden changes that are harmful to them. If the soil in the boxes gets stagnant or green on the top, scratch it up with a sharp-pointed stick; this is equal to hoeing them in their later stages. The tops are pinched out of all my plants; this makes the side growths much stronger.

"Planting Out.—Early in April planting-out time comes. Choose the right days according to the state of your ground and the weather. In the garden I grow the Sweet Peas in

double rows 1 foot apart each way and 6 feet between the rows, the ground being well trenched during the winter. In the field the plants are put in with a trowel 10 inches apart in single rows and 5 feet between the rows, which run north and south. I plant the varieties that are similar in colour next to each other for easy comparison.

"Sticks for Support.—I use the ordinary Pea-sticks, which are easily obtained round here, and have never used wire or wire-netting or any other support. Short, branching sticks are stuck in directly after planting, and the taller ones put in later. Readers may ask, Why take all this trouble about planting out; why not sow in the ground? The answer is, The plants are much earlier, and you start with a perfect plant to begin with, whatever happens afterwards. I believe that Sweet Peas are something like children, and should have time and attention given them in their early stages. Having had a good send-off they will continue to grow up in the right way."

Although Mr. Christy so strongly and rightly advocates autumn sowing under glass, the amateur, who for some reason or other is prevented from doing so, can get good results by sowing the seed in the open garden in March. In warm localities, and where the soil is well drained, outdoor sowing in September may be successfully adopted, and if the plants survive the winter they will give better results than those sown in spring. Thin sowing is essential, and the plants should be subsequently thinned so that they stand at least nine inches apart.

Good Sweet Peas for Exhibition.—Mrs. C. W. Breadmore, cream, red edge; Elsie Herbert, white, red edge; John Ingman, carmine; Selected King Edward VII Spencer, crimson; Hercules, pink; Nubian, maroon; Helen Grosvenor, orange pink; Mrs. Routzahn, pale cream pink; Queen of Norway, mauve; King White, white; Florence Nightingale, lavender; Earl Spencer, salmon; Clara Curtis, cream; Mrs. W. J. Unwin, white, red stripes; Thomas Stevenson, orange scarlet; Doris Usher, cream pink; Elfrida Pearson, pale pink; Arthur Unwin, rose and cream; Scarlet Monarch, scarlet; Flora Norton Spencer, pale blue; Mrs. Townsend, white, shaded blue; Charles Foster, pink, mauve shades; Marie Corelli, rose; Queen of Spain Spencer, pink.

In the above list the first twelve varieties form an excellent all-round selection for those who require that number. Those who require eighteen varieties should choose the first eighteen in the list. Of course, in such a matter as the selection of

varieties, opinions will greatly differ, and some growers would include in their first eighteen varieties which are placed lower in the list. Comparatively few growers will require more than eighteen varieties ; but, on the other hand, those who desire to exhibit only twelve are advised to grow at least three spare varieties.

Varieties for the Garden.—So far the selection of varieties has been made from the point of view of the exhibitor, but all the varieties tabulated are good growers, and are otherwise suitable for garden decoration. For a selection of twelve varieties for the latter purpose the following might be chosen : Maud Holmes, Nettie Jenkins, Mrs. Hugh Dickson, John Ingman, Elfrida Pearson, Mrs. Breadmore, Elsie Herbert, King White, Constance Oliver, Queen of Norway, Clara Curtis, and Nubian. Where twenty varieties are required, the following might be added : Arthur Unwin, Hercules, America Spencer, Marie Corelli, Flora Norton Spencer, Helen Grosvenor, Mrs. Townsend, and Scarlet Monarch.

SPRING AND SUMMER BEDDING

Spring Bedding.—There are many kinds of spring-flowering plants that may be associated with bulbs, the beauty of the flowers of the latter being much enhanced by the close proximity of the other kinds of flowers. The spikes of the

FIG. 1.—Effective Ways of Planting Spring Flowers.

bulbs, especially those of Hyacinths, Tulips, and Narcissi, grow a fair height above the soil. The growth of many kinds of hardy spring flowers is, in comparison, dwarf, so that the latter may be used as a groundwork to the taller flowers or as a bordering to the various beds. The beds shown in both A and B designs are suitable for

planting as separate borders in any garden, on a small or large scale, and, of course, the whole design in each case may be used on a lawn or cut out, edged with tiles and gravelled between.

Effective Ways of Planting the Beds.—The long central bed in Fig. 1 may be filled as follows: Nos. 1 1 1, Hyacinth La Grandesse; Nos. 2 2 2, Hyacinth Roi des Belges (dark red); No. 3, entirely filled with *Aubrietia deltoides* (lavender blue). The whole bed would thus show the colours red, white, and blue. No other bordering would be needed, as the *Aubrietia*

FIG. 2.—Simple Designs for Spring Beds and Borders.

would form it in the way of a carpet bordering. Where the three sets of beds are planted close together, as drawn, the two outer ones may be filled as follows: Nos. 4 4, Tulip Keizerskroon, scarlet, with yellow border; double white *Arabis* as a groundwork. Nos. 5 5, Tulip Queen of the Netherlands, blush colour; *Aubrietia Leichlinii*. Nos. 6 6, Tulip Duchess of Parma, orange red, yellow border; groundwork of white *Arabis*. All other divisions, Nos. 7 7 7 7, filled with Hyacinths King of the Blues and L'Innocence, blue and white respectively, and single-flowered *Arabis alpina* as an edging only, but not as a groundwork for all the Hyacinths. No. 1 in Fig. 2 may be filled with *Hyacinth gigantea*, or Norma or Moreno, all pink-flowered, and La Grandesse, white, with a groundwork of Forget-me-not, or an edging, No. 2, of the latter plant. Nos. 3 3 and Nos. 4 4, Tulip Dusart, dark red, and *Arabis alpina*,

respectively ; Nos. 5 5 and Nos. 6 6, Hyacinth Grand Maître, light blue, and single-flowered Arabis, respectively ; Nos. 7 7, Tulip Mon Tresor, yellow ; Nos. 8 8, Aubrietia Crimson King, dark red ; Nos. 9 9, Tulip Rose Gris de Lin, a pale rose ; and Nos. 10 10, *Silene pendula compacta* or *Silene acaulis*, both pink-flowered.

The Soil and the Planting.—As it is not desirable that the groundwork plants should be very gross in growth, manures must not be applied to the soil in such a way that their roots will come in direct contact with it long before the flower-buds are formed. The necessary rotted manure must be dug in very early before the bulbs are planted. The surface or groundwork plants must be put in first. Where bulbs are associated with other kinds of plants, it is well to allow them more space than in

FIG. 3.—Useful Designs for Summer Bedding.

cases where they alone occupy the beds. The surface plants must be put in far enough apart to allow of due expansion of growth without overcrowding. These should, when in full bloom, form a dense carpet or a compact edging, as the case may be.

Summer Bedding.—The filling of beds or borders with summer-flowering plants is very interesting work. Those who have had considerable experience know quite well that the best effects are obtained when the designs are simple. Complicated designs cannot well be worked out unless the beds are very large and small-growing kinds of plants are used, such as those employed in carpet-bedding.

The accompanying designs may be easily made by an inexperienced person, and also as easily filled with inexpensive as with the more choice and expensive kinds of plants.

Fig. 3, Circular Bed: A, Zonal Pelargonium Paul Crampel; B, Zonal Pelargonium Flower of Spring; C, white-flowered or cream tuberosus Begonias; D, tuberosus Begonias, mixed colours; E, white Violas as a broad edging.

The Same Bed Filled with Annuals.—A, Eschscholtzias; B, Godetia Duchess of Albany, white; C, *Jacobea elegans alba*; D, Godetias, mixed colours; E, *Nemophila insignis*, blue, as a broad edging.

Fig. 3, Oblong Bed: A, Fuchsia Mrs. Marshall; B, Zonal Pelargonium Paul Crampel; C, pink-flowered fibrous-rooted Begonias; D, blue Lobelia.

The Same Bed Filled with Annuals.—A, Salpiglossis, mixed colours; B, *Linum grandiflorum rubrum*; C, *Saponaria alba*; D, Mignonette as an edging.

Fig. 4 shows a long, narrow border. Such borders are formed near paths as well as on lawns, and with Box or tile edgings. They may be

FIG. 4.—Plan of a Narrow Border on a Lawn.

planted with different kinds of plants in straight lines (to form ribbon borders) or in scrolls, as well as in the way shown. A, Zonal Pelargonium Henry Jacoby; B, Heliotrope; C, Zonal Pelargoniums Flower of Spring or Little Dandy as an edging.

The Same Border Filled with Annuals.—A, *Zinnia elegans grandiflora robusta plenissima*; B, *Phlox Drummondii*, mixed colours; C, *Tagetes signata pumila*. The different kinds of plants recommended will continue to flower throughout the summer months, so that there will be no gaps or lack of blossom at any time, a very important matter.

Distance Apart for the Plants.—Zonal Pelargoniums, 1 foot; those used for edgings must be planted closer. Tuberosus Begonias, 1 foot to 15 inches; fibrous-rooted Begonias, 8 inches; Violas, 8 inches to 10 inches, according to the size of the plants when put out; Heliotrope, 15 inches (these plants spread); Salpiglossis, 14 inches; Godetias, 10 inches; *Nemophila*, 7 inches. Mignonette must be thinned out to 6 inches apart from seedling to seedling.

The Soil.—This must not be made very rich for Zonal Pelargoniums; moderately rich for Heliotrope, Mignonette, Begonias, and *Nemophila*;

not very rich for *Phlox Drummondii*; rich for *Salpiglossis* and *Godetias*. All organic manure used so late in the season must be well rotted.

A large, square-shaped bed may be effectively planted in a variety of ways. Of course, only one design is given in the accompanying plan, but I will mention others very briefly. The whole of the body of the bed may be filled with tuberous *Begonias* and edged with *Violas*, or it may contain one variety of a *Zonal Pelargonium* and have an edging of blue *Lobelia*. *Heliotrope*, with dot plants of *Fuchsias*, would look charming, the edging consisting of white *Lobelia* or white *Violas*. *Sal-*

FIG. 5.—An Oblong Bed to be filled with Bedding Plants or Annuals.

vias, with dot plants of *Liliums* and blue *Violas*, *Ageratum* or blue *Lobelia*, would also look effective.

Fig. 5 as drawn. The centre, A, white *Marguerites*; the whole space surrounding A, yellow *Calceolarias*; BB, *Zonal Pelargonium King of Denmark*; CC, white or cream-coloured tuberous *Begonias*; D, *Zonal Pelargonium Golden Harry Hieover*.

The Same Bed Filled with Annuals.—The centre, A, annual *Chrysanthemums*; the whole space surrounding the centre, A, *Phlox Drummondii*; BB, *Zinnias*; CC, *Nasturtiums King of Tom Thumbs* (scarlet); D, *Mignonette* or *Portulaca grandiflora*; the latter would make a border of mixed colours.

Fig. 6: A, Fuchsia Lord Roberts; B, pink-flowered Zonal Pelargoniums; C, an edging of Ageratum.

The Same Bed Filled with Annuals.—A, *Calliopsis atrosanguinea*, scarlet flowers; B, Mignonette; C, an edging of *Nasturtium minus coccineum*, rich scarlet crimson.

Fig. 7: A, single-flowered Petunias, mixed; B, brown Calceolarias; C, an edging of geranium Little Dandy. A dot plant of *Kochia* in the centre of A would look charming.

The Same Bed Filled with Annuals.—A, Stocks, mixed; B, Asters, mixed; C, an edging of Mignonette.

An Alternative Scheme.—A, Godetia Duchess of Albany, white; B, Godetia Lady Albemarle, crimson; C, an edging of *Nemophila insignis*, blue.

Distance Apart to Plant.—Marguerites, 18 inches to 22 inches; Fuchsias, according to the size of the plants, so that when at their best

FIG. 6.—A Star-shaped Bed is much favoured by Suburban Gardeners.

FIG. 7.—A Diamond-shaped Bed is often useful in awkward-shaped Grass Plots.

they will not be overcrowded. Dot plants used, if 2 feet high, must not be closer than 3 feet 6 inches.

Soil and Manure.—Some lighter material must be put in for Fuchsias if the original soil be clayey. Marguerites and Petunias must not be planted in very rich soil. Nasturtiums require to be grown in poor ground ; then the plants make moderate growth and flower well. Overcrowding is a common error in bedding, it being a mistake to grow six plants where one will suffice.

ROSES

A GOOD start in Rose-growing is most essential. Many failures in gardening are simply the result of beginning in an unreasonable way, thinking nothing perhaps of the soil, the varieties, whether they are vigorous, free, or the reverse, and the treatment necessary to ensure a happy life. The Rose is the flower of the English garden, and its value increases as we grow accustomed to the charms of the Tea-scented varieties, and know something of the wonderful beauty of the climbers, the Dorothy Perkins, Tausendschön, and many other rambling kinds that fling their flower-laden shoots over arch, pergola, and pillar, and sometimes look into the window to flood the house with perfume.

The Soil is a matter of some importance, but the great majority of growers are compelled to make the best of the garden as it is, and are not in a position to bring in a large amount of fresh material. Ground that has been occupied with vegetables is usually in excellent condition for Roses. The best position in the garden should be given to the Roses. It is unreasonable to expect an abundant harvest of flowers from plants under the shade of trees, or soil already filled with roots from a neighbouring shrubbery.

We will assume, therefore, that the bed is in the centre of the garden, or some spot about which the ardent rosarian would not quarrel. The Rose absolutely revels in sunshine and air, and the aspect cannot be too carefully selected for the bed. A convenient size for the bed would be about 20 feet long and 6 feet wide. This would provide space for about thirty Rose bushes. The preparation of the bed is of first importance, and should be carried out, if possible, not later than September, if autumn planting (by far the best) be adopted. Unquestionably the best soil for all Roses (except those of the Tea-scented and allied tribes) is a strong, rather heavy, even clayey loam. In this soil the Hybrid Perpetual kinds are very happy, but if light and sandy, then the Tea-scented and Hybrid Teas should predominate. In making preparation for bastard trenching or double digging the bed, mark out the length and width with a line.

Divide the bed off into six sections as illustrated on next page. The soil of section A is dug out to the depth of the spade and placed on the path at the other end of the bed, C. The broken soil is then shovelled out and placed at C also. The second or lower spit of section A is then broken

up with a four-pronged fork, well incorporating with the soil thoroughly decayed farmyard or stable manure. The soil must not be brought to the top, but kept in the same place. When this second spit appears heavily charged with water, artificially drain the bed. To do this, the second spit must be thrown out, and about 4 inches or 5 inches of large stones, clinkers, or broken bricks put in the bottom, and the second spit returned. It is wise to raise the bed 4 inches or 5 inches when the soil is badly drained, as stagnation means that the young roots rot away. When manure has been mixed with the bottom spit, the top spit

A	B				C
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of section B is put into section A. The shovellings of section B placed in A will complete the first trench. When much manure, either liquid or solid, has been used on the soil in the past, a dressing of chalk would improve its fertility if incorporated with the surface soil at the rate of two pounds per square yard. When the soil is very light, *i.e.* sandy or gritty, put a good layer of cow manure during trenching below the bottom spit of soil. Burnt weeds and other garden refuse are excellent to mix with the top soil. These may appear unnecessarily elaborate preparations, but the bed when thoroughly made will last for years, with the usual attention required by the plants. A pint of bone-meal to every square yard should be well mixed with the top spit.

Purchasing.—Give the order to the nurseryman early, or, better still, go to the nursery and bring the plants back with you. If foliage is still on the growths cut, not pull, it off, and to prevent the wood shrivelling, make a trench in a shady spot and place the roots of the bushes in it, covering them with soil until they can be properly planted. If the arrangement of the kinds has been well considered on paper the Roses should be so laid in the trench as to enable them to be drawn out as required without disturbing the others. Do not leave their roots exposed to the air for even a few minutes. Tea Roses are best upon the seedling or cutting briar, and the last-mentioned is the best stock for the Hybrid Perpetuals.

Planting.—Early planting is one of the most important points, and choose from the middle of October to the end of November. Roses may, however, be planted in the spring, or in winter when the weather is favourable. When about to plant have a bucket of water ready at hand to dip the roots in. Keep the roots covered with a sack or mat until required. Trim over the jagged ends of the roots with a sharp knife, and if the branches are more than 2 feet in length cut the surplus away, as this prevents the wind from moving the stems to and fro after the plants are in their places. In planting make a hole in the soil about one foot each way, and deep enough to allow space for the roots to be

PLAN OF A SUNK ROSE GARDEN AT CARROW ABBEY, NORWICH.

A bush Rose ready for planting. The arrow indicates the proper depth to plant.

The same bush firmly planted.

spread out carefully. Dwarf or bush Roses are either on their own roots, that is to say, struck from cuttings, or budded upon a foster stock. This foster stock is of four kinds—the Briar-cutting, the Seedling Briar, Manetti, and De la Grifferaie. These are described under the heading of Stocks. All these stocks spread their roots outwards, except the seedling briar, which makes a long tap-root, and must be shortened to prevent it going too deep into the cold soil below the first spit. Place the junction between scion and stock an inch below the surface (not more) as shown in the illustrations. The roots having been dipped in water, hold the plant in the left hand and arrange the fibres to the right and left. It is not labour lost to prepare ready a bushel or two of fine soil for placing immediately over the roots. Give them a thin covering of this, and lift the plant gently up and down to allow the soil to run among the fine roots. Now shovel on a little more soil, then give each plant a good handful of bone-meal well scattered around it. Put some more soil on and tread firmly. Roses like firm planting when the land is not wet. Do not quite fill up the hole. When a saucer-like cavity is left around each plant this facilitates watering should the weather remain dry. After the plants have been in the soil about a week give one good watering, unless rain has intervened, then fill up the cavity with fine dusty soil and allow this to remain as loose as possible. Do not plant when the ground is wet and sticky, but leave the plants in the trenches. When planting is finished the surface soil should be left rough, not raked over and made neat. Earth up the bushes in November in the same way one would Potatoes, hence the wisdom of planting the bushes in rows. All the growths covered with the soil are quite safe from severe frosts. The Hybrid Perpetuals should be earthed up as well as the Teas. One never knows the kind of winter to expect, and there is comfort in the thought that the Roses are safe. Even when the soil is frozen very hard the growths remain uninjured. When Roses for some good reason cannot be planted in November wait until February and March unless one is blessed with a fine January. In the case of deferred planting prune the plants back to three inches or four inches from the base before planting. Remember that it is unwise to allow fresh manure to come immediately into contact with the roots.

To plant a bed 20 feet by 6 feet containing a good representative collection, and arranged according to habit of growth, having the strongest in the centre row, the following diagram will indicate the position of each variety according to the number against the name:—

20 feet.

6 feet.	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
	21	22	23	24	25	26	27	28	29	30

Distance to Plant.—Bush Roses may be planted as close together as 14 inches in the rows, and 18 inches from row to row, but 18 inches to 24 inches each way is better. Many growers for exhibition prune their plants severely (a practice alluded to under the head of pruning), then 14 inches is sufficient. Standard Roses are usually given a distance of 2 feet 6 inches to 3 feet each way.

Stocks for Roses.—Many beginners, when ordering Roses, desire them on "their own roots." It should be clearly understood what an own-root Rose is: it is one raised from a cutting of any particular variety; but an ordinary bush Rose is one that is budded or grafted upon a foster stock, either in the stem near the root or upon the root itself. Own-root or cutting Roses are very satisfactory for some varieties, but they are not always procurable. The foster stocks usually employed are the Manetti; Hedge Briars from cuttings known as the Briar-cutting; Briars from seed known as seedling briars, Hedge Briars to make Standard or Tree Roses, De la Grifferaie, and Polyantha stocks. But Roses may be budded upon almost any variety of Rose—in fact, one could bud an old Rose all over with a modern kind if so desired. Where a foster stock is used there is always a danger of suckers springing up and choking, as it were, the kind we desire to possess. We have known instances where Maréchal Niel has been planted and the plant killed by frost. The owner, however, was unaware of this, and instead of the Maréchal Niel he cultivated for some time the stock that sprang up from the roots, and wondered why it produced only tiny pink flowers instead of rich blossoms filled with perfume. It may be as well to briefly describe the Manetti, Briar, De la Grifferaie, and Polyantha stocks.

The Manetti Stock cannot be mistaken for the cultivated Rose. The foliage is of a tender grass-green colour, the leaves seven in number, whereas most of the Hybrid Perpetual, Tea, and Hybrid Tea tribes have five only; the wood in the young sucker state is a reddish brown, and the prickles of the same colour. In about two inches of its growth there are two or three large prickles, interspersed among them being numerous tiny prickles resembling the cylinder of a musical-box.

The Briar Stock is so well known that it seems superfluous to describe it. There are, however, many varieties of the Wild Briar, some of them much resembling the Ayrshire Roses, but the usual form is very prickly, the foliage of a dull dark green, and there are seven leaves on a stalk.

The De la Grifferaie Stock may deceive the novice. It has large leaves like a cultivated Rose, but they have a peculiar downy appearance and are purplish-green in the young state. The wood is thick and of a red colour, spines large and about equal in size. The tip of the growth has quite a mealy look.

The Polyantha Stock has a flower like the Blackberry, nine leaves on a stalk, very pale but dull green, and the edges are prettily notched. The tip of the growth is downy, and the wood is green with brownish spines.

The Rugosa Stock.—This is *Rosa rugosa*, a well-known garden

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THREE GOOD GARDEN ROSES—

Yellow : A. R. GOODWIN.

Pink : LADY ALICE STANLEY.

Red : GEORGE C. WAUD.

species. During recent years it has been extensively used by some nurserymen for making standard or tree Roses, as well as weeping standards. It is claimed for it that it will, owing to the fibrous character of its roots, transplant better than the ordinary Briar, and, owing to its comparatively shallow rooting, does better than the Briar stock on light or sandy soil.

As the best bush Roses can be obtained from the leading growers from ninepence to one shilling each, probably it would not pay the beginner to bud his own Roses. Later on, however, he may wish to do so. As the cuttings are inserted in September at the same time as those of cultivated Roses the method is described under the heading of propagation by cuttings (p. 77), and as for the seedling briars it is not worth the trouble involved for the amateur to attempt to raise them, when they can be bought so cheaply. Stocks planted for budding should be secured in the autumn, the roots put into some soil temporarily, and protected from frost until February. When planted before this, hard frost is liable to raise the plants out of the ground. Plant them in rows 2 feet apart in the best position, and the stocks 8 inches apart. If they are to remain permanently where planted, and this plan is strongly advised, more space should be given between the plants, say 12 inches. Dwarf stocks must be planted rather shallow, their roots being about 6 inches below the surface. When about to bud the stocks hoe the soil away, so that the root stem is accessible.

Standard briars may be bought from labourers for one shilling to one shilling and sixpence per dozen, but do not buy them unless they have some small fibrous roots, and see that they are not green and sappy. Plant these briars in November in rows 3 feet apart and 12 inches asunder in the rows, and their roots about 8 inches deep. All stocks should be grown in good soil, and hoe frequently and deeply. Thin the growth of standard stocks in June, retaining three of the best to receive the buds.

Pruning.—When pruning Roses the first thing is to determine whether the object in view is to obtain Roses for exhibition or Roses for the decoration of the garden, because the pruning that would be suitable in the one case would be unsuitable in the other. The following notes and illustrations refer to the pruning of Roses for the garden, and not for the purpose of securing blooms for exhibition. The exhibitor who wants the very best blooms he can get, even if he has a small number on each plant, prunes his Rose trees much harder than the man who prefers to have more blooms or poorer quality, although they may be beautiful in the garden and valuable for cut flowers. Naturally, the farther back one cuts the shoots the fewer buds there will be to burst into growth and the stronger the resulting shoots will be. The Rose grower who does not care to sacrifice quantity for the sake of a finer quality prunes more lightly; that is to say, he leaves the shoots longer, with the result that they produce more shoots, though they may be less vigorous and bear flowers that from the point of view of the exhibitor may be wanting in size and form. Some of the stronger-growing Hybrid

Perpetuals and Hybrid Teas will, if pruned lightly after they have been planted two years, develop into large bushes, giving an abundance of blossoms. Such plants, however, are useless to the exhibitor who places size and form high in the list of qualities a Rose bloom should possess. In the Rose garden, however, they are delightful objects, and yield a profusion of flowers for cutting. The exhibitor's Rose garden is not, as a rule, a thing beautiful to look upon, since his efforts are directed towards the production of individual blooms of quality and not towards making the beds and borders a mass of flowers.

Pruning Explained.—What is Rose pruning? In what are usually termed garden Roses it consists of cutting back the growths made last year more or less according to the variety, removing weakly growths, unripened wood and surplus shoots, also any which cross each other. The shoots must always be cut back to an "eye" or bud, which are in the axils of last year's leaves. Most of the leaves have fallen, leaving the buds exposed. At the first sign of spring some of these will commence to grow, especially those near the ends of the shoots on Tea Roses. The probability is that the cold winds and spring frosts will kill them. However, these buds would probably be cut off when pruning later on, and the cultivator has the satisfaction of knowing that the buds near the base of last year's growth have not started.

What to Prune With.—It may be that when visiting a large garden where thousands of Roses are grown one has seen secateurs used for pruning. To prune all these with a knife would take more time than could be spared. A sharp knife should always be used when possible, it makes a much cleaner cut; secateurs bruise the wood and bark. Always commence to make the cut on the side of the shoot opposite the bud. About on a level with the bud make a slightly upward cut, the knife will then cut the wood on the opposite side just above the bud that is to be left.

When to Prune.—From the middle to the end of March is the best time. Commence with the Hybrid Perpetuals, leaving the Teas until last. If cold winds and spring frosts are prevalent it will be better to defer pruning these till April. How much or how little to prune depends largely on the class and the individual variety. Roses, however, vary considerably in growth, some sorts making much more vigorous shoots than others even in the same class. If not carefully watched, the pruning of Roses year after year has the tendency to leave a lot of old wood at the base. If possible, one or two of these old shoots should be cut clean out each year. This usually ensures a good supply of young wood. Before commencing what may be termed "pruning proper," all weak, unripened wood must be removed. The shape of the bush has to be considered. Too many of the best shoots must not, of course, be sacrificed, but a little regard should be paid to the shape of the bush. To strengthen weak-growing sorts, cut back last year's growth to within one or two buds of the old wood. Likewise, when dealing with strong-growing sorts, half a dozen or more buds should be left, so that the energy of the plant is distributed, not confined to one or two buds.

HYBRID PERPETUAL ROSE BEFORE
PRUNING.

HYBRID PERPETUAL ROSE AFTER
PRUNING.

THE
ROSE

HYBRID TEA ROSE AFTER
PRUNING.

HYBRID TEA ROSE BEFORE
PRUNING.

TEA ROSE AFTER PRUNING.

TEA ROSE BEFORE PRUNING.

ROSE BLUSH RAMBLER ON A HOUSE FRONT.

Again, if good quality blooms are desired rather than quantity, the shoots must be cut rather harder.

Hybrid Perpetuals.—These vary considerably in growth; some sorts are much more vigorous than others. A good general rule to follow is to cut back the less vigorous varieties to within 3 inches or 4 inches of the old wood, varying this according to the habit of growth, leaving in the case of the vigorous-growing sorts 9 inches to 1 foot of the previous year's growth (see illustrations).

Hybrid Teas.—This group is by far the most useful for garden decoration. This section does not require such hard pruning as the Hybrid Perpetuals. If, however, good quality rather than quantity of blooms is desired, cut back the strong-growing sorts to within 4 inches or 5 inches of the old wood. Thinning out of weak shoots is very important to allow the strong shoots to develop. These can be left 12 inches to 15 inches in length. If there is room to peg down the shoots the entire length, blooms will be produced from every bud. The side growths should be cut back to one or two buds. There are in this section a number of weak-growing sorts—Liberty and White Lady, for example—which are better if cut fairly hard back, say, to within 3 inches or 4 inches of the old wood (see illustrations).

Teas.—The growths of the plants in this group suffer rather severely from frost except where well protected. With many of the bushes all that is necessary is to cut off the injured shoots and remove the pithy and weakly growths. Where the plants have been protected, cut back the weak growers to within about 3 inches, and the strong growers to 8 inches or 9 inches of the old wood (see illustrations).

Standards.—These are usually cut back on the same lines as advised for bush Roses, but rather hard to keep the heads in shape, although during recent years standards with large heads are becoming more popular, while weeping standards of Wichuraiana Roses are very beautiful. From the latter remove thin, weakly shoots, allowing those which remain plenty of space.

Climbing Roses.—Broadly speaking, the chief point to be remembered when pruning climbing and dwarf Roses is that while the latter produce their flowers on the shoots that will grow during the coming summer—on the current year's shoots—the blooms of the climbing Rose come from older shoots and largely from those of the previous year. Thus the pruning that suits the interests of one class would be ruinous to those of the other. The best time to do the chief pruning among climbing Roses is soon after the flowering season is over. If this is carried out the only thing to do in spring—the correct time to prune bush and standard Roses—is to cut off a few inches, 6 inches, 9 inches or 12 inches, as may be necessary, from the ends of the shoots if the wood there is green and soft, or as generally termed “unripened.” Such soft wood as this is of no value, and its buds would not burst into growth of sufficient strength to produce flowers. Moreover, cutting off the unripened end strengthens the remainder of the shoot and helps to produce stronger flowering growths. The Rose grower should always

endeavour to have as many one-year-old shoots in his climbers as possible, as there should not, as a rule, be any shoots more than three years old. This, of course, cannot be laid down as a hard and fast rule, but it serves to show the value of having as many young shoots as possible and the disadvantage of having old ones. The latter only produce flowers on the lateral or side growths that have formed on the main stem. In March these side shoots are cut back to within two or three buds of the base, so as to induce the formation of flowering shoots as strong as possible. The shoots made last year produce flowering shoots from almost every bud; it will thus be apparent what a far better display of bloom the one-year-old shoots give, as they flower from the main stem itself, while the older shoots are able to bear bloom only from laterals, not from the main stem. Many of the strong-growing climbing Roses produce stout shoots from the base of the plant every year, but some do not, and in order to encourage them to do so it may be necessary to cut back to within, say, 6 inches of the ground in March one at least of the strong shoots. Roses such as Crimson Rambler, Reine Olga de Wurtemberg, Dorothy Perkins, and some others need no such assistance to enable them to send up strong young shoots from near the ground level, but they are not all so free as these, and when it becomes necessary a shoot must be cut back, otherwise the base of the plant will get bare, and nothing looks much worse than a climbing Rose with flowers and leaves on the top and bare unsightly stems below.

Watering and Syringing.—Instead of using so much patent manure use the hoe more frequently, and keep 3 inches or 4 inches of the surface soil loose. This considerably counteracts drought; it allows the air to penetrate the soil, and admits the warm rays of the sun. Always hoe after rain, at each artificial watering, and use the syringe freely to cleanse the foliage. When the garden is near a large town sponge the foliage now and then, but avoid wetting the leaves during bright sunshine. Syringe early in the morning, before seven o'clock. The city man as well as the artisan will find the work among Roses a delightful occupation, especially before breakfast. When hoeing is constantly practised Roses will not as a rule require artificial watering before the flower-buds appear, except in very dry springs, and then water only newly-planted kinds. It is when foliage is ample and almost fully expanded that the roots take up most moisture. The best time to water is the end of May and early in June; if dry, give a thorough good soaking with plain soft water about twice a week. The plants also appreciate gentle syringing in the evening of a hot day. Mildew often results through unseasonable waterings and overdoses of artificial manures, which burn the tiny rootlets. A dressing of lime and soot soon after pruning is helpful; indeed, both soot and lime are not sufficiently used.

Manures.—Roses are not gross feeders, but they like good food. Phosphates are very important to promote abundant flowering. Bone-meal, which is so rich in phosphate, is an excellent fertiliser, a light sprinkling in March being very useful and lasting. Night-soil is excellent, but must be applied with care. Make a drill at the end of May

A HYBRID TEA ROSE : THE RESULT OF DISBUDDING

A ROSE SHOOT WITH THREE BUDS.

THE SAME SHOOT WITH THE TWO
SIDE BUDS REMOVED.

down the middle of the rows, as though one were about to sow beans. Pour the night-soil into the drill and return the earth. The rains will wash the fertiliser to the roots. Never give liquid manure in dry weather unless plain water has been previously applied. An excellent manure is known as Tonk's, and should be applied early in February. Hoe the ground, then sprinkle all over the soil at the rate of $\frac{1}{4}$ lb. to the square yard. The recipe is as follows :

	Parts.
Superphosphate of lime	12
Nitrate of potash	10
Sulphate of magnesia	2
Sulphate of iron	1
Sulphate of lime	8

Liquid manure can be easily made by setting up a paraffin cask in an out-of-the-way corner. Put a bushel of fresh cow manure into a bag, tie the end up loosely, and put the bag into the cask, which should then be filled with water. Give this liquid in equal proportions, and change the manure every ten days or so. If sheep droppings are procurable, put some in the tub in addition. Ichthemic, or fish guano, is a splendid stimulant for Roses. Do not give liquid manure to weakly plants, only to those in full vigour. It must not be given too early, but wait until the flower-buds can be just seen or felt at the points of the shoots, or gross, green-centred flowers will result. When the buds are seen, an application of manure water twice a week may be given. Withhold liquid manure when the flowers show colour. After first flowering a few doses are beneficial to such Roses as bloom a second time. Manure water may be given to Roses in winter to their great advantage.

Mulching the surface during June and July is important. A good material is peat moss litter from a good stable. Wakeley's hop manure is also valuable. Hoe the surface deeply before applying it, then lay on about 2 or 3 inches.

Thinning and Disbudding.—Pruning should be supplemented by thinning the young shoots in May. Remove all that appear to crowd the centre of the plant. If one growth carries three or four young shoots at its end this will suffice. Growths may be entirely removed in May when they appear too crowded. If variety is wanted, as well as quality, put the plants closer, and retain not more than two of the best growths of the previous summer. Disbudding usually applies to the reduction of the number of flower-buds. Where show blooms are required remove the side buds and retain the centre one, which, if faulty, must be removed, and the best of the side buds retained. (See illustrations.) Pinch off all new growths as they spring out of the shoot that is crowned with the flower-bud. Tea Roses require this if show blooms are desired, but for garden decoration leave them alone. Plenty of growth means plenty of flowers.

Budding.—This operation as well as many another in garden craft is very simple when the art has been acquired. Fig. 8 represents a piece of Rose growth. At the base of each leaf-stalk is an eye, or

leaf-bud, which contains the germ of a new plant. To be successful in budding this growth must be "ripe," that is, it must have flowered, or be on the point of so doing. The growths first produced are the best to use for budding. They should be firm, and the spines or thorns be easily rubbed off. If the latter are soft and juicy the wood is not ripe enough, but it is more important to see that the stocks "run well," that is, there should be an abundance of sap in the plant. In a very dry summer it is sometimes necessary to water the stocks a day or two

FIG. 8.—Budding Roses.

before budding. Always bud the standard briars first, for they cease to grow long before the dwarf stocks. The latter should be budded as close to the root as possible, especially if the plants are wanted for potting up. Standard briars should be budded in July, and the dwarf stocks during August. Insert the bud on dwarf stocks on the west side if practicable. During the operation of budding keep the shoots in a jar of water, previously cutting off the leaves but retaining about half an inch of the leaf-stalk so as to obtain a firm hold of the bud. Insert the knife in the shoot about one inch above the bud as at B, Fig. 8.

Cut thinly under the bark and when past the bud rend it off. It will then appear as C and D, Fig. 8. Hold the bud between the thumb

and finger of the left hand, and with the point of the knife lift up the small slice of wood attached to the bark and jerk it out. As a rule it comes out easily enough, leaving the germ of the bud intact. If this germ is missing, and there is a hole about the size of a pin head under the bud, it is waste of time to insert the bud. Some varieties behave in this way and must be cut rather thinner than others. Before cutting off the bud wipe the stock clean and make a cut upwards, and then cross-wise in shape like the letter T (see Fig. 9, A B). Do not cut so deeply as to injure the wood of the stock. Raise only the bark gently on each side of the long cut by inserting the bone of the budding knife. Then insert the bud at C and gently push it down to the end of the cut D.

Many budders dispense with the cross cut, but it facilitates the insertion of the bud. When the bud is placed in position cut off the surplus piece of bark and bind up the wound tight (see E, Fig. 9) with raffia. A month after budding examine the bud, and if found to be dead another should be inserted in the opposite side. Do not touch the tops of stocks until after the leaf has fallen, and not then unless they are wanted for cuttings. The time to remove them is in February. They are then cut quite away to within an inch of the bud. Seedling briars are budded in the collar, that is, the thick root immediately below the branches.

Budding Standard Briars.—These are budded in the best lateral growths, but close up to the upright stem two or more kinds may be budded on one standard, but they should agree in growth—for instance, La France (pink) and Alfred Colomb (red) would associate well together. In the case of the standards remove the raffia after the fourth

week and retie again loosely, but do not cut away any of the growths until February. When the buds start out (as they often will and blossom), leave them until autumn, and then cut back to one eye. Retain the raffia on dwarf stocks; the soil will rot it off before February.

Propagating by Cuttings.—There are many different ways of striking Roses from cuttings, but the best one for the beginner is as follows: Early in September a piece of ground in a sheltered part of the garden, but not necessarily under a north hedge, should be deeply dug, or, better still, trenched. When gritty material, sand, burnt garden refuse, &c., is at hand intermix this with the soil, unless the latter is sandy. Whilst this soil is settling down make the cuttings from growths that bore the first or summer flowers. Where possible they should have a heel, *i.e.* a piece of the old stem attached.

The cutting may be of any length, but 5 to 6 inches is about right. Smooth over the heel with a sharp knife, remove all foliage save the topmost leaf-stalk, but do not cut away any eyes or buds (see illustrations). The cutting is now ready for planting. Where a heel cannot be secured, cut the end just below an eye or leaf-bud. The wood must be quite hard. As the different kinds are made, tie into bundles, and lay them in boxes of moist sand or soil, and keep them in a

FIG. 9.—Budding Roses.

shed. When all are made they should be planted. Take out a trench of the prepared bed one foot wide, and the depth of a spade. Cut down a wall of soil as perpendicular as possible. At the bottom of this wall of soil put an inch of sand or old cocoanut fibre, then stand the end of the cutting on the sand, and lean them against the wall of soil, the cuttings being about $1\frac{1}{2}$ inches apart or more, if there be plenty of room (see illustrations). Many prefer to dibble the cuttings in with a dibbler, which is often disastrous, as the cuttings hang, *i.e.* do not touch the bottom of the hole. It is much better to dig the ground as advised. When the row is completed, gently place half the soil to the cuttings, then tread firmly with the foot, the remainder of soil being returned and made firm. The cuttings should not be out of the ground more than an inch, but this is not material so long as they are in the ground to a depth of 5 inches. When the row is completed, more ground is dug, and another row commenced about 12 inches from the first. After a hard frost the cuttings are often by its action raised out of the ground and left hanging. As soon as frost has gone, go over the cuttings, and push them down. It may be necessary to do this two or three times, but if neglected for long, success cannot be expected. Subsequent treatment consists in keeping the surface soil loose for about 2 inches, and in the following spring twelvemonths, that is about eighteen months after planting, the cuttings should be transplanted to their permanent position. When doing this, place a little very fine soil near the roots, which are so fine that in heavy soil they do not start properly. The majority of Roses will strike readily from cuttings, but will not all be in fit condition at one time. Do not attempt to strike any from the first lot of plants, for the wood you would use is of great value the second season for flowers. Plants three years old will provide plenty of useful cuttings. There are other ways of making Rose cuttings, the next best to the above being from the growths of pot-grown plants in March or April. If a variety is scarce, one eye or leaf-bud is cut off and stuck, with leaf attached, round the side of a $3\frac{1}{2}$ -inch pot of sandy soil. A cutting with two eyes and both leaves attached, however, is preferable, but remove the end leaflet, and plunge the pot in cocoanut fibre in a cucumber or melon frame. Place a small bell glass over the pot of cuttings, and freely sprinkle the foliage. It is most important to well preserve the foliage, and, of course, when inserted the cutting should be clean and free from insect pests.

Protecting Rose Blooms.—Even the beginner, if he grows a fine Rose, wishes it to last as long as possible, and develop to its utmost beauty. With some of the Tea and light-coloured Roses, shading of the flowers is necessary. Zulu straw hats fastened on sticks are as good as anything, or a frame of wire can be made cheaply to support a piece of calico. Even a flat piece of board tacked on a stake will keep a flower clean, and not exclude the air. High-coloured Roses should not be shaded.

Treatment after First Flowering.—Go over the plants that are autumn flowering, remove any crowded growths, and those that have flowered, unless the flower has been cut with a fairly long stalk, should be cut back a few inches to a dormant leaf-bud looking outward. A

*ROSE SHOOTS OF DIFFERENT TYPES PREPARED
AS CUTTINGS.*

*HOW TO PLANT ROSE CUTTINGS IN A
SANDED TRENCH.*

ROSE SHOOT AND LEAF ATTACKED
BY MILDREW.

ROSE LEAF AND LEAFLET ATTACKED
BY "RUST" DISEASE.

better second growth is secured, and it does no harm to next season's blossoming. It is a great strain upon a plant to allow it to seed. As the flowers die off, cut back the growth at once, instead of allowing the seed-pods that appear at the base of the flower to develop. The plants should also have some liquid manure about once a week.

Pests, Insect and otherwise.—Caterpillars and green-fly are the worst insect pests. There is nothing better than hand-picking for the former. When two leaves are stuck together, or rolled up, a fat maggot will be found. Pinch the leaf, and this will settle the marauder. Constant watching is necessary. Do not let two days go by without looking over all the plants. Many a flower is injured through neglect of this precaution. When pruning is carried out as directed, and the plants relieved of much old wood, the eggs of these caterpillars will depart also. Green-fly will not trouble those who keep their Roses thoroughly healthy. Good syringings with cold water dislodge many, and it is a good plan to dip the ends of the young shoot when covered with green-fly into a vessel of strong tobacco water or quassia chips solution.

A good recipe for quassia chips solution is as follows: Take four ounces of quassia chips, steep them in water for a few hours, then simmer from twelve to twenty-four hours in a gallon of water, and add three ounces of good soft soap. When dissolved, add water to make up two and a half gallons. Green-fly upon Roses under glass can be readily exterminated by fumigating. M'Dougall's tobacco sheets are the simplest remedy. One or more, according to cubic measurement, are hung in the house, and set alight. They gradually consume, and not a fly will be found the next day. Richards' XL All is too well known to need description; it is an excellent fumigant.

Red spider is often very prevalent on Roses under glass. Want of syringing and too dry an atmosphere cause it. The leaves turn yellow and drop off. With a magnifying glass the pests may be seen running about on the under side of the leaf. The same fumigation will check them, but syringing well the under side of the leaves is the best remedy.

Mildew is a troublesome fungus. It inflicts considerable injury by choking the breathing pores of the foliage, and consequently growth is hindered (see illustration). When a plant is badly attacked, the latter has the appearance of being dusted with flour. It makes its appearance under the leaf as well as on the surface. A thoroughly good dredging with black sulphur, underneath as well as on the surface of the leaf, will check its ravages. Put some sulphur in a piece of cheese-cloth made into a bag, and thoroughly dust the foliage with it. After remaining on for two days, syringe off and give another dredging if needful; this should be done on a quiet evening, when the foliage is slightly damp. It is a mistake to wait until the plants are badly attacked, but as soon as a few spots appear, press them with the thumb and finger, previously dusting or dipping the thumb and finger into some sulphur. Mildew is the result of a check of some kind. Out of doors one cannot quite avoid it, but never let anything, if possible, check the young roots, such as strong liquid manure. Indoors one is troubled most with mildew.

In starting Roses into growth, do so gradually, then the foliage becomes as it were hard, and can stand a little cold. Give them, however, very warm treatment at the start, so that the growth is tender, and the first cold wind, or too much air, will bring about mildew. Cold winds blowing immediately on the foliage are fatal. Soot is a good remedy for mildew if applied carefully. It should be some months old, and must not remain on the foliage more than two days at a time. If the tiny white spots of mildew are dusted with sulphur when first observed, the plague is checked.

Red Rust or Orange Fungus is another troublesome fungus. It forms on the shoots like knots of powder, and is of a rich orange colour (see illustration facing p. 79). Go over the plants, and pick off and burn the leaves thus troubled. Several good syringings at intervals of a few days with Bordeaux mixture will help to check the disease.

Black Spot.—This fungus has become very prevalent in recent years. It causes circular brown or black patches on the leaves (see illustration), and causes them to drop off. Collect and burn all affected leaves, and spray the bushes at intervals of three or four weeks with Bordeaux mixture, commencing early in May and continuing until the growth ceases in autumn.

Canker.—This attacks the stems of Roses, the fungus gaining an entrance where there is a wound. It causes ugly, open scars (see illustration), but first appears as a purplish dead area on the bark. As soon as noticed this dead portion should be carefully cut away and burned. Then paint the wound with a solution of Lysol, $2\frac{1}{2}$ parts to 100 of water. There are other pests, insect and fungoid, but the above are the chief.

THE TEA AND HYBRID TEA ROSES

The Tea Rose is queen of the Rose world, and the hybrid Tea is almost as delicate in colour and in form. During recent years many beautiful kinds have been added to our collections, and this raising up of practically a new race has altered in no small degree the complexion of the English garden. A group of Edith Gifford or of Viscountess Folkestone upon the lawn is a joy, if not for ever, at least from the time the crimson shoots appear through the soil until the last flower has faded in the cold dark days of late October; and when the weather is fine in the autumn and early winter flowers may, in sheltered places, be gathered even at Christmas. A well-drained soil is most suitable, and always select a sunny aspect, although the plants are a success in a north border, the flowers appearing later. Most of the Tea varieties and hybrids may be grown as bushes budded upon the seedling briar or struck from cuttings. The plants should be kept

A ROSE STEM BADLY
CANKERED.

ROSE LEAF ATTACKED BY BLACK
SPOT.

THE NEW
AMERICAN

STANDARDS OF ROSE FLORENCE PEMBERTON WITH
VIOLA WHITE SWAN.

growing by hoeing and watering freely. Tea Roses and hybrid teas are excellent for forcing, providing lovely button-hole flowers as well as long-stemmed blooms for table or vases. Protect the bushes in winter by earthing up the base with burnt earth or ordinary mould. Then put some fern from the wood among the branches and they will be secure for the winter. Commence to cover up in November and keep soil to the base until April, but the fern should be removed now and then during mild intervals. If flowers of high quality are desired prune hard each year (in April), but if profusion then merely remove unripe ends of growths and keep the centre open.

Walls for Tea and Hybrid Tea Roses.—Every advantage should be taken of walls and close-boarded fences for the beautiful Tea Roses. Unless the walls are very high do not plant the usual so-called climbing kinds. Varieties known as the strongest dwarf growers are the most suitable. Trench the ground, plant in autumn, and prune very sparingly. Thoroughly soak the plants at the roots now and then with water. Twelve excellent sorts for this purpose are Anna Olivier, Mme. Hoste, Caroline Testout, Molly Sharman Crawford, Gustave Regis, The Bride, Billiard et Barre, White Maman Cochet, Marie Van Houtte, Sunburst, Mme. Charles, Mme. Lambard, and Mme. Abel Chatenay.

Hybrid Perpetual Roses.—This famous group of Roses has its origin in the Damask Perpetual which was crossed with the Bourbon, Hybrid Chinese, and other closely allied kinds, and practically all the varieties have been raised since the year 1844. The h.-p.'s, as rosarians called this class for the sake of brevity, are more in request to give those beautiful flowers seen at the exhibition, perfect specimens of form and colour, but not always so perfect or desirable in the garden. There is no question that the hybrid perpetual is for the garden doomed to partial extinction through the raising of so many charming hybrid tea-scented varieties, brilliant China, or Monthly Roses, flowers far more worthy of the name perpetual than those so christened, possessing also greater delicacy of colour and form. But we hope the day is far distant when the hybrid perpetual Roses, flowers of intense colour, deep crimson, pink, rose, and white, and many other shades, and filled with richest perfume, will entirely disappear. We have need of them.

Standard Roses.—When these are desired the planter would do well to select them from the hybrid perpetual and hybrid tea races,

except a few from the climbing Tea-scented and Noisette sections to vary the colouring. If well chosen they are excellent for bordering the lawn or for the centres of beds.

Climbing Roses under Glass.—Climbing Roses succeed best when they can receive plenty of heat and moisture after flowering the first time to perfect new wood for the following season. The old wood is partially cut away when the flowers are gathered, and by giving heat and moisture fine new rods are produced, which should be well ripened. Climbing Roses also succeed well if the long growths produced the previous summer are bent down on a framework of wire or wood about a foot from the side benches. A flower-bud, with of course a short stem, will start from nearly every one of the eyes. After flowering cut the shoots back hard to promote fine long rods early in the year. This is only possible where artificial heat is available. Unless that is so it is better to leave the growths unpruned and thin them when they become crowded or too old, merely shortening the laterals to one or two eyes.

Maréchal Niel Rose under Glass.—This glorious Rose deserves a house to itself, but this is seldom possible. It must be grown with a variety of greenhouse plants. The three points essential to success are: a good border; a healthy plant, well rooted, and young; good annual growths thoroughly hardened.

A Good Border should be made inside the house. Prepare it as if for a Grape Vine. Remove the old soil to a depth of 3 feet; put about 9 inches of drainage in the bottom, consisting of clinkers, large stones, or broken bricks. Then fill up with a compost of three-parts fibrous loam, one-part cow dung, and a 6-inch pot of bone-meal to each wheelbarrow-load of soil. When the loam is obtained fresh from a meadow put the turfy portions with the grass side downwards. This work should be done some five or six weeks before planting time, which is for preference in October.

A Healthy Plant.—The best stock to grow Maréchal Niel upon is a hedge briar, known as a half-standard. The briar may either be planted first and budded afterwards, or a plant procured already budded. When the latter, see that it has an abundance of fibrous roots. When this is the style selected, prune its growths back to within an inch or two from where it has been budded. This can be accomplished about January or February. Do not give too much heat at first. The slower the new growths break the better, and as they grow, train them horizontally. If the plant is put on one side near the centre, one growth would be trained to the right and one to the left. These would probably reach further than the ends—if so, do not prevent them. Pinch out the points in September to help the shoots to ripen. These two arms provide, as it were, the limbs for the base of future shoots. The following spring, retain the growths of the same length as the house is, then, as the new shoots break out, the best are led up the roof and tied to wires. More shoots break out than are wanted; the best only are retained, and, as far as possible, at even distances apart, say about one foot. Suppose the roots work freely, these shoots will go up the roof on one side and

THE
GARDEN
OF
THE
FUTURE

PROTECTING STANDARD ROSES IN WINTER.

THE
GARDEN
ARCHES

Hudson & Kearney

ARCHES OF ROSES ON THEIR OWN ROOTS.

down the other. They must be stopped in autumn, but not too early or they will break out into growth again. The object is to get them thoroughly hard, for it is upon these that the flowers appear, and if they are good, strong, hard growths some noble blossoms will result.

Now comes the question of the rods for future requirements. After flowering cut the canes right back to the two main arms, and again the latter send out new shoots, which will require thinning as before. After flowering maintain a good heat, and freely syringe the plants before eight o'clock in the morning, and after four o'clock in the afternoon. The border must not be neglected, but usually one or two good waterings suffice, with an occasional dose of liquid manure. Before doing so prod the soil with a fork. This, then, is the best plan of growing *Maréchal Niel* Roses.

But it may also be grown in a cold-house. Here again we advise half-standard plants, but they must not be pruned back so hard, as artificial heat is not available. Keep the growths well spread out, and weak wood thinned out. Remove old shoots now and then, and retain as much new wood as possible.

Amateurs would find this Rose profitable to grow, especially if retarded so that the plants flowered about the end of May and early June when Roses are scarce. This can be done by pruning late and keeping ventilators open night and day. We have seen the door made in two sections so that the lower half is kept always open, thus allowing a current of air to enter without a draught being caused.

Preparing a Border for Roses under Glass.—Allusion has been already made to this work. When it is decided to plant out all Roses (and we strongly advise this) prepare the border in the same way, even for dwarf growers. Roses glory in good loam, but they detest stagnation, hence the need for drainage either natural or artificial. An investment in two or three cartloads of loam will well repay the grower of indoor Roses.

Roses in Small Greenhouses.—In a small structure where other plants are grown, Roses should be in pots or tubs. If there are no cold draughts the hardier section can be cultivated. Such plants as have been grown for twelve months outdoors in pots are the best for the beginner. The pots are full of roots, which is the main secret of success. Supposing the beginner wishes to grow a few pot Roses let him either purchase established plants in 6-inch or 8-inch pots or bushes in October and pot them up himself. Prepare some compost in September, and this should consist of three-parts loam, one-part well-rotted manure, preferably from the cowyard, not fresh but one year old. Then add a little artificial manure at the rate of a 6-inch potful to a wheelbarrow-load of soil. Mix all well together, and let it remain in a rain-proof open shed until required. When plants are received in October, cut off all foliage, trim back the growths to $1\frac{1}{2}$ to 2 feet, shorten the roots a little, and smooth off jagged ends, and they are ready for potting. Keep them in the shade until potted. Prepare some 8-inch pots by washing them inside and out, place about $1\frac{1}{2}$ inches of drainage in bottom,

and a little well-rotted manure over the crocks. Take the plant in left hand, carefully arrange the roots to prevent cramping, and with a wooden trowel place some of the compost among the roots. Ram the soil about the roots firmly with a potting stick, then put in some more soil, give another ramming, and the operation is complete when the soil reaches the rim of the pot. Keep the tops well syringed, but do not water the roots for a day or two, and then only give one good watering. Plunge the plants in some ashes outdoors unless a cold pit is available, then it is better they should be kept in this, with the light off, unless frost or heavy rains intervene. Prune the plants in February, cutting them back to 4 or 5 inches from the top of the pot. Keep lights off on mild days, but put them on every night. Neither let the soil get quite dry nor over water. As new growths appear keep the plants well apart, and fumigate with tobacco sheets when green-fly is seen. It is not necessary to keep the plants in pits, but it is advisable, as then one is able to prune earlier without danger of new shoots being injured. Simple pits may be made with turf walls, and any handy man can make a light, or the parts can be purchased and nailed together. By May there will be fine flowers on these plants. Plunge outdoors in full sun for the summer, and in autumn they may be introduced to the greenhouse. Pits with a southern aspect will grow Roses quite as well as a greenhouse; in fact, they would be better if it is necessary to have other plants too. Give a top dressing the first year, not repotting. This is accomplished by scraping away about an inch of the surface soil; scatter a tablespoonful of guano on the soil, and replace the soil removed with some fresh loam. If a *Maréchal Niel* or other climbing Rose is desired to grow on the wall or roof of the greenhouse, either plant it in a large pot or tub, unless a small border can be prepared for it, as advised under heading of "*Maréchal Niel under Glass*" (p. 82). If in pot or tub, give plenty of drainage, and raise it upon two or three bricks, so that water can pass away freely and also air enter the soil.

Climbing plants known as "extra sized" in 8-inch pots are the best to secure. For very small houses it would pay the grower to renew the plants annually, for the nurseryman has better facilities of growing this class of Rose correctly. When purchased no pruning is necessary, save the extreme ends of the growths, for the stems should be well ripened and in condition to produce a number of fine flowers the following spring. Unless these climbing Roses, especially *Maréchal Niel*, can be made to yield new and strong annual growths they soon deteriorate, hence the advice to purchase annually, for they can be secured for two or three shillings, and the flowers they yield would realise more than this at wholesale prices.

Potting Roses.—Roses forced in strong heat should be repotted in July, and those grown in cool house in September. The pots and crocks should be clean and pot firm; the soil must not be too wet or too dry. Give ample drainage, and do not sift the soil, as Roses like the little lumps of loam. The best compost consists of three-parts loam, that which has been stacked twelve months, if one can obtain it; one-part

ROSE BLUSH RAMBLER GROWN AS A PILLAR.

ROSE DOROTHY PERKINS VEILING AN UGLY CEMENT WALL BY
THE WATERSIDE.

one-year-old cow manure ; and a 6-inch potful of bone-meal to a barrowful of the prepared soil. When about to pot, turn out the plant, lay the ball on its side, and remove the crocks. Then with a pointed stick gently prise up the surface of the ball. This releases the roots, and some of the soil at the same time. Then take the mass in both hands, and shake gently. Place it carefully in the centre of the pot, and fill up with compost, ramming this hard in. The pots must not be filled too full, merely to the rim. Place the plants on a bed of ashes when potted, and keep them here until wanted, unless frosts or heavy rains intervene.

Pillar Roses.—For many varieties of Roses the columnar, or pillar form, is the most natural as well as the most attractive. A pillar, say of Crimson Rambler, well isolated upon the lawn, its fine growths darting out here and there to relieve the pillar of formality, is, when aglow with its crimson panicles of blossom, a gorgeous picture. By selecting the freest growers, and placing the pillars some 12 to 20 feet apart, and connecting each by chains hung loosely, a pretty effect is produced when the growths are sufficiently developed to clothe the chains with blossom. For this purpose, what are known as running Roses, are only suitable. Here the new *Wichuraiana* tribe will prove useful. Old kinds, such as *Flora*, *Aimée Vibert*, the *Garland*, *Dundee Rambler*, *Ruga*, &c., are also good. For pillar Roses, four-pronged iron stakes should be used, if possible, unless some stout larch poles are available. As Roses of this kind are often fixtures, trench the ground well before planting, working in some good manure and burnt garden refuse. Place the pole in position before planting the Rose. Early planting is advisable, and in all cases pillar Roses should be cut back rather hard the first year, say within two feet of their base, or even lower would be better. The growths that result from this pruning are then retained their full length another season. When the plants become filled out with wood or growths, two or three supplementary stakes placed around, as one would tie out a *Dahlia* plant, prevent overcrowding. It is when such pillars are bunched up that insect pests become a great trouble. As the pillars develop, old worn-out growths should be cut clean out in early autumn, and the healthy one, two, and three-year shoots only should be retained, and not all of these if likely to crowd too much. The lateral shoots breaking out from the main growths may be cut into three or four eyes, or left longer. It is generally from these laterals that the best blossoms are procured. Pillar Roses should receive liberal doses of liquid manure.

Creeping Roses.—Sloping banks are not generally suitable for trees or shrubs, but by planting such things as creeping Roses on the top, and allowing them to run down the bank, much beauty is given to the garden. Now that we have the delightful and valuable *Rosa wichuraiana* and its hybrids, one need not look further for suitable kinds. Most varieties are now to be had on their own roots. The type will make yards of growth in a season. In August it is bespangled with delightful star-like white flowers, and its small shiny foliage has a most refreshing

appearance. Jersey Beauty, Ruby Queen, Evergreen Gem, and Gargania are all worthy sorts, and most luxuriant growers.

Pegging-down Roses.—This is a first-rate method of growing the vigorous Roses. Plant them from 2 feet 6 inches to 3 feet apart; prune hard the first year, then the following year tie down the long growths parallel to the ground. Flowers will appear along the shoots. Later on young growths start up from the base, and, if allowed to grow upright, will bloom about a month later than the pegged-down shoots. When the long shoots appear worn out, cut them clean away, and peg down young ones instead; indeed, it is advisable to do this whenever possible provided they are well ripened.

Beds of Roses so treated make a fine feature on a lawn, such kinds as W. A. Richardson, Frau Karl Druschki, Gustave Regis, and others, blooming most profusely, as will also strong-growing hybrid perpetuals and Bourbons.

Roses for Hedges.—In small gardens it is better to plant hedges, where required, of some good shrub that will serve as a dividing line, and give an abundance of flowers too. For this purpose nothing can be better than the Rose. Given good soil, deeply dug, with a good dressing of manure when preparing, and also yearly afterwards, vigorous hedges may be produced. Plant the bushes from 2 to 4 feet apart, according to whether a thick or thin hedge is wanted. Where a wall of Roses, rising some 8 feet to 10 feet, is preferred, rambling Roses would be best. Secure in the ground at intervals of 6 feet or 8 feet some good, stout oak posts. Stretch some wire in between them, to which fasten the Roses. By bending them out palmate shape a pretty effect is created.

It is not possible to get a safe shelter with the help of only Roses, but certainly they may be used as a screen. Where the position is cold and exposed, an outer belt of Austrian or Corsican Pines, or some other good tree, would be necessary. A free growth, of course, is essential.

Preparation of the Soil is important. Most soils are improved by draining. We know that the wild Roses grow vigorously in country hedgerows with dykes on either side. If the staple soil is a heavy clay, before planting a hedge put down some drain-pipes about 2 feet 6 inches deep. If a clayey loam, then about 3 feet. The ground should be trenched two spits deep for the heavy soils, and bastard trenched for those of a lighter nature. Good, well-decayed farmyard manure, together with burnt garden refuse and bone-meal, all favour a vigorous growth in the hedge. Rather than make the soil sour by too much raw manure, give liquid manure liberally, not only in summer, when growth is active, but also during winter, when usually this valuable liquid runs to waste.

Most of the kinds recommended will in time support themselves; but if a tall hedge be desired, set some oak posts in the ground at intervals of from 6 feet to 8 feet to support two or three lengths of wires. Galvanised wire must be *painted*. Give the plants plenty of space to extend laterally, so as to secure robust base-growth.

ROSE LADY WATERLOW PEGGED DOWN.

THE
GARDEN
OF
THE
GODS

Rose hedges must be pruned to promote an abundant flower display. The way to prune will depend upon the variety. Avoid, of course, any trimmed-up effect. The branches should droop with their flower burden. Growths one and two years old produce the finest flowers, and on some kinds laterals appear from three- and four-year-old wood. One or two branches may be cut out of each plant so as to give those remaining more space for development. This pruning may be carried out in the autumn; it is a better time than the spring.

With regard to the stock, secure, if possible, strong own-root plants. If this cannot be managed, then get them upon the seedling briar, the roots of which go down deep, and the plant is then better able to resist drought.

The Sweet Briar is of course the hedge of hedges. Pleasant is it to wander round the garden in the clear light of a June evening when the air is saturated with the perfume of the Sweet Briar, fresher and sweeter still when the day has been warm and moist. Many of the Penzance briars are almost as sweet, and are now largely used as hedges. Unfortunately the flowers are quickly over, but they welcome us in the early summer, and in the autumn we have in their place a harvest of bright fruits, especially upon the one named Amy Robsart. The Penzance briars are remarkable for the brilliant colouring and profusion of their hews. There are not many truly distinct kinds, as a family likeness runs through them all; but Anne of Gierstein, or Meg Merrilies, deep crimson; Amy Robsart, pinky-white; and Lady Penzance, with copper yellow flowers of great beauty, are the most useful.

Several single Roses are of value, some for their richly coloured bark in winter, others for their hews. *R. lucida*, *R. polyantha Thunbergi*, and *R. rubrifolia* may be mentioned as the most suitable.

The Japanese Roses are, perhaps, apart from the Sweet Briar, the most useful of all Roses to make hedges of. The plants make a dense prickly growth, and are beautiful practically the whole year, as the fragrant flowers are followed by large crimson fruits. The plants are apt to become bare at the base, but not so if pruned in the way advised.

Hedges round a Lawn or Flower Garden.—When a dwarf hedge is desired, and nothing can be sweeter than Roses round a tennis court or lawn, choose first the Monthly or China Roses. When finer individual flowers are preferred, place faith in the Tea and hybrid Tea Roses, such as Mme. Abel Chatenay, Caroline Testout, Viscountess Folkstone, Marie van Houtte, Gloire de Dijon, and Gruss an Teplitz, all Roses that will grow between 4 feet and 5 feet in height. A dense hedge may be formed with the early-flowering Scotch Roses and the single kinds of the same race.

Selection of Roses.—As complete selections of Roses as possible are given in the tables on p. 574, bearing in mind the readers for whom this work is chiefly written. It is therefore needless to repeat them in this chapter.

China Roses.—Although the China or Monthly Rose has many delightful attributes, it is by no means present in every garden; indeed, one may go through many and never see it at all. Some one who truly loves good garden plants says: "If I had only one square yard of garden it should have a bush of Rosemary, but if I had a yard and a half it should have a Rosemary and a China Rose." It is, indeed, a delightful flower this common old kind, with its loose clusters of cool pink bloom, sometimes cup-shaped and sometimes flattened from the slight reflexing of the fully expanded petals, always dainty and pleasantly fresh-looking, and with a faint and tender scent whose quality exactly matches its modestly charming individuality. There are garden varieties of deeper colour, but these seem rather to lose the distinctive grace of the type; it is one of the cases, of which others might easily be quoted, where any departure from the type gives varieties that are a loss rather than a gain to beauty.

If proof were needed of the merit of this good plant it might be found in the many ways in which it can be used. A hedge of China Rose is always pretty, and there is a certain class of greyish foliage with which it enters into most satisfactory combination. The cool dusky foliage of Rosemary is the best of grounds for the clear pink flowers, and the grey of Lavender is equally pleasing. Old Lavender bushes that are somewhat overgrown, and whose branches fall about, leaving dark empty spaces in the heart of the bush, seem to invite the companionship of these pretty pink Roses, whose flowering branches can be led into the empty spaces. Even if it be desired to do away with the old Lavender, whose lifetime is shorter than that of the Rose, and to plant them afresh, that is only an opportunity for cutting the Roses down and letting them grow up anew in company with the young Lavender.

But it is not with grey-leaved shrubs alone that China Roses should be planted. Their fullest season is towards the end of June, but even as late as October they are fairly full of flower. The flowering bush Ivies are then in bloom, and on sunny days attracting a busy humming crowd of insect life. Here again the pretty pink of the Rose bloom is charming, with the yellow green of the Ivy clusters, and as the Ivy bushes grow to their full height of 5 feet or 6 feet the Rose shoots up in friendly companionship, and thrusts long flower-crowned stems through the mass.

With the *Anemone japonica* it also groups well, or with hardy Ferns, and makes good autumn garden pictures. No

Rose is more accommodating, for it will bloom either in sun or shade.

Of late years the China Rose has been wisely used by hybridists, whose labours have given us charming Roses that inherit the long-blooming qualities of the parent.

Green Centres in Roses.—Beginners are often perplexed as to why their Roses should come with green centres. The most common cause of this troublesome occurrence is spring frosts. At pruning time, especially when the season is early, one is tempted to leave young promising growths, but unfortunately the frost comes and so injures the embryo buds that these green centres are the result. Another cause is over-feeding with chemical manures. The remedy in both cases is obvious.

WORK MONTH BY MONTH

The Rose is a flower so popular and beautiful that the work required amongst the plants month by month will prove helpful to the beginner.

JANUARY.—On established Rose-beds strong liquid manure may be poured. Standard briars may still be planted if weather is mild. Indoors, the borders or large tubs of permanent Roses should receive a top dressing. Remove 2 or 3 inches of the old soil, scatter on some good artificial manure, then replace soil removed with fibrous loam and well-rotted manure in equal parts. If borders are dry, give a good watering first.

FEBRUARY.—If farmyard manure be applied to the beds this should now be dug in. Do not dig very deeply, just enough to bury the dung. The surface of the Rose-beds should also be loose. This is not a hard matter to secure if the hoe be diligently used. Planting may still be done if mild and dwarf stocks for budding should now be set out. The stocks are better heeled in if frosty, for the frost only draws them out of the soil and practically kills them. So when cold weather threatens wait for milder days. Give the beds of established Roses a dressing of manure; keep the surface soil loose so that rains will wash down the nutriment. If the appearance of manure is objected to cover it with soil. Artificial manures are a great aid in developing good blooms. The cheapest and one of the best for this purpose is basic slag, which should be applied early in winter at the rate of 4 to 8 ounces per square yard.

Cuttings inserted in autumn will require pushing down, as the frost usually raises them, and unless their ends rest on the soil failures will occur. Hoe the cutting beds when necessary. Pruning should be done now to plants upon walls; this will merely consist in tipping the ends of shoots, for the thinning should have been done in autumn. Release the growths from the wall to retard them as much as possible. If they break too early much disappointment occurs through injury by spring

frosts. Hardy Roses, such as Mosses, Gallicas, &c., may now be pruned. Budded stocks should now be cut back as far as the inserted bud. After this cutting back, the soil is then dug thinly and laid up as rough as possible to sweeten. Any old bush Roses one does not care for, if cut down to the ground, may be rebudded in July with good kinds. Where one desires to layer some Roses, hard pruning should be done now. Give new stakes to standard and pillar Roses before March winds arise.

Roses under glass will require much attention. Keep the soil rather dry until new growths are about one inch in length, then give plants a good watering with tepid water. It is best to repeat the watering the next day in order to thoroughly soak through the ball of earth. Put the plants upon inverted flower-pots on two bricks. Fumigate whether fly is seen or not. The Rose house should receive a dressing of lime-wash upon any brick-work inside. Paint the hot-water pipes with black sulphur. If some skim milk is mixed with the sulphur the latter adheres to the pipes better. Do not give side ventilation to pot Roses, but top air on all suitable occasions. If the sun is bright forestall the rapid rise of temperature by timely ventilation. Shut the ventilators about three o'clock. Pot Roses revel in the sun heat thus enclosed. Syringe the plants every bright morning with *cold* water. Endeavour to harden the foliage so that it will withstand the mildew which often causes so much trouble. Sudden risings or lowerings of temperature as well as cold draughts bring mildew quicker than anything else. As soon as a spot of white downy substance is noticed rub it with finger and thumb dipped in sulphur. If bad attacks of mildew should appear syringe the foliage with V. 2 K. fluid, using a fine spray syringe. Jeyes' Horticultural wash is also an excellent remedy. Prune Roses in cold pits.

MARCH.—Planting may yet be done, but, if dry, water frequently. The plants should also be hard pruned before planting. Cut newly-planted Tea Roses back to 3 or 4 inches or less. They are sure to grow well if roots and growths are healthy. Pruning should be finished by the second week. In the north the third and fourth week will do. Prune all now except the Teas, Polyanthas, Noisettes, and Chinas. After pruning dig the land thinly. The best plan is to lightly prick it up with a fork. On no account dig deeply, for the feeding roots run close to the surface. If ground has been well prepared avoid mulching beds with manure, as this mulch shuts out both sunshine and air. Mulchings are only beneficial during hot days when plants are growing fast, and a good loose blanket of earth is better than all the mulchings with manure. Dwarf stocks for budding should now be planted. Where the pegging-down system is adopted with vigorous growing Roses, some of the ripest and longest growths should not be pruned. Do not, however, bend them down until April.

Indoor plants showing buds may have weak liquid manure twice a week. A layer of fresh cow-manure is also of much benefit if applied to the borders now, or to the surface of the pots. Do not allow the temperature of the forcing-house to fall below 55° at night. Where

A FINE WEEPING STANDARD OF ROSE DOROTHY PERKINS.

*ROSE FÉLICITE ET PERPETUE SURROUNDING
A WINDOW.*

Roses are grown without artificial heat by day, provision should be made to afford a mild amount during the night. A little heat about ten o'clock at night to such houses will suffice. This will prevent the temperature declining below 45°. It also wards off injury through a stagnant atmosphere. No doubt Tea Roses are best grown quickly, so that if no heat or very little be available it is wise to cultivate the hybrid perpetuals and the freest of the hybrid Teas, for they can endure a lower temperature than Teas. By the end of the month the soil around the Teas outdoors may be removed, and also the litter from heads of standards and bushes. Keep lights on the Roses in cold pits every night, but remove by day unless very cold winds prevail.

APRIL.—Tea and hybrid Teas, Chinas, and Polyanthas, if planted late, will give a succession of blossom when the established plants are over. Procure dormant plants, viz. those that have been heeled in under north hedges or walls. Dip their roots in mud-soup before planting, and prune back hard all the growths. Tea Roses and allied tribes may now be pruned. Remove earth from budded stocks, and place a stick against each, in order to tie the bud securely as it grows. Budded standard briars should have a thin stick tied on the upper part of stem for a similar purpose. Keep the hoe frequently used now among all Roses. Scatter soot on land and hoe it in. This is beneficial to Roses, and wards off insects and fungoid troubles. Water newly-planted Roses. Climbers under glass as they go over may be pruned. *Maréchal Niel* if cut back to about 3 or 4 feet from the base of the growths will be induced to make new shoots which will give the best flowers next year.

This is an excellent time to plant out own-root or cutting Roses from pots.

MAY.—Insects will now prove troublesome. Go carefully over the plants and give a pinch where the enemy appears to be hiding. Disbud growths on the plants. Rub off the supernumerary shoots in the centre of the plants. Two or three of the best on each growth will suffice. Liquid manure may be given now about once a week if weather be dry, but first apply plain water. If the season be wet, a sprinkling of artificial manure will be more beneficial. Sometimes bad frosts occur this month. Wall Roses pay for a mat hung over them each night till danger is past, which is in about the last week. Wall Roses also need a good soaking of water once a week. Like wall-fruits they often are neglected in this respect, and really need it most. Hoeing is an important operation. A sprinkling of bone-meal is helpful; keep it well hoed in. Suckers must be cut away as they appear. Standard briars for budding must have their shoots thinned. Retain three or four at the top or lower down if stronger.

This is a good time to put in cuttings in a greenhouse. Select shoots that have flowered. Cut them in lengths of 4 inches to 6 inches or more, remove lower leaves and dibble into very sandy soil, or all sand may be used. Place a large cloche or bell-glass over them, and keep the cuttings lightly sprinkled each morning. Shade from midday sun. Wipe the glass every morning. In about five weeks the cuttings may be

potted off into 3-inch pots. Keep them in a close frame in the greenhouse for a few days after potting.

Tea Roses in pots after flowering should be rested for a time by partially withholding water. Shorten the growths a little to good plump eyes. When buds are again active give the plants water and syringe now twice a day. Air must be more plentifully afforded, and a little let in at night. Hybrid perpetual Roses after flowering should be plunged outdoors. Stand them on ashes or two bricks and surround the pots with ashes or soil.

Green-fly or aphid will now be troublesome. As a rule, it is generally upon Roses not growing freely or in an unhealthy state. A good remedy is to dip the shoots covered with the aphid in tobacco water. Put one pound of tobacco paper into one gallon of boiling water; when steeped well, add one gallon of soft water. Keep a stock of this, and go round the plants and drench the shoots with it.

JUNE.—Any gaps in Rose beds may be filled up with plants from pots. Those potted in October are best for the purpose. Make a hole for them, turn the plant out intact, and carefully set it in, then fill up with soil. Tread carefully around the ball of earth so that it be not broken. If no check be given, such plants flower well from July till October. To old-established Roses in the best condition, applications of night-soil and sewage are beneficial, but must not be given to weakly plants. Draw a drill down the centre of the row between two rows of plants, pour the night-soil in, and return soil. Rains soon carry down the food, and a marked difference is manifest in foliage and blossom. Disbudding must now be done in the case of Roses for exhibition. The centre bud is usually retained, and the two side ones removed. Do this as early as possible, even if you have to prick them out with a goose quill, then all the strength goes into the bud retained. With Teas for exhibition it is even necessary to remove the side shoots that break out before the bud is as large as a marble. But for garden decoration the glorious Teas should have all their buds retained. Some of the hybrids that make bunches of buds are all the better thinned even if only for cutting for decoration, otherwise no good flower will develop. Show boxes must be prepared. Nothing helps more to win prizes than a good style of arranging the blossoms. Foster's tubes prevent dumpiness. Give liquid manure twice a week to such Roses as have not received an artificial dressing. In watering remember a good soaking is better than three or four dribbles. Worn-out pot Roses, or plants that have become leggy, if planted out into good loam, will enjoy a fresh lease of life.

The glorious array of single and semi-double Roses, briars, and a host of lovely kinds will now be in full bloom. Try and see a good collection growing. More will be gained than by an inspection at a flower-show.

JULY.—As the perpetual Roses go out of bloom, cut back their growths to a good eye looking outward, but not too low. If this is done carefully the perpetual character is more developed. Old growths

GARDEN ROSES ARRANGED IN A FLAT WICKER BASKET FOR EXHIBITION.
THIS METHOD IS LARGELY ADOPTED NOW AT THE PRINCIPAL SHOWS.

*A BEAUTIFUL ARCH OF ROSE BLUSH RAMBLER IN A
WEYBRIDGE GARDEN.*

on Wall Roses, such as Teas, Banksias, &c., when they have blossomed should be removed, retaining last season's growths, and those of the current season. Tea Roses in pots that have now flowered for the second time must be removed to a sunny spot outdoors. Do not neglect them, but give liquid manure now and then, and they must not suffer for want of water. They must remain here until the time comes to repot (September). Repot now Roses required for early forcing next winter. Pot off cuttings rooted under glass. Put in cuttings under bell-glasses in a shady spot outdoors. If able to attend to them the cuttings do remarkably well if dibbled into small pots, one cutting in a pot. Use very sandy soil. The frames of such cuttings may be placed in full sunlight, but paint the glass with whitewash containing size. Sprinkle the foliage every hour when the sun is bright. Cuttings will root in this manner most readily. Then remove them to a pit, and repot when required.

Cuttings rooted in greenhouse should be potted off when the roots are about an inch long. Keep in a close frame in house for a week, then put on stage, standing the pots on ashes. Do not water much at root, but keep tops lightly syringed two or three times a day. If mildew becomes troublesome indoors or out, give a good dusting with black sulphur. Sulphide of potassium sprayed on foliage is an excellent preventive, so also are V. & K. fluid and Jeyes' Horticultural wash. Spray the under part of foliage also. Suckers must be kept down, those from the root being removed with an iron spud.

Budding will now be in full swing.

AUGUST is a quiet month. Mildew is usually troublesome, but it cannot well be avoided—one is at the mercy of the weather. The most affected shoots may be cut off. Mildew is often caused through want of good hoeing, too much water or not enough, and over-doses of liquid manure. Trench ground well, keep plants thrifty, and much of the evils they are prone to will disappear. Soil should now be prepared for potting next month. If bone-meal is used (and no better fertiliser for Roses can be found) add this now at the rate of a 5-inch pot to a barrow-load of soil. Keep the compost in an airy shed away from wet.

Layering is best done this month. Wherever a growth is pliable enough to bend, an own-root plant may be secured. Give the shoot a twist if too risky to cut it; put it under the earth as explained, using plenty of sand about that part which is under the ground. Fine plants in about eighteen months are to be had by this method of propagation.

SEPTEMBER.—Where possible the beginner should commence his operations this month. The bed or border that he proposes to plant with Roses should be trenched. By doing this a month before planting the ground settles down and is in better condition for planting when the time arrives.

Cuttings of hardy Roses should now be made and planted at once. This would include some cuttings of Hedge Briers, also Manetti, for stocks, if anxious to bud a few for one's self. If Manetti be not available, cuttings of old-fashioned and Rambler Roses will answer as well.

Buds that were inserted in July should now be untied if not already done. If any are dead it may not be too late to rebud dwarf stocks.

Climbers on walls, arches, or pillars should be unfastened and old and dead wood cut away. Where plants have been neglected this thinning should be done by degrees, not in one season. Tall climbers, such as Gloire de Dijon, are best unfastened and laid carefully on the ground. The old wood can be more easily removed and the plant re-fastened in a more satisfactory way. Roses that were grown under glass in the late spring, and that have been plunged outdoors for the summer, must now be repotted. Afterwards stand them on a bed of ashes, and syringe morning and evening for a week or two. If very dry, water at the root. Loam may sometimes be bought at a reasonable price where building operations are going on. If so, do not fail to secure a load or two. This is the stuff to grow good Roses in, both in pots and beds.

OCTOBER.—Study the catalogues carefully and give the order early. Never buy cheap Roses because they are cheap. Go to a good house that has a reputation of supplying quality and true to name. Remember many of the old Roses are still the best. The lists have been carefully prepared, so that the novice need have no hesitation as to his selections. By the third week planting may commence. Roses may be planted from October to April, but October and November are the best months. If the plants have much foliage when received cut it off. Cover their roots with earth immediately the package is undone. Never let the roots become exposed to sun or wind. If the weather is dry, water the plants before filling in all the soil, and again at intervals of a few days. Replanting of established Roses may be begun at the end of the month. Roses that have been planted from six to ten years may be safely transplanted, and this often gives them a new lease of life.

NOVEMBER.—Planting is now in full swing, many millions of Roses being annually planted during this month.

Standard Briars for budding should also be planted, other stocks being best kept healed in until February and March.

Tea Roses grown as bushes should be earthed up like potatoes by the end of the month. This is maintained until March. Bracken fern should be at hand ready to place among the branches both of bush and standard Teas.

Pot Roses must now be put under cover, except those potted from the ground last month. These may be kept outdoors plunged until January, unless the weather is very severe.

DECEMBER.—Be prepared to protect Tea Roses if hard weather occurs. They are better for the free circulation of air, providing the frost is not severe. During mild intervals the fern litter or evergreens should be removed, to be replaced when hard frosts occur again. Pot Roses for early forcing should now be pruned. With moderate heat, three months elapse from the pruning to the blossoming of a pot Rose, so that if wanted before March the plants should be pruned in November. Climbers under glass, if attended to in the summer, will merely require tying out now.

Roses over Old Trees.—A delightful way of growing the stronger Roses—*Aimée Vibert*, *Mme. Alfred Carriere*, *Bennett's Seedling*, *Flora*, *Paul's Carmine* and kindred varieties—is to allow them free play in an old orchard. Perhaps there may be dead trees, then convert them into fountains of living beauty with Roses. The climbing Roses are more beautiful when grown in such ways than against a brick wall. Plant them well, and give a yearly top dressing of manure, and always remember that climbing Roses need no pruning in the general acceptance of the word; it is simply necessary to cut out the old growths after flowering is over to encourage the strong new wood. Very good Roses for growing against trees are: *Aimée Vibert*, *Dorothy Perkins*, *Crimson Rambler*, *The Garland*, *Félicité-et-Perpetué*, *Excelsa*, *Bennett's Seedling*, *Claire Jacquier*, *Gloire de Dijon*, *Mme. d'Arblay*, *Alberic Barbier*, *American Pillar*, *Blush Rambler*, *Ard's Rover*, *Reve d'Or*, and *Paul's Carmine Pillar*.

BULBOUS FLOWERS

HARDY bulbous flowers are a sheet-anchor for the beginner, who need merely plant the bulbs in the autumn, and await results. Their fresh beauty and cheapness should make them more popular than they are even in these days of general gardening, and those with greater opportunities of painting beautiful pictures than are provided by the mixed border of the ordinary flower-bed, may enjoy the Daffodils and other early flowers in meadow, in shrubbery margin, and beneath trees in the orchard. It is only in recent years that we have learnt how beautiful many of the hardy flowers are, and especially those that have bulbous roots, when planted out in grassy and other half-wild places. The nature lessons that lay before us in meadow and woodland were long unheeded, and yet they were patiently awaiting for just appreciation. The Fritillaries and Daffodils of our strong-soiled meadows, the blue Hyacinths and purple Orchis of our woodlands, the Snowflakes of the river banks, these and others in our own land, and to travellers the Poet's Narcissus of the Alpine meadow, the sheets of other Daffodils in Pyrenean mountain valleys, the Crocuses and Cyclamens of southern Italy, and many other foreign bulb familiar only in our gardens, were all waiting to teach us a lesson. All these good plants, though known to us for garden use, had never been utilised to the full of their ornamental capacity until we were taught to have them in bold plantings outside the garden proper, in wider spaces, where they not only could show a much larger measure of beauty, but were safe from the continual disturbance that bulbs must suffer when grown in close association with other plants.

It is only now, since we have learnt to plant our bulbs boldly in such ways, that we can see the full beauty of their effect in the mass, and can enjoy the pictorial aspects of the flower-enriched landscape.

Of all bulbous plants the Daffodils must rank the highest in their willingness to enliven wood and meadow-land. Not only do they show at their best when so grown, but such

treatment also suits them admirably, for many kinds that are tender or unsatisfactory in gardens will grow willingly in the sheltering grass of field or copse, and make but slow and steady increase, that seems to tend to more healthy reproduction than the unnatural stimulation of manured garden ground.

When one thinks of the great range of choice, of the many kinds of Daffodils, of Snowdrops, of Scillas and their allies, of Iris and Dog's Tooth Violet, of the early winter Aconite, and the autumn Cyclamen, Crocus, and Colchicum; of the strong and stately Crown Imperials and Tulips of spring, and the dainty Acis of latest autumn; of Lilies, many of them doing best in the wild; when one thinks of all these, and many others, one becomes aware that there is no lack of material, but that it is only apathy in its utilisation that leaves many a rough space in the garden outskirts bare and featureless when they might be gladdening us with smiling pictures of floral beauty.

SOME PLACES TO PUT BULBS

The following hints may be useful to beginners. Sometimes there occurs in a garden a low bank or bed of hardy Ferns. The spaces between these offer excellent places for bulbs, such as the smaller Scillas, Chionodoxas, and Puschkinias. This is well worth noting in preparing a Fern garden—a kind of garden that seems to have fallen into disuse, but is capable of being made extremely beautiful, though not by planting the Ferns among heaped-up stumps, as was formerly so often done. When the little bulbs are blooming the Ferns are not yet thinking about unfolding their fronds, but after the bloom is over and the foliage has grown full and tall, as it begins to turn colour after completing its life-work, the Fern fronds are unfurling and spreading over the ground. To avoid the monotony that might be felt if the space showed nothing but flowering bulbs and brown tufts of undeveloped Fern, it would be well to introduce just a few early-flowering plants such as Dentaria, Woodruff, Virginian Cowslip, and the pretty feathery *Myrrhis odorata*. Among the bulbs, first there are the splendid blues of the Chionodoxas and early Scillas, then there is a range of colourings that must be kept apart from these, and will do well amongst themselves or near neighbours. These will comprise the old garden Dog's Tooth Violet and its varieties, and an old cottage garden

plant that is not showy, but is full of a certain quiet modest charm, namely, the purple Fumitory (*Corydalis bulbosa*). These should be intergrouped, as they form a quite delightful colour harmony. Following these, and keeping within the same colouring, will be the purple Fritillary, and some of the white variety, and this white kind will also be near a good planting of the beautiful *Scilla italica alba*, a plant not common in gardens. Further back will be patches of the tall Snowflake (*Leucojum æstivum*) while its earlier relative *L. vernum* will be in connection with the patch, or rather long straggle, of *Scilla sibirica*. Winter Aconites and Snowdrops are too early for this bit of garden, so their homes are elsewhere; and as the space is somewhat shaded, possibly neither the brilliancy of *Anemone fulgens* nor the splendour of *Iris reticulata* can be depended on, but this condition will make it all the better for *Anemone apennina* and the best of the Wood Anemones.

The Ferns will be few in number of kinds, and these will be nothing out of the common—the Male Fern, Lady Fern, Dilated Shield Fern, Hart's Tongue, and Polybody, perhaps these and no others. Plant mostly in long drifts and sink a few large stones in the earth, partly for appearance' sake and partly for comforting coolness and moisture to the roots of the Ferns; let there also be some tufts of *Iris foetidissima*, a plant whose dark-green sword-shaped leaves would make a distinct contrast to the feathery light-green fern-frond masses.

The following are amongst the most important bulbs for the garden :—

Amaryllis Belladonna.—This is the Belladonna Lily, and is a beautiful autumn bulbous flower for a warm border, where the soil is deep. Plant in the spring or autumn and give protection with cocoa-nut fibre or heather in severe winter weather; the flowers appear without the leaves, which come in the following spring.

Bulbocodium vernum.—An early spring-flowering bulb, bearing rosy purple flowers about four inches long, and growing to a height of six inches, and requires to be put about two inches deep.

The Calochorti.—The Californian Tulips or Mariposa Lilies are a charming group of bulbs, not exactly for quite the beginner with a very small garden, but for those who have a sunny border, as Calochorti revel in warmth. In their native country of California they are found plentifully in some districts, but usually the various kinds are found growing by themselves. Although the writer has never seen the Californian Tulips growing wild, travellers have told him of the glorious picture created by the flowers, sheets of butterflies dangling on the slender stems, spotted and dabbled with colour. The bulbs must not be dotted about

*THE BELLADONNA LILY (AMARYLLIS BELLADONNA)
AT KEW.*

AUTUMN CROCUSES IN GRASS.

the borders ; they must be planted in masses, and it is wise to devote a small part of the garden to them, as then their requirements are easily supplied. The dwarf-growing species, the *Cyclobothras* and Star Tulips are best in little corners and ledges facing south in the rock-garden. Among these, *C. Purdyi*, white and quite downy from its covering of soft hairs, is the best. Plenty of sun and a south aspect is considered suitable for them, but Mr. Wallace of Colchester writes me : " I rather fancy that shade from the hot midday sun in summer is beneficial, and a soil that does not become too hot and dry is preferable. A little good friable loam worked in with the light soil will be found of assistance, and one must not forget that good drainage is also essential. Growing the bulbs in a cold frame, with a raised light over them to admit air and throw off the rain, is perhaps the simplest and most effective method of cultivation. Some of the finest flowers I have ever seen were in the gardens of the Rev. E. H. Ewbank, St. John's, and Captain Daubuz, Buckingham Villa, both in Ryde, Isle of Wight, some years ago. They were grand, quite three feet high. Flowers of *Pictus*, *Vesta*, *Citrinus*, &c., two inches to three inches across, and as many as eighteen flowers from a bulb ; *C. clavatus* I saw at Hayes growing in a border outside a greenhouse, a small clump about three feet high, and, counting both flowers and buds, there must have been almost a hundred—it was a particularly fine sight. Now that the bulk of the *Venustus* variety are so cheap, and where a quantity of cut flowers are required, many people want these extensively, growing them in frames ; if cut when just opening they last a long time in water. The following is a selection comprising most of the finest and best :—*Pulchellus* and *amœnus*, *Benthami*, and *Purdyi*, of the dwarf-growing kinds. Amongst the true *Mariposa* Lilies, *C. clavatus*, *splendens*, *Lyoni*, *venustus*, *citrinus*, *vesta robustus*, and the *Eldorada* strain are to be recommended. I would advise those who have not at present attempted the culture of this beautiful family to procure some of the above kinds and make a start, bearing in mind, however, that it is far better to devote a *small corner* to them than to have them scattered throughout the garden. The best time for planting is from the middle of October to the middle of November, and put the bulbs three inches deep."

Camassia (*The Quamash*).—Handsome North American plants, producing flower-spikes three feet in height. *C. esculenta*, purple, and *C. Leitchlini*, white, are ornamental ; the former is the Quamash. We should, however, choose Daffodils, Tulips, and commoner bulbs before the Camassias. Plant in the autumn, and if there is a meadow or orchard garden the Camassias are pretty there.

Chionodoxa.—Charming plants bearing many-flowered bloom-spikes of deep blue in early spring. *C. sardensis*, deep blue, is the most striking in colour, but *C. Luciliæ*, which bears larger flowers of a lighter tint, is still more largely grown. *C. Alleni* and *C. grandiflora* are improved forms of the latter. The popular name for the *Chionodoxa* is *Glory of the Snow*. *C. Luciliæ*, in particular, is a delightful bulb, quite easily grown, and may be scattered about the rock-garden, in the border, and

is pretty in pots in the greenhouse. In some light soils the Glory of the Snow increases rapidly. We enjoy the fresh blue and white flowers of this plant. *C. grandiflora*, or *gigantea*, as it is also called, has larger flowers of a more self shade. Plant in the autumn, and put the bulbs two inches deep in any good soil.

Colchicum (*Meadow Saffron or Autumn Crocus*).—This is a charming family. The best known is *C. autumnale*, which produces its rosy-purple flowers in September and October. There are several varieties, bearing flowers of different hues, and they form a pretty picture when naturalised in the grass or at the edge of a shrubbery. It is always well to plant such bulbs as these, which flower late in the year, with a groundwork of mossy Saxifrage, Stonecrop, *Herniaria*, or similar things to protect the blooms when heavy rains dash up the soil and sully their fresh beauty. Plant them in August, putting them about six inches deep in good loam. The double white variety is charming; it is like a white rosette. *C. speciosum* is a splendid flower; its rosy-purple, goblet-like flower is on a stem or stalk about a foot high, and stands far out of the ground. *Parkinsoni* is easily known by its purple-chequered flowers. The most beautiful of all Colchicums is the little-known *C. Sibthorpi*. Instead of *C. Sibthorpi* being nearly as large as *C. speciosum*, as it is sometimes said to be, it is in reality a great deal larger. It is of a more attractive colour than its congener, and its globular shape—it seems to sit on the ground like a large cup—sets it off wonderfully. Moreover, it is very strong and floriferous, and grows with such ease that no particular rules for cultivation are required. The flowers are richer in colour than those of *C. speciosum*, and with beautiful crimson reticulation. Autumn Crocuses enjoy a cool soil. To increase them lift the bulbs every third year, and replant as soon as the foliage is fully matured. Plant in August.

Crocus.—Besides the common garden Crocus, golden, purple, white, and striped, there are many other attractive species, some blooming in the autumn, some in winter, and others in the spring. The winter-flowering kinds will flower on a warm border outdoors and may be planted two inches deep. *Crocus Imperati*, with purple and buff flowers, is the earliest Crocus of the new year, and is sometimes in flower at Xmas. It is closely followed by the beautiful mauve-coloured *C. Sieberi*, which often opens in January. There are so many Crocuses that it is impossible to do anything like justice to them in a beginner's work. The ordinary Dutch Crocuses, the large yellow, purple, white, and other colours, are the showiest, and may be planted as margins or in colonies in the border. Near large towns especially, birds are frequently troublesome, so much so that in London sparrows will peck off the florets wholesale. A few lengths of thick cotton stretched across the rows stop the depredators in a large measure. Poison and traps will thin out mice, which have a strong liking for Crocus bulbs. It is a pity that the beautiful autumn-flowering Crocuses are not more grown. The most beautiful is *C. speciosus*. Mice are fond of it. Plant in the summer, and put the bulbs wherever clouds of purple colouring are desired in autumn; sun is necessary to

open out the flowers and disclose the orange stigmata. The Meadow Saffron (*C. sativus*) spreads freely in warm gardens, and its pale lilac flowers are very pretty. *C. iridiflorus*, *C. nudiflorus*, and *C. longiflorus* are handsome autumn flowers. Put Crocus bulbs about two inches deep.

Dahlias and their Cultivation.—The Dahlia is an ideal late summer and autumn flower, and is admirably adapted for town gardens where many other flowers will not thrive owing to the smoky atmosphere. I have seen perfect specimens of the Cactus type grown in Clerkenwell and Stoke Newington. In the former case they were grown in tubs on the flat roof of a house, and the receptacles used were the ordinary margarine or butter tubs, which were first thoroughly burnt out with lighted paper, and then holes about the size of a sixpence burned through the bottom for drainage.

The planting of Dahlias should be done about the end of May. The ground ought to be well dug over to a depth of about 2 feet and thoroughly broken up, and a liberal quantity of old, well-rotted manure mixed with the soil. The plants, if grown in beds, should be quite 3 feet apart, and a strong stake should be placed in the soil at the time of planting about 4 inches away from the plant. The stake ought to be at least 5 feet in length. Novices often wonder why such long, unsightly stakes are put in at the time of planting; but to the experienced gardener it is obvious that to insert such a stake at a later period, when the plant has grown 2 feet to 3 feet in height, would mean irreparable damage to the tubers or roots. The plants should be well watered after they have been put in, and loosely but securely tied to the stake with raffia or bast. As the plant grows, the tying process should be continued, fresh raffia being added as needed.

Some varieties grow much taller than others, and it is always better to consult a catalogue that explains the height of each variety before putting them in position. When they reach about 2 feet in height, two other stakes—the same length as the first—should be put in about 1 foot from the plant, the three forming a triangle.

Thinning and disbudding in the case of the Cactus, decorative, and show varieties will cause some anxiety to the beginner. If quantity in preference to quality of blooms is required, it is usual to leave about six main stems; but if exhibition blooms are wanted, the main stems should be reduced to three or four. Shoots multiply very quickly and need taking out from their base. No plant should be allowed to become in the least degree crowded.

As the summer advances they will require a liberal amount of watering—on an average twice a week if the weather is hot and dry. Each plant should be given not less than a gallon at each time. Dahlias are very gross feeders, and almost any animal manure is suitable. It may either be dissolved in a tank loosely or placed in a sack and allowed to escape gradually. The feeding with manure-water should always follow after the usual watering. Each plant should be given about one gallon. It is never necessary to feed as much in rainy as in dry weather.

As the blooms begin to open, a sharp look-out must be kept for earwigs and caterpillars. The best plan is to place a 2½-inch pot partly filled with greasy paper on the top of each stake. The pots should be examined every morning and the earwigs and other insects found in them destroyed. The best time to catch these pests is after dusk. The blooms should be carefully looked over with the aid of a lantern. The Pompon varieties do not require thinning out, disbudding, or feeding, and they do not grow so tall as the other varieties.

Dahlias should never be planted in a shady position or allowed to be crowded by other plants or shrubs.

The following is a first-rate dozen of both the Cactus and show sections: Cactus—Ajax, orange buff; Advance, scarlet terra-cotta; Débutante, peach pink, creamy centre; Dorothy, silvery pink; Dreadnought, dark crimson maroon; Glory of Wilts, pure yellow; H. H. Thomas, scarlet crimson; Mrs. Macmillan, pink, with white centre; Nellie Riding, crimson, with white tips; Rev. T. W. Jamieson, coral pink, with creamy centre; Snowstorm, pure white; and William Marshall, bronzy yellow. Show—A. M. Burnie, orange, with yellow edge; Blush Gem, white, tipped with mauve; Countess, blush white, shaded rosy purple; Goldfinder, yellow, tipped with red; Harry Keith, rosy purple; J. T. West, yellow, tipped purple; Mrs. Gladstone, soft blush; Mrs. Langtry, cream, edged with crimson; Nugget, orange, tipped scarlet; Sulphurea, sulphur yellow; Tom Jones, creamy yellow, edged with rose; and William Rawlings, crimson purple.

Dahlias for Garden Decoration.—There is no autumn flower that can vie with the Dahlia for brilliancy. As a rule, all others appear dull in comparison. For massing we have scarlet, crimson, yellow, purple, orange, white, and pink in self colours. These lend themselves readily to almost any garden colour-scheme if only the right varieties are grown; while they can be utilised anywhere, as they vary in height from 2 feet to 5 feet. Should the plants be required to flower

DAHLIAS GROUPED FOR EFFECT IN A BED NEAR THE
WATERSIDE.

DAHLIA KAISERIN AUGUSTA VICTORIA, A FREE-FLOWERING WHITE VARIETY
FOR THE GARDEN.

in July or very early, the best plants for the purpose are old stools, which should be divided as small as possible; or perhaps better still, pot tubers, which are obtainable in the early spring months. These flower earlier than plants produced from cuttings, though the individual flowers are not so perfect, and, generally speaking, the double forms are liable to produce semi-double flowers; but for colour effect this is immaterial. Pæony-flowered Dahlias are very useful. The individual flowers may not be perfect in form, but as a mass of colour they are perfect. Even the double or show varieties produce wonderful colour effects when growing in masses. Where whole beds are devoted to them, only one variety should be grown in each bed, so that they are uniform in height and habit. Just a few of the best decorative kinds are: Kaiserin Augusta Victoria, not the Pæony-flowered variety, but a pure white decorative kind that grows about 2 feet to 3 feet high. This has been largely used at Kew and other places, and is always greatly admired (see illustrations). Pure pink is not often seen in the Dahlia, but we have it in the decorative variety *Delice*. This is a good sturdy grower that flowers on stiff stems well above the foliage. Massed in numbers the effect is perfectly charming. Scarlet is always admired, especially in the autumn months. Here we have the Cactus variety *Amos Perry*, which is still unsurpassed in its colour and habit; while the best white variety in this section is undoubtedly *White Ensign*, for it produces its white blossoms well above the foliage on fine stiff stems, which cannot be said of any other white Cactus I know. *Garden Yellow* is the best of its colour in this section, though *Caradoc* runs it very closely. In mauve shades *Mauve Queen* can be recommended. Perhaps the best crimson for our purpose is *Conquest*. This is very rich, with a splendid habit. The finest of the very dark forms is still the old variety *J. H. Jackson*. In bright crimsons *Mary Purrier* is quite the best. In cases where dwarf colour effects are desired, the bedding double varieties produce splendid masses of colour. They rarely exceed 2 feet high. *Marguerite Bruant* and *White Bedder* are both good whites. *King of Dwarfs* is a good purple. *Flora Macdonald* can be recommended as a fine yellow, while *Rising Sun* produces masses of scarlet flowers. The Pæony-flowered varieties have not been noted for their habit, because the flowers are so heavy. They have a tendency to hang down, but it is only a matter of time before we shall have varieties with excellent stems. At the present time a few of the best sorts are *Bayard* (red and yellow), *Mrs. J. B.*

Riding (scarlet), Cecilia (yellow), Salome (buff apricot), Holman Hunt (crimson), and Mrs. T. G. Baker (white). The Pompons and many of the single varieties are equally suitable for massing, especially the self-coloured sorts, for most of them possess a fine sturdy habit. Those who contemplate using the Dahlia for this purpose should pay a visit to one of the nurseries where the Dahlia is a speciality. They could then make a selection for the purpose, for they could see the plants

FIG. 10.—Preparations for obtaining Dahlia Cuttings and the Mode of Increase by Division of Roots.

growing in quantity and so obtain the exact colours they need.

The Propagation of Dahlias.—This is not a difficult task, providing a few essential points are observed. If weakened by improper treatment while in their first stages of growth, the plants rarely turn out well during the summer months. The storing of the tubers in the winter time will not tax the resources of any establishment if there is ordinary accommodation, such as dry rooms, cellars, and outhouses, from which frost can be excluded. All tubers brought out from damp cellars or store-rooms must be very carefully examined, as fungus sometimes grows round the base of the old stem, and it then kills the new bud or buds, which would, in a healthy tuber, grow and form young shoots fit for cuttings. I may here mention that the crowns of all old tubers, when stored, should be covered with pure sand.

How to Procure Healthy Cuttings.—Old tubers should be taken, similar to the clump shown in Fig. 10, No. 1, and placed carefully in rather deep boxes, as shown in Fig. 10, No. 2. The horizontal line in Fig. 10, No. 1 denotes the depth to bury the tubers in the soil in the boxes. Put a few crocks over the holes in the bottom of the boxes, and use as a compost loam, sifted, two parts; leaf-soil, one part; and sand, one part. A, drainage; B, tubers. At this season good positions for the starting of the new growths are in a frame on a mild hot-bed, on a stage in a warm greenhouse, or on a high shelf near the glass in an intermediate temperature. If the first shoots which appear are very spindly, remove them and wait for the second batch. When those forming the second

FIG. 11.—Method of taking Cuttings and the subsequent Treatment.

batch are rooted, a third lot will probably be available, and, if the varieties are scarce, further propagation may take place.

Division of Roots.—Fig. 10, No. 3 shows a detached part of a cluster of tubers. The extreme point is cut off simply to admit of the tuber being well placed in a rather small flower-pot.

How to Insert Cuttings and Tubers.—Fig. 11, No. 4 shows a young shoot detached from the old tuber, with a heel portion adhering. If the cultivator wishes to have more cuttings from the same tubers, he must not cut with a heel, but sever the stem 1 inch away from the tuber.

Prepare the cutting by severing it immediately below a joint and remove the two basal leaves, as denoted by the three dark lines drawn on the stem and leaf-stalks in Fig. 11, No. 4. Insert the cutting with plenty of coarse sand round the stem and base, as shown in Fig. 11, No. 5. Use a good sandy compost, but not one with manure in it. Fig. 11, No. 6 shows how the cultivator must pot a divided tuber.

Treatment of Cuttings in Frames.—Guard against excessive moisture, as it would cause the cuttings to decay at the soil-level. Admit air on fine days, shade from bright sunshine, and be careful not to overwater. Plunge the pots to their rims in sifted ashes, soil, or cocoanut fibre.

Hardening and Planting Out.—Directly the cuttings are rooted they must be exposed to more sunshine and air, this to be a gradual process. A slight frost would cripple the plants. Fig. 11, No. 7 shows how a young plant must be put out in its flowering quarters. The crocks used for drainage should be removed and the roots carefully spread out. Fig. 11, No. 8 depicts how an old cluster of tubers may be planted, and Fig. 11, No. 9 shows the resultant new growths. It is well to reduce the young shoots to two. Old tubers should be planted several inches deep in well-manured, trenched ground in April. Young plants from cuttings must not be put out before the end of May. In the North, June 8 will be early enough. Surround the young shoots with sifted coal-ashes.

Daffodil. See *Narcissus*, p. 113.

Fritillaria (Fritillaries).—Of these plants *F. imperialis* (the Crown Imperial) is the most striking. It is a stately, spring-blooming plant, growing to a height of four feet, and bearing heads of drooping flowers, clear yellow and orange-red in colour. *F. Meleagris* (Snake's-head), with its purple diapered flowers and its white variety, are charming when naturalised in moist places in the grass. It is amongst the Fritillaries that we find so many of the varying tints of green and others of a bluish glaucous tone, from which they merge to purple and plum. The flowers are usually of quiet beauty. Many of the species are quite easily managed, not only in the border or in the rock-garden, but equally so in ordinary ground or in pasture. *F. pallidiflora* is very distinct, and certainly one of the best. The flowers are of a pale yellow tone, and beautifully chequered, whilst the foliage is glaucous in colour. The species comes from Siberia, and is therefore quite hardy. Another species also in flower at this time and a good companion is *F. pyrenaica*, a rather dark plum-coloured flower, heavily netted with dark brown, very hardy, and quite easily grown in sandy soil. Others worthy of note are the scarlet *F. recurva*, *F. citrina*, *F. alpina*, and the beautiful *F. Whittalli*. In the general culture of Fritillaries remember to plant in autumn, and for most a comparatively dry soil is beneficial. The Snake's-head, however, prefers moisture. Seed sown as soon as ripe in pans of sandy soil will not result in flowering plants under five years. Small bulbous offsets are produced, which should be planted in a reserve bed of porous soil, and soon make good specimens. Plant from four inches to six inches deep.

Galanthus (Snowdrop).—The Snowdrop, though grown in every condition of soil and site, flourishes best in a moist and shady situation. *G. plicatus* and *G. Elwesii* are two fine forms. There are many other Snowdrops, but these are quite sufficient for a small garden. The ordinary Snowdrop, *G. nivalis*, is pretty too, and very effective under tall trees. Plant two inches deep as early in autumn as possible.

THE SNAKE'S-HEAD FRITILLARY (*FRITILLARIA MELEAGRIS*).

GROUP OF THE GOLDEN YELLOW CROWN IMPERIAL.

Galtonia (*Hyacinthus*) **candicans**.—This is a tall, bulbous flower, with a stem quite three feet high. Unlike so many other bulbs from South Africa it needs no special care, such as drying off and replanting, but makes itself quite at home in our gardens, preferring rich and stiff soils. It is a plant so distinct as well as important that it deserves to be placed with special care. Of all positions the best would be as an isolated group, only associated with some rather important foliage of a different character, such as that of the larger form of *Megasea* (*Saxifraga*) *cordifolia*, and so placed that it would be against a background of quiet and yet dark rich greenery, such as that of the clipped yew hedge, where its ivory-white bells, suggesting large Snowdrops, and glaucous leaves would have their fullest value. Propagate by offsets or by seed. Four years elapse before the seedlings bloom. Sow the seed as soon as ripe in the open ground. Plant in the autumn, six inches deep.

Hyacinths.—Few bulbous flowers have a greater hold upon the affections of those who love sweet fragrance and bright and varied colours than the Hyacinth. A selection of the best varieties is given on p. 316.

Growing the Bulbs in Glasses.—We cannot do better than quote the following from Messrs. Kelway's *Manual of Horticulture*. These rules were recommended in a lecture given before the Royal Horticultural Society: "Set the bulb in the glass so that the lower end is about, but not quite, in contact with the water; use rain or pond water. Do not change the water, but keep a small lump of charcoal at the bottom of the glass; fill up the glass with water as it shrinks by the feeding of the roots and by evaporation. When the bulb is placed, put the glass in a cool, dark cupboard, or in any place where light is excluded, there to remain for about six weeks, as the roots feed more freely in the dark; when the roots are fully developed and the flower spike is pushing into life (which will be in about six weeks), remove by degrees to full light and air; the more light and air given from the time the flowers show colour, the shorter will be the leaves and spike, and brighter the colour of the flowers. All Hyacinths succeed well in winter."

Hyacinths Outdoors.—Any ordinary garden soil is suitable, if it is not too wet. Should the soil be heavy, it can be improved by digging in some leaf-mould, sand, or road grit. Plant early in autumn, and choose a fine day when the surface is dry. Begin by lightly trenching the soil, afterwards levelling the surface with a rake. In dealing with a round bed the first bulb should be planted in the centre, afterwards following on by planting in circles until it is completed. For square beds or on borders plant in lines, except when it is

desired to fill in between other plants in a mixed border. A trowel should be used in preference to the dibbler for opening the holes. These should be made 4 inches deep, a little sand placed in the bottom, and then the bulb in position; after that carefully fill in the soil. Take great care in making the holes to have them all the same depth. For a very rich effect plant the bulbs 6 inches apart, but a very good display will be secured if they are 9 inches apart. The Hyacinth is seldom injured by frost, except when growing freely in the early spring. The bulbs may be taken up and dried off when the leaves have faded. Place them in an airy shed, but not in the sun. When dry remove the offsets, keeping the large sound bulbs to plant again the following autumn.

Hyacinths in Pots.—There is nothing better than the common flower-pot, and in quite small pots satisfactory flowers may be produced by planting one bulb in a pot. Use a rich soil consisting of two parts good loam, and a part each of manure, leaf-mould, and sand. The best manure is equal parts of cow and horse manure mixed together. This should be thoroughly decayed; fresh manure is dangerous. It is wise to prepare the soil some time before it is wanted for use. Mix the soil thoroughly, and see that the pots are perfectly clean and dry before using them. If small pots—viz. $3\frac{1}{2}$ inches—are used, one hollow crock will suffice as drainage; but if larger pots are used, then several smaller crocks must be placed over the larger one, and a layer of moss or coarse soil over the whole. When all is ready and a start is made to pot the bulbs, begin by filling the pots quite full of soil, press the bulb into it, and finish by pressing the soil moderately firm round the bulb. They must not be potted loosely, or they will fail; and if the soil is made too firm, it is quite likely that the flower spikes will be mishapen and spoilt.

When several bulbs are placed in a large pot, they may be almost covered with the soil, but in small pots they should be only half covered, so as to allow the largest possible amount of root-room. After potting, give a good watering through a "rosed" watering-pot. The pots may then be covered with 6 inches of cocoanut fibre refuse or sand. Coal ashes are sometimes used for this purpose, but they are not recommended, as they contain too much sulphur. When there is no convenience for standing the pots outside, they may be placed in a dark cellar or cupboard, but must be kept quite cool until well rooted. When the roots have reached the sides of the pots, the first lot may be removed to produce early flowers. Do not place them at once in full daylight.

SPANISH IRISES AMONG ROSES IN A SCOTTISH GARDEN.

SNOWDROPS NATURALISED IN THE WOODLAND (See Page 106).

A good plan is to place an inverted pot over the crown until the latter has become green. During this period they should be kept cool. A frame, cool greenhouse, or a window, is a suitable place for them.

Fortunately the Hyacinth is not difficult to grow, no matter whether the garden to be planted is in town or country; and, as we have already mentioned, the flowers are deliciously sweet. The breath of the Hyacinth in the greenhouse or in the house is a reminder of the brighter days to come, when the Daffodil is dancing in the spring wind and the Tulips are beginning to raise their buds on strong stems. I have a stronger affection for the single varieties than the double, but each group has its charms. They are welcome, too, in spring decorations, not only for the sweet scent of the flowers, but for variety of telling colours. When the bulbs in pots or in glasses have flowered, allow them to gradually ripen until the leaves are quite yellow. They are of no further use under glass, but, planted out in a corner of the garden, will flower freely for years; the spikes will not be large, but quite as attractive.

The Roman Hyacinth has small spikes of white flowers. It is useful for pots, as it flowers earlier than the large Dutch or bedding Hyacinths. These bulbs should be grown in a pot 6 inches in diameter at the top. During recent years miniature Hyacinths have become very popular for growing in pots and also for bedding. They are small forms of the bedding Hyacinths, and need the same treatment.

Iris.—The English Iris (*I. xiphioides*) and the Spanish Iris (*I. xiphium*) are the best known of the bulbous section of this family. Both are handsome plants. The English Iris bears white, lavender, deep-blue, purple, maroon, and striped flowers, while in the Spanish the colours are blue, yellow, white, and striped. The striped varieties are far inferior to the self colours for effect. The bronze, purple, and yellow Thunderbolt, belonging to the Spanish section, is an interesting flower. These Irises succeed best in a light, well-drained soil. In heavy, retentive soils they often perish during the winter. Plant the bulbs about four inches deep. *I. reticulata* (the Netted Iris), *I. alata*, and *I. persica* are three dwarf plants flowering in the early spring. It is well to have some of these in pots in a cold frame quite early in the year.

I. reticulata is an especially sweetly fragrant flower. There is a variety named *major*, which has larger flowers than the type. A few of the deep-purple flowers will scent a large room. A well-known gardener, writing about this bulb, says: "I planted them in large groups in the hardy plant border, which is well drained and faces south. The only attention they receive consists in clearing off the old foliage in autumn,

forking up the top soil, and adding some old potting material. In March I counted, on a clump two feet across, sixty to seventy flowers, either open or opening, and many more to follow. It has often puzzled me why gardeners who need a lot of cut flowers do not grow it, considering the quantity of lovely flowers to be had from good plants." Occasionally the bulbs are attacked by a fungus, which may be brought into the garden from stock affected with it. When this Iris has established itself in a garden, it is wise to ascertain the condition of any fresh bulbs introduced, and the place whence they came.

Leucojum (*Snowflake*).—Graceful plants, bearing drooping, white bells. *L. vernum* blooms in the spring and grows to a height of six inches. *L. æstivum* flowers later and often exceeds two feet in height. It is excellent for naturalising in the wild garden or in the grass by water.

Lilies.—Of the numerous Lilies many will be found to flower well in ordinary garden soil. The following form a good selection:—*Bulbiferum*, two feet, orange-red; *candidum* (Madonna Lily), get the best form; *chalconicum* (Scarlet Turk's Cap), three feet; *Croceum*, six feet, orange; *davuricum*, two feet, orange-red, black-spotted; *excelsum* or *testaceum*, five feet, buff; *giganteum*, ten feet, ivory-white; *Henryi*, six feet, orange-yellow; *Humboldti*, five feet, apricot, spotted-maroon; *Martagon*, three to five feet, white, purple, and purple-black; *pyrenaicum*, three feet, yellow, spotted-black, red anthers; *szovitzianum*, five feet, pale yellow, sometimes dotted with minute black spots; *thunbergianum*, eighteen inches, yellow to red, sometimes spotted; *tigrinum*, four to six feet, orange-red, purple-spotted. Lilies should be planted as soon as the flower-stems die down, and should have four inches of soil above the bulb, which is best surrounded by sand. Of those named in the foregoing list, *L. giganteum* requires a deep rich bed in decayed vegetable matter; the others will generally succeed in good, porous garden soil. Lilies should be grown in a sheltered spot, and partial shade is beneficial for all except the Madonna Lily, which likes sun. In peat the Swamp Lilies, *L. canadense*, *paradalinum*, and *superbum* can be grown. They are exceedingly graceful and brightly coloured. Other handsome Lilies are *L. auratum*, *speciosum*, and *longiflorum*, but, as these have a habit of dying out after the first year or so in many gardens, an annual purchase is often requisite to maintain a display. They should, however, be tried, as they sometimes become established. There are many other beautiful Lilies besides the twenty here enumerated, but they are less suited to general cultivation than those already named. In large gardens the bulbs are planted amongst shrubs with excellent effect. The shrubs protect the rising Lily stems in spring from frost, and the association of the two is quite happy.

It will interest Lily growers to read the remarks made by Mr. Wallace of Colchester, a well-known Lily specialist, in a paper published in the Royal Horticultural Society's *Journal*: "It is difficult to lay down hard and fast rules as to the proper positions to plant Lilies, as the same variety may be seen flourishing equally well under totally different conditions, but I would recommend intending planters to avoid positions

THE
LILY

THE BUFF-COLOURED LILY (*LILIUM TESTACEUM*).

THE BEST FORM OF WHITE OR MADONNA LILY.

exposed to cold, sweeping winds. Never plant directly underneath trees, but if possible at some distance away—the trees will then give them the required shade; nor in a hot, dry corner, or in a cold, wet, heavy soil, or where the soil is water-logged. If planted near a lake or a large expanse of water, the young growths will need protection from late spring frosts. *L. Henryi*, *auratum*, *longiflorum*, *speciosum*, are specially liable to injury from this cause. In *Rhododendron* beds and amongst low-growing shrubs they always do well, and in no position do they show up so effectively as when backed by the rich deep-green leaves of the shrubbery. The beds at Kew near the Palm House are excellent examples of this mode of culture. Therefore in a few words, and at the risk of repeating myself, the best positions for Lilies are those that afford partial shade, protection from spring frosts and hot midday sun, and that give coolness and moisture at the root.

“Having found the right position for Lilies, the next thing is to see that we give them the best and most suitable soil for their requirements. One can generally do this, even if an ideal position is not to be found. The different soils suitable for successful cultivation I have divided roughly into three classes:

“First, any good garden soil of a fair depth, well dug before planting, is suitable for such good growing kinds as *L. Browni*, *candidum*, *chalcidonicum*, *croceum*, *excelsum*, *Hansoni*, *Henryi*, *Martagon* (purple), *pyrenaicum*, *thunbergianum*, *tigrinum*, and *umbellatum*; these will all flourish in any good border soil with fair treatment.

“Secondly, Lilies that prefer a strong soil, such as a good, rich, friable loam, not too heavy, viz. *L. auratum platyphyllum*, *Batemanix*, *Columbianum*, *Humboldti*, *Humboldti magnificum*, *Martagon album*, *dalmaticum*, *pomponium verum*, *rubescens*, *speciosum*, *Szovitzianum*, *Washingtonianum*, and *Wallichianum superbum*.

“Thirdly, we come to those that require peat and moisture, viz. *Burbanki*, *canadense*, *Grayi*, *pardalinum*, *Parryi*, *Philadelphicum*, *Roetzlii superbum*. The above lists represent, in my opinion, those Lilies which can be grown with little trouble. Those in the first list will succeed in any ordinary border under conditions inferior to those already described as essential for perfect cultivation. Those in the second list require a certain amount of partial shade and coolness at the root, and are suitable for planting in *Rhododendron* beds and amongst low-growing shrubs. Finally, the third group comprises those that require a cool, shady spot such as the edge of a pond or stream, or in a woodland glade. In addition to the species mentioned, there are a great number which are capable of successful cultivation with a little extra care, varieties which to an enthusiast would be indispensable. Having found the right position and soil, the next step is to see about planting the bulbs, and at what time this is best done. On this point great divergence of opinion exists among the general public (I am not now speaking of Lily enthusiasts). In fact, I should say more Lilies are planted in the spring months than in the autumn; whereas it is plain to all those who look into the matter that autumn is the best time to plant most of the species. A Lily when

in full growth is performing two functions—one developing, by means of its stem, the flowers, and the other, by means of its basal roots, the bulb for next year's growth—so that it requires as much attention to its wants below the ground as above. All Lilies do not have similar root action; there are two classes. First, those that make two sets of roots, one from the base of the bulb, the other from the bottom of the flower stem. Second, the Lily that only produces roots from the base of the bulbs.

"Now it is obvious which Lily requires early planting and which Lily can be planted late with reasonable hope of success. Those Lilies that have only basal roots to depend upon must be well established before they can flower with any degree of success; as, unless they are well rooted, the stem has nothing to draw from and feed on except the bulb, which naturally suffers. Whereas those that have two root actions may be planted almost at any time, for as soon as the stem is about six inches high, roots may be observed breaking out in small rings round the base of it, which grow with exceeding vigour, and help and support the stem to produce its flowers almost independently of the bulb. I have often noticed when lifting *L. auratum* that those bulbs which had plenty of basal roots had new, well-formed bulb growth, whereas, when it was absent, the bulb had flowered by means of the stem roots and then collapsed.

"*Lilium Martagon* and its varieties, *chalconicum*, *Szovitzianum*, *dalmaticum*, *Humboldtii*, and others of a similar character, only produce basal roots. The root action commences about the middle of October or earlier, and continues during the winter. Therefore, if it is necessary to lift the bulbs, it is best to do so before root action takes place, for if the bulb be lifted after root action has commenced, and the roots damaged or dried, it receives a serious check, and will only produce a weak growth.

"I lift my bulbs early, and keep them cool and moist in cocoa fibre, and plant them again not later than December, when root action at once commences, and not much time is lost. And I think that there is not much doubt that the late planting of *Martagon* Lilies, and after root action has been checked, is the cause of their partial failure the first season. Good, sound, imported bulbs of Japanese Lilies, which now arrive in excellent condition during the early part of the year, may be planted as late as March and April with every confidence as to the result, provided they are in a fresh and sound condition for planting when received.

"As a general rule, when planting bulbs, they should be put in the soil about three times their own depth; the soil should be well dug, and it is beneficial if a little peat, turfy loam, leaf soil, and sea sand be added. This latter (the sea sand) should be placed all round the bulbs; in fact, we use sea sand to a very large extent, generally covering the bulb entirely with it. It is always moist, and being of a gritty nature prevents the attacks of slugs and grubs, and also keeps the soil from setting fast round the bulbs.

"I would recommend, when planting Lilies amongst *Rhododendrons* and shrubs, the using of old tubs cut in half with the bottoms knocked

out. They can be sunk in the beds and filled with a good mixture of soil, and will serve to keep the roots of the shrubs and trees from interfering with the bulbs. Lilies planted in this manner are generally very successful."

Mr. Wallace makes a few remarks about growing Lilies in pots, selecting for this purpose such kinds as *L. auratum* and its varieties, *speciosum* and its varieties, *longiflorum*, *Hansoni*, *excelsum*, *umbellatum*, *candidum*, *Henryi*, and *Wallichianum superbum*: "The bulbs should be placed in pots about two and a half times their diameter and two inches below the surface of the soil. Good turfy loam, peat, and sand make an excellent compost. Plunge the pots in ashes outside under a wall, or in a cold frame; and as soon as root action has well commenced, take them into the greenhouse as required. When the bulbs are well rooted, care must be exercised in watering; for, as the pots are full of roots, if once they get dry, serious damage is quickly done. Give *auratum* plenty of shade and moisture; the variety *platyphyllum* is a noble pot plant, and very reliable. After flowering they should be plunged outside in a cool, shady border; and when the foliage has quite died down, they should then be stored for the winter in a cool frame or outhouse. In early spring they should be gone over, and fresh soil added and renewed."

Muscari, or Grape Hyacinths.—These are charming little plants, producing heads of bright blue, beaded bells in early spring; they are suitable for the rock-garden or sloping bank. The stronger forms may also be naturalised in the grass. *M. atlanticum*, *M. neglectum*, *M. armenaicum*, *M. botryoides*, *M. paradoxum*, *M. præcox*, and *M. racemosum* are beautiful kinds. *M. moschatum*—the Musk Hyacinth—is valuable for its delicious perfume, while *M. comosum monstrosum*—the Feather Hyacinth—is interesting from its quaint formation. *M. conicum* is one of the best and least known of the family. The rich violet-blue flowers are produced in profusion, and their delicate fragrance is enjoyable. It may be used with advantage to cover the ground in shrubberies and beds where the plants are not too close together. Naturalised in the grass it is quite at home, multiplying freely. The flowers last long in beauty, and are useful for cutting. This useful and easily-grown group is much neglected in English gardens, notwithstanding the fact that a rough bank may be purpled with their flowers in early spring. Plant Muscari bulbs two inches deep, and for increase separate the bulbs when they are lifted.

Narcissus (*The Daffodil and Narcissus*).—Narcissus is the Latin or botanical name for the whole of the Daffodil family, and strictly speaking each one is a Narcissus. In popular language it is usual to confine the word to the *poeticus* and the bunch-flowered sections, and to leave the word Daffodil to those varieties which have a larger centre. Thus an Emperor or a Sir Watkin is spoken of as a Daffodil and an *ornatus* or *recurvus* (Sweet Nancy) as a Narcissus. No

family of plants has been more improved by hybridisation in recent years. Twenty-five years ago only a few varieties were available for garden decoration, and with the exception of the Tazettas or *Polyanthus-narcissi* none were ever used for growing in pots. Now, thanks to the pioneer work of the late Peter Barr and the late William Baylor Hartland in collecting and introducing new species, and the garden hybrids of Leeds and Backhouse, and still later to the successful work of Engleheart and an ever-increasing band of enthusiastic hybridists, the number of varieties has been so much added to that they literally seem to be without end, as year by year adds its quota to the total available.

The majority of these newcomers are necessarily very expensive, as there is no short cut to increase a Daffodil like there is in the case of many other flowers. It can only be done in a natural way by its offsets, and these must not be separated from the parent bulb unless they come away almost by themselves, and are only joined to it by the smallest bit of tissue at the base. It is tempting to use forcible means to take an offset away when the variety is expensive, in order to increase the stock, but the practice is a bad one, as the vigour of the plant suffers, and a weak stock is more often than not the result. This is a most important factor in the successful cultivation of the *Narcissus*. "Never over-divide" is one of the golden rules in its management in the garden.

Another question upon which great uncertainty prevails is the length of time a bulb should be left in the ground without being lifted. Much depends upon circumstances, but with the few exceptions of some delicate kinds that need annual lifting, and which for practical purposes may be ignored, all *Narcissi* are the better for being left in the ground for two or three years. Perhaps the best general advice to give is to lift at the end of every third year. This must never be done until the foliage has turned yellow, and is lying flat on the ground. After lifting, the bulbs should be spread out to dry in an airy shed or room, and then cleaned and divided into sizes, when the larger ones may be again used for garden decoration, and the small ones grown on nursery beds, or, if there is no room available for the purpose, they may be in the case of the cheaper sorts thrown away.

A third point of immense importance is the best time to plant. All the most famous growers plant as early as possible. The month of August is none too soon, but it is quite safe to do it in September and early October. After the middle of the latter month the bulbs begin to deteriorate, and then the

DAFFODILS NATURALISED IN GRASS.

THE PHEASANT'S EYE NARCISSUS BY STREAM EDGE.

longer the planting is delayed the less vigorous is the plant the next spring. Plant both in the open and also in pots as early in the season as possible, is another golden rule. Details of management are out of place in a general treatise ; suffice it to say now that ordinary kinds of Daffodils should be planted with the top of the bulb about four inches below the level of the soil, and that it is only the small varieties that should be near the surface. The practice of growing bulbs in bowls, or other receptacles which have no drainage, has grown of late years, as it is a convenient method of having flowers when soil is difficult to procure, as in large towns and many suburban districts. Any medium which will give a foothold to the roots and will retain moisture may be used. Most of the large dealers in bulbs supply a suitable compost at a low figure.

As in the case of bulbs in pots, the bowls should be placed in some dark, airy place for the first six weeks after they have been planted, to encourage root action—after that the most important point to see to is that the compost should be neither too wet or too dry. If either of these extremes takes place and is suffered to continue, the plants suffer, and in bad cases bloom prematurely or perhaps not at all.

Planting in grass is now largely practised. For this purpose a Barr's Bulb-planter is a most useful tool, and enables the work to be done neatly and quickly. It is always best to wait until the autumn rains have softened the turf before planting, otherwise the same operation takes much longer and never seems quite so satisfactory.

A list of a few of some of the most suitable varieties for the different purposes for which Daffodils and Narcissi may be used will be useful. As the descriptions will be found in the usual trade catalogues it is not necessary to give them here.

For Pot Work in January.—Henry Irving, Golden Spur, Princeps, Paper White Polyanthus narcissus, *Obvallaris* (Tenby Daffodil), Cervantes, Campernelle Jonquils, *Poeticus ornatus*, and the old double yellow (*Telemonius Plenus*).

For later Work in Pots.—The new poetaz, such as Alsace, Aspasia, Irene, Elvira, and Orient, which have now largely taken the place of the Polyanthus narcissus; Emperor, Victoria, Mrs. Langtry, Seagull, King Alfred if not too expensive, W. P. Milner, Autocrat, Sir Watkin, Lucifer, Blackwell, Stromboli, many of the new *Giant Leedsii*, Madame de Graaff, Queen of Spain, Orphee, Weardale Perfection, and Firebrand.

For Bowls without Drainage.—Most of the above.

For Rockeries.—Such small growing varieties as Queen of Spain, W. P. Milner, Minimus (the smallest Daffodil in the world), Nanus, Lobularis, Juncifolius, *Triandras albus*, *Bulbocodium citrinus*, *Jonquilla*

simplex, *tenuior*, *gracilis*, *moschatus*, and some of the newer dwarf-growing hybrids, such as Beryl and Diana.

For Grass.—Nearly all the larger Daffodils and Narcissi do well. The following should always be tried: *Pallidus præcox*, *Horsfieldii*, *Lobularis* (small early trumpet), *Princeps*, John Ball, Autocrat, Sir Watkin, *Poeticus recurvus*, the wild Lent Lily, Emperor, *Barrii conspicuus*, Vanessa, Minnie Hume, and in some places *Albicans* or Mrs. Thomson.

For Borders.—It will be most useful to enumerate a few of the new ones of sterling merit which can be safely bought: Duke of Bedford, Firebrand, Lucifer, Lady Margaret Boscawen, White Lady, Seagull, Argent, Beethoven (soft yellow trumpet), Hall Caine, Madame de Graaff, Vanilla, Ben Jonson (poet), Horace (poet), Cassandra (poet), King Alfred (when the climate suits), Whitewell, Elvira (poetaz), Orient (poetaz), Torch, Diana (*Giant Leedsii*), Solfatare, Noble, Occident, and Olympia.

For Cutting.—Such decorative or light-looking flowers as Frank Miles, Countess of Southesk (a white Frank Miles), Torch, Duchess of Westminster, Golden Bell, Maximus, Golden Spur, Castile, Eyebright, Thora (*Giant Leedsii*), Beethoven (yellow trumpet), Mrs. Langtry, *Barrii conspicuus*, *Princeps*, Olympia (very large yellow trumpet), and the *Rugulosus* variety of the Campenelle Jonquil.

Ornithogalum (*Star of Bethlehem*).—Attractive plants bearing heads of white flowers. *O. arabicum* and *O. pyramidale* throw up flower-spikes four feet in height, while *comosum*, *latifolium*, the greyish green *nutans*, and *umbellatum* are also attractive. Plant in autumn.

Puschkinia scilloides is a pretty little blue-flowered plant suitable for nooks in sunny borders. Plant in autumn.

Schizostylis coccinea (*Winter Flag*).—This bears crimson flower-spikes in late autumn. Its place is against a warm fence, wall, or in some sheltered corner. It enjoys rather a moist soil, but nothing approaching stagnation. During very severe weather protect the crowns with bracken or similar material. Plant in spring.

Scillas or Squills.—The common bluebell (*S. nutans*) is well known throughout England, and many of the family are well worthy of garden culture, amongst these being *S. bifolia*, *S. hispanica*, *S. italica*, and *S. sibirica*. The Scillas form a very charming family of bulbs, very easily grown by the amateur. They are a sheet anchor in the small garden from the time of *S. bifolia*, the earliest of the family to bloom, until the spikes of *S. campanulata*, or *hispanica*, as it also is called, have faded. *S. bifolia* is a very pretty kind, very hardy, and with spikes of deep blue flowers a few inches high, whilst there are varieties of it, such as the pretty *taurica alba* or *candida*, white, *rosea*, or *carnea*, the names indicating the flower colouring. *S. sibirica* has intense blue flowers, and is very free and cheap. The amateur should plant the bulbs in quantity. Of the Bluebell there are white, rose-coloured, and French-grey varieties, but more satisfactory in a confined place is *S. campanulata*, the Spanish Scilla, which will flourish in town and country gardens alike. It is very strong in growth, with stems eighteen inches high, and deep blue, but

*NARCISSUS WHITEWELL, A BEAUTIFUL VARIETY
FOR GARDEN AND EXHIBITION.*

A BORDER OF MIXED MAY-FLOWERING TULIPS.

there are varieties of it, white, rose, and pink, and all vigorous. The Spanish Scilla will grow in quite a shady place. Put the bulb two inches deep in autumn.

Snake's-head. See Fritillary.

Snowdrop. See Galanthus.

Sternbergias (*Winter Daffodil*).—*S. lutea*, the Winter Daffodil, bears bright yellow crocus-like flowers in autumn, and is supposed to be the "Lily of the Field" of Scripture. The Sternbergias form a beautiful group of autumn-flowering bulbous plants. They are not in the least degree difficult to grow. Sometimes newly-planted bulbs will not bloom, but this is frequently due to the imported ones being of a very small size, so much so, that two years elapse before they are sufficiently strong to flower. After that period they increase. A light and well-drained soil is needful, and, if heavy naturally, lighten it by adding grit, leaf-mould, and road-scrappings. Plant the bulbs early in August, at a depth of eight inches. A form of *S. lutea*, called *angustifolia*, is not so shy flowering as the type. *S. l. major* is another excellent form, with very rich yellow flowers. *S. l. fischeriana* blooms in February, or soon after. All the autumn-flowering forms of *S. lutea* produce foliage at the time of flowering. A very important species is *S. macrantha*, which is also autumn-flowering, sending up leaves in early spring. The flowers are twice the size of those of *S. lutea*. *S. colchiflora* is of smaller growth, but the rich yellow flowers possess quiet beauty.

Tigridias (*Tiger Flowers*).—These gorgeous flowers cannot be considered hardy except in light soil in especially favoured districts. *T. Pavonia* is the most familiar kind. Its flowers are of brief duration, but a succession appears, so that their short life is unnoticed. The flowers are about six inches across, and intense scarlet, splendidly spotted and dabbled with crimson. There are beautiful forms, such as *grandiflora*, which, as the name suggests, is conspicuous for its larger size, and the yellow blotched with red *T. conchiflora*. Tigridias requires a hot, moderately dry, sunny place, such as many borders offer. Generally it is necessary to lift the bulbs in autumn, much as one would a Gladiolus, but in the quite southern parts of the country they will be safe in the ground all winter. Plant in the middle of April, putting the bulbs six inches deep, and a little sand for them to rest upon in the hole, to reduce risk of rotting off to a minimum. Lift the bulbs in November, and store in a dry cellar, or some place free from frost.

Triteleia uniflora is an attractive flower, with quantities of white, star-shaped blossoms in April. It does well in light soil in raised positions. Plant in autumn two inches deep.

Tulips.—The advent of the "Darwin" strain of Tulips almost twenty-five years ago has done more than anything else to restore the Tulip to its rightful place in our gardens. The early varieties, classed as a whole, may be said to be on the formal or stiff side, and while they are undoubtedly useful for early spring bedding, they have not the same charm or

grace that the taller and later flowering cottage and Darwin ones have. These latter fill an important and necessary place in the first three weeks of the month of May. Daffodils are then over, and there would be a distinct interregnum in the garden as far as colour is concerned had we not these brightly coloured flowers to come along after the yellow and white of the Narcissus family. We strongly recommend them for this purpose, more especially as their culture is simple, and their cost by no means prohibitive. Before giving any general principles of management out of doors, we must remind readers that the early singles and doubles are very good for pot culture, and—what may be news to some—we must call attention to the adaptability of almost the whole of the Darwin family for the same purpose as valuable succession plants to come in during the latter part of March and April. All they need is very cool treatment. Pot culture will, however, be found dealt with on page 314.

The following directions as to successful Tulip-growing are obviously only general. Details of culture must be sought for in more specialised works, and also a trade catalogue, many of which supply much valuable information.

Soil.—Any good garden soil will grow Tulips. The best results are usually obtained where it is on the *stiff* side, and where there is a certain amount of lime present, and where the subsoil is moist and cool.

Position.—Tulips like a fairly sunny position which is sheltered from cold winds, and where the early rays of the morning sun do not strike the buds too early in the day. If possible it is best not to plant them for two years running in the same bed or border. It cannot be too widely known that cold winds and cold draughts are very detrimental.

Protection.—It is impossible to do much in this way in the flower garden, but where Tulips are grown for cutting or for show, some idea of how to protect and shade may be gleaned from the two illustrations given here. A slight shade either as a wind-screen or as a covering lengthens the flowering period considerably.

Planting.—The latter half of October and the first half of November is the best time for planting, although the operation may be delayed until early December with no very harmful results. Put the bulbs in the ground and allow from two inches to four inches of soil over them, according as they are large or small varieties. As to the distance from each other at which they should be planted, this must be left to the ideals of the planter and the depth of his pocket. The dwarf early varieties must be put in fairly thickly to look well. It is less imperative in the case of the later ones, and in addition ground or carpet plants can be suitably introduced. Never, if it can be avoided, put Tulips two years running in the same ground. If this is necessary double dig and enrich with *old cow* manure, bone meal, or basic slag.

MAY-FLOWERING TULIPS PROTECTED FROM WIND BY A SCREEN
OF COIR NETTING.

CHOICE DARWIN TULIPS PROTECTED FROM WIND BY A CANVAS SHELTER.

Lifting.—If possible lift every year. This undoubtedly gives the best results. Tulips will, however, succeed fairly well if they are undisturbed for two, three, or sometimes a larger number of years, especially if the soil is light. The writer has seen good flowering clumps in old cottage gardens which have not been lifted for ten to twenty years. Somehow, as in the case of the Madonna Lily, the ordinary canons of horticulture do not apply to these lowly spots. Hence we should never advise anyone to try it. The time to lift is when the foliage has partly turned yellow and is soft and flabby to the touch. Speaking broadly, it will be from the middle of June to the middle of July.

Storing.—When the bulbs are dug up put them in an airy, sunless shed, outhouse, or room to dry, and be sure to take away all the green leaves, should any be remaining. If the beds where late Tulips are growing are wanted for summer bedding, the plants may be lifted (if it can be done without breaking off any foliage or roots) and at once heeled in in some other part to ripen off, when the usual lifting processes may take place.

Diseases.—Two different fungi attack Tulips. The withered and dried-up look of the foliage, which is generally observed just before or at flowering time, is caused by "fire." Any damage to the outer tegument of the foliage from hail, sun on frozen beads of water, &c., is conducive to this. Cut off all affected parts as soon as and as much as possible.

The other disease is a sort of rot, and is much more deadly, and may be known by the stem coming away from the bulb with the slightest pull. Take up every bulb so affected with the surrounding soil and burn the whole. Never plant Tulips in that particular ground if the disease has been at all bad for five or six years.

Some of the best varieties are contained in the following selections. A diagram of a Tulip bed is given on the next page. Early singles—Yellows: Mon Tresor, Prince de Ligny (tall and pointed), Yellow Prince. Orange: Fred Moore, Christian de Wet, Prince of Austria. Pink and Rose: Cottage Maid, Pink Beauty, Le Matcllas. Reds: Artis Coleur Cardinal (late), Dusart, Vermillion Brilliant (early). Whites: Brunhilde, Princess Hélène, White Pottebakker. Various: Keizerskroon (red and yellow), Van der Neer (rosy purple), Hector (orange and orange red), La Remarquable (purple red edged flesh). Early double: Murillo (pinky white), Safrano (pinky yellow), Cochineal (crimson), Schoonoord (pure white), Couronne d'or (orange). Cottage—Branching: Mons. S. Mottet. Brownish shades: Clio, Toison d'or, Jaune d'Œuf, Gondvink. Mauve and pinky mauve: Inglescombe Pink, Le Rêve (mid-season), Saloman. Yellow: Inglescombe Yellow, Ellen Willmott, Moonlight, Mrs. Moon, Bouton d'or, Leghorn Bonnet, Vitellina. Reds: Elegans, Gesners, La Merveille, Scarlet Emperor, Scarlet Mammoth. Picotee edged: Golden Crown, Picotee, Isabella. White: White Swan, *Didiera alba* (species). Orange: Orange King. Broken: Striped Beauty, Dainty Maid, Columbus, Gold Flake, Buenaventura. Darwins—Red: Isis, Mr. Farncombe Sanders, Pride of Haarlem, William Pitt, Loveliness. Pink: Clara Butt,

FIG. 12.—A Border of Tulips arranged for Colour Effect.

Fanny, Suzon, Flamingo. Mauve: Rev. H. Ewbank, Euterpe, Erguste. Dark shades and purple: Velvet King, Fra Angelico, Zanzibar, Zulu, The Bishop, Marie. Nearly white: La Candeur, Margaret. Deep crimson: Millet, King Harold, Donders. Parrots: These are best in clumps but are not very free. All are equally suitable. Species: For borders—Mauriana, Præstans, Tubergeniana, Sprengeri, Strangulata primulina, Billietiana, Fosteriana, Greigi (last two a little doubtful doers). For rockeries: Linifolia, Batalini, Didieri (type), Kaufmanniana, Dasystemon, Marjolletti. Rembrandts: a new race of broken Darwins, which seem to be coming into favour—Admiral Kingsbergen (red and white), Crimson Beauty, Semele, Quasimodo, Procles, Red Prince, Victor Hugo. Florist varieties: these are not much cultivated at the present time. Everything depends on the beauty of the markings of the individual flower. They are divided into Bizarres, Roses, Byblœmens, and Breeders. Some of the Lancashire and Yorkshire towns are centres of their cultivation, and there is now an annual

Florist Tulip show in London. It is a pity they are not more widely taken up, for in a small space and at no very great cost a most interesting and alluring hobby may be set up. Information may be obtained from Mr. W. Peters, Farcet House, Cambridge, who is the honorary secretary of the National Society.

THE CARNATION AND PICOE

The Carnation is certainly one of the most beautiful flowers of the garden. For three centuries at least it has been prominent in English gardens, and is cultivated by all classes. The cottage grows it in their small front gardens, the nobleman of villas now so numerous, that every large town, makes a specialty of the Carnation, for it will thrive and produce its hardy flowers under the driest conditions that nature offers. A gentleman of some eminence in London, and who lives within three or four miles of the tank of London, had made up his mind to leave his residence and to transfer into the country, as he could not grow Roses and other flowers he loved. He tried Carnations, which were a great success, and he then decided to remain in the old home. There is no sense in making comparisons, favourable or unfavourable, between Carnations and other flowers of the garden. All flowers have their merits. They do not all flower at the same time, but some can be obtained at all seasons by skilful culture, others cannot. Amongst those amenable to forcing and flowering at every season of the year is the Carnation.

It will be my duty to give as full an account as possible of the Carnation and Picoe in every class, those beloved of the "house," as well as the ever more popular garden variety.

The Carnation in its wild state is the *Dianthus barbatus*. It is found generally on the walls of old castles, and is found generally on the walls of old castles. It is found in our time, and may now be the walls of Rochester Castle. This may give an explanation of the conditions under which the plant may be cultivated in our gardens. Certainly the supply of food to be obtained on the walls of an old castle cannot be rich; but it is well known that such plants are free from the diseases that attack the plants raised on rich loam, and stimulated with artificial manure.

Forster's Carnations.—There is something a vague form, as almost every class or section of the Carnation is adapted for cultivation in the garden, and it is merely a matter of the taste of the owner of the garden as to the varieties that are preferred.

THE CARNATION AND PICOTEE

THE Carnation is certainly one of the most beautiful flowers of the garden. For three centuries at least it has been pre-eminent in English gardens, and is cultivated by all classes. The cottagers grow it in their small front gardens; the occupants of villas, now so numerous near every large town, make a speciality of the Carnation, for it will thrive and produce its handsome flowers under the smoky conditions that usually prevail. A gentleman of some eminence in London, and who lives within three or four miles of the Bank of England, had made up his mind to leave his residence and go farther into the country, as he could not grow Roses and other flowers he loved. He tried Carnations, which were a great success, and he then decided to remain in the old home. There is no sense in making comparisons favourable or unfavourable between Carnations and other flowers of the garden; all flowers have their admirers. They do not all flower at the same time, but some can be obtained at all seasons by skilful culture, others cannot. Amongst those amenable to forcing and flowering at every season of the year is the Carnation.

It will be my duty to give as full an account as possible of the Carnation and Picotee in every class, those beloved of the "florist" as well as the even more popular garden varieties.

The Carnation in its wild state is the *Dianthus Caryophyllus* of the botanist, and is found generally on the walls of old castles, &c. It did grow at one time, and may now, on the walls of Rochester Castle. This may give us some inkling of the conditions under which the plant may be cultivated in our gardens. Certainly the supply of food to be obtained on the walls of an old castle cannot be rich; but it is well known that such plants are free from the diseases that afflict the tufts nursed on rich loam, and stimulated with artificial manures.

Border Carnations.—This is somewhat a vague term, as almost every class or section of the Carnation is adapted for culture in the garden, and it is merely a matter of the taste of the owner of the garden as to the varieties that are preferred.

A very fine display can be obtained by growing seedlings, but to obtain anything like good results seed should be saved from the finest varieties in cultivation, and the flowers ought also to be cross-fertilised. This is done by setting aside the best varieties in their respective classes, and using the pollen of a variety with well-formed flowers and of decided colour.

The seed bearer should be of robust habit and of good constitution; the flowers to be also of high-class quality. The flowers of Tree or winter-flowering Carnations are cross-fertilised in May and June. So also is the Malmaison for seed. The border and show Carnation seed is obtained by placing the plants under glass, and setting the blossoms in July, as in that month the flowers are produced without forcing. The seed will ripen in two months, and the pods must be gathered as soon as the seed is nearly black. The pods become brownish when the seed is ripe. Dry the seed in the pods, and when it has lain in a dry place in the pod for two or three weeks the seed may be removed, done up in packets, labelled, and dated, and kept until the spring. The Tree Carnation seed should be sown in February, and if the plants are grown on and carefully attended to they will flower in the autumn and winter of the same year. On the other hand, the Malmaison and border Carnation seed is best if sown about the end of March or early in April, so that the plants have a full season to make their growth; they will flower in due course the following season. The flowering of the seedlings is a time of excitement; there will be some pleasant surprises, and, until the amateur is seasoned by some years of experience, times also of disappointment. I receive hundreds of letters from amateurs in the course of the season, and it is amusing to read the different notions they have of the results to be obtained from sowing seed. Many have an idea that they can reproduce the finest varieties from seed; others that if the seed is saved from the best varieties all the seedlings may be like their parentage to a certain extent, and if any varieties are produced amongst them with single flowers, showing a reversion to the original parentage, the easiest way is to blame the seed. Taking a hundred plants raised from the best strains of seed, there would be a dozen to fifteen plants with single flowers. Seventy or eighty would be varieties with double flowers of unequal merit; perhaps five or six might be worth growing again to be tested against the named varieties.

The cross-fertilisation gives some very curious results. For instance, it is intended to produce some new varieties of

yellow or white ground Picotees, and care is taken to cross-fertilise the best varieties in the various classes. The flowers may be yellow or white, with narrow margins of red, rose-pink, purple, scarlet, &c. The seedlings produced from such crosses would give a large proportion of self flowers, and nondescript fancies of various colours. The yellow ground varieties produce many seedlings with white grounds; but seedlings from white ground Picotees may never be expected to produce varieties with yellow grounds. Similar results are obtained if seed is saved from flaked and bizarre Carnations; selfs and fancies are freely produced from such, whereas an inexperienced amateur might think he ought to have all white ground Picotees from seed saved from such, and the same with flakes and bizarre.

When choice varieties are obtained they should be propagated from layers in the usual way, and a good stock of healthy plants will soon be established.

A bed of well-grown seedling Carnations is a beautiful feature in any garden. The seed if sown as advised in March, April, or early May, and the plants well cultivated—that is, planted in good deep rich soil and about 15 inches asunder—each of them will produce a hundred to two hundred blooms, and they may be cut in handfuls of flowers and buds borne on long stems. For placing in vases for this purpose the single flowers are also of merit.

Propagation and Culture of Border Carnations.—Every one with a garden of any kind can grow border Carnations. They do not suffer much, if at all, in an impure atmosphere, but to obtain the best results good loam is needed, with some good rich manure placed some 6 inches below the surface. Lime, or chalk, especially in the form of old mortar, is also much appreciated if dug into the border; it imparts a beautiful blue-grey tint to the foliage. The fibrous roots very soon reach the manure or lime, and the effect is seen in healthy foliage and large well-developed flowers.

The plants are obtained by layering in July and August. The layering may be continued into September, but the strongest and best plants are from layers late in July or early in August. About the last week of September, or any time during the month of October, they may be removed from the parent plants, and planted out where they are to flower.

The amateur gardener will notice when his Carnations and Picotees are flowering in the month of July that some growths are developing at the base of the flower stem. These growths are called “grass,” and are intended when fully grown to be

"layered," and thus make fresh flowering plants for the ensuing year. These pieces of "grass" are known as "layers" in all border Carnations and Picotees because of the "layering" method by means of which the stock of these is usually perpetuated. About a single flower stem of Carnation there may be six or more pieces of grass or layers, and the whole of these, if properly dealt with, will make fine flowering plants for the following year. The work of layering is usually accomplished in the end of July or early in August. Perform it in this way. Take one of the layers in the left hand, and, beginning from the ground level, carefully remove all the leaves on the stem for a space of two inches. Endeavour in removing the leaves not to tear the skin of the stem, or if preferred remove the leaves with sharp scissors. The object in removing the leaves, which occur in pairs on the stem, is to allow of the growth being well laid down (hence the term "layering") in the soil. Every shoot or layer must be dealt with in the same way until all are ready for putting down. When all the pieces are thus trimmed, gently stir up the soil an inch deep or thereabouts all round the plant.

Purchase some "layering pegs" made of straight bits of thin wire six inches long with a crook at one end, or, what will do just as well, some long hairpins. These are intended to hold the layer steadily in the soil. Then with a sharp pen-knife make an upward cut in the portion of the stem from which the leaves were removed previously, and this is the method to follow. Take one of the layers with the left hand, grasping all the leaves. Place the forefinger of the same hand low down on the prepared part of the stem, and cut into the stem just below a good joint, continuing the cut in an upward direction for almost an inch.

FIG. 13.—Carnation Shoot Layered.

Endeavour to make the cut quite in the centre of the stem. When the knife is withdrawn one portion remains in direct communication with the upper portion of the growth, while the other is separated from it. The separated part is called the "nib" or "tongue," and it is from this that the roots will eventually be produced. Place the layer in the soil, already

loosened to receive it. Make a tiny trench with the finger, and while keeping the tongue of the shoot open lay the stem on the surface, and carefully peg it into position, finally covering rather firmly with soil. In every case rooting of the layers is greatly assisted by using a good addition of sand of any kind, even builder's sand will do. This is the practical work of layering, and the same system is followed not only with trees but hosts of rare and beautiful subjects that take a long time to root when other methods are adopted. In dealing with the Carnation thus the chief fear is in the process of making the cut, as frequently the blade slips right through the stem and the shoot is sacrificed. The best way to obviate this is to practise a little on boughs of Privet or shoots of trees before starting upon the Carnation. Give a good soaking of water when layering is finished.

The Carnation gives the best results if planted in beds or masses, so that an imposing group of one colour is obtained if the garden is a large one; small beds may be made of white, crimson, yellow, scarlet, pink, &c. In small gardens there may be room for one small bed only; in that case mixed colours must be grown. The plants ought to be about 15 inches asunder, as a certain space is necessary for layering. The plants may also be put out in open spaces in the mixed border; the layers may be thinned out from these clumps, some good soil placed around those that remain, and in this way a greater mass of blossoms may be obtained the following season. In some gardens, and in certain districts unfavourable to the growth of the Carnation out of doors in winter, it may be better to put up the plants in small flower-pots. The flower-pots are termed small, medium, and large 60's, $2\frac{1}{2}$ inches, 3 inches, and $3\frac{1}{2}$ inches inside measure. Two plants are placed in the large size and single plants in the smaller sizes. They are potted firmly, and a good compost is four parts fibrous loam, one part leaf-mould, and one part decayed manure; this material answers admirably. The plants can be wintered in ordinary garden frames. The lights may be kept rather close for a week or so, but when fresh roots are formed they should be removed whenever the weather is favourable, and during the winter only give sufficient water to keep the pot in soil from becoming dust dry. Many people prefer planting in autumn, while others believe spring is best; but if strong hardy stock is obtained from growers of repute any time between September and May, provided the weather is fairly open and the ground not frozen, will be successful.

CARNATION LAYERS ROOTED AND READY FOR LIFTING.

A YOUNG PLANT READY FOR POTTING AND ONE POTTED UP.

NEW
PERPETUAL
FLOWERING
CARNATION

NEW WHITE PERPETUAL FLOWERING CARNATION
WODENETHE (See Page 131).

Nearly all amateurs grow a goodly number of plants in flower-pots. When this is the case they are repotted in March, using a similar potting material. Two plants may be put in an eight-inch flower pot and three in a nine-inch. Drain the pots well with potsherds. Some fibrous material ought to be used to prevent the loose particles of soil from mixing with the drainage. If the weather happens to be favourable at the time of repotting, the plants may be put out at once into the open garden. But if cold east winds are blowing, they do better in frames until they become established. At the same time, they seldom suffer from cold; wet is more likely to be injurious to them. Pot firmly is an established axiom amongst Carnation growers, but this may be overdone. I have seen it so at my own potting-bench. The best border Carnations are the self-colours, and they are now to be had in almost any shade.

The following lists have been kindly compiled by Mr. John Douglas, the well-known Carnation expert of Great Bookham, Surrey. These varieties marked with an asterisk have received awards of merit of the Royal Horticultural Society.

Selfs—

White Varieties : Trojan, Mrs. Henwood, * Bookham White (new).

Yellow : * Daffodil, Eros, and Solfaterre.

Buff or Apricot : Mrs. G. A. Reynolds, * Elizabeth Shiffner, Benbow (an old but good one), Golden Oriole, and Robert Bruce.

Crimson : Agnes Sorrel, Basuto, Zulu, and * Hercules.

Ruby-coloured : Lord Nelson and Ruby.

Dark Rose and Pink : * Mrs. Robert Gordon, Mandalay, Lady Hermoine) * Rosy Morn (extra fine), * Miss Willmott (coral red).

Blush : Lady Roscoe, * Annie Laurie (extra fine), Innocence, Countess of Paris.

Red and Scarlet : * Cardinal, Brigadier, * Jean Douglas, Ibis, Prince Charlie, Fujijama.

Heliotrope or Mauve : Greyhound, Ellen Douglas, Miss Ellis, * Duchess of Wellington (very fine).

Fancy Carnations.—These have a lovely effect in the border. Unlike the fancies of long ago, the present day representatives are of robust constitution, stronger in many cases than the Clove Carnation. Few other flowers afford such a range of colour; grounds of white, blush yellow, buff, heliotrope, and crimson; striped, mottled, splashed, and suffused, with every shade of colour known to Carnations. It is impossible to enumerate

every variety worthy of a place in the garden. A few of the best are as follows :

Alice B. Stewart, apricot marked rose ; Forester, yellow marked red and crimson ; * John Ridd, yellow suffused glorious rosy red ; Mona, beautiful buff suffused pink ; Renown, buff ground, heavily splashed and marked brilliant red ; * Montrose, white ground, marked scarlet ; Mrs. H. L. Hunt, white ground, marked lavender ; Virginia, buff ground, suffused pink ; * Liberté, rich yellow, marked maroon and crimson ; Linknan, buff ground, suffused scarlet ; Mellon Prior, rich yellow, heavily marked glowing scarlet ; Delicia, white ground, marked pink and crimson ; the Bride, the best white ground, marked rosy red (extra fine) ; Normas, yellow ground, striped crimson and scarlet ; Queen Eleanor, buff ground, blotched and edged copper scarlet ; Sweetheart, delicate apricot, marked and suffused pink ; Osprey, buff ground, spotted scarlet ; Harlequin, canary yellow, striped rose and crimson.

All the above are suitable for the keenest exhibition purposes, and on account of their robust constitution can be grown in the border without difficulty.

The Picotees.—Next in importance as border or greenhouse plants are the Picotees or edged flowers. A Picotee to reach the standard of excellence must be without blemish on its ground colour and evenly edged with its colouring, of good form and substance of petal. Such varieties of yellow grounds are not easy to obtain. The yellows, like the whites, should have a clear ground with broad, medium, or wire edge of red, rose, crimson purple, and scarlet. The late Mr. R. Martin Smith and the late Mr. James Douglas did much to uphold the high standard of the yellow ground Picotees. At that time the former raised Childe Harold, and the latter Mrs. James Douglas (both peerless flowers), but both since superseded by better.

The appended list of varieties will be found pure and free from blemish, as far as one can say of any yellow grown Picotee, and quite suited for a border or outdoor life :

Yellow ground.—Agnes, Constance, John Ruskin, Santa Claus, Margaret Lennox, Onward, Ophir, Togo, Exquisite, Flora M'Ivor, Richard Goodfellow.

White Ground.—Brunette, Gannymede, John Smith, Polly, Brazil, Queen of Spain, Amelia, Ann Lord, Lavinia, Mrs. Sharp, Radiant, Thomas Williams.

Bizarres and Flakes.—These were dearly loved by the old florists more than a hundred years ago, and are still cultivated and shown to perfection at the leading Carnation Shows of to-

day. But as the showing to perfection of this type necessitates dressing the petals with tweezers and displaying the flower on a card or collar, the popularity of this class has waned ; but they can still be seen to perfection in cottagers' gardens in the north, especially on Tyneside, where they may be seen in great beauty in very out-of-the-way places in August. They are divided for show and exhibition purposes into six classes, as follows :—

I. *Scarlet Bizarres*.—These have a white ground, or as near white as possible ; the purer the white is the greater are they esteemed. The colours are divided into lines and flakes, and in this class are maroon and scarlet. The best varieties are : Admiral Curzon, a very old variety, and still not surpassed when at its best ; Dr. Hogg, Edward Adams, Robert Houlgrave, and George Lord. II. *Crimson Bizarres*.—These are white grounds, flaked and striped with crimson and purple. The best of them are : Bruce Findlay, C. F. Thurston, J. S. Hedderley, Master Fred, Phœbe, and Thaddeus. III. *Pink and purple Bizarres*.—These are pink and purple, some a very pale pink are of delicate beauty. The best of them are : Melody, Harmony, William Skirving, Squire Penson, and Sarah Payne. This last is very old, but still grown for its charming arrangement of colours. There are also three sections or groups of flaked Carnations included in the show or florists' type. IV. *Purple Flakes*.—These have also a white ground with flakes of purple. The best of them are : Charles Henwood, James Douglas, Squire Whitbourn, Gordon Lewis, and George Melville. V. *Scarlet Flakes*.—Flambeau, Guardsman, John Wormald, Matador, and Sportsman. VI. *Rose Flakes*.—Lady Mary Curry, Torchlight, and Recorder.

Malmaison Carnations.—This favourite flower of Queen Alexandra is one of the most useful of greenhouse plants, giving as it does, when properly managed, a succession of sweet-scented bloom from March until August. One has only to inspect an exhibit at the Royal Horticultural Society's Show from such growers as Mr. Leopold de Rothschild or Mr. C. F. Raphael to realise the possibilities of specimen plants for conservatory decoration or for out bloom. One very fine specimen in a 16-inch pot, shown, we believe, by the latter gentleman, bore something like sixty-eight disbudded blooms, some of which measured 5 inches across. The late Mr. Martin R. Smith did much for us by raising new kinds—some thirty, we believe, which are now standard varieties. He failed in one respect, as everyone has done who has essayed the task of raising a good yellow Malmaison. The only one worth saving was found to be a variety he called Yaller Gal, and against his

own judgment it was put on the market ; but alas ! it was a poor apology for a yellow Malmaison, and we are still waiting for a good one.

Propagation.—Malmaison Carnations are propagated freely both from layers and cuttings or slips. These may be taken off in May and placed under hand-lights or a propagating frame in a little bottom heat. They must be shaded from bright sunshine, and also kept close until roots are formed. When it is seen that some growth is made, more air must be admitted, and the shading not so close over them as at first. Layers are the most convenient method of propagation, and it is only desirable to make slips of the growths that are too high up on the main stem to be layered in the flower-pot. When the layers have formed roots, which may be in July and August, they ought to be potted up into sixty-sized flower-pots, using similar soil to that required for other Carnations. The plants must be potted into larger flower-pots when necessary. In all stages of growth, especially in winter, the plants should be near the roof glass, and in a dry, airy atmosphere. A close atmosphere, especially in the early spring, is sure to cause "spot." The temperature in winter and early spring ought not to be higher than from 50 degs. to 55 degs. as a minimum, with 5 degs. more in the daytime.

As a selection for general purposes I should give :

Astarte, vivid rose ; Baldwin, rose pink ; Duchess of Westminster, salmon ; Florizel, rose ; Lady Rose, pink ; Margot, salmon pink ; Mercia, salmon pink ; Mary Measures, crimson ; Nautilus, delicate blush pink ; Nell Gwynne, white ; Mrs. Torrens, salmon pink ; Mrs. Trelawney, reddish salmon.

Tree or Perpetual-Flowering Carnations.—These are the most delightful ornaments of the greenhouse and conservatory in the late autumn, winter, and spring months, and they are so easily grown that any amateur may enjoy their beauty and delicious fragrance all the year round, for in truth they will continue to flower all through the summer. Large well-branched specimens will give at least a hundred blooms during the season, but perhaps the most useful for ordinary purposes are those grown and flowered in five and six inch flower-pots.

Propagation and General Culture.—As the shoots or slips cannot be layered owing to their position on the plants, they must be propagated entirely by slips or cuttings inserted into pots of sandy soil, and placed in a propagating frame or close greenhouse. The earliest cuttings are put in

*A HOUSE OF MALMAISON CARNATION
PRINCESS OF WALES.*

THE DOUBLE WHITE VIOLET COMTE DE BRAZZA (See Page 137).

early in January; they form roots in two or three weeks, and should be removed from the frame as soon as they are rooted; pot them off into small flower-pots, and gradually inure them to a cooler atmosphere. They do better out of doors after the month of May, and should be taken into the greenhouse early in September, when the earliest of them will begin to flower. These one-year-old plants are allowed to flower in five and six inch flower-pots, and the same potting materials may be used as for the others. If large plants are wanted, they may be repotted after flowering, into eight and nine inch pots. For these larger plants the soil ought to be packed in firmly over good drainage secured by some quite fibrous loam over the potsherds. In the early stages of growth the plants ought to be stopped. When they are merely about four inches high the centre should be pinched out, and this may be done a second time if the plants are not bushy enough. The plants must be kept clean and quite free from insect pests. An occasional fumigation with tobacco smoke will effect this.

There are some people who advise amateurs to plant perpetual-flowering Carnations out in the border; but although in some instances they do very well, they will never take the place of the true Border Carnation, and the Border will never supply the place of the Tree. Tree Carnations can be planted out in May and staked with tall stakes, for they grow to a height of three feet or more. Under a sunny south wall is a good position, where the locality is suitable for their culture out of doors. There are so many on the market, and so many growers of American sorts, that it is most difficult to please every one in a limited list of favourites; but there are many varieties with high-sounding names and posing as élite, that are still a little behind our charming first love Enchantress; and it has yet to be proved that the grand scarlet British-raised Britannia has been superseded. A list is appended of really first-class varieties:

White—White Enchantress, White Perfection and Wodenethe. *Scarlet and Red*—Britannia, Beacon, St. Nicholas, Victory, William Eccles, scarlet glow. *Pink*—Enchantress, Dorothy Gordon, Lady Meyer, Rosette (cerise), R. F. Felton, Mrs. C. W. Ward, Pink Delight, Winsor (rose) Empire Day, May Day. *Crimson*—Triumph, Pocahontas, Sultan. *Fancies*—Bay State, Benova, Sunstar, Rainbow, Hon. Lady Neeld. *Heliotrope*—Geisha, La Mode, Salome. *Yellow*—Golden Ray.

Diseases and Insect Pests.—The most troublesome and persistent is the "Rust" (*Helminthosporium echinulatum*), a

fungoid growth which develops between the membranes of the leaves ; it ultimately bursts and scatters its coffee-coloured spores. There is no cure except to cut off the affected leaves as soon as the disease is noticed. A good preventive is spraying with one part of methylated spirit to 100 parts of water by measure. The next disease is "Spot" (*Uredo dianthi*) ; it is not so deadly, nor is it really infectious. The plants should be placed in a light and airy position, and in as dry an atmosphere as possible ; the parts attacked should be cut off. I find it useless to dip or dust the plants. Another very troublesome pest is the "eel worm" (*Tylenchus*). This is a minute nematoid worm, which produces the disease known as "gout." The worms attack the collar of the plant, causing it to swell ; they seem to eat their way up the stem, and ultimately kill the plant. When they have made a lodgment in the plants there is no cure ; best destroy the plants and remove the soil.

The Carnation maggot (*Hylemyia nigrescens*) is very troublesome, and sometimes does much damage to the plants. It does more mischief to those planted in the open garden than to those in pots. It is the larvæ of a small dipterous black-fly, which greatly resembles in appearance the house-fly ; it is generally found in the centre of the plants, and it eats its way down until the heart is totally destroyed. It is easy to see where the depredator is at work, and it can be dug out with a needle. Wireworm is the larva of a small beetle (*Agriotes lineatus*). In the larval period they remain in the ground from three to five years. A full-grown wireworm is about an inch long, of a yellow colour, hard and wiry to the touch. They work underground and eat into the stem, working up the centre of the plant, and the first sign of its being there is the decay of the leaves. By that time the worm has gone into the ground again, and is probably engaged on another plant. For pot plants it is best to look the potting soil well over when it is being mixed. In the open garden a good plan is to dig in a coating of fresh gas lime about six months before planting out the Carnations. Slices of carrots inserted in the soil attract the wireworms ; these traps may be examined three times a week and destroyed.

Aphides, or green-fly, if allowed to increase, do more mischief than most people imagine ; they suck the juices of the plants, and cause them to become polluted by their excrements, the leaves becoming dirty and sticky from the glutinous substances. They spread rapidly in warm weather, but can always be destroyed with tobacco smoke, or the plants may

be dipped in a solution of soft-soapy water, two ounces to the gallon. This will also kill them.

The small yellow thrips are also most troublesome on the choice show Carnations, and quite spoil the beautiful Flakes and Bizarres. The pest attacks the unfolded petals of the Carnations even before the colour is seen bursting from the calyx. The white ground Picotees are also much disfigured by it. As soon as the plants can be taken into the greenhouse and smoked the insects are killed. It is always more frequent upon pot plants than upon those grown in the open garden.

Marguerite Carnations.—A modern race, the result apparently of crossing an early flowering type with the Indian Pink (*Dianthus chinensis*). The varieties are practically annuals, though in some seasons they have a biennial character. The plants flower in about four months from the time of seed sowing. Sow in heat in March and the seedlings will soon be ready for potting into 2½-inch pots. When sufficiently rooted, transfer to a slightly larger size, and use a rich gritty soil. At the end of May plant them out. They may also be grown on in pots. The flowers are very pretty in colour, fragrant, and generally quite double. It is a race worthy of the beginner's care, and the seed is reasonable in price.

SWEET VIOLETS AND THEIR CULTIVATION

Outdoor Violets.—Sweet Violets will grow and flower freely in almost any good garden soil, and that which will produce good vegetables will be found equally suitable for the growth of Violets. In preparing the bed or border to receive the plants do not charge the soil with a mass of rank manure, as this in all probability would lead to much leaf growth and few flowers, the latter being in small proportion to the foliage. Those who have a light, hungry soil to deal with might improve by digging in some thoroughly decayed cow manure. This while feeding the roots would also tend to keep the ground cool and moist during summer, no small feature in successful Violet culture. The Violet does not grow naturally in a place where rank manure prevails; the plants require rather shade and moisture, and a soil rich in humus, viz. the accumulation of decaying leaves for many years. A free addition of leaf-mould is an advantage, especially to heavy soils that are inclined to bake and then crack under the influence of the sun. The presence of decayed leaves in the ground would prevent this, while the roots would revel in what is naturally their chief rooting medium.

Some growers are so situated that they find it is difficult to secure either cow manure or leaf-mould, but the Violet is not particular, thriving almost as well when the site is dressed with what we may term a mixed compost. The ordinary rubbish heap contains more valuable plant food than many imagine, especially after all the nondescript material has gone through a process of decay, the germinating power of the seed of weeds destroyed, and the whole turned and well mixed. A good heap of such compost may be used with advantage for most flowers, and none would appreciate it better than Violets. Of other suitable dressing mention might be made of spent mushroom dung or the remains of an old hot-bed. Lime, wood ashes, or fresh horse droppings should be avoided, as these are not moisture-holding agencies, therefore they are

not suitable for the plants under notice. Whatever dressing is used should be dug into the ground deeply some time before the plants are put out.

Position of Beds.—In summer while the plants are making their growth a shady spot is best, or partially so, as the foliage, being so liable to the attacks of red spider, is more likely to become infested in a hot, dry position than if the plants are grown in a cool and shady one. North or east borders should be selected, or the shady side of a hedge, between fruit trees and bushes, or any position where the plants will receive shade during the heat of summer. In such places, too, the plants often produce an abundance of flowers in autumn, and give a wealth of bloom in spring; but to maintain a continuous supply throughout the winter the plants must be lifted in September and planted in the warmest and most sunny spot in the garden, such as at the foot of a south wall, or in frames. Thus while the plants require shade and moisture during summer, all the sun possible should reach them throughout the winter months.

Raising Young Plants.—Violets should be propagated annually. It is natural for the plants to increase rapidly, the same as the strawberry, by means of runners. When strawberry plants grow at will, the beds the second year are one mass of foliage crowded together, so thickly do the runners appear and spread, and there is little or no fruit. So it is with Violets, and instead of the beds being an entangled mass of side shoots, each plant should be grown separately and quite a foot or more apart. Then by nipping off the runners during summer strong individual crowns or clumps are formed, which not only produce fine flowers abundantly and on long stems, but which are more valuable for arrangement when cut. A limited number of the plants, however, should be reserved for stock purposes, allowing these to form runners, which become rooted in the ground. The desired number should be severed from the parent plants, with a lot of roots attached, and transplanted in properly prepared beds. If these are to flower in the open, plant fifteen inches apart each way. Water and syringe frequently if the weather is dry after planting. Keep the soil hoed, and then they will soon become established.

New plantations should be made in autumn for the following reasons: First, the plants are more easily and quickly established in September than is possible say in March, when there are often trying winds and a bright sun. Then, again, the plants should be in full flower in the latter month, and one is reluctant to disturb them for increasing the stock; while if

propagation be delayed until after the flowering period, the season is too far advanced, and the weather generally too hot for the divisions or offsets to make any progress, and they either remain stunted during the summer, or, what is worse, many may fail to grow at all. Some growers simply pull the old plants to pieces in spring, and dibble out the divisions. Many of these have hard woody stems and few fibres, and unless the weather is mild and showery such divisions fail to start. How much better then must it be to have a reserve of young, clean, and well-rooted autumn-struck plants. If it is necessary to transplant these in spring there will be no risk, as each plant can be lifted with a good ball of earth, and they begin to grow at once in their new quarters. Such young stock would probably show flower buds, but these should be pinched out, as the established beds would furnish the supply. If, after planting, a slight mulch of decayed manure could be spread around the plants so much the better, as subsequent rains would carry the manurial properties down to the roots, and the residue on the surface would greatly assist to keep the ground cool and moist during a hot and dry summer. During the summer encourage leaf growth free from red spider. Keep the runners picked off and the ground between the plants free from weeds. Treated in this way the plants will not fail to give a wealth of bloom in due season.

Violets in Frames for Winter.—However good the summer treatment may have been, or how strong the plants may be by autumn, a continuous supply of bloom throughout the winter cannot be maintained without some protection. Temporary frames may be placed over the beds, but then the shady position the plants occupied during the summer would be against free-flowering throughout a season of dull short days. Therefore, the plants should be removed to a more sunny one and planted in shallow frames—an ordinary portable frame, such as is generally used for growing cucumbers in during the summer; indeed, a bed that has been used for this purpose requires little alteration to receive the Violet plants. The hillocks need only be levelled down, and the soil trodden somewhat firmly and the Violet plants put out say one foot apart. Of course, we are supposing that the soil in the frame will not be more than eighteen inches from the glass. The nearer the plants can be brought up to the glass the better, so that every ray of sunshine reaches them. The frame, too, should have a sharp pitch and face south. This will allow of rain or snow passing off quickly, and then there

is less fear of the foliage suffering from damp or mildew. The Violet is hardy, and resents fire heat; protection from damp and severe frost is all that is needed; and when severe weather is anticipated, pack leaves, bracken, straw, or stable litter round the sides of the frame, and cover the lights with double mats to keep out frost, and the plants are more likely to succeed in such quarters than in heated brick pits.

The plants should be exposed fully whenever the weather permits. Even in wet weather tilt the lights well at the back, harsh winds, frost, and heavy rains being guarded against, and ventilation afforded accordingly. These are the simple lines upon which to work, and by getting the plants placed in the frames the first or second week in September, flowers may be expected in October, and by having several varieties a succession of bloom is maintained until the end of April.

The best Varieties for the open are undoubtedly the single ones, though the double Marie Louise and Lady Hume Campbell might be included in the collection. Among the single varieties mention must be made of one very beautiful single violet, it is undoubtedly the best, viz. Princess of Wales. It grows very strongly, and should be allowed plenty of space for the large leaves to develop. The flowers are also very large and borne on long stems; when cut they can be used with greater taste than is generally seen in the arrangement of cut Violets. Victoria Regina is an old favourite, and with the blue La France one need not seek further in forming a collection. With the doubles, many amateurs call all these the Neapolitan, but the true variety has pale lavender-coloured blooms with a white centre. They are very fragrant and pleasing, and appear freely in frames during the winter, but they have rather short stems. We rely chiefly on Marie Louise, rich lavender mauve blue, with a white eye, a general favourite, which flowers continuously until spring. Then there is that beautiful late variety, Lady Hume Campbell, which makes a good succession, and so prolongs the season of Sweet Violets, not perhaps to the extent many would wish, but certainly over a period that it is possible to induce the plant to bring forth those deliciously scented flowers of which we never tire. Comte de Brazza is a double white variety that is much appreciated, but it is not easy to cultivate.

THE ROCK AND WATER GARDEN

ROCK-GARDENS have of late years become increasingly popular in the British Isles, and deservedly so, since they give opportunities for appreciating the beauties of numberless Alpine plants within a limited space, while one of their chief merits, from the amateur's point of view, lies in the fact that the proprietor, if he has a fair knowledge of the elements of gardening, is enabled to do all necessary work with his own hands. The plants may be attended to while he stands on a stony pathway or rock steps, instead of upon the moist earth of the mixed border. In dividing and planting the porous earth scarcely soils the fingers, and stray weeds may be removed by the feeblest hands. The rock-garden, if thoughtfully planned, offers, with its varied exposures and elevations, a congenial home to a large assortment of charming flowering plants that will paint the ledges and crannies with bright colour from the early days of spring until past midsummer. In mild seasons the *Arabis* spreads its white veil over the rock-face in the first days of March, followed by the *Aubrietias*, purple, crimson, and blue-grey, the dwarf *Phloxes*, Mountain Pinks, brilliant Sun Roses (*Helianthemum*), and a host of other lovely things that provide a succession of bright colours through a long period.

Much, however, depends on the formation of the rock-garden, and in this, as in other cases, there is a right and a wrong way of going to work. Unfortunately, in the majority of instances, the latter method, or want of method, has been followed, as may be seen from a casual inspection of the numberless so-called "rockeries" that deface villa gardens and others throughout the length and breadth of the land. The constructors of such abominations appear to have been utterly ignorant of the requirements of the plants destined to occupy these sites. In many cases these "rockeries" convey the impression that a cartload of rough stones or clinkers has been shot out upon a heap of soil; in others flat stones are embedded in pairs at right angles to each other, in almost perpendicular banks, each pair enclosing a triangle of soil, which

A ROCK-GARDEN IN THE MAKING, SHOWING DRAINAGE FOR CENTRAL MOUND.

THE PROPER WAY TO PLACE ROCKS IN BUILDING A ROCK-GARDEN.

soon becomes parched by the sun ; while there are yet others, whose designers have evidently spared no pains or expense to produce a masterpiece of art, with the result that their rock-gardens must remain till the end of time places of rocks, and not of flowers.

In *Forming a Rock-Garden* it must be borne in mind that the object in view is to grow beautiful plants, and to display to the best advantage, amid appropriate surroundings and in robust health, the flowers that enamel the rugged Alpine slopes, and streak the creviced crags with colour. The mission of the rocks is to afford congenial crannies for the roots to explore, and to provide surfaces for trailing growths to veil with greenery and blossom. They are there to act as a natural setting for the flowers, which should spread in tinted breadths over the spaces as freely as on their native ledges. The nearer Nature can be approached the more natural will be the effect, and rocks should therefore emerge from the soil in such a manner as to give the effect of an outcrop of the living rock from a mountain side. Where rock-masses are built by placing stones against one another, either in a horizontal or sloping position, those having flat surfaces should be used in order that the form of natural rock-stratification may be presented (see illustrations). An open position, *i.e.* one that is not unduly shaded by buildings, or in the least overhung by trees, must be selected for the rock-garden. On no account should cement be used in the rock-garden, but all fissures and seams between stones should be crammed with soil, great care being taken that no vacuum exists between the rock-faces. Should these occur, losses are certain to ensue through the dry air entering the crevices and parching the roots. It is well to excavate, where the rock-garden is to be formed, to a depth of eighteen inches, in order that thorough drainage may be ensured, since stagnant moisture at the root is fatal to many Alpines. A depth of fully three feet of soil should be provided, as many rock plants send their roots downwards to some distance between the masses of stone, where they remain cool and moist during the hottest weather, while foliage and flower enjoy the full benefit of the sunshine. Sandy loam mixed with some peat, to which a good proportion of sandstone chips and grit has been added, will be found suitable for the majority of rock plants. Some, however, prefer peat, while others like a calcareous soil, in which case broken limestone should take the place of sandstone. The mixture of stones and grit with the soil is a great help to alpines, as it prevents rapid evapora-

tion. It is generally best to use country stone—that is, stone easily procurable in the locality—in the construction of the rock-garden, unless the stone be of a nature likely to crumble away. No spar or carved stonework should be employed, while old tree roots should be rigorously excluded, as these breed fungi. Simple paths only are necessary in the rock-garden.

Here and there along the irregular edges, Sea Pinks (*Armeria*), Sedums, Saxifrages, Corydalis, and other plants, throwing out into the walk, will create an informal verge, while in the chinks of rough rock-steps the *Erinus alpinus* will blossom freely, and *Arenaria balearica* spangle the perpendicular stone faces at the side with countless tiny white blossoms. Some plants, such as *Ramondia pyrenaica*, prefer shade, while others delight in the fullest sunshine, and for each class sites are readily provided in the well-arranged rock-garden. In the lowest level a bog bed may be formed where hardy Cypripediums, Trilliums, and other moisture-loving plants will flourish. Running water, though by no means a necessity, adds much to the charm of such a garden, and where this is procurable a streamlet, falling from the higher to the lower levels by a series of cascades, passing here over rocky slabs and there beneath overhanging outcrops of stone, and entering at length an informal rock basin where the hardy Water-lilies flower, produces a pretty effect. The surroundings of the ideal rock-garden should be picturesque, and it therefore follows that the most perfect is one that is not overlooked by houses or buildings. Such a site is, however, out of the question in the majority of small gardens, in which the rock plants will flower as profusely as when provided with a less formal environment. No trees should overhang the rock-garden, but the shelter of a belt of shrubs, planted at a sufficient distance to preclude their roots robbing the soil, is a decided advantage. The selection of plants for the embellishment of the rock-garden is largely a matter of taste, but the following list of fifty, compiled by Mr. S. Arnott for *The Garden*, will serve as a good guide.

THE FIFTY BEST ALPINES FOR SMALL GARDENS

It requires a considerable amount of temerity to submit a list of fifty alpines, and to assert that they are the best fifty for a small garden. Criticisms, some of them doubtless well founded, will arise, but it must be remembered that several

DRIPPING WATER AND BOG GARDEN.

WILD PINKS (*DIANTHUS*) IN THE ROCK-GARDEN.

THE ROCK AND WATER GARDEN

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Name.	Height. Inches.	Aspect.	Soil.	Colour.	Flowering Period.	How to Propagate.
Acantholimon glumaceum.....	9	Sun.....	Loam.....	Pink.....	June and July.....	Seeds or cuttings
Adonis amurensis.....	9	".....	".....	Yellow.....	Feb. to April.....	Seeds or cuttings
Adonis grandiflorum.....	9	".....	Sandy loam.....	Rosy purple.....	July to Sept.....	Seeds or cuttings
*Androsace lanuginosa.....	6	".....	Loam and grit.....	Rose.....	May to Sept.....	"
Anemone nemorosa Allenii.....	6	Shade.....	Loam and leaf-soil.....	Blue.....	April and May.....	Division
A. sylvestris major.....	9	".....	Rich loam.....	White.....	May and June.....	"
Anthemis Alcockii.....	6	Sun.....	Sandy loam.....	".....	June to Aug.....	Seed or cuttings
*Arenaria montana.....	6	".....	Loam and grit.....	".....	June and July.....	Seeds or division
Arnebia echinoides.....	9	".....	Sandy loam.....	Yellow.....	May to Aug.....	Cuttings or division
Aperula anuberosa syn. Athoa.....	6	".....	Sandy loam and grit.....	Pink.....	June and July.....	Division or seeds
*Aubrietia Moerhousii.....	4	".....	Sandy loam.....	Rose.....	April to June.....	Cuttings or division
*A. Dr. Mules.....	4	".....	".....	Purple.....	April to June.....	"
*Campanula garganica hirsuta.....	6	Sun or shade.....	".....	Pale blue.....	June to Sept.....	Division
*C. portenschlagiana major.....	6	".....	".....	Blue.....	Feb. to March.....	Seeds or offsets
Chionodoxa gigantea.....	4	".....	Common.....	Lavender.....	September.....	"
Crocus speciosus.....	5	Sun.....	Sandy loam.....	Blue.....	Aug. to Oct.....	Seeds
Cyclamen neapolitanum.....	6	Shade.....	Rich loam.....	Crimson or white.....	May and June.....	Seeds or cuttings
Dianthus neglectus.....	6	Sun.....	Sandy loam and grit.....	Cherry red.....	Dec. to March.....	Division
Erica carnea.....	6	Sun or partial shade.....	Sandy loam.....	Flesh or white.....	June to Oct.....	Seeds, division and cuttings
Erodium chelidoniifolium.....	6	Sun.....	".....	Pink.....	April.....	Offsets
Erythronium Pink Beauty.....	6	Sun or partial shade.....	Loam.....	White.....	May to July.....	Division
Galea apylla.....	12	Shade.....	Moist peat.....	Flesh.....	June to Sept.....	Division and seeds
Geranium lancastriense.....	6	Sun.....	Sandy loam.....	Pink.....	May and June.....	Cuttings and seeds
*Gypsophila prostrata rosea.....	6	".....	".....	Lilac purple and white.....	May to Aug.....	Division and seeds
Habertia rhodopensis.....	6	Deep shade.....	Moist peaty loam.....	Yellow.....	June to Sept.....	"
Hypericum fragile.....	6	Sun.....	Sandy loam.....	White.....	May to July.....	Cuttings and seeds
Iberis Little Gem.....	9	Sun or shade.....	".....	Blue, &c.....	Feb. and March.....	Offsets and seeds
Iris reticulata.....	9	Sun.....	".....	Blue.....	May to Sept.....	Seeds and division
Linum alpinum.....	12	Sun or shade.....	Loam.....	White.....	Jan. and Feb.....	Offsets and seeds
Leucogon vernal carpaticum.....	6	Sun or partial shade.....	Sandy loam and grit.....	Blue.....	May to July.....	Cuttings or division
*Lithospermum prostratum var. Heavenly Blue.....	12	Sun.....	Sandy loam.....	Yellow.....	June to Oct.....	Cuttings
Onosma tauricum.....	6	Shade or partial sun.....	Sandy loam.....	White or rose.....	June and July.....	Division or seeds
Oxalis enneaphylla.....	6	Sun.....	Loam and sand.....	Deep rose.....	April to June.....	Cuttings & division
*Phlox setacea Brightness.....	6	".....	".....	White.....	Feb. to May.....	Division and seeds
*P. s. Nelsoni.....	6	Any.....	Sandy loam and grit.....	White.....	March to May.....	Division
Primula marginata.....	6	".....	Moist peaty loam.....	Blue-purple.....	June and July.....	Seeds and division
P. pubescens alba (nivalis of gardens).....	6	Deep shade.....	Sandy loam and grit.....	White.....	Jan. to March.....	"
Ranunculus Natalis.....	6	Sun or shade.....	".....	".....	May and June.....	"
Saxifraga Alcockii Portae.....	6	Sun.....	".....	".....	May and June.....	"
S. burseriana.....	12	Partial shade.....	".....	".....	".....	"
S. lantoscana.....	6	".....	".....	".....	".....	"
S. primulacoides.....	6	".....	".....	".....	".....	"
S. Wallacii.....	4	Sun.....	Sandy loam.....	Rosy pink.....	June to Sept.....	Division & cuttings
Sedum obtusatum.....	6	".....	".....	White.....	June to Aug.....	Division
Sempervivum arachnoidum.....	6	Shade.....	Loam and peat.....	Rose.....	Feb. to May.....	"
Shortia galacifolia.....	6	Sun or shade.....	Sandy loam.....	White and pink.....	".....	"
Silene Schafta.....	6	Sun or partial shade.....	Loam.....	Rosy pink.....	May to Sept.....	Seed
Synthlipsis reniformis.....	6	Sun.....	Sandy loam.....	Rosy white.....	June and July.....	Seed and division
Tunica Saxifraga.....	3	Sun or partial shade.....	".....	Blue.....	".....	"
*Veronica rupestris.....	3	".....	*Trailing.....	".....	".....	"

considerations have had to be taken into account. In a small garden not only is the space limited, but an effort has to be made to prolong the display during as much of the year as possible, and a representation of the various classes of plants should also be included. Then, while the easiest subjects need not always be included, it is necessary to confine ourselves to those which are not among the really troublesome flowers. Most of the strongest growers are omitted, but *Aubrietias*, *Phloxes*, and *Arenaria montana* cannot be banished altogether. Exception may well be taken to the small selection of certain plants given here, but this is due to the necessity of affording as much variety as possible. Unless the owner of the garden is obsessed with his fancy for certain plants, he will be well advised not to make a collection of, say, *Saxifrages*, worthy though these are of our full consideration, but to cultivate alpinists giving a more extended period of bloom.

It will be observed that a few bulbs are named, though the list of these might be greatly extended. For various reasons shrubs, with the exception of one or two, have been omitted. These and other sins of omission are due to reasons which seemed to the writer to be too powerful to ignore. It may be added with respect to the cultural notes and other information that sandy loam will answer for most of the plants named. Some like lime, but all will do without it. In conclusion, it may be said that the list is submitted in no spirit of self-sufficiency, although it is founded on an actual experience of at least thirty years in growing alpinists in the rock-garden. This really adds to one's diffidence in furnishing it, owing to the full recognition of its many omissions—omissions which may to some appear unpardonable offences against their favourites. See also pages 156 and 550.

PROTECTING ALPINES AGAINST WIND AND RAIN

A very effectual, inexpensive, and rapidly-arranged "protection" for delicate alpinists is made as follows, and it has the further advantage of cutting off the minimum of light, being readily adapted to various sizes, such as single plants, or clumps, and so useful for winter *Crocuses*, early *Narcissi*, &c., in the rock garden. Moreover, while it is rigid, it is capable of giving sufficiently to render a good account

EVERGREEN CANDYTUFT

EVERGREEN CANDYTUFT, *IBERIS SEMPERVIRENS*, IN THE ROCK-GARDEN.

AN INGENIOUS GLASS FRAME TO PROTECT CHOICE ALPINES FROM WET (See Text).

of itself in windy weather. All that is needed to protect, say, a clump of a dozen *Crocus Imperati* flowers from wind and rain are four pieces of glass, each 4 inches by 8 inches, one piece 10 inches by 10 inches, and twelve pieces of wire about 8 inches long and not less than one-sixteenth of an inch thick. Bend eight of the wires like A in the accompanying illustration, now hold one of the strips of glass so as to form one side of a square about the clump of blossoms, press the lower edge gently into the soil three-sixteenths of an inch deep, then put in *close* beside it and about an inch from one end one of the A wires ; press this down till the hook engages over the top edge. Then do the same at the other end of this strip, taking care to place this second wire on the opposite side of the glass to that against which the first one is. Do likewise with each of the four strips of glass, and a rectangular box will have been formed quite close enough at the corners to keep off any damaging wind. All that now has to be done is to bend the remaining four wires, as B in the illustration, and to put two in an inch or so from one side of the glass box and similarly two in at the other side, and into these wire clips the piece of glass 10 inches by 10 inches can be sprung. If the soil or a small stone is then firmly pressed against the four wire supports, the glass roof will be quite safe during the stormiest weather. When this roof glass is in position, it can with a steady pressure be brought down until it is as much above the sides of the glass box as seems desirable to give sufficient ventilation, and yet not allow too much wind to enter. The size of the roof glass may be increased if the ventilation space is to be more than three-quarters of an inch, so that it may spread out far enough to keep out driving rain. It is well to let one end of this glass be lower than the other, so as to rapidly drain off all dirt and wet. If the height of the flowers necessitates wider strips of glass than 4 inches, it may, in exposed places, be advisable to put a turn or two of flower wire round the glass box when formed, as the extra size will offer more surface for the wind to act upon ; but this has never been a necessity with me.

For plants like *Androsaces* and all those requiring a dry crown during winter, the roof glass and B wires answer admirably, provided the glass is sufficiently larger than the plant to intercept driving rain, and I would recommend that the sides be used only for *flowering* plants, the same to be removed as soon as the blossoms are over. I have used these roof glasses for several years, and have never

yet had one dislodged by wind, while their construction permits a current of air to pass over the plants at all times and so lessens the liability to mildew. To remove the whole thing is the work of a moment, and if galvanised wire is employed, the supports last for several years. Another advantage is the compact way these glasses and wires can be stored during the summer, a hundred going safely into a small wooden case—a matter of no small moment to the average gardener, who has little spare room. Of course, an occasional rub with a wet cloth or leather is advisable to keep the roof glasses clean, especially after fog. After experiencing the difficulties of a bell-glass partly raised, or the cumbersome and ugly hand-light, I feel sure that other gardeners will appreciate this simple form of protecting their especial treasures through our trying winters.

ROCK-GARDEN PLANTS THAT FLOWER IN EARLY AUTUMN

Everything—be it Rose, or alpine plant, or what you will—has its season, and when that is past, when the fullness of the beauty is gone, what remains, welcome though it be, constitutes but fractional parts of the greater whole we remember so well. Of no section of plants is this more true than that we know as alpine, and which inclines to yield of its fuller wealth of beauty and variety before the year has more than half run its course. Those that come to us after that time, despite their individual charms, are but few and far between, disjointed members, as it were, of a great flowering chain that had remained unbroken for months.

The passing of June, however, is usually the signal for the snapping of the last link in the chain, and though by that time alpinists should have had a good innings, yet they appear never to be quite satisfied—to be wishful for more of the wealth of spring, even amid the breath of parched July or even later. That this is the condition of things existing in most rock-gardens at the time indicated few will attempt to gainsay, though it is a moot question, I think, whether the fault is not a little on the side of the planter, who, encouraging the greater flower wealth of spring and early summer, discourages—if all unwittingly—the lesser wealth that follows by and by.

In the earlier months of the year we see the incomparable

flower pictures of alpine Phlox, Aubrietia, Dianthus, Candytuft, and so on; but is there one among the number to surpass a spreading, well-flowered mass of the rosy pink *Convolvulus althæoides* of July? But we do not see it, or certainly only rarely, and then not always in good condition. It may be—indeed is, probably, that our rock-gardens are not big enough for all—not big enough to provide representative pictures of all that is good; hence the comparative rarity of some. And there are Campanulas, too—one might almost enumerate a dozen such—*Zoysii*, *Tymonsii*, *Garganica* and its forms, *Fragilis*, *Isophylla* and its varieties (hardy enough and perennial enough if planted in chinks of rock instead of the richer soil in the pockets), *Stansfieldii*, *White Star*, *Profusion*, to say nothing of the later-flowering varieties of the turbinate group—which are worthy of a little more thought from those who would embrace the longest possible season of flowering. Then there is the wild *C. rotundifolia*, or Harebell, a charming plant that is worthy of inclusion in the best rock-gardens where flowers are required during July and August.

In not a few instances the owners of large gardens are absent from home for weeks after midsummer, when but little encouragement is given to subjects flowering after that time. These and other things might readily constitute contributory causes for the absence of some plants and the unrepresentative display of others during some weeks of the latter part of summer. What is needed most of all, perhaps, is a rock-garden on a more representative plan planted with a view to do justice to all, rather than, as is often the case, to permit the free-flowering and showy to predominate, to the exclusion of much else that is good or even more worthy. In private gardens, naturally, the season of greater gaiety is at the direction or wish of the owner, while at Kew or at Wisley, whither gardeners and others go for inspiration and education, the idea of more representative planting, as opposed to display work covering shorter periods of time, might reasonably receive studious thought.

In certain directions late-flowering alpine flowers are asked for—almost clamoured for—hence there is need to look around to see what is to be had. Each year, too, is giving evidences anew that the supplies are not exhausted; and when in a single season such good things as *Astilbe simplicifolia*, *Lysimachia Henryii*, and *Wahlenbergia vinæflora*—plants of undoubted merit and utility—may all be added to the lists of late summer alpine flowers, growers of such things have no cause for repining and much less for despair. At the

same time, there are good plants other than novelties or reintroductions meriting all consideration, and one recalls *Zauschneria*, *Polygonum vaccinifolium* (a rock-draping mass of this almost challenges description), *Gentiana septemfida*, *G. Andrewsii* (good in its unopened bud colour), *Sternbergia*, *Crocus*, *Cyclamen*, and others which might profitably be used to prolong the season of flowering in this department. Just what is available and what most useful are questions worth pursuing, while of even greater moment is the increase of some.

The following are among good things worthy of consideration: *Campanulus waldsteiniana*, *Zoysii*, *Profusion*, *Stansfieldii*, *fragilis*, *isophylla*, *garganica*, *Tymonsii*, *White Star* and *rotundifolia* (Harebell), *Cyananthus lobatus*, *Erigeron mucronatus*, *Polygonums vaccinifolium*, *empetrifolium* and *affine* (Brunonis), *Lysimachia Henryi*, *Saxifraga Fortunei*, *Zauschneria californica*, *Gentianas Andrewsii* and *septemfida*, *Sternbergias*, *Crocus* species in variety, *Sedum spurium* in variety, *Ceratostigma plumbaginoides*, *Silene alpestris*, *Mesembryanthemum uncinatum*, *Androsace lanuginosa*, *Wahlenbergia vincæflora*, *Achilleas* in variety, *Acænas* and *Eriogonum umbellatum*.

DWARF TREES AND SHRUBS FOR THE ROCK-GARDEN

The miniature trees that are sent from China and Japan are very suitable for planting in the alpine garden. *Abies excelsa* variety *inverta* is an exceedingly good plant, as it is low-growing. *A. pygmæa* and *A. clanbrassiana* are interesting; *Azalea rosæflora* is excellent, and a batch of six or twelve should be massed according to the amount of room at disposal. *A. amœna* and its varieties *Brilliant*, *Hexe*, *Hinodegerii*, *carminata*, *coccinea*, *splendens*, and *narcissiflora* are all charming and showy. *Rhododendron ciliatum*, *R. racemosum*, *R. Anthopogon*, *R. intricatum*, *R. ferrugineum*, *R. f. album*, *R. hirsutum*, *R. h. album*, *R. Wilsonii*, and *R. myrtifolium* may be planted as dot plants in the interstices of rocks, where they are exceedingly beautiful and add much enjoyment to the alpenes surrounding. Plants of this character and nature require some suitable soil in which to become established, such as peat and leaf-soil with some sand and loam, and they must be made very firm in the soil so that they are not shaken by the wind. *Berberis actina-*

CISTUS SALVISFOLIUS, A DWARF SHRUB FOR THE ROCK-GARDEN.

CYTISUS KEWENSIS, A BEAUTIFUL DWARF HYBRID BROOM IN
THE ROCK-GARDEN.

cantha, *B. Wilsonii*, *B. deflexa*, *B. acuminata*, and *B. Thunbergii* are all useful and beautiful. The same may be said of *Cistus* in variety, *Cotoneaster horizontalis*, *C. microphylla*, *Cupressus lawsoniana compacta*, *C. nana compacta*, and *Cytisus* in variety. *Clematis coccinea* is charming when allowed to fall over the rocks carelessly. *Daphne Mezereum*, *D. Cneorum major*, *D. blagayana*, *Erica lusitanica* (codonodes), *E. carnea*, *E. c. alba*, and many other varieties and species must not be overlooked. *Fabiana imbricata* (a beautiful *Erica*-like flower), *Gaultheria nummularioides*, *Genista ephedrioides*, *G. Ferox*, *G. hispanica*, *G. horrida*, *G. procumbens*, *G. triquetra*, *Sedum palustre*, *Menziesia polifolia* and *alba*, *Nandina domestica*, *Juniperus communis aurea*, *J. Sabina*, *J. S. variegata*, *Retinospora ericoides*, *R. obtusa*, *R. nana aurea*, and *Thuiopsis borealis nana compacta* all are suitable. *Veronica cupressoides* is admired both in summer and winter. *V. Hectori* is another good evergreen, and as a dot plant has scarcely any equal. *V. Armstrongii* is also very fine. *Pinus montana*, *P. monophylla*, *P. Mughus*, and *Taxus fastigiata aurea compacta* are all useful. *Korokea Cotoneaster* makes an admirable dot plant, and is always interesting, especially when in flower; it bears myriads of little stellate yellow flowers, and when not in flower its tiny leaves with a white tomentose covering are extremely pretty. A good clump of *Chamaerops nanus* looks very handsome, and should be planted in the warmest position as high up as possible, with some tall shrubs at the back to break the wind. *Crinodendron* (*Tricuspidaria*) *hookerianum* is very charming, and should be put in a snug position in well-drained soil in which some peat and grit have been mixed.

Desfontainea spinosa is a very fascinating plant when in bloom, and an interesting evergreen. This should be planted high up and in well-drained soil, which should also be very firm. It sometimes grows in partial shade placed on the cold side. *Escallonia langleyensis* does well, but should be pruned after flowering to keep it small. *Mitraria coccinea* is a lovely plant when carrying its bright scarlet flowers in contrast to its pretty, bright, shining green leaves. This requires partial shade and moist ground in which some peat has been worked. All these dot plants must be secured firmly in the soil, and for the first year water must be given with discretion, especially those planted on shallow, well-drained soil, as in warm nooks and bays they would become baked if not watered most carefully. Plants in such positions are difficult to water thoroughly if allowed to become dust dry, as the water runs

away before getting to the roots. It is a good plan to lay stones over the roots, and this very much conserves the water and shades the roots in exposed places from the hot sunshine.

ANNUALS FOR THE ROCK-GARDEN

A rock-garden or rock-path is a charming sight when well furnished. However, as it is some time before the plants will cover their allotted spaces, during the first year or two one must have recourse to quicker-growing subjects. There are so many annuals now, both dwarf and tall, which may be used, that they are indispensable, and we are sure, when once seen, will be looked for again. Many may be sown in the open, others are best sown under glass and afterwards transplanted, and of these latter we will give a selection. There are, first, the *Ageratums* of soft blue, lavender, and white, ranging in height from 4 inches to 18 inches; *Abronia umbellata* (the Sand Verbena), rosy pink and of trailing habit. Then comes the annual *Alyssum*, Snow Carpet or procumbens, which should be planted in good masses to produce the best effect. Seed of this may also be sown where the plants are to bloom. The individual plants spread out very quickly and remain in bloom a long while. The flowers are very minute, but produced in the greatest profusion. To go from white to scarlet, there is *Alonsoa Warscewiczii compacta*, which is the best. Planted in soil that is not too rich, it will not grow too tall, and will flower more freely.

The next we come to are the *Antirrhinums* (Snapdragons) of the dwarf and intermediate sections. Though not true annuals, they are usually treated as such. They have been much improved as regards colour and form of late years, and there is now plenty of variety. The dwarf forms may be planted in masses of one colour, and should be given a bold position, when their beauty will be much enhanced. The intermediate varieties, which grow about eighteen inches high, may be used in the same way. The *Antirrhinum* is not particular as to soil, therefore may be planted where more fastidious plants in this respect would fail.

Delphinium Blue Butterfly is very pretty, and should be sown early to obtain the best results. This should be given good soil in a position where it will not get too dry, and it will then present its true character. It is one of the best blue-flowered annuals we have, and will flower over a long

period. Then come *Dianthus chinensis*, or Indian Pinks, which are really biennials, but, if sown early and treated as annuals, make lovely pieces of colour. Salmon Queen, The Bride, laciniatus, Queen of Holland, and Eastern Queen are all good varieties of different heights. The *Nemesia* is quite at home in the rock-garden. It enjoys plenty of sun, and its roots should be kept moist and allowed good soil to grow in. The flowers are of all shades of yellow, red, cream, pink, and white, and seen under strong sunlight are most gorgeous. There are now some new hybrids of a lovely pale blue, and another of pale lemon colour.

Another beautiful little plant is *Phacelia campanularia*, of a lovely deep blue. The flower is something like a blue Gentian, both in colour and form, and produces a striking effect, however planted. The foliage also turns a pretty shade with age. The next on the list is the Portulaca, a half-hardy annual especially suited for rockwork gardens, and one that will thrive in a dry, sunny position, where it will be seen at its best. It quickly covers the ground, grows about six inches high, and the colours are various shades of orange and yellow.

The *Silenes* are very pretty, and should be sown in the summer and transplanted to bloom in the spring. They are very dwarf, seldom reaching more than 6 inches high, and prefer soil not too rich and an open position. Empress of India has crimson flowers and flower-stalks. Snow King and pendula alba are two good whites, and pendula compacta and Double Pink are two first-rate pinks. The latter is a very showy plant.

Although *Statice*s, the next on the list, are mostly perennials, there is one exception, *Statice Suworowi*, a plant of singular appearance. The foliage looks something like a Dandelion leaf, and the flower-spikes are thrown up from the centre. The colour is rosy pink, and the individual blossoms are very minute, packed closely together on stalks about eighteen inches high. It needs a good depth of loamy soil.

Sowing and Thinning.—We will now name some that may be sown where they are to bloom, and with proper attention to sowing, thinning and keeping clean will produce equally as good results as those that are raised under glass and planted out. We first mention the Pimpernel, or *Anagallis*, to give it its proper name. There are two colours, pale blue with a black blotch in the throat, and a red brick shade with the same markings. They remain in bloom a long time, especially if the faded blooms are kept picked off. They

should be given a warm, sunny position, or the flowers do not open well.

Another effective plant is *Cacalia coccinea*, the Tassel Flower. This grows about a foot in height, and has flowers like a double Daisy on slender stems. The foliage is very luxuriant and of a nice green shade. It is a plant that is always noticed by reason of its very bright colour. Then come

The Candytufts, which are so free-flowering and sweet-scented. There is the White Spiral, which grows about a foot high, and also lilac, purple, carmine, crimson and cardinal, which are somewhat dwarfer. All are very beautiful, and should be sown in good-sized patches of one colour. Pick the faded flowers off, and stir the soil occasionally to promote new growth.

Dimorphotheca aurantiaca is a decided acquisition. The colour is a rich orange, with a black disc, and the flowers are little affected by the weather, although the plant is at its best when warm and sunny, and the flowers also open better. The various coloured hybrids should also be included. Another pretty plant is *Ionopsidium acaule*, the Violet Cress, a tiny thing covered with little lilac-coloured blossoms. It is admirable for sowing in narrow crevices between the stones, and should be kept moist at the root, or it is apt to shrivel up. It does not grow more than 2 inches high, and does not spread like many dwarf plants. Then come the Linarias or Toadflax, indispensable little plants. *Aurea reticulata* is crimson and gold, and *bipartita splendens* is purple and light blue. Both grow about a foot high, and should be sown thinly and not thinned out too much as they are very slender in growth. The blooms are very small and something like a miniature Antirrhinum.

Dwarf Nasturtium deserves a place, and is another plant that flowers better in soil that is not too rich, and also in a dry season. Two or three sowings should be made to prolong the season. The flowers are all shades of yellow, crimson, scarlet and rose, and some are spotted and veined with deeper markings. Some have golden foliage and others are silver variegated, which produce a fine effect even if they never flower. The next that claims attention is the Nemophila, a most attractive plant when in bloom. The colours are very pleasing and dainty. *Insignis* is a Cambridge blue; *I. alba*, white; *maculata*, white, with purple blotch; and *atrocærulea*, bright blue, with small spots. They all grow from 3 inches to 6 inches high, and are very hardy. Two or three sowings at intervals should be made, as the plants do not last so long as some annuals. They may also be sown in autumn to bloom

the following spring. *Saponaria calabrica* is an annual of rose colour, and there is also a white form. Both are old favourites with many. They are both very dwarf, and may be used in the front portion of the rockery in any good soil.

BULBS FOR THE ROCK-GARDEN

These subjects are worth the attention of all lovers of rock and alpine gardens, as their presence during winter and spring, peeping up here and there, forms a nice feature of colour, and there are many that are extremely interesting. The little *Narcissus minimus* ought to be planted and grouped in clumps of about a dozen in different spots; one gets a very charming effect. *Sternbergia lutea* is a splendid mass of colour in autumn; then there are Colchicums in variety and Cyclamen, all in splendid flower and all from bulbs. The Crocus species are exceedingly interesting, and these should be planted early, say in September. Snowdrops should also be planted early to be successful. All of these are better in small clumps. Ixias are hardy in sheltered plots near the base of rocks, and are very pretty. *Iris cristata* and *I. persica* should likewise be planted as soon as possible. These are gems, and, dotted about, take but little room and afford endless pleasure. The slugs are very fond of these, and must be trapped as soon as the growths are beginning to push through. The Mariposa Lily (*Calochortus*) does very well in sheltered nooks in fine soil. There are some very brilliant colours among these, and the flowers are large for such small bulbs. Then we have the Jonquils, both double and single. These are very striking and delightfully fragrant. There are several Narcissi in addition to the early one mentioned at the commencement of these notes, and a good one is *Pallidus præcox*, which looks very charming popping up under a shrub or from behind a boulder. A few clumps of such varieties as *N. maximus* of the Pyrenees, Victoria and King Alfred, should be planted; but these large varieties must have some good food, or they fail to give good results. Ordinary alpine soil will not be good enough. *Narcissus cyclamineus* is very pretty, and should be planted in several positions to ensure succession. There are some interesting hybrids between this and *N. minimus* which are very pretty. *N. triandrus* and *N. t. alba* are both pleasing, well adapted for conspicuous positions, and last a considerable time in flower.

Scillas are very charming. Good groups of these are effective. *Scilla sibirica* and *S. s. alba*, *S. bifolia*, *S. verna*, and the late variety, *S. italica*, are most useful. These do well in towns and smoky places, and endure many hardships. Grape Hyacinths are also effective. The earliest is *Muscari botryoides azureus*. *M. botryoides albus*, *M. b. cæruleus* Heavenly Blue, and *M. Heldreichii* are among the best to grow. A few of the ordinary Hyacinths may be used in borders on the top surrounding, but not among stones or rocks. Anemones may be largely used with distinct advantage and success. Among the earliest to bloom is *A. blanda*. *A. sulphurea*, *A. Pulsatilla*, *A. sylvestris*, *A. narcissiflora*, *A. Allenii*, *A. fulgens*, *A. apennina*, and *A. alpina* are all beautiful and make a fine succession, and, if there is plenty of room, some St. Brigid might also be planted. *Adonis amurensis* is very showy. It has deep green fern-like foliage and yellow flowers. *A. pyrenaica* is also a fine type. *A. amurensis* and *A. vernalis* flower in early spring, and *A. pyrenaica* in early summer. *Chionodoxa sardensis*, *C. Lucilæ*, and *C. gigantea* are all pretty and effective, and should be grown by everybody. Leucojums are also very handsome, and flower in spring, summer, and autumn. These are like monster Snowdrops, and sometimes have stems 2 feet long, which make them valuable for furnishing a vase of lovely flowers. They grow in any garden soil. *L. æstivum* is the summer-flowering variety; the others flower in early spring, except *L. autumnalis*. *Sanguinaria canadensis* (Bloodwort), a very pretty white flower, requires a little protection in winter—a covering of peat will suffice. When cut, red juice exudes from the flower-stem or leaf; hence its name of Bloodwort.

Trillium grandiflorum, with lovely choice white flowers, requires a moist, shady, and well-drained position. It is very pretty when among ferns and alpine which are grown in shady nooks. *Uvularia amplexicaulis*, golden yellow, after the habit of *Convallaria polygonatum*, is fine for cool, shady spots. All spring and early summer flowering bulbs are best planted as early as possible in the autumn.

HOW TO MAKE A MORaine GARDEN

Recently considerable attention has been given to that adjunct of the rock-garden, the moraine; and where it is possible to devote the space (if only a square yard or two) in some fully-exposed position it would, I think, be well to pro-

ceed without delay to make the necessary alteration. The three main factors to bear in mind in this connection are (1) ample provision for the shortest possible drainage; (2) a copious supply of water during the growing season; (3) some provision to ensure the utmost dryness of the crowns of the plants during the winter, coupled with comparative dryness of the moraine soil during that time.

It is easy to understand how our little mountain friends obtain these conditions in their alpine homes. The heaps of stone detritus which accumulate at the foot of a glacier, often piled up at an acute angle, ensure ample drainage, while the continuous melting of the ice and snow on the slopes above during the warm or growing season not only supplies copious volumes of ice-cold water to the little plants, but carries away all the finer parts of the broken stone and so greatly adds to the rapidity of drainage. When the falling temperature causes growth to cease, the water supply is automatically cut off by the freezing up of the glacier, usually accompanied by heavy falls of dry snow, which effectually protect the plants from any sudden change of temperature, should it occur, while the considerable time it takes for this snow blanket to melt through and expose the plants in the following spring ensures that they come forth into a year so far advanced that the likelihood of a check is improbable. Often June is well advanced before these high mountaineers see the sunlight after their long winter sleep. With some care and thought we can do a great deal to minimise the widely different conditions which prevail in our gardens from those existing in the Alpine regions. When one's garden is situated upon a comparatively retentive soil—and I suppose but few of us are favoured with a coarse gravel or rock subsoil—the best way to proceed in making a moraine is, from my own experience, as follows:

Position for the Moraine.—Having decided upon the position, which must be an open one, and preferably where the rock-garden slopes gently up, dig into this mound so as to form a trough about two feet deep, and with the bottom falling gently to one point, say, in the front. Either brick up the sides of this compartment or build up with stone or concrete, so as to make this "dish" water-tight to at least 8 inches from the bottom. At the lowest point of the bottom an outlet should be arranged which can be easily opened or closed from the outside. It will be readily seen that if this bottom valve is closed and water allowed to enter the compartment, it will rise to the depth of 6 inches in the front

(and something less at the back, owing to the slope of the bottom), while if the valve is opened, no water whatever will remain in it. Care should be taken to carefully guard the inner side of the valve, say, with perforated zinc, or, better still, perforated brass. The next thing to do is to put in about 5 inches or 6 inches of broken stone or brick of about the size of an orange, and on this a layer, 2 inches thick, of stones, just large enough to roughly cover over the interspaces

FIG. 14.—Section showing construction of a small Moraine Garden.

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

between the lower "rough stuff," and so prevent finer soil from choking up the drainage (see Fig. 14).

The Best Soil.—Upon this intermediate layer the moraine soil proper should be laid, of sufficient thickness to entirely fill the moraine, and should consist preferably of sandstone chips put through a half-inch or three-quarter inch mesh sieve for the lower part and a quarter-inch mesh sieve for the upper. If there are fine particles in this, as there probably will be, it is advisable to put the whole through an eighth of an inch mesh sieve to get rid of the dust, which so readily clogs the drainage. Just a suspicion of well-decayed leaf-soil may be added to the top 6 inches, say, one part to fifteen of stone chips. If the boundary walls of the moraine have been arranged in an irregular outline and have been topped with

decorative pieces of stone, the whole should resemble any other part of the rock-garden, except that the contents of it are more stony than the rest. Similar pieces of stone can also be inserted just into the surface of the moraine to break the otherwise flat expanse, and among these the plants will nestle.

The Water Supply.—If water is now allowed to enter the moraine from some diverted trickle which may already decorate the rock-garden, or, if not, is supplied by hand every day or so, fresh water will be more or less constantly passing beneath the roots of the plants contained therein and overflowing at the 6-inch level, and during the growing season this should be the condition of things. When the autumn is with us, the water supply may be cut off, and about the end of October or early November, dependent upon the kind of weather at the moment, the lower valve should be opened and left so until spring returns. It is a good plan, where possible, to let the overflow from the moraine trickle down to supply our bog-bed, and thence away or into any little pool we may have. To protect the crowns of the plants from overhead wet, or the dirt brought down by fogs, a very simple contrivance of three pieces of bent wire so placed as to support a sheet of glass some 4 inches or 5 inches above each clump serves admirably, and, if occasionally cleaned, admits both light and air and so does not "coddle" the plants at all. The glass should be slightly tilted to allow the rain to drip off clear of the plant itself. A very fair substitute for broken sandstone is broken brick, but any old mortar adhering thereto should be taken off if it is proposed to grow lime-hating plants.

The Best Plants for a Moraine.—The following list of moraine plants, by Mr. Reginald Farrer, should prove useful not only to the beginner, but also to the expert cultivator of alpine, as Mr. Farrer is a widely recognised authority on the subject. Each moraine, like each gardener, has its special favourites, and the pet results of one moraine are not necessarily those of its neighbour across the wall. Again, the moraine being a very special affair, there is no need in this choice to trouble about "utility" plants, such as the Aizoon Saxifrages, which will grow anywhere. I mean to allow myself, in fact, an orgy of special treasures, since it is for these that the moraine exists. As to the condition of this, let me postulate a moraine of some three parts chips to one part good compost of peat, leaf-mould, and sand (a larger percentage of soil than I have suggested hitherto), watered by a subterranean perforated pipe

some 12 inches to 15 inches down, but sharply drained; for more and more do I grow to distrust cemented bottoms, unless, indeed, your slope is very specially rapid and your climate of a very specially Saharan torridness. And in this mixture, then, I will allow myself a free hand in choice, and advise my friends to follow it without fear of disappointment if they succeed. But it must be remembered that my selection is purely personal, haphazard and incomplete. Many things are omitted simply as untried, such as *Dryas*; and my own blank failure hitherto with most *Gentians* and *Potentilla nitida* in the moraine is very likely a mere matter of conditions—a little soil the more or some question of treatment—though I confess to doubting *Gentians* as a family for the moraine, despite the fact that one of my *G. Clusii* is now wearing a beautiful flower. But in one place very often I think a given plant enjoys moraine, and yet refuses to put up with another apparently like it somewhere else, where, perhaps, the conditions are not precisely such as to suit it. It was some time before any of my moraines suited *Dianthus neglectus*, which forms huge, grassy masses in open and rather inferior soil here.

Name.	Height. Inches.	Colour.	Date of Flowering.	Soil.
<i>Androsace alpina</i> (glacialis)	1	Rose white	May-June	Non-calcareous, soft, cool and rich
<i>A. primuloides</i>	4	Pink	"	Ordinary
<i>A. villosa</i>	3	Pearly white	"	"
<i>Anthemis Aizoon</i>	5	White	Summer	"
<i>Asperula Athoa</i>	3	Pink	"	"
<i>Artemisia splendens</i>	4	Silver leaves	"	"
<i>Aster alpinus</i>	6	Purple	"	"
<i>Campanula alpestris</i> (Allionii)	3	"	June	Non-calcareous
<i>C. Cenisia</i>	1	Electric blue	Summer	"
<i>C. excisa</i>	3	Violet	Late summer	"
<i>C. pulla</i>	6	"	"	Calcareous
<i>C. Raineri</i>	3	Blue	"	"
<i>C. Zoysii</i>	4	"	"	"
<i>Cyanthus lobatus</i>	4	Electric blue	"	Ordinary
<i>Delphinium nudicale</i>	6	Scarlet	June	"
<i>Dianthus alpinus</i>	4	Rich rose	"	Calcareous
<i>D. Arvernensis</i>	3	Pink	"	Ordinary
<i>D. Freynii</i>	1	Pink white	"	"
<i>D. neglectus</i>	6	Fiery rose	"	Ordinary or non-cal- careous
<i>D. Glacialis</i>	4	Rose	"	Non-calcareous
<i>D. sylvestris</i>	8	"	"	Ordinary
<i>Eritrichium nanum</i>	1	The blue of blues	"	Non-calcareous, rich, cool, and light
<i>Iberis petræa</i>	2	White	"	Ordinary
<i>Leontopodium alpinum</i> Flannel-flower	6	Silver white	All the summer ..	"
<i>Linaria alpina</i>	3	Violet and gold ..	"	"
<i>Lithospermum Gastonii</i>	4	Blue	Summer	Very calcareous, nearly pure lime-rubble
<i>Mertensia primuloides</i>	6	Blue to amethyst	"	Ordinary, cool
<i>Morisia hypogæa</i>	3	Yellow	Early summer ..	Ordinary, dry
<i>Myosotis rupicola</i>	3	Blue	June	Ordinary
<i>Papaver alpinum</i>	6	White to rose	All the summer ..	"

THE ALPINE HOUSE AT KEW.

(Inside measurements : Length, 40 feet ; width, 9 feet ; height at apex, 8 feet 6 inches, at sides, 5 feet 6 inches.)

INTERIOR OF THE ALPINE HOUSE, ROYAL GARDENS, KEW. (Photographed in February.)

Name.	Height. Inches.	Colour.	Date of Flowering.	Soil.
<i>Petrocallis pyrenaica</i>	2	Whity pink	June	Calcareous
<i>Primula intermedia</i>	4	Rosy lilac	April	Ordinary
<i>P. spectabilis</i>	4	"	April-May	"
<i>Polemonium confertum</i>	6	White	Summer	"
<i> mellitum</i>				
<i>Ranunculus alpestris</i>	4	"	All the season ..	Damp, calcareous
<i>R. glacialis</i>	5	White to red	June	Damp, non-calcareous
<i>R. parnassifolius</i>	4	White	May	Damp calcareous!
<i>R. Segueri</i>	5	"	"	Drier calcareous
<i>Saxifraga burseriana magna</i>	3	"	February-March ..	Ordinary or calcareous
<i>S. caesia</i>	4	"	June	" "
<i>S. Burnatii</i>	6	"	"	" "
<i>S. Faldonside</i>	4	Yellow	March	" "
<i>S. Grisebachii</i>	6	Red	March-April	" "
<i>Silene Elizabethæ</i>	3	Rose red	Summer	" "
<i>S. Hookeri</i>	5	Rose pink	June	Ordinary "
<i>Soldanella pyrolæfolia</i>	5	Lilac	March-April	Damp, rich and silty
<i>Thlaspi limosellæfolium</i>	4	"	May-June	Ordinary
<i>Veronica canescens</i>	1½	Blue	All the summer ..	Fine and sandy
<i>Viola cenisia</i>	4	Violet	Summer	Ordinary
<i>Wahlenbergia Pumilio</i>	3	"	Early summer	Calcareous

ALPINES UNDER GLASS

The cultivation of alpine plants in pans is a most attractive form of gardening. Anyone with a small garden may grow many interesting plants in this way, as the amount of accommodation required is not extensive, and the majority of the commoner as well as most beautiful kinds are easy to grow. Once potted up in suitable soil, many of the *Saxifragas* and *Sempervivums*, to mention only two families out of a great number, require little attention besides watering for two or three years. In the case of bulbs, however, it is always desirable to obtain a fresh supply each autumn.

With the advantage of a small greenhouse without artificial heat in which to place the pans when the plants are coming into flower their value is greatly enhanced, for then one can enjoy their full beauty unimpaired by unfavourable weather, to which they would be exposed if outside. A view of such a house at Kew is shown in the illustrations, from a photograph taken during the second week in March. This house is unheated, and merely affords a shelter for the plants while in flower. During the rest of the year they are grown with the pans plunged to the rim in ashes in a frame or sheltered border outside. The principal families represented in flower are:

Anemone (*Windflower*).—This genus is represented by the early flowering *A. Blanda*, from Asia Minor, with its lovely dark blue flowers; *A. Hepatica*, with shades of red, white and blue; and the South European *A. hortensis*, with lilac purple flowers, having a paler eye.

Crocus.—Most of the spring-flowering Croci were at their best during February, but several continued to display their attractive flowers well into the month of March, including the purple *C. Sieberi*, the white-striped *C. versicolor* and *C. biflorus*, with *C. ærius*, to mention only a few of the numerous worthy kinds.

Cyclamen.—These charming plants are suitable for pans, and usually open their flowers in February, but remain attractive for several weeks. There is *C. ibericum*, with its rosy purple flowers and faintly zoned leaves, and *C. Coum*, which differs from the other in having unspotted dark green leaves. There is also a white-flowered variety of the latter, a desirable plant. After flowering they should be placed outside to complete their growth, and the corms should then be well ripened off by exposing the pans to the full sun.

Narcissus.—The Narcissi form another valuable bulbous family, some of the smaller-growing kinds being well adapted for the alpine house. The earliest flowering kind is the snowy white Hoop-Petticoat Daffodil from Algiers (*N. Bulbocodium* var. *monophylla*). Others are Angels' Tears (*N. Triandrus*), with its two and three cream-coloured flowers on a stem, the Cyclamen-flowered Daffodil (*N. cyclamineus*), *N. Cernuus* and *N. minimus*, one of the smallest in the family.

Primula.—This is represented by the Himalayan *P. denticulata*, with its dense heads of lilac purple and white flowers; *P. Fortunei*, closely allied to the Bird's-eye Primrose (*P. farinosa*); *P. marginata*, with its silvery margined leaves and pale lilac flowers; and *P. verticillata*, with mealy leaves and whorls of yellow flowers.

Saxifraga.—This is one of the most important families of spring-flowering plants, and the varieties in cultivation are numerous. The best-known are the various forms of *S. burseriana*, with large white flowers borne on slender stalks above a cushion of glaucous foliage. Other white-flowered kinds are *S. scardica*, var. *obtus*a, *S. Petraschii*, *S. Salomonii*, *S. rocheliana*, and *S. Boydii alba*.. Yellow-flowered kinds are the lovely *S. Boydii*, *S. Paulinæ*, *S. apiculata*, and *S. sancta*. Among those having red flowers is the Macedonian *S. Grisebachii*, *S. Stribnyi*, and *S. Frederici Augusti*, while for making a charming show in pans there is nothing to excel the purple-red *S. oppositifolia* and its variety *grandiflora*. The white variety of the last is also very pretty.

Tulipa.—The Cretan *T. saxatilis*, with its flesh-pink flowers having a yellow base, which opened its flowers at the end of February, was still in full beauty the third week in

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SOME BEAUTIFUL HYBRID SAXIFRAGES.

March. One of the most beautiful members of the genus is *T. kaufmanniana*, with its variable flowers of cream and yellow with red stripes. Others in flower at that time are the rose purple *T. pulchella* and the paler *T. Lownei* from Syria.

Other miscellaneous plants which contribute towards a display in spring include the well-known *Arabis alpina*; *Adonis amurensis*, with yellow flowers, with its later flowering, curious and handsome double variety, with a green fringed centre; *Chionodoxa* (Glory of the Snow); *Fritillaria aurea*, with its large chequered bells of golden yellow and brown; and *Hyacinthus azureus*, which is undoubtedly the most charming little bulb of the genus for this purpose, with a Muscari-like spike of light blue flowers. Among the choicest plants are the Shortias, which include *S. galacifolia*, from North Carolina, with its white-fringed, bell-like flowers; *S. uniflora*, from Japan, of dwarfer habit, with large, pale pink flowers; and *S. uniflora* var. *grandiflora*, with larger foliage than the last and deep pink flowers of large size. *Morisia hypogæa*, with its rich yellow flowers, and the *Draba* of various kinds help, with others too numerous to mention, to make a pleasing display that is very welcome in the early spring.

Cultivation.—Although some of the alpine plants from higher elevations require special conditions and soil, a great number are easily accommodated and will flourish freely in gritty or well-drained porous soil, say good loam 2 parts, coarse sand 1 part, with just a little fine leaf-soil added. For the choicer Saxifragas a little crushed limestone may also be mixed with the bulk. The size of the pans in which the plants are to be grown is immaterial, but the most convenient for general purposes are those 6 inches or 7 inches in diameter and about 4 inches or 5 inches deep. For Saxifragas, Sedums, Androsaces, and such like plants the pans should be about half-filled with broken crocks to secure thorough drainage, but in the case of bulbs or stronger growing plants less is needed. When in full growth and flowering abundance of water is necessary for nearly all alpine plants; but, at the same time, anything in the nature of stagnant moisture is injurious. The best time for potting up the perennial kinds is soon after they have done flowering for the season, when they can be divided up carefully, afterwards placing them in a frame where they can be kept close and shaded for a time. Bulbs should be potted up in September, or as soon after as they can be procured. After potting the bulbs plunge the pans to the rim in ashes outside; only bring them into the house when they show signs of flowering.

After flowering replunge the pans and keep well supplied with plenty of water till the bulbs have matured their foliage, then withhold the water, and allow them to be well ripened off.

THE WALL GARDEN

Apart from the orthodox rock-garden, endless opportunities present themselves to the enthusiast wherein the charming individuality, it may be of some capricious or even commonplace subject, will acquire a fresh interest from meeting it under less stereotyped conditions. In this respect the grow-

FIG. 15.—Elevation of a Dry Wall. The shaded parts represent soil; the crosses indicate positions for plants.

ing interest in dry walls calls for attention, for, while these embody the principles of rock-gardens, often, indeed, in charming miniature, also presenting characters entirely their own, their ultimate success will, as a matter of course, largely depend upon the knowledge and taste of the person who designs or plants them.

We would strongly insist upon careful study being given to the position where dry walling is intended to be introduced, as it is difficult to harmonise it with formal or geometrical features; further, the method and materials employed in this form of building are quite the opposite to that present in "finished" architecture.

Simplicity is a safe principle in dry wall construction, and it is wise economy to use the best material one can command. Stone may always be recommended, as, apart from its decorative effect, in itself it favours the maximum development of

NEPETA AND OTHER FLOWERS IN A WALL GARDEN, THE RESULT OF EIGHTEEN MONTHS' GROWTH (COUNTY BERKSHIRE).

CERASTIUM IN DRY WALL.

plant growth. The portions should be used as they arrive from the quarry, irregular in shape and size, and varying in thickness from 2 inches to 6 inches.

The practical work in building dry walls is comparatively simple, the main principles of which we have attempted to make clear in the accompanying diagrams. Fig. 15 shows the face of the wall as it appears when finished, the plants being indicated by a cross. The method of "bonding" the stones

FIG. 16.—Section showing the principle of arranging stones in dry walls. *Note how the stones slope back from the vertical.*

must also be observed, as this renders the wall more permanent. Fig. 16 shows the way in which the face of the wall inclines backward, while the individual stones dip in the same direction. To proceed in building, the ground-line is first marked out and made quite firm by thorough ramming. The largest stones are then placed in position, keeping the joints fairly close when the stone is in small pieces, while a 3-inch or 4-inch joint will not endanger the structure when the stone is of good size. Whenever a course is laid, the joints and crevices behind are filled with good soil and the whole made perfectly firm. The first layer of stone is then covered to

the depth of an inch with soil, and the second course laid in a similar manner to that already described, each subsequent course being similarly treated until the requisite height is gained. The inclination or "batter" given to the wall is readily measured by driving in one or more stakes perpendicular with the front projection of the bottom course; then, by placing a set-square to these stakes at intervals of a foot, one can measure to a nicety the inclination obtained. The brick wall illustrated is built with 1-inch batter to every foot of height obtained, and while the results have been quite good, yet, regarded from the standpoint of the practical cultivator, we put this as the extreme minimum, and would double this batter when at all possible.

The planting of dry walls should take place concurrently with building, as this admits of larger plants being employed, and, the roots being spread out into the soil behind, lay hold and the plants become established in a very short time. It is also a good system to have a rough plan prepared of the main groupings contemplated, particularly with reference to the colours, as then mistakes are less likely to occur; moreover, a well-thought-out system of planting, in which due recognition is given to the diversity of plant growth, is always more satisfactory as a composition than that obtained by haphazard planting. Rooted cuttings and seedlings are the most suitable methods for planting dry walls already in existence, while a large number of plants may be introduced by means of seed.

The best time to make and plant a dry wall is during early spring, as then growth is most active, and the plants having a full season before them become thoroughly established and capable of withstanding the utmost rigours of winter. It is always in terrace gardens where dry walls reach their highest; in such they may be interpolated so as to overcome the most awkward slope.

DRY WALLS IN WINTER

The two illustrations of the same place are from photographs taken in November, the second a year later than the first. The bank was considered beyond garden cultivation and was famous for its Thistles. Books were read and plans of dry-walling studied, but they gave little help, for in them the stones were always right in shape and size; only reality could teach one what a handicap the only procurable stones of the neighbourhood might be. It is a true test of workmanship

A DRY WALL IN NOVEMBER. A YEAR PREVIOUSLY THE SITE WAS A BANK OF THISTLES.

THE SAME WALL
A YEAR AFTER

THE SAME WALL A YEAR AFTER PLANTING.

and perseverance to turn poor material into good work. The material we used was either dug up in this garden or brought here as rubbish to fill in a new drive; so each stone had first to be sorted out of dozens and then to be shaped with mallet and chisel.

Experience was a fine teacher to the amateur builder of this wall. The chief points he learned were these: Have a firm and level foundation trench, with the foundation at least 6 inches below ground-level. Place the stones in layers, and keep them in a straight, horizontal line. As in brick-laying, let one stone lock another, that is, one joint come under the centre of the stone above. The face of the wall must incline inwards, so as to lean against the bank it supports. This wall might be called serpentine-fronted. The first illustration shows how it bows forward in the centre, about one third of the length being shown. The seedling Pinks, *Dianthus plumarius annulatus* hybrids, were planted as the building progressed, and were each encouraged by a handful of good loam. The second illustration shows the result. Another thing to remember is to ram and pack the soil tightly behind and between the stones. Just above the Pinks is *Convolvulus althæoides*. All through the summer its soft pink flowers have shimmered and glowed on this warm, sandy bank, and in winter one is thankful for its beautiful silvery grey leaves, shaped like those of the Passion Flower. One word of warning. This graceful Bindweed wants plenty of room—one realises this if the illustrations are compared—for it has now pushed its way through the stones, has invaded the Cistuses, and is fast taking possession of the *Nepeta Mussinii* above it; but it requires a well-drained soil and a southern aspect to make it such a ramper.

The *Cerastium pennsylvanicum* was just arriving at its winter's best when the second photograph was taken, for all this young growth has been made since July, when it was cut down to the ground. This bank, which a few years ago was an uncultivated waste, is now, thanks to its wall and its clothing of motley grey foliage, the brightest spot in a November garden.

THE PAVED GARDEN

There is at present a growing feeling among gardeners that the reaction against formality in gardening has reached its limit, and that it is time the pendulum began to swing back

in the opposite direction. People are beginning to realise that gardening comprises something more than a servile imitation of Nature ; that the artistic criterion of a garden is something higher than its naturalness. The mistake, which is still too often made, is the failure to realise the architectural character of such garden appendages as pergolas, trellises, arbours, and summer-houses. With a growing appreciation of the fact that such things demand as careful planning as the dwelling-house itself there is arising a class of specialists whom one may designate "garden architects." The particular branch of gardening to which we desire now to draw attention falls within the peculiar province of such garden architects, and a paved garden designed by one of that fraternity will be far less likely than would otherwise be the case to display such glaring and rudimentary errors as, for example, the use of so-called "rustic" work in conjunction with paved walks or courts. For one of the cardinal principles to be observed in the design and construction of the paved garden—be it merely a paved walk with or without a pergola, a paved Rose or water garden, or a paved forecourt—is that the only traces of rusticity allowable in such a garden are those due to art and not to accident. It is, for example, not merely permissible but desirable to encourage the mossing over of stone edgings and the interstices of paving, for thereby is obtained that venerable appearance betokening the undisturbed restfulness of long years, which should be an attribute of the paved garden.

If any plants at all be admitted upon the actual paving, the very greatest care should be exercised in their selection and insertion. It cannot too often be insisted upon that paving is primarily intended for the feet of man, and any plants allowed to grow upon the space devoted to that purpose must not only wear the semblance of having made a bold bid for freedom and escaped thither from the neighbouring borders, but they must in themselves be strictly in harmony with their surroundings. The indiscriminate planting of a variety of rock plants is most strongly to be condemned. To an artistic mind the result of such planting is as repellent as would be the appearance of casual footpaths across one's choicest Rose-beds. As Rose-beds are intended for Roses, so are walks intended for walking upon, a proposition so elementary that its habitual neglect is little short of astounding.

A cardinal rule to be observed in planting crevices is that all traces of the gardener's hand must be studiously

obliterated; accordingly, the most successful results are obtained where the paving is flanked by low retaining walls built of unmortared stones, the chinks between which are filled with suitable alpine, so that any plants allowed to grow upon the paving appear to be favoured intruders in forbidden regions. Where no such retaining wall is present, it is advisable to have a stone edging covered here and there with the most prostrate plants, some of which may be permitted to trespass a short distance upon the walk. The varieties of *Phlox subulata* are peculiarly charming when grown in this way. Again, where the paths or walks are flanked by beds, in which the front portions are occupied by the lower-growing Campanulas, Saxifrages, or Sedums, a stray plant or two of the same variety may be allowed to wander on to the adjoining pathway.

A solution of the difficulty is to be found in the use of exceedingly dwarf species only, such as the *Veronica canescens* and *rupestris*, *Arenaria balearica*, *Herniaria glabra*, *Mentha Requienii*, *Thymus Serpyllum albus* and *coccineus*, and possibly also the *Acænas*, such as *inermis* or *pulchella*, or, best of all, *Buchanani*. None of these will resent an occasional trampling. Subject to the restrictions already stated, such dainty small flowers as *Asperula Gussonii* and *hirta*, *Campanula pusilla*, especially the variety named after Miss Willmott, and *pulla*, *Stansfieldii* and *waldsteiniana*; *Erinus alpinus*, *carmineus*, and *albus*; *Hutchinsia alpina*, *Saxifraga muscoides atropurpureum* and *Rhei*, *Silene acaulis*, *Sedum farinosum*, *Sempervivum arachnoideum*, and such plants as the dwarf Dianthus, may be allowed upon the outer portions of the paving.

One of the most charming and effective uses of paving is in the Rose-garden; but here, great though the temptation may be, the walks should be left free of vegetation, with the exception of moss. One word of warning should be given concerning the size of the stones employed. These should never be less than 1 foot square, but should preferably be considerably larger. For walks those of rectangular shape are most suitable. For a paved enclosed court, such as the little Tudor garden at Hampton Court Palace, stones of irregular sizes and shapes may be used. An admirable example of a large paved garden associated with tub plants and Lily tanks is to be seen in Kensington Gardens, near Lancaster Gate. Such a garden forms a most appropriate connecting link between the precincts of the house and those of the garden proper. Many alpine will be found to seed freely between the joints of the paving; where there is ample

space, a charming effect is produced by a few clumps of seedlings of plants such as *Campanula portenschlagiana*, *garganica*, and G. F. Wilson; *Cheiranthus Allionii*, *Dianthus deltoides roseus*, *Erinus alpinus*, *Linaria alpina*, and *Papaver alpinum*. But even here the keynote of success is moderation.

In Old English gardens Lavender walks formed one of the most pleasing features, and those who are fond of old-world effects could not do better than introduce this feature in gardens of to-day. Nothing could be more simple. Cuttings of Lavender root readily in the autumn if prepared from young wood and inserted in free, sandy soil under hand-lights, when they will be ready to plant out in the spring. Cuttings, when taken with a "heel," also root in the open in sandy soil, but the method of using a hand-light ensures success, and is generally preferred. The paved Lavender walk seen in the illustration is a delightful feature of the gardens at Regal Lodge, Kentford. The bold lines of Lavender are edged with Thyme, while between the paving-stones are many little tufts of dwarf Campanulas, chiefly *C. pulla* and the variety Miss Willmott. If preferred, pink China Roses could be mingled with the Lavender, the combination being particularly pleasing.

THE BOG GARDEN AND ITS FORMATION

Of the many phases of open-air gardening, none, perhaps, is fraught with greater possibilities, and none, certainly, possessed of greater charms, than the bog garden if well and rightly conceived. It is in this type of garden that we see plants grow, flourish, and blossom that too frequently are met languishing for the moisture they love in the open border. Indeed, one of the great charms of bog gardening is that the plants thrive and grow apace, and that nothing droops or dies, simply because the subjects are rightly placed and constantly provided with the moisture so essential to their well-being. But in the bog garden, as in all else, there is just the possibility of the strong crowding out the weak—just the possibility that by one false step, made unwittingly, a plant may be introduced that may prove a nuisance for years. Hence, at the outset, there is the same need for discretion and for that close, intimate knowledge of the subjects chosen for the work, of their slow or quick growth as well as their ultimate

A PAVED WALK BETWEEN LOW HEDGES OF LAVENDER.

TRILLIUM GRANDIFLORUM ROSEUM IN THE BOG GARDEN.

development, as there is in any other phase of gardening work.

The host of plants benefiting by constant supplies of moisture during a hot season may tempt some to introduce those that intrude their presence in all directions, or that quickly choke or overrun others whose finer attributes render them far more desirable for such a place. Of such as the former many examples might be given, though one, the *Epilobiums*, will suffice for all purposes. Here we have a small group of rapidly-increasing plants that appear to grow all the year round, sending out such vigorous stolons or underground shoots or stems which, springing up some distance from the original, soon make their presence felt in their new homes. For such as these, then, welcome as they are in the wild garden, there is no room—there should certainly be no place—in the bog garden we have in mind, and no quarter should be given to the smallest seedling which might appear. Thus it will be seen that, in our opinion, a bog garden should not be a sort of dumping-ground for any and every moisture-loving plant; rather should it be a spot—an adjunct to the garden proper if you will—to be enriched and beautified with the choicer subjects of other climes as well as those of our own land, subjects which, revelling in moisture, know no happier place than the natural bog.

But some may say, very few gardens are possessed of or include a naturally boggy spot, hence, if we would grow such things as delight therein, an artificial substitute must be arranged. In connection with this not infrequent question arises the all-important point as to whether the abode for such plants must be made water-tight. The correct answer depends not a little on the available supply of water and equally on the nature of the subsoil. Where a retentive, plastic clay soil exists, a veritable dribblet or trickle of water will maintain the soil in a state of semi-saturation, sufficient, indeed, for all purposes. On the other hand, where the subsoil is of sand or gravel, a slight excavation of this will be required to admit of the introduction of well-tempered clay, than which nothing is so good or so natural. A lowering, too, of the ultimate surface soil is desirable in those instances where a light soil obtains, to admit of the water from the rainfall finding its way into the bed.

In all large gardens in hilly districts, the forming of an artificial bog garden or bed is quite an easy matter. The ideal condition for such is, when a fountain basin exists on the terrace lawn, with the overflow tumbling into a rock-garden pool a

few feet below, and in turn trickling away into the woodland lower down, where it can be used to advantage for the purpose we have in mind. In just these happy circumstances, many years ago I spent much time in adding beauty to a phase of gardening not then common, and where the founder of the garden delighted on occasion to roam. An opening in the wood gave all that was desirable, and with sun and warmth and varying degrees of moisture a large area was furnished with the plants varying from such carpeting subjects as *Anagallis tenella*, *Sibthorpia europæa*, *Linnæa borealis*, and *Pratia angulata* to the giant Royal Fern, *Osmunda regalis*, of several feet high and through.

There are also peat-loving and loam-loving plants, handsome Lilies as *pardalinum* and *superbum* that reflect their greatest beauty in the woodland bog garden, while dozens of others, Primulas, Trilliums, Sarracenias, Parnassias, Dodecatheons, Cypripediums in variety, Saxifraga Hirculus, Marsh Marigolds, Orchises, Pinguiculas, Droseras and the like may all be grown to perfection in a few square feet of bog. There are, of course, Primulas such as *P. japonica* and Saxifragas such as *pellata* that are not quite suited to the smallest of these bog-beds, unless, indeed, they be given place at the outer margins where the chief supply of moisture enters. Just what is suited to any and every case will, of course, depend entirely upon circumstances. Happily there are plant giants like the Gunnera, Osmunda, and Spiræa, together with the miniatures I have already named, that make bog gardening possible in large and small gardens alike, and where the plants of our own marshes and woods may, with others from the higher mountains of Europe and elsewhere, jointly play their part in making this aspect of gardening one of the most fascinating of the year.

THE HARDY NYMPHÆAS OR WATER LILIES

The following article is by Mr. James Hudson, V.M.H., head gardener at Gunnersbury House, Acton. Mr. Hudson is an expert on hardy Water Lilies, having made a careful study of their requirements for many years:

Their Popularity.—Perhaps no flower among all the British flora is more admired than our common or wild Water Lily, *Nymphæa alba*. It was about the first of all flowers that claimed my attention nearly sixty years ago. I remember well the lovely effect that was made upon

some large sheets of water in a deer park near to my home, and with most suitable surroundings, too, such, for instance, as the Bulrush (*Scirpus lacustris*). I have also seen other sheets of water covered with this Water Lily flowering in the greatest profusion. The flowers are often offered for sale in the seacoast towns of the Eastern Counties, the source of supply, no doubt, being the Broads. The true *N. alba* has a comparatively small flower, and must not be confounded with *N. candida*, which is more vigorous in every respect. Considering how very popular these old inhabitants of our ponds and lakes have ever been, it was no wonderment to think how the first of the tinted hybrids took on when first imported into this country. There was, it is true, an impression in some quarters that these hybrids were not perfectly hardy. That doubt has now, I think, been completely dispelled. We have been steadily led up to the deeper tints that now obtain in some of the more recently-introduced hybrids. Now we have an ample choice from point of colour alone, as we have also in diversity of growth. Many are the ponds and lakes that are now ornamented with these lovely flowers, and that to great advantage beyond a doubt. They look well when seen at a distance, and even more so when viewed from rising ground, such, for instance, as at the Wisley Gardens of the Royal Horticultural Society; also at Gravetye Manor, Mr. William Robinson's country seat in Sussex. To fully appreciate their individual beauty and distinct characteristics, a closer inspection needs to be made. Then we can fully realise how lovely some of the later hybrids are.

Their Utility.—Many sheets of water, both large and small, look well without any superabundance of aquatic growth. It is, however, around the margins and in cosy nooks of the larger surfaces of water that the Nymphæas have a good effect. Smaller sheets of water may, in some measure, have a greater quantity of these plants, so as to produce a distinct effect. For these purposes there is now an abundant choice, both in various forms of growth and in the diversity of colours. Some, too, are suitable to large fountains; others are better even when grown in small basins of water; while it is also possible to grow them in large shallow tubs with very good results. In whatever way they are grown, they add to the attractiveness of the garden, and that, too, at a season when the garden is most frequented and more time spent therein. Small ponds and shallow pools are at times, in a measure, unsightly by reason of a scum upon the surface of the water. Where this happens to be the case, some Water Lilies should be planted. These, it is true, may not altogether dispel the bad effect produced, but they will greatly assist in doing so.

Their Freedom of Growth.—Many of the hybrids raised by M. Latour-Marliac are remarkable for their vigorous growth. For these more room is needed than is often allotted to them. When it is seen that the leaves are so dense as to force themselves out of the water, it is indicative that a greater depth is necessary for them. If this cannot be provided, it is better to thin out the crowns. This should be done without any hesitation, for two or three good crowns are very much

better than twice the number in the same space. For the strongest growers 6 feet in depth of water is none too much. I have seen such as *N. Marliacea chromatella* doing well in as much as 18 feet of water, but I do not recommend planting at that depth. This variety is very often seen late in the season to be overcrowded. When such is the case, it points to a need of division. The flowers are often smothered by the leaf-growth also when the latter is so dense; this in no sense is desirable. Vigorous growth is also fostered and encouraged when the mud is too deep; this fact must also be contemplated when the planting is being done. I knew an instance once where there was an escape of sewage into a lake; here the growth was luxurious almost beyond description.

On the other hand, there are several of these hybrids that are of quite moderate growth, yet producing both leaves and flowers of large size. When I note that any particular variety possesses long petioles (or leaf-stalks), I take it as an indication that it will thrive better in deeper water. What I do not like to see is a plant that has a tendency to produce a multitude of small leaves, which lie almost upon each other at times, and with but few flowers. A few years ago this appeared to be a weakness of a few of the hybrids. I have not noted it to such an extent during the past two or three years. When it does occur, it is advisable to break up the plant into single crowns where it is possible to do so. This should be done in May, if it be possible, and with a sharp knife, aiming at a few roots to each division. These will almost invariably establish themselves during the coming summer. Some there are that flower so profusely, almost at every leaf, and do not in consequence make any back breaks. It is rather difficult to propagate such. We had such a case once in *N. Laydekeri rosea*, which never made a break. This plant ultimately died, but not before we had obtained one seedling from it.

Their Value in the Water Garden.—Water Lilies play an important part now in the effective grouping of water plants, combined with sub-aquatics and plants that associate with both, and which may be fairly termed water-side plants. Taking the illustration as an example, one may note how well all the subjects comprised therein blend with one another. Here may be noted such water plants as the Arrow-head (*Sagittaria* species), the Water Sedge (*Cyperus longus*), and of sub-aquatics such as the Astilbes in variety. Upon firmer ground may be noted both Bamboos and Miscanthus, as well as the moisture-loving Saxifrage (*S. peltata*), the giant Californian species. Such a grouping as this is most effective, the trees in the distance adding to the general attractiveness. In the immediate foreground one Water Lily gives indication of needing either deeper water or division. Allusion to the treatment of such will be noted further on. Each of the clumps of Lilies is planted at a good distance apart. This is as it should be. When possible, it is most advisable to plant for colour effect. By selecting those that can be relied upon to flower freely, this can be done. It is possible to so arrange such a water garden as this

A WATER-LILY POND WITH SUITABLE PLANTS AT THE MARGINS.

HARDY NYMPHÆAS (WATER LILIES) IN TANK.

or distant effect, but personally I should favour such an arrangement as would produce a surprise. In the illustration it may be noted that no large trees overhang the water. This is as it should be, as these are not, by reason of the shade, at all favourable to healthy growth. *Caltha polypetala* (the new Kingcup) would add much to the colour effect, while both *Menyanthes trifoliata* (the Bog Bean) and *Butomus umbellatus* (the Flowering Rush) would, if not so showy, add to the attractiveness in their season. For growing in the water absolutely, *Richardia æthiopica* is most valuable in such groupings as this. It will continue in flower for a long period in the summer season.

Methods of Planting.—Various methods of planting can be adopted, but the system I have practised from the very first I have found to answer well. To begin at the beginning, in our case here I would state that the first order that was given was for a dozen varieties. That would be about eighteen years ago. The cost of all of these did not amount to £3; but I should state that the plants were all small, though well rooted and healthy. When unpacked on arrival from M. B. Latour-Marliac I placed them securely in shallow Strawberry punnets. These held them quite comfortably, each plant being tied in to prevent its escape by any movement of the soil. These, with the exception of *N. flava*, all thrived well the first season and survived the following winter, which was a very severe one. The plant of *N. flava*, however, succumbed during that trying winter. As I did not then feel assured of their hardihood, I covered the ice, soon after it formed, with some straw litter to prevent, if possible, a thick coating over the Lilies. I followed this system of protection for a few seasons afterwards. Finding, or at least deeming it not to be essential, I ceased to cover them, and have never done so since. These little plants of the first season grew so well, that a few flowers were produced the second year from planting. At two years from their receipt I lifted them carefully. The punnets were, as a matter of course, decayed; but the roots all lifted well. I then transferred the plants to small, but old, nursery rounds of about 2 feet in diameter.

The best Soil.—The soil I used then—and I have found nothing to answer better—was, first, a layer of decayed leaves over the bottom of the basket; then some broken-up turfy loam and road scrapings. Into this soil the plants were firmly placed, being again tied down to prevent floating. That season the eleven plants grew surprisingly well, and flowered quite freely for their size.

Dividing the Plants.—In about three years afterwards I found it necessary to divide the stronger-growing varieties. These were *N. Marliacea albida*, *N. M. chromatella*, *N. M. rosea*, and *N. M. carnea*, all of which are well known as vigorous growers, even under adverse circumstances. I then used larger nursery rounds of from 3 feet to 4 feet in diameter. It was somewhat of a difficulty to lift the plants that time, so well had they rooted into the muddy bottom of the lake. They were slid back into the water; then, by means of a cord, the baskets were pulled into greater depth from the other side. Divisions

of these and other strong-growing varieties have taken place since. One has to be careful, I find, about the division of the weaker growers. This has to be done with more care and not so frequently. I divided our plants of *N. odorata rosacea* and others of this section, and they never thrive well afterwards, I am sorry to say. The root growths of these are much smaller and not nearly so succulent or sappy, being somewhat hard in texture. They make much smaller roots in comparison also. The *N. Laydekeri* section appear to be somewhat intermediate in growth, but they grow freely, all the same, and flower most profusely; but, like the *N. odorata* section, do not need to be disturbed so frequently.

One other method we have adopted with success, viz. that of planting without baskets by merely laying some soil upon the bottom; then place the plants in position and cover with soil, taking care to weight them down securely. This plan can only be adopted when the water is quite low; meanwhile, and until the water rises sufficiently, they must be covered with a mat or other shading. Never on any account should tubs be used. This is an utter mistake, for the soil in them becomes stagnant beyond any hope of improvement. I have heard of Teak tubs being used for the purpose, but it is an expenditure that cannot be in any sense justified. Wire baskets are not so bad as tubs, because aeration of the water and the soil can then take place within them. But wire baskets will contract, or limit, the growth of the rhizomes, and this is to be regretted. Loose bricks are better than wire baskets, as these can be removed and extended. Of all the systems, however, I much prefer wicker nursery rounds without any handles to them. In small and easily accessible fountains or basins of water, I consider nothing to equal bricks of the usual size; these should be built up lightly and loosely, so as to hold the soil. About three courses of these are sufficient for all but the strongest growers, and these only need four courses at the most. So-called "pockets," or hollow spaces provided in rockwork, at times are bad places for Water Lilies, as the soil cannot be readily renewed in them.

Season of Planting and Seedlings.—After several years' experience now, I find no time to equal the spring. From the last week in April to the third week in May I consider to be the best time to both plant and divide the rhizomes. The water then is more perceptibly rising in temperature week by week, and this will be congenial to quicker root development. Later planting may be safely practised, but such does not give the plants the same opportunity of re-establishing themselves before the autumn sets in. I should never attempt to plant or divide after August draws to a close. If by any chance seedlings are noted during the summer months, it is better to mark these and leave them until the following spring before in any way attempting removal. If during the month of August or early September any seed should be seen floating upon the surface of the water it may be secured and at once sown in mud, then raised in a temperate house. After the bursting of the seed-pods the seeds only float twenty-four hours, then sink to the bottom.

Varieties.—We have now, thanks in a great measure to the untiring efforts of the late M. B. Latour-Marliac, and more recently to his son and successor, a marvellous selection of hybrids, and that in surprising variety, both as it pertains to colour, to vigour, and to freedom of growth. There is an abundant choice now in whites, in pale pinks, in deeper pinks and rose colours, in reds, in crimsons of various shades, and in yellows also. Of these some of the more recently-raised hybrids are most remarkable, both in purity of colouring, in size of flowers, in the breadth and substance of the petals, and in their floriferousness. To look at some of these later hybrids when in their full beauty is but to admire them, and even to wonder how they have been evolved out of those we knew, say, ten years back. In more than one instance the season of flowering has been extended, both early and late. Some of the best of these newer hybrids, so far as I have been able to note them, are: Whites—*N. virginalis* (Latour-Marliac, 1910), which is very free-flowering, with flowers of the largest size, the petals being shell-shaped and of the purest white. The sepals are very slightly tinged with faint rose colour at the base, the stamens being yellow. With us it is the earliest of all to flower, as well as one of the very latest. Its description anent this by Latour-Marliac is “*précoce et tardive*,” and it well explains this characteristic. The foliage is large, and has a faint tinge of purple therein. The pale pinks, *N. Mrs. Richmond* (Latour-Marliac, 1910) is, in my opinion, the most lovely flower imaginable in this the softest of colours. Of it we have had flowers nearly, or quite, 9 inches in diameter. The petals are broad and massive, the stamens yellow. The flowers, when fully expanded, are a lovely sight. Its vigour, too, is all that one can desire. It has flowered now for two seasons with us, and is gaining in vigour. *N. formosa* (Latour-Marliac, 1909) is somewhat similar to the preceding in its colouring, but deepening towards the centre. The petals in this instance, I have noted, are distinctly margined with pale pink (quite a picotee edge); the growth, also, of this hybrid is very vigorous. The stamens are yellow and the flowers of the largest size. *N. somptuosa* (Latour-Marliac, 1909), in which the rose colour is slightly more intensified, is another acquisition. In form it very much resembles *N. Laydekeri rosea*, having that incurved shape of the petals. The stamens are of a deep orange tint. I should add that the petals are more numerous than in many of these hybrids; in addition, also, it is fragrant. The growth is both dense and vigorous. *N. Newton* (Latour-Marliac, 1910) is not, strictly speaking, a pink colour, having a suffusion of vermillion, though of a pale shade. Its flowers are stellate in form and stand distinctly above the foliage; the stamens are orange yellow. *N. Colossea* (Latour-Marliac, 1901) is not quite a new variety; nevertheless, I do not think it is sufficiently known. It produces the largest flowers of any with us, and is best described as being a glorified *N. Marliacea rosea*. I have noted its flowers in the height of the season as much as 10 inches in diameter. It flowers both early and late; the foliage, also, is of the largest size. The parentage

of *N. Colossea* is given as being *N. maxima alba* × *N. gloriosa*. Of crimsons, the finest, in my opinion, is *N. Escarboncle* (Latour-Marliac, 1909). In its colouring it is almost unique. We have none that approaches it in intensity of colour, which is described as a uniform vermilion red. So far I do not think it is found in many collections. The stamens are of a deep vermilion red, very distinct. *N. Meteor* (Latour-Marliac, 1909) is somewhat after the preceding, but not so brilliant in colour. The petals are streaked with white, but not regularly; the sepals are lined with red, and the stamens of a golden yellow shade. *N. Attraction* (Latour-Marliac, 1910) resembles somewhat that well-known hybrid *N. atropurpurea*. It is, however, much brighter, and cannot be considered as of the same colour, which in this instance is a deep bright purplish crimson with venations of almond white; the stamens are of a deep mahogany tint. *N. Conqueror* (Latour-Marliac, 1910) has very fine and distinct flowers of the largest size, bright red in colour, with white veinings occasionally, the colouring being deeper upon the convex side of the petals; the stamens in this instance are orange yellow. The flowers possess great substance in addition. The foregoing are ten of the finest of the newer hybrids, so far as I have been able to prove them. They are all distinct from the older varieties, and every one possesses the essential of a vigorous growth.

N. gladstoniana is a most remarkable hybrid and one of the finest whites in cultivation, with no semblance whatever of pink in the petals; instead of which the few touches of palest green add to its beauty. The flowers are somewhat after *N. tuberosa* in form, being disposed to incurve as in that species. The flowers are of the largest size, while the leaves are larger than any other Water Lily with which I am acquainted. I suppose this latter feature is why the moorfowl often-times select it upon which to make their nests.

Enemies.—Like all other plants that are cultivated in our gardens, the Water Lilies have some enemies to contend with. The water snail is one that is, in a few waters, somewhat troublesome. The best remedy that I can advise for this is the use of finely ground lime (not slaked lime, which is not quite so effective, I think). If very troublesome, then lower the water and destroy all that can be seen, and lime all the surface lightly before raising the water-level again. Too free a use of lime, be it noted, is prejudicial, in my opinion. Aphides will attack them at times. For this the remedy is spraying over the entire surface towards the evening, and with repeated doings if needful, selecting a dry, quiet time if possible. A mite or other small insect will eat away the leaves from the under side. For this the remedy is a well-proven insecticide at about double the usual strength of application. This should be forced under the foliage, so that it rises against the under surface of the leaves. Another and most determined enemy of the Water Lily, in my experience, has been the waterfowl of divers kinds, from the black and white swans down to the moorfowl. All grades have a liking either for the young bronzy leaves of many of the best hybrids or for the flowers themselves. The moorfowl will peck

through the unopened buds of those of the highest colour; this is most provoking. Again, as I have alluded to, the same bird will appropriate the leaves of the individually small plants (these in most instances will be the choicer kinds), and this, too, is annoying, as if the leaves of the older varieties were not good enough for making their nests. Ducks will dive and peck out the hearts of small plants very persistently, while swans do a vast amount of injury in tearing off the leaves and swimming through the separate plants. Water Lilies, other than the common variety, cannot be grown as they should be where aquatic birds, large or small, predominate. The vole or water-rat is also an enemy to the crowns, and this rodent will do a lot of harm possibly before he is detected.

WATER LILIES IN TUBS

Water Lilies add so much to the interest of a garden that even the smallest place will be rendered more attractive if one or two of these fascinating flowers can be cultivated. This is not difficult, as by means of tubs, or even of zinc cans, such as can be bought for a shilling or so, some of these flowers can be accommodated, although not, of course, with the fine effect produced in large tanks or ponds. Tubs can be readily prepared, and are cheap to purchase. The most convenient to secure are generally made from casks which have been used for petroleum. Treacle casks are also suitable, but are not always so durable as the others, although generally cheaper. Larger ones, such as those employed for oil for factories, are excellent, especially for the larger varieties. The casks should be cut in two, and a hole bored in each near the bottom, so as to drain off the water if required. This should lead into a drain. It is not, however, essential to have this hole, as the tubs can be emptied by hand if required, and a change of water is not necessary, but may be provided for by an overflow arrangement at the top, conveying the surplus into a miniature bog garden or a drain. The tubs should be tarred, pitched, or creosoted on the outside for preservation, but this is not essential. The interior should not be treated except by charring it, using a little petroleum and a few shavings. Tarring inside is injurious to the plants. The tubs ought to be sunk with the rims level with, or even a little below, the ground level, and their artificial appearance can be hidden by surrounding them with rockwork, arranging the stones so that they will form an irregular margin to the tubs. Another plan the

crimson; *N. odorata exquisita*, rosy pink; *N. caroliniana perfecta*, and *N. caroliniana rosea*, pink; with *N. c. nivea*, white, are first-class. *N. ollisiana* is capital, but *N. Robinsonii* may take its place as a crimson of moderate growth. Other good varieties which may be selected are: Crimson and shades of the same hue—Attraction Meteor, James Falconer, *Fræbelii*, and *lucida*. Yellows—*N. odorata sulphurea grandiflora*, *Mariacea chromatella* (thin out severely), and *mooreana*. Whites—*N. Mariacea albida*, *virginalis*, *caroliniana*, and *N. tuberosa Richardsonii*. Pinks—Mrs. Richmond and *N. formosa*.

THE HEATH GARDEN

THE following article is by Mr. T. Wilson, head gardener at Glamis Castle, N.B., and is included here on account of the practical suggestions set forth by the writer :

In these days, when fashion has given a healthy impetus to the improvement of flower gardening in all its aspects, including rock, water, and wall gardening, as well as a revival of topiary work, it may not be out of place to enter a special plea for a more extended use of this interesting race of hardy plants. If one could imitate the graphic pen of a Reginald Farrer and so describe the many gems contained in the genus, their easily understood and modest requirements, together with the knowledge that they provide an inexpensive hobby which may be enjoyed equally by those looking for further extension to their pleasure grounds or those possessing only a small strip of ground which may be unsuitable for other styles of gardening. Then the formation of Heath gardens would soon become general.

The genus *Erica*, belonging to the Natural Order Ericaceæ, is said to contain between four hundred and five hundred species, the majority of which come from South Africa, the others being natives of Britain and Southern Europe. The common Heath or Ling, *Erica vulgaris* or *Calluna vulgaris*, so plentiful in the Highlands of Scotland and on moors in England, is said to extend to North America, but only in small quantities. The South African species were at one time largely grown as greenhouse plants, but few of them are now in cultivation, their places being filled by numerous soft-wooded hybrids which are largely grown on the Continent for autumn and winter decoration ; but it is of the varieties that have proved hardy in Britain that I propose to treat. A full collection or a selection of those best suited to the climate may be had to provide a succession of flower almost throughout the year ; indeed, it may be said that the Heath garden is never entirely devoid of flowers unless when the plants are buried deep in snow. Those flowering in late autumn retain their flowers, with very little diminution in the bright colours, through the dull months of November and December, and after the plants are entirely denuded of flowers, numerous varieties show such a distinction and contrast in the colouring of the foliage—some silvery, some golden, and others bronzy or russety—that they are not without decorative effect, while such varieties as *E. multiflora*, *E. arborea*, and *E. codonodes* will by the end of the year be pushing out their delicate flowers until arrested

by severe frost or a heavy coating of snow, only to reappear with renewed beauty as soon as the sun has proved strong enough to melt the snow on the higher shoots. These three are followed in quick succession by a host of spring and early summer flowering varieties, a list of which I propose to give later on, with their respective colours and habits.

Situation and Soil.—The situation chosen for the Heath garden should be one having a southern aspect, if possible, or on a sunny slope leading from the formal flower garden to the shrubbery or plantation, a sort of connecting link, in fact, between the purely artificial and the natural. The place selected must be thoroughly drained, if not naturally a dry spot, for these plants will not thrive with any excess of moisture about the roots, and the soil, if of a heavy, retentive nature, or containing much lime, would require to be removed and replaced with a mixture of peat, leaf-mould, and sand or grit. Should the natural soil be a light sandy loam, however, none of these ingredients will be required.

Formation of the Heath Garden.—As I have already said, the situation of the Heath garden may form an adjunct to the formal flower garden, or it may be an extension or addition to the rock garden; and a very pretty effect may be obtained if a piece of ground is selected which has a decided slope with an undulating surface, where beds of irregular shapes and sizes could be made to harmonise with the existing surroundings. A plantation or belt of timber on the north and east of the site, if an exposed one, would give shelter to visitors and do no harm to the plants; while a rustic summer-house, thatched with Heather obtained from some friendly owner of a grouse moor, erected on a spot to command a good view of the garden, would add to the general comfort and appearance. Avoid geometrical designs or the making of gravel paths, which I do not think are in keeping with the subject under notice. Beds cut out in grass, so that when in full growth the plants may appear as if growing naturally in clumps out of the turf, give the best effect. The grass will require to be kept regularly mown, so that each bed may be examined conveniently. As vermin do not, as a rule, molest the Heaths, protecting fences, which often prove a difficulty, need not be considered. The positions of the beds having been determined, these should be excavated to a depth of $1\frac{1}{2}$ feet to 2 feet and filled in with the mixture already mentioned.

Planting may be safely undertaken during favourable weather, either in autumn or spring. The fringes of shrubberies or large borders might also be made more interesting by the addition of numerous varieties of the Heath, disposing them in large, bold clumps or in bays formed by taller-growing subjects. Edgings of some of the dwarfer, free-growing sorts might be formed around the margin of all beds or borders containing hardy shrubs. There are also numerous varieties that do not exceed 6 inches in height which might find a place in the rockery, their stations being filled with a suitable compost.

Propagation is effected by seeds, cuttings, and layers, the former

being only practised in the raising of hybrids, although self-sown plants of the common Ling are to be found in great quantities on the hills and moors of Britain. A favourable seed-bed for these is, however, only found after a quantity of Heather has been burned off and the ground rendered bare of vegetation for a time. Propagation from cuttings is also slow, but is a successful enough method if carried out with sufficient care. The cuttings should be selected about June or July from half-ripened shoots of the current year's growth and placed around the edges of pots filled with a sandy compost. After receiving a good soaking of water they should be placed in a cold frame or under a bell-glass and shaded from bright sunshine.

Layering.—The most satisfactory method, however, of increasing the stock of hardy Heaths is by layering, as this can be done in the open, unless where the soil is unsuitable, in which case a cold frame may be utilised, filling it to sufficient depth with a light, sandy compost.

As all the *Ericas* are liable after a few years occupation of the beds to become leggy or straggling, replanting with fresh dwarf plants becomes necessary, and for this purpose it is a good plan to have always a few plants in reserve. These should be planted or laid on their sides with the shoots buried up to within a few inches of the tips; when left thus for a year or eighteen months, fresh roots will have been produced from the hard stems, and young plants or tufts of a convenient size for replanting will be easily secured. In replanting the beds with young plants it will not be necessary to entirely renew the soil; the addition of some well-decomposed manure will generally be found sufficient, well mixing it with the compost. Top-dressing the beds annually with stable manure is found of great advantage to the plants; this should be secured, if possible, where the stalls or boxes have been bedded down with moss-litter. A little of the material taken fresh from the stable and shaken among the plants during their season of growth will well repay the trouble by assisting the production of strong, healthy growth and abundance of flowers.

Selection of Varieties.—In making a selection of varieties, one must be guided by the extent of ground to be treated, by the climate, and whether spring or autumn flowering varieties are most desired. The most interesting selection, however, would be one in which all varieties are represented and planted with a view to having the beds flowering in succession during the greater part of the year. Where a number of beds can be conveniently arranged, each should be planted with varieties flowering about the same time, in preference to having them filled with many sorts flowering at different periods. The grouping of colours should also be carefully studied along with their comparative heights, commencing with those that flower early in the year.

Heaths for Winter Effect.—A large bed might be devoted to *Erica multiflora*, *E. codonodes*, *E. carnea* or *herbacea* and its varieties. Arborea, under favourable circumstances, will grow to a height of from 4 feet to 6 feet, and, indeed, sometimes attains to the dimensions of a small tree.

This plant is said to provide the wood from which the so-called Briar-root pipes are made, and is largely imported from France to this country for that purpose. It may form the central figure of a large bed; the flowers for the most part are white, although several varieties in different colours are recorded. *E. lusitanica* or *codonodes*, occasionally known as *E. polytrichifolia*, closely allied to *E. arborea*, is also a tall grower, reaching a height of 4 feet; this is a most beautiful variety, with white flowers borne very profusely, and having foliage of a pleasing soft green. *E. multiflora* is, perhaps, the earliest to show flower, producing its blossoms of a pale red colour sometimes in the last weeks of December, if the weather at that time is at all favourable. Its average height is about 2 feet, and is well adapted for planting between the first two named and the dwarf varieties of *E. carnea* with which we would finish the planting of the early bed. *E. carnea* forms dense tufts of pink flowers, and rarely exceeds a height of six inches. It is one of the freest, both in growth and flower, of the whole genus, and should be included in every collection. *E. c. alba*, often catalogued under the name of *E. herbacea*, is of slightly dwarfer dimensions than the former, but otherwise an exact counterpart in all but the colour of the flowers, which are white. When grown in quantity these lovely little Heaths provide some of the earliest forage for bees, and together with the tall varieties, already named, give a display during the first three months of the year; but before they have quite gone out of flower other varieties are rapidly coming forward.

Heaths for the Spring.—During the period from March to May, *E. mediterranea* in numerous colours will serve to keep up the succession, and several beds may be devoted to this section. The type grows almost 3 feet high, and has flowers of a pleasing shade of red, and should be planted towards the centre of the bed or well back from the margin of the border; the others, being mostly of a uniform height of from 9 inches to 12 inches, according to the suitability of the soil and climate, may be disposed in patches or blocks to fill up the beds according to the ideas of the planter. *E. m. glauca* is distinct in habit, being a very compact grower bearing red flowers; this variety requires somewhat closer planting than the others to enable it to cover the ground properly and avoid a certain stiffness in form that it assumes when given too much room. *E. m. hybrida* has somewhat larger and brighter individual flowers on shorter stems, and usually flowers were early, particularly in the southern counties. *E. m. rubra* might be described as a deep pink; *E. m. nana* and *E. m. stricta* both being red. The first four named should serve for most purposes, except where a very full collection is desired.

Heaths for Summer Effect.—June is perhaps the month in which we find the smallest number of hardy Heaths in flower, that is, at the full expanse of their beauty, for those that were in full flower during April and May have by no means ceased to provide some colour effect in their respective beds, as the plants retain their flowers and colour, though somewhat faded, for a long time after they have lost their fresh-

ERICA MEDITERRANEA HYBRIDA, A BEAUTIFUL HARDY HEATH THAT
FLOWERS IN DECEMBER AND JANUARY.

A BED OF THE WINTER HEATH, *ERICA CARNEA*.

ness. The later-flowering varieties, too, when only in bud provide a certain amount of colour as a promise of what may be enjoyed in the near future. The varieties, then, that we may expect to find in full flower in the month of June are restricted to two, so far as I can gather from my own observations. These are *Erica australis* and *E. Stuartii*, two plants with very different habits, the former being about 3 feet high, with flowers of a curious shade of colour, which, for want of a better description, I would call purplish red. *E. Stuartii* is a neat little plant about 6 inches high, with pretty, rose-coloured flowers, and forms a suitable subject for a comfortable pocket in the rock garden.

The Best Autumn Varieties.—From July to September a very large number will be found in flower, and, as little difference can be noted as to their respective times for flowering, I give them in alphabetical order. *E. Lawsonii*, a neat-growing dwarf variety with flowers of a clear red shade, forms a suitable subject for edging. *E. mackayana*, a very pretty red variety growing about 9 inches high, also a double-flowered form of the same, found in Connemara, give a pleasing variety among a class of plants represented principally by single flowers. *E. mediterranea multiflora* is the only one in the Mediterranean group that flowers in autumn, all the others flowering in spring. This is a distinct and striking variety, having white flowers with prominent chocolate-coloured anthers. A bed of smaller dimensions might be filled with the last three sorts mentioned, none of these being tall growers. *E. m. multiflora* should occupy the centre, with *E. mackayana* next, either in broad bands or suitable-sized patches, and *E. Lawsonii* near the margin.

The Cross-leaved Heath.—*E. Tetralix* is one of the most distinct of the whole genus, known as the Cross-leaved Heath. The whole plant when not in flower is of a greyish hue. Most of the varieties are about 6 inches high, a few attaining the height of 9 inches to 12 inches. *E. Tetralix*, pale red, also a white-flowered variety, *alba*, and another, *alba major*, having somewhat larger flowers, are similar in habit. Another white variety called *molle* has slightly shorter and denser flower-spikes, but otherwise similar to the former. *Pallida* resembles the last-named except in colour, which is of a very light shade of red. *E. T. præcox* grows somewhat taller than any of the above-named, and has white flowers. All are, however, of neat habit, and suitable alike for the rock or Heath garden. The characteristic peculiarities of the foliage of this section are at all times striking and attractive. A new variety, a hybrid between *E. Tetralix* and *E. aliaris*, and named *E. T. Watsonii*, is well worthy of being included in the list. The flowers are of a pretty rose pink colour. The plant is a free and vigorous grower, with attractive foliage.

The Cornish Heath (*E. vagans*) is perhaps the most vigorous of all the autumn-flowering Heaths, and although none of its varieties exceed 18 inches in height, they soon form large masses, and are therefore invaluable for planting in quantity either in the Heath garden proper or for clothing banks where the soil may be too poor for the free growth of shrubs. I have also used this extensively for edgings to

walks, and if clipped immediately after it has passed out of flower, it will keep in good order for a number of years before it requires replanting. The type is represented by a plant of compact growth about 12 inches high, bearing flowers of a pale purplish red colour, freely produced on slender, wiry stems that are not easily damaged by rough usage. *Alba* (the white form), *carnea* (pink), and *pallida* (flesh-coloured) differ only in colour from the first named; but a variety called *nana*, possessing a dwarf and neat habit, not exceeding 6 inches in height, is quite distinct. *E. v. rubra* is the tallest of the group, attaining a height of 18 inches when in full growth, with flowers of a bright red colour.

E. Veitchii is a lovely white hybrid obtained from crossing *E. arborea* and *E. codonodes*. This novelty we have as yet only seen as pot specimens, but from its general appearance it gives promise of being a valuable addition to an already extensive collection.

Common Heather or Ling.—*E. vulgaris* (*Calluna vulgaris*), is too well known to need description, clothing our hills and moors, where during the autumn months it transforms the whole landscape into a rich purple mass, presenting a picture of rare beauty not easily forgotten, especially by those who view it for the first time on a bright autumn day on the slopes of the Grampians. There are numerous varieties of this popular Heath, some of which make excellent subjects for grouping in the grounds either in large masses of one colour or judiciously mixed in beds. The white varieties are in much demand, and must be a source of industry in some districts, judging from the quantities that are to be seen on sale as cut flowers.

White Heather for luck, besides being the badge of a Highland clan, is in much demand for wedding bouquets, and there are few sportsmen who will not sacrifice the chances of a good shot to stoop and pluck a sprig of white Heather when discovered amid a sea of the common purple variety. In the selection of the finest of a long list of varieties of *E. vulgaris*, we would give first place to *E. v. Hammondii*, closely followed by *E. v. Alportii* and *E. v. Serlii*, the former being a very free growing variety about 18 inches high, with white flowers produced on fairly long spikes and forming a less compact but more graceful-looking bed than many of the others. *E. v. Alportii* is a very pretty dark red variety growing about 1 foot high, and where beds of mixed colours are favoured, this makes a fine companion for *E. v. Hammondii*. *E. v. Serlii* is conspicuous even when not in flower owing to the mossy appearance of its foliage which is further enhanced on the appearance of the flowers, which are pure white, of fine form and substance. The whole plant does not exceed 12 inches in height. *E. v. alba* and *E. v. alba minor* partly convey in the names their general description. *Argentea* has beautiful silvery foliage, and *aurea* golden. On a first acquaintance with the last named one might be forgiven for assuming that the plant was in an unhealthy condition, the appearance from a little distance being a sickly yellow colour in the foliage. *Cuprea* possesses a distinct

bronzy foliage, which is more pronounced in winter than in summer. The variety *flore pleno* should not be omitted, as its double red flowers, having a silvery sheen, are very attractive. The plant is free-flowering, with a compact habit. A few other varieties of *vulgaris* worthy of mention are *decumbens alba*, *tomentosa alba*, *hypnoides*, *pilosa*, *pygmaea*, and *rigida*. These are of slow growth, and are better adapted for the rock garden than the Heath garden. Having disposed of the principal varieties of *Erica vulgaris*, those remaining are generally a little later in flowering, and, with one or two exceptions, are not recommended for planting in large quantities.

The Dorset Heath (*E. ciliaris*), however, makes a very effective mass about a foot in height, bearing pale red flowers, coming in a little later than *E. vulgaris*.

E. cinerea, sometimes designated the Scotch Heath, embraces a fair number of dwarf-growing plants, rarely exceeding 12 inches high, and mostly of red and purple shades. The type is represented by a neat little plant of about 9 inches high, with purple flowers shading to lilac. *Alba* and *alba major* are the only white forms we have noted, the former being a facsimile of the type, except in colour, the major form being slightly larger and later. *Atropurpurea* (9 inches), *atro-sanguinea* (6 inches), *coccinea* (6 inches), *purpurea* (9 inches), *rosea* (9 inches), and *rubra* (6 inches), are appropriately described in the names they bear. *Spicata* is perhaps the tallest of this section, bearing long spikes of a dull red, showing somewhat dingy when placed beside those already named.

A rather curious specimen is found in *E. scoparia*, the flowers of which are of a greenish hue; the plant attains a height of about 2 feet, and the flowers are distributed unevenly on longish spikes.

The Corsican Heath (*E. stricta*) forms a large bush about 3 feet in height, and possesses more of an upright habit than any of the genus. Its foliage is also especially attractive, particularly in the earlier stages of growth; the flowers are a pale red colour, and are borne near the terminals of the shoots.

With *E. maweana*, a dwarf-growing variety, rarely more than 9 inches in height, and having flowers of a rich purplish red, which are usually at their best in the month of October, we would close our list of hardy Heaths; but another very interesting genus belonging to the same Natural Order is found in *Menziesia*, and which is usually included among the Heaths, having a similar habit and succeeding under the same treatment.

The Irish Heath (*Menziesia polifolia*, syn. *Dabæcia polifolia*, the St. Dabeoc's Heath, and perhaps better known as Irish Heath) is a very pretty plant, and quite as hardy and as free-growing as any of the Heaths. There is a purple and also a white variety each about a foot in height and of upright growth; the foliage is attractive, being a glossy green above and white beneath. The individual flowers are larger than any of the *Ericas*, and are drooping, the white form being very pretty.

THE LAWN: ITS FORMATION AND MANAGEMENT

FEW gardens are without grass of some kind. To call this "grass" in all cases a lawn is incorrect. Many lawns are patches of bad turf, but everyone appreciates the close, deep green "velvet pile" that good seed and good management will give.

In *Forming a New Lawn* the ground must be carefully prepared. An open, level piece is preferable, but where this is not obtainable the soil must be removed from the highest to the lowest parts until the surface is quite level. If the ground is wet and retentive, drain pipes 3 inches in diameter should be laid in $2\frac{1}{2}$ feet deep, each row of pipes being 12 feet apart. These will carry off the surface water. The pipes must have a gentle fall, and be connected with a cross main drain with a safe outlet.

The ground must be well dug to a depth of 18 inches or 2 feet, and if poor, enriched with well-decayed farmyard manure. Digging completed, tread and rake the surface, finally well rolling it to make it firm. Where the natural soil is not of sufficient depth more must be added, and it should be wheeled, not "carted," on to the plot, as the cart wheels make hard ruts, and where the soil subsides an uneven surface is left. Planks should be laid down for wheeling on. The surface soil to a depth of 3 or 4 inches should be of a rather fine character, as the seed germinates more quickly and the grass gets a better start in such a medium than in one of an opposite nature. In any case several weeks ought to elapse after preparing the soil before sowing the seed to allow the new soil to settle down. The quickest and probably the best means of securing a good lawn is by covering the plot with grass sods, but unless they are of first-rate quality, the more common method of sowing lawn grass seed should be resorted to. The sods may be laid down any time during fine weather from October to April; if laid later, they are apt to suffer from drought during a dry spring. From $1\frac{1}{2}$ to 2 inches is a good thickness for the turves, and they

should be laid close together, and afterwards well rolled at intervals throughout the winter—except when sodden or frozen. If all goes well, the grass will commence to grow freely in April, at which time the surface should be well swept with a stiff broom in order to remove all stones and rubbish, which, if allowed to remain, would cause injury to the mowing-machine or scythe. Allow the grass a little grace to encourage root action before mowing it for the first time, and if the spring be hot and dry, once a fortnight will be sufficient to mow during April and May. If possible, the lawn should be rolled every time it is mown during the first summer.

Sowing Grass Seed.—If grass seed is sown, obtain it from a reliable firm, because some samples contain a large percentage of plantain and other rubbish. A fair sample of the soil should be submitted to the seedsman, who will then supply a seed mixture suitable for it. April and September are the best months for sowing, and the quantity of seed required is from $\frac{1}{2}$ lb. to 1 lb. to the rod, or from 3 to 6 bushels to the acre. Well tread or roll the surface, and sow the seed quickly broadcast, afterwards raking it well in with a coarse toothed rake and again rolling. As chaffinches and small birds are fond of grass seeds, it will be advisable to give it protection until the plants make their appearance. Covering with old fish netting, raised on sticks a few inches from the soil, is best. When the grass is in active growth, give a moderate dressing of an approved fertiliser, of which there are several on the market, whilst the ground is moist with rain. When the grass has grown 3 or 4 inches high cut and roll it. Lawns that soon suffer from hot sun, owing to the soil being shallow or sandy, should receive a liberal dressing of fine soil and artificial manure annually. Mix the manure with the soil, and spread it evenly over the surface, about $\frac{1}{2}$ inch thick, in January or early in February. Rain will then wash in the manure and most of the soil, and if the grass is well swept and rolled early in April, previous to mowing, its density will be increased and the quality improved. Where the soil is fairly deep and good the turf will remain in good condition for an indefinite period, if well attended to, but on shallow, hungry soil it wears out in time, even if top-dressed annually. The only course then open is to remove the soil to a depth of at least 12 inches, replace it with the best soil procurable, and after levelling and rolling, either turf it over or sow it with the finest lawn seed. When good soil and seed are used, few daisies, plantain, and other weeds occur. Grass seeds can hardly be sown too thickly for making new or renovating old lawns. For light or

shallow soil it is advisable to mix a fair quantity of clover with the grass seed, as, being of dense growth, it prevents the surface soil from becoming parched. Where lawns are required for playing on, however, the clover is best left out as it wears black.

Weeds.—Daisies and other weeds should be eradicated. Bentley's lawn sand, if applied according to printed directions sent with each bag or tin, is a potent destroyer of them. Daisies may also be dug up with an old knife. Previous to commencing this operation stretch two garden lines across the lawn 3 feet apart, then work between them; fill up the holes that the daisies are taken from with fine soil, which should be beaten firmly into them. The bare places will then soon be covered with grass. If daisies are numerous dig them up early in April, and after the holes have been filled up, a slight dressing of artificial manure and fine soil should be given.

Mowing is an operation that requires considerable judgment. As a rule early April is the best time to begin, and if the grass is dense and vigorous it may be mown once a week. On the other hand, if thin and weak, once in ten days or a fortnight will be often enough. If possible always mow the grass when dry, for if mown when wet it never looks well, and wet grass also clogs and strains the machine. For lawns of large extent horse or pony machines are necessary, but leather boots must be placed on the animal's feet to prevent them from cutting into the turf. For small lawns use hand machines. Before commencing to mow in spring the edges of the lawn should be well rolled, and an inch cut off them with an edging knife.

Where practicable a good supply of water should be laid on in close proximity to the lawn, in order that it may be well watered in dry weather by means of a hose. A verdant lawn is beautiful and restful, and may be made to remain so by employing a little cheap labour each year, and by giving an annual dressing with fine soil and an approved fertiliser.

Worms are a great nuisance on lawns, particularly where it is desired to play tennis, croquet, or bowls. Most seedsmen now supply a powder worm-killer which, if applied according to the directions supplied with it, will free a lawn of worms for a year. For small areas of grass lime water may be used. Place $\frac{1}{2}$ peck of lime in a wooden tub, add 8 gallons of water, well stir and then allow to stand until the water becomes quite clear. The grass must be well soaked with this clear lime water, preferably during the evening of a damp, warm

day. Larger quantities can, of course, be prepared in proportion.

The size of a tennis court is as follows : Full length, 78 feet ; width, 27 feet ; net to be in the centre and extend 3 feet over each side of the court, $3\frac{1}{2}$ feet high at the ends, and 3 feet high in the centre. Service lines 21 feet from the net on each side.

THE TREATMENT OF LAWN TENNIS COURTS IN WINTER

The following article by Mr. Peter Lees is included here because the methods advocated can be advantageously applied to lawns of all kinds :

"As soon as the playing season is over, the groundsman should at once set about renovating the worn-out parts, and where the turf has been subjected to so much wear and tear, fresh turf must of necessity be laid down. I am frequently called in to advise as to this work, and I must say that I am surprised sometimes that the greenkeeper in charge should advise the importation of turf that is quite unsuitable for the purpose, as, when it is put down, its texture, compared with the other turf on the courts, is quite different, and during the whole of the next season, until it gets worn bare again, looks out of place, with the result that the court looks very bad indeed.

"To remedy this I would advise all lawn-owners to, if possible, patch the bare and worn parts from the sides and ends of the ground outside the playing area, and returf this part or sow down with turf as near as possible to the same texture as the court itself, as with careful attention this can be easily worked up during the season—as there is no play on it—to almost the same condition as the turf on the court. Another point in regard to this turfing of the ends, which must of necessity be done year after year, is this : the soil below must be removed from time to time and fresh soil substituted, otherwise, no matter how good the turf, the results will be found to be very disappointing indeed. This returfing should be carried out as soon as possible after the courts are closed for the season, so as to enable the fresh-laid turf to get well 'knit' together for the next season's play.

"All inequalities or hollows should be raised, and the best way to do this is by simply folding back the turf, not cutting it clean out, filling up to the desired level, and replacing the turf again. By folding or rolling back the turf, the number of joints are lessened and a better job is made.

"*The Best Top-Dressing.*—After this work has been carried out, the whole green or court should be top-dressed with a dressing of good mould (not sand) and well-rotted manure, mixed. This dressing

should be well rubbed in, and on no account allowed to lie on the surface.

"Worms in the Soil.—Remove all worms from the soil, as a true playing surface is absolutely impossible when they are allowed to burrow and throw up their casts all over the surface. By their removal a firm, true, clean, and level surface is obtained, which could never have been got if they had been allowed to remain in the soil. It may, to some people, seem like heresy when I say remove the worms, as it has always been held that worms are the natural drainers of the soil, and that if they are removed the ground will become waterlogged and the turf die out; but this idea is all wrong, and I have proved it so. I strongly advise the removal of every worm if possible. The most effective, simple, safe, and non-poisonous worm eradicator I have found is that supplied by Messrs. James Carter & Co.

"Mowing.—I now come to a very important part of the winter treatment of the grass on a tennis court, or, indeed, of any lawn, namely, mowing and rolling. I shall take the case of the mowing first, as I consider it the most important. There is a mistaken idea that if the grass is kept cut short during the winter months, the frost and cold will surely kill it. Now, I wish to point out that this is all wrong, and I strongly advise the mowing of the grass. When I say this, I mean that it ought not to be allowed to grow any longer than what it was in the playing season; in other words, keep it as close as possible and always mow when it requires it, as it will harden the grass, make it thicken out, and, when the playing season comes round, the surface will be a great deal more truer and firmer from the commencement. If, on the other hand, the grass is allowed to grow without being mown, it will get thin, and when the spring comes the greenkeeper has practically to set about doing his best to manufacture a new playing surface.

"Rolling in Winter.—The other point is rolling, and this is hardly less important than the mowing. How often does one see, after heavy rain, the iron roller at work for all it is worth to, if you ask, make a nice, smooth surface! A good piece of turf can very easily be ruined by the injudicious use of the roller, especially during the wet winter months. I have seen lawns and tennis courts—which I have been told a few years before were in perfect condition—that had got into a very bad state indeed, and this has nearly always been caused to a great extent through using too heavy a roller and also using it at the wrong time. Never, especially in winter, roll the grass with a heavy iron roller when the surface is wet, as it is simply ruination to the lawn. Keep the grass cut short, and roll when the surface is dry (not wet) if a good, clean piece of turf is desired. The foregoing hints are what I practise myself, and which I find the most suitable for what is aimed at—a true, firm carpet of turf."

PLAN OF A SINGLE AND DOUBLE
LAWN TENNIS COURT.

A SUBURBAN FLOWER GARDEN. (EALING).

TOWN GARDENING

GARDENING in towns and their neighbourhood is hampered by conditions which the dweller in the pure country air knows nothing of, but gardening may be pursued with pleasure even in the suburbs of London and the great towns of the midlands, where many a mechanic grows his special favourites with consummate skill, sufficiently so to make even his country friends envious of his well-deserved success. Success depends of course upon individual effort. The man who will not try cannot succeed. He bewails his lot amidst smoke and dirt, raves against (and with reason) the domestic cat, and even levels abuse at the tiny heads of the chirping sparrows. But with reasonable attention to details and a proper choice of subjects the town garden should be gay with blossom for many months.

One cannot remedy the impure air, although the atmosphere of a large town or its surroundings is not so disastrous to plant growth as many imagine. The atmosphere is frequently blamed when the cultivator is really at fault in not trenching the soil well, and in filling the garden with hungry rooting shrubs bent upon extracting every ounce of goodness from beds and borders. Perhaps a description of a garden in which flowers, and even fruits and vegetables, have been successfully grown, may give fresh courage to those who have hitherto reaped nothing but failure. Mr. Woodall, a well-known gardener, who "gardenes" for his own pleasure, writes: "Few things are more depressing to the average man than the dismal aspect of a neglected back-garden in a town of considerable size. Such a plot came under my notice not long ago, and, under judicious and careful arrangement, it has in a very short time proved such a pleasure that I think some details may be of use to those who find themselves possessors of such a potential 'Eden.' As is usually the case in all ordinary town gardens, the area is about three times as long as it is wide—in this case containing quite a third of an acre—surrounded by sooty brick walls devoid of any climber whatever. The ground is quite flat and the

soil strong clay, which, however, had once been well worked. On the ground stand two dilapidated and dark old glass-houses ; one a vinery facing south with a somewhat raised Vine border long disused ; the other house, a span roof, near the eastern wall of the garden. A few poor trees outside at one corner give the only touch of greenness to the space within.

"The first idea, to cut up the ground into three squares, one for flowers, one for vegetables, and one for reserve ground, was abandoned, both on account of its ugliness and also because it did not afford scope for a grass walk with flowers at each side and a seat in shelter, which was the cherished wish of the new possessor. At last it was decided to make a broad gravel walk across the width of the garden at the far end, and heighten the old Vine border so as to obtain a southern slope. The entrance to the garden is at the south-west corner, and the greenhouse stands midway on the eastern side, projecting into the ground. This afforded an opportunity to destroy the formality of the long strip by making a broad grass walk from the entrance diagonally across the ground into the angle between the greenhouse and the garden wall. This walk, 7 feet broad, was sunk quite 3 feet into the ground by the steps at the entrance, and rose gradually to the ground-level at the other end. The clay and soil taken out were used to raise the beds on either side and make an even slope to the path as it rose to the level. At a distance of about 12 feet from the grass path a hedge of *Olearia Haastii* and red and white double Japanese *Rosa Rugosa* was planted to screen off the reserve and vegetable plots from the decorative part of the garden. By this means two broad borders were obtained having different aspects, and at the upper end a very warm and sheltered corner was formed for tender plants, while at the lower end by the door two fair-sized triangles were dug out of the clay to form a drainage to the sloping walk, and at the same time afford a moist and shady nook where some hardier bog plants and flowers might thrive.

"Towards the upper end a narrow gravel path was cut through the bank round the end of the greenhouse which joined the broad terrace walk at the foot of the Vine border, and afforded on the side near the greenhouse a suitable place for a seat where the flower borders might be seen. Four Bay trees in tubs (which find shelter in winter in the disused vinery) protect the seat from the neighbours by means of striped awnings tied from stem to stem.

"After this rough blocking out of the flower garden the next

thing was to plant it, and to harden one's heart against unsuitable things, however lovely and desirable they might be in themselves. I am not sure that in the long run there is not some advantage in being unable to grow many things, as the best effects are always attained by simple means.

"Roses are forbidden in a town garden, except the invaluable *Rosa rugosa* and its varieties, but the extra vigorous *R. wichuraiana* does well. Its corymbs of sweet white little flowers in August and September are most delightful, and its glossy neat foliage an ornament to any garden. Some of the newer and vigorous hybrid teas might also be included. Conifers are quite useless, and so is any evergreen that is sooty and black like some of the varieties of the Holly.

"On the other hand, Carnations and Pinks thrive extremely well, so broad masses of them adorn this walk, and a bed of seedlings in the reserve plot affords a long succession. Yuccas, Tritonias, Lilies, and tall Composites form a stately background to the usual semi-hardy bedding plants and annuals, and Sweet Peas, Mignonette, and Sweet Geraniums afford, with Coreopsis and various Composites, plenty of bloom for cutting, even though their fragrance may not equal that of those grown in country air. Irises of all sorts, and especially Gladioli, are as happy as possible, and Dahlias are bright and useful till the sun gets hidden behind the tall houses near, and causes an early collapse in autumn.

"*The Walls of a Town Garden* are always a trouble. In this instance they were so dismally sooty and black that the only thing to do was to whitewash them all; and a precious business it was to obtain anything like a clean surface! But no sooner was it done than the way the plants responded to the increased light and lessened dry baking heat in the summer was wonderful, and proved it was the right thing. Trifles can make or mar, and I am inclined to think this trifle made a great deal of the success in this town garden.

"There is one decided advantage in a town garden, and that is the greater freedom from frost, so that many shrubs will live there that would perish in frostier situations. So the walls where the sun lingered longest were planted with Choisyas, Laurustinus, Jasmines, variegated Euonymus, Escallonias, and many another flowering shrub and climber, including Clematises in variety, and they are all doing well and looking as they should do—ornamental.

"The plague of caterpillars so common in town gardens in the early autumn does not affect any of these. On the shady sides, the simple plan of planting tall Oval-leaved Privet and

sowing climbing Nasturtiums to climb over and between was, of course, adopted, and Aucubas, Aralia Sieboldi, Megasea, and Funkias formed handsome masses of solid foliage, till in two years' time this garden has become as full of interest and beauty as it was desolate and barren before, and a wonder to those whose knowledge was not equal to their love."

Much that is written in this work applies with equal force to the town garden as well as the garden in the country, especially with regard to the greenhouse and its management, window-boxes, and plants in rooms.

Absence of Light and Tree Planting.—One of the great drawbacks to town gardening is the absence of light. Suburban and town streets are frequently over-planted with trees, which cast their shadows over road and pavement, create damp pathways, and shut all sun and air from the dwelling itself—precious life-giving agents, without which no home is wholesome. Never shut out the sunshine by erecting a large greenhouse or by planting trees in such a way as to throw shadows into the living rooms. Frequently Horse Chestnuts, Limes, Planes, and, in truth, forest trees are planted close to a small house. The garden, perhaps, is lined with Poplars, or things as vigorous and tall in growth, with the result that the soil of the garden is full of hungry roots, plants refuse to behave respectably, and the house itself is dark and unhealthy. Nothing of tall growth should be planted near the suburban house, and there is no reason why things fit only for the forest should enter the forecourt of a suburban residence, and we have in mind now small houses and gardens, not even those in which space is provided for a tennis court or spacious lawn. Under these conditions Quinces, masses of Lavender and Rosemary, Siberian Crabs, Medlars, Thorns may be grown, and any of the beautiful deciduous flowering things of moderate stature recorded in our chapter upon Trees and Shrubs, the Almond, Rose Acacia, Catalpa (even this is too large as a rule), the Silver Birch, where it will succeed, *Paulownia imperialis*, Guelder Rose, Laburnum, Fig, *Ailantus glandulosa*, Flowering Currants, *Ribes sanguinea* and its varieties, especially *atro-sanguinea*, the flowers of which are deep crimson; the Pyruses, not forgetting the delightful dwarf growing *Pyrus Malus floribunda*, one of the most charming dwarf shrubs in existence; *Daphne Mezereum* or the Mezereon, and the varieties of Weigela (Diervilla), one of the best of which is Eva Rathke.

The Weigelas are amongst the best of town shrubs. The writer has seen the crimson-flowered variety Eva Rathke quite happy even in a Chelsea garden, where against a southern

fence the shrub blossoms with great freedom until the late autumn. *Euonymus japonicus* and its varieties, all evergreen, are useful, and also of note are the Aucuba, Lilacs, the Sumach (*Rhus*), *Arbutus Unedo* (the Strawberry Tree), unless the garden is very exposed; Rhododendrons, Laurustinus (in warm sheltered gardens), *Cotoneaster frigida*, *C. Simonsi*, the sprawling deep green-leaved evergreen *C. microphylla*, the Wistaria, and the familiar Maple and its variegated variety (*Acer Negundo variegata*). Hollies, Magnolias, common Barberry (*Berberis vulgaris*), especially the early-flowering *M. conspicua* (Yulan) are a success. We have also seen very healthy Yews, but as a rule anything of this nature and Conifers are a complete failure, soot or fogs clogging up the shoots and producing suffocation. One of the most frequently planted things is the Fiery Thorn (*Crataegus Pyracantha*), conspicuous for its bunches of creamy white flowers in summer and its crimson fruits throughout the autumn and winter. This should never, however, be placed against red-bricked houses; the effect is distressing to those who pride themselves upon an appreciation of beautiful colour association.

The aim of the town gardener should be to get away from the eternal repetition of a few things. There is joy in variety. Privet is repeated with sickening regularity; the suburbs smell of Privet, and a dead sense of colouring oppresses every one who knows how bright and gladsome is the garden planted with things that bring beauty to it through their flowers, foliage, or ruddy fruits in winter. Get out of the well-beaten tracks. Seek further afield than the local nurserymen, and revel amongst the Thorns, the Lilacs, the Magnolias, and many other beautiful families of trees and shrubs—things that will give a new beauty to the town garden.

It is unnecessary to describe in this chapter how trees and shrubs should be planted. The advice already given about planting in general applies in this case, but the

Soil will probably need more stirring up in the town garden than in the country. Read carefully the remarks about trenching, manures, and so forth, pp. 375–383, and carry them fully into practice. A town garden when presented to the owner fresh from the builders hands is frequently a sorry affair. The soil has been denuded of its precious gravel, if it possessed any, and is filled with brickbats and refuse of a miscellaneous character that must be removed in the interests of the flowers that are to follow in due season. It is labour well spent to make a sure foundation. Trench the soil thoroughly, and if poor, bring in plenty of loam and road scrapings.

The majority of gardens are rectangular, they follow the lines of the house ; and usually a border at the sides and grass in the middle suffice, without any needless cutting up of the middle into small, patchy beds. Keep away all shrubs, especially such things as Elder, from the borders. It is not always possible to do this, but unless the roots of trees and shrubs are kept out of the soil where perennials are to go, endless attention in the way of mulching and manuring will be needful during the late spring and summer.

Hardy Perennials.—The sheet anchor of the beginner in gardening is the hardy perennial, which requires no lifting in the winter to shelter it from the frost, and comes up again each season to again give pleasure to the possessor. The writer has had considerable experience with town gardens, and can place faith in border Auriculas, sweet-scented, finely-coloured flowers, so gay and green that even a strong tuft will almost flower itself to death ; and again it may be mentioned that everything referred to here is alluded to in some part of the present book, so that a detailed description is needless here. Campanulas, or Canterbury Bells, in rich variety of form and colour ; Creeping Jenny (*Lysimachia nummularia*), Day Lilies (*Hemerocallis*) for shady places, *Dielytra spectabilis*, Larkspurs, or Perennial Delphiniums, Evening Primrose (*Oenothera biennis*), and some of the other *Oenotheras*, such as *O. fruticosa* and the rich orange-flowered *Fraseri* ; Everlasting Peas, Spiderwort (*Tradescantia*), Phloxes of good colours, London Pride, *Papaver umbrosum*, delightful for edgings ; Michaelmas Daises, Oriental Poppy (*Papaver orientale*, and its variety *bracteatum*), Primroses, Polyanthus, Snapdragons, Wallflowers, Sweet Williams, double and single Pyrethrums, Thrift, Solomon's Seal, *Anemone japonica* and its beautiful white variety *alba*, also known as Honorine Joubert ; *Arabis albida* (White Rock Cress), *Alyssum saxatile* (Rock Madwort), with rich yellow flowers ; Aquilegia hybrids, particularly the beautiful spurred varieties ; Aubrietias, dwarf plants for edging the border, or forming groups near the front ; *Cerastium tomentosum* (silvery foliage), Carnations, Pinks, Doronicums, early-flowering perennials with large, handsome yellow flowers—*D. plantagineum excelsum* is the finest ; *Gypsophila paniculata*, wavy masses of flowers ; German Iris, Lupines, Golden Rods (*Solidago*), Forget-me-nots, Crimson Pæony, many kinds of Saxifrage, especially *Saxifraga hypnoides*, and the large leathery-leaved Megaseas, Stonecrops, Sempervivums, Tufted Pansies, Monkshood (*Aconitum Napellus*), *Campanula glomerata dahurica* (with deep purple flowers) ; *C.*

THE WHITE JAPANESE WINDFLOWER (*ANEMONE JAPONICA ALBA*).

WALK OF EVENING PRIMROSES. THESE ARE GOOD FLOWERS FOR A TOWN GARDEN.

persicifolia, early-flowering Chrysanthemums, *Coreopsis grandiflora*, *Helenium autumnale*, *Erigeron speciosus superbus*; the perennial Sunflowers (*Helianthus*)—the last-mentioned are quite happy, sending up a wealth of golden flowers throughout the autumn months; *Hieracium aurantiacum* (one of the Hawkweeds), with warm brownish orange-red flowers; Hollyhocks, *Lychnis chalcedonica*, *Montbretia crocosmiæflora* (in a warm soil and sunny place), Pentstemons, a host in themselves, but are not very hardy; and *Rudbeckia Newmanii*. This is a respectable list, and will provide a good selection. All will grow in almost any situation and in any reasonably good soil.

Bulbs.—The town gardener should place faith in bulbous flowers, which seem little upset by stuffy surroundings. They should be grown liberally indoors, in window-boxes, and in the open. True, they deteriorate more quickly than those in more airy gardens, but bulbs are cheap, and therefore quickly replaced at a reasonable outlay. Daffodils are invariably a success for two years, when the ground has been carefully prepared and they are planted at the proper time, viz. in September or quite early October. *Allium Moly*, yellow, and *A. neapolitanum* the writer has seen become almost weeds. The autumn-flowering *Amaryllis Belladonna* will thrive in a sunny, warm, south border, preferably against a wall, and other good things are the pretty little Chionodoxas of spring, Crocuses, Crown Imperials (*Fritillaria imperialis*), Snowdrops, *Galtonia candicans* (late summer flowering; it has a tall spike, with snowdrop-like flowers), Spanish and English Irises (always a success and very cheap), Lilies, Grape Hyacinths (*Muscari*), Scillas, particularly the late spring-flowering *S. hispanica* or *campanulata*, *Triteleia uniflora*, and Tulips. These, also, are not particular as to soil and situation.

Annual Flowers.—These should be made excellent use of. Seeds, even those saved from the finest flowers, are very cheap, and therefore sown so thickly that the results are disappointing. Neither attempt too much, nor sow a preponderance of one thing, so that it monopolises the garden to the exclusion of everything else. The Sweet Pea should be well represented by groups of one variety, say mauve, white, rose, and so forth, colours, of course, most agreeable to the possessor of the garden. Tropæolums (*Nasturtiums*) are very bright and useful for cutting, but they must not be allowed too rich soil. Mignonette is welcome for its grateful perfume, so too is the night-flowering Stock. The following is a short list of a few good annuals for a town garden: Marigold (but only a few; it is a terrible weed, if so bright and wholesome looking a

flower can be described in this way), Celosias, from seed sown under glass in spring; *Aster sinensis*, a handsome, tall, purple single flower; one of the China Asters (sow seed in heat in spring), *Chrysanthemum tricolor*, the beautiful major and minor Convolvuluses, Coreopsis, Chinese and Indian Pinks, the old-world Extinguisher-flower (*Eschscholtzia*), *Gypsophila elegans*, Everlastings (if they are cared for), Lupines, Mignonette, the blue Nemophila, Love-in-a-mist (*Nigella*), Poppies (these are very beautiful, especially the "Shirley" kinds, but they must be well thinned), Phlox Drummondii, Salpiglossis, Scabious, Stocks (these should be freely planted for colour and perfume), Sweet Peas, Foxgloves (biennial), Verbenas, Virginian Stock, and Zinnias, quaint flowers of various colours, raised in heat in spring.

Summer Flowers.—When the garden boasts a little greenhouse, many plants known as "bedders" can be raised, but this is only possible where artificial warmth can be given during the winter. Many town gardens, and others for that matter, are rendered bright chiefly through the agency of summer bedding plants, the "Geraniums," or Zonal Pelargoniums as they should be called, Tuberous Begonias, Zinnias, Dahlias, Ageratums, Celosias, the China Asters, dwarf Lobelias, the Tobaccos, especially the sweet-scented *Nicotiana affinis* and the newer *N. sylvestris*, which has white tubular flowers which do not flag or close up under a hot sun as in the case of *N. affinis*; Petunias, very successful in town gardens, bright flowers of many colours—sow seed in spring under glass; Verbenas, easily raised in gentle heat in spring, and, if very large plants are required, Cannas (not usually very happy near towns), and such big-leaved things as the Castor-oil Plant. As a rule, however, exclude everything of tall spreading growth, otherwise the garden will contain nothing else, and before the summer is half over be a choked place full of unruly growths and struggling vegetation, all striving for the mastery, and a hunting-ground for slugs and snails.

Climbers.—The beginner is frequently perplexed as to the Climbers to select for the wall of the house or to clamber over a summer-house or arch. All the following will thrive in reasonably good soil. Of annuals the Japanese Hop is remarkably vigorous. Seed sown in March, or even in early April, will result in plants that will clamber over trellis or summer-house in one season. Climbing Tropæolums (*Nasturtiums*), Convolvuluses, or the Canary Creeper, with light green growth and bright yellow flowers, are available. This

is called *Tropæolum peregrinum*. Of permanent Climbers the Ivy is the most satisfactory if occasionally cut hard back in spring, removing almost every leaf ; and of deciduous kinds the Virginian Creeper is safe. The kind that clings most tightly to the wall is called *muralis* ; it is not so well known as *Veitchi*, but is freer, the growths being close to the wall without that excessively rigid character conspicuous in a *Veitchi*. When the garden is not in the centre of a town, but a few miles (say five) outside, of course the list of plants that may be grown is more extensive. Against the south wall may be planted the beautiful *Ceanothus azureus*, which will reach almost to the chimney stack, a surface of delightful blue flowers in summer ; the Winter Sweet (*Chimonanthus fragrans grandiflorus*), which bears pale lemon-coloured deliciously fragrant flowers upon its leafless shoots in winter ; the evergreen but not very hardy Mexican Orange-flower (*Choisya ternata*), the handsome big-leaved Dutchman's Pipe (*Aristolochia Siphon*), *Clematis Jackmani*, *C. montana*, which also succeeds against a fence, a vigorous climber with a profusion of white flowers in late spring ; the Vine, not omitting the Japanese Vine (*Vitis Coignetiae*), with its immense leaves dyed crimson with colour in autumn ; the pretty, warmth-loving *Eccremocarpus scaber* ; White Jasmine ; *Kerria japonica fl. pl.* (the double orange-flowered Jews' Mallow), often very beautiful over cottage fronts, the winter-flowering *Jasminum nudiflorum*, Honeysuckles, Passion-flower (the ordinary *Passiflora cærulea* is more beautiful to the writer than the white *Constance Elliott*), and Roses.

History of a Small Town Garden.—The following account of a small garden in the suburbs (west and in Thames valley), and about three miles from the Marble Arch will show how much may be accomplished in quite a small way when suitable plants are obtained and spare time is given ungrudgingly. In this case, however, the possessor of the garden was much occupied with his official pursuits and many evenings occasionally went by when little work was possible : " My garden is small, in a crowded suburb, and when taken possession of presented the usual picture of despair. It was in truth not a garden at all, but a small plot fresh from the builders' hands. The builder had busied himself in eloping with the rich gravel subsoil and substituting refuse of a varied kind. The ground was taken possession of in September, trenched, good soil substituted for bad, levelled, and before the autumn had far advanced planted with a few things known to prove impervious to the vicissitudes of suburban life. I have pursued the healthy

pastime of amateur gardening for many years, and lived once in serener climes, but was at first overcome by this spectacle of builders' rubbish and unholy filching of good soil.

"I noticed that many good garden plants seemed to thrive in the district. In a garden near, perennial Sunflowers shone with a wealth of golden blossom, the Starworts tossed their cool-coloured flowers in the autumn wind, and the Sweet Peas still carried a few fragrant blossoms. So, the foundation having been made, plants were put in, too soon, unfortunately, as it afterwards happened—no fault of the plants—that the borders sank, and I had perforce to remake and then relift everything.

"All the things named have succeeded beyond my very moderate expectations. The forecourt garden (in dense shade, the house being placed almost direct north and south), was laid down with turf, and a narrow border made all round, with a Yew hedge against the boundary fence, and for trees, Silver Birch (a beautiful tree, which is a success in the light soil of the neighbourhood), Thorn, Rose Acacia (*Robinia hispida*), and a large green-leaved Holly. In the small border skirting the house are planted the shade-loving Spanish Scilla, Day Lilies, Crocuses, and Snowdrops, all a success, but the Winter Aconites are always poor. Their puny little yellow flowers would scarce cover a small button, so the Eranthis will in the future go on the black list. For climbers, *Ampelopsis Veitchi*, *muralis*, Rose W. A. Richardson, but this being placed on the sunny side of the house the flowers get bleached by the hot sun beating against the wall, and lose their rich Apricot-like tint; Gloire de Dijon, a never disappointing rose; Alister Stella Gray, a perfect vision of exquisite orange buds, and whitish expanded flowers; Passion-flower, Honeysuckles, and in the border the fragrant Lavender and Rosemary, two shrubs so picturesque and interesting in colour that I wish amateur gardeners would grow them more. The common Lavender should never be omitted from the garden, whether small or large. My bushes are in a little hot border, upon which the sun shines fiercely, and the soil is light. Here this fragrant blue-flowered bush delights to grow, spreading out into a soft silvery group, and giving quite a handful of flowers in the autumn for the house. These should be gathered when the buds are about half-open, not waiting until they expand. It is pleasant to see a China rose thrusting its flowery shoots into the Lavender bush; it is a happy flower-marriage. In the same warm light border revels the Rosemary, a shrub filled with fragrance and delighting in sunshine.

"*Borders* run round the three sides of the back garden,

which faces almost due south, a favourable and pleasant position. Grass occupies the centre, a grateful and refreshing setting to the flower masses encircling it, and under the pantry window is a narrow border, if it can be so called, of light soil; the position is in full sun. Here revel many things in good loaming soil, the beautiful little early Irises, *I. alata* and others, and the early-flowering coloured Gladioli are quite at home. I have never seen the bulbs happier even in the south of England, and one year *Crimum Moorei* flowered superbly. Of course, Crocuses, Scillas, the splendid Gesner Tulips, and Daffodils are a success. When *Tulipa gesneriana* is fully open in the blazing sunshine this is in truth a place of colour. Against the wall Roses are planted—Gloire de Dijon, Alister Stella Gray, and Mme. Berard Roses, with a plant also of *Choisya ternata* and Passion-flower Constance Elliott. The left-hand border, looking down the garden, is filled with many things—annuals, such as Sweet Peas, Mignonette, Tufted Pansies, Day Lilies, Carnations, Pinks, and other homely English flowers, the majority of which are quite well known. How well Carnations succeed! The old crimson Clove gave handfuls of bloom; but even better was Uriah Pike (what a name!), a vigorous variety, with firm tall stems and large crimson-coloured fragrant flowers. This kind should be noted by all town gardeners. The old white-fringed Pink was very beautiful too. I had an edging of White Pinks, but alas, wireworms consumed many; and this reminds me that new loam or the top spit from a pasture should always be most carefully examined, as it is frequently full of wireworms. A friend planted an edging about 30 yards long of White Pinks, brought in new soil to give them a start, and the wireworms consumed three parts of the entire margin of silvery tufts. In this left-hand border plants flourish amazingly; even Roses, particularly the Tea-scented Edith Gifford, the beautiful hybrid Tea, Viscountess Folkestone, Mme. Charles, and the lovely Alfred Carrière, which has large, loosely formed, pure white flowers filled with sweet scent. Against the fence the winter-flowering *Jasminum nudiflorum* is very beautiful throughout a mild winter. It is covered over with blossom, so rich in colour and fragrant; the green leafless shoots are crowded with buds in winter, and these when cut for the house open perfectly in water. A tall vase with *Jasminum nudiflorum* shoots is very pretty and refreshing in winter. No climber flowering in winter is more valuable in the town garden than this; it is impervious to soot and dirt generally.

"The border at the lower end of the garden is in the shade of a row of Poplars and tall houses near. Ivies cover the fence with a dense covering, and in the border itself the Day Lilies flourish, whilst last summer the crimson Phlox, Etna, flowered well. *Scilla campanulata* (the Spanish Scilla) increases, and Polyanthuses, Tuberous Begonias, and Irises are at home too.

"**The German or Flag Iris** is one of the most important of town garden flowers. True its flowering time is not of long duration, but the silvery-toned sword-like leaves are always pleasant to see, and there is great variety of flower colouring. The plants succeed even in the shade, and may be put in during the spring or in the autumn, but perhaps the best time is immediately after flowering. There is something satisfying in colonies of German Irises, especially the blue varieties, Atropurpurea, Purple King, or Black Prince. Where space admits a garden of summer Irises may be made, but in the ordinary border may be grown in large clumps the best of the group, beginning in May with the old blue German. This is quickly followed by the white-grey Iris of Florence. My favourites are Mme. Chereau, white, feathered with lavender; Queen of May, rose and lilac; Pallida Dalmatica, a tall kind with beautiful pale blue flowers; Victorine, rich purple, and white; and the ordinary Blue Flag, so familiar in English gardens. The German Flag will grow even upon a London railway bank, but is worth a layer of manure beneath the roots, not in contact with them, at planting time.

"The border by the gravel path is margined with stone, which is now almost covered with Stonecrops, Saxifrages, and Creeping Jenny; whilst near the drawing-room window, in a border running to the steps, English and Spanish Irises are planted alternately. Nothing in the whole range of bulbous plants gives more pleasure than the beautiful colouring of these two groups. The pure colours of the Spanish Iris are irresistible, and if my garden were larger, I should form colonies of them, in amongst shrubs, anywhere, to get the full value of their exquisite shades. The bulbs are so cheap that they ought to be freely planted in every garden. The English Iris blooms about a fortnight later, and has flowers in which the segments are broader and flatter than those of the Spanish Iris. Of course the 'English' Iris is not a native, but comes from Spain and the Pyrenees; it probably obtained its popular name through the bulbs having first come to Bristol and thence were transferred to Holland. The Dutch merchants, thinking the plant was a native of these isles, named it the 'English' Iris—a sad misnomer.

"General Hints.—I think my letter has exceeded all reasonable bounds, but a few general hints that I have found produce good results in town gardening may be given. During warm summer evenings after a hot day, syringe the plants gently. This is very refreshing and helpful. Stir the soil occasionally to prevent 'caking' of the surface. This surface stirring lets in light and air to the roots. When watering do so thoroughly. Never dash the hose upon anything and everything. Cut the flowers freely, especially of such things as annuals, which quickly collapse when seed pods are allowed to form, some more so than others. Poppies and Sweet Peas are of brief duration when called upon to bear a double burden. Of course watch for slugs and snails. Never leave refuse about, and in the management of the lawn always keep the grass moderately short. It is a mistake to have a thorough lawn cutting at stated intervals; long grass is difficult to cut and the machine suffers. With regard to cats, I wish some one would give me a remedy. It is impossible to surround the garden with loosely fixed wire-netting; perhaps a good terrier is the best preventive.

"Keeping Plants in Winter.—When the garden boasts of a greenhouse, it is easy to accommodate the Pelargoniums, Dahlias, Tuberous Begonias and other tender summer plants during the winter. When the first frost has spoiled their beauty, lift them, and, in the case of Geraniums, pot them up, but Dahlias, after the soil has been removed from the tubers, may be stowed away under the stages. Corms of Tuberous Begonias should be stored in silver sand, and put away in a dry place. Dahlias and Begonias may be stored in a frost proof cellar, and where there is no greenhouse, shake the soil from the roots of Geraniums or even Fuchsias, and hang the plants head downwards from a peg or a beam. Some will die, but many will live, and start away in the spring, when they can be potted.

"I think I must have exceeded my limit, and, in conclusion, give this advice to town gardeners, that success only comes when the gardener tries to understand the flowers he professes to love. Failures are the result usually of a languid interest in a healthy and fascinating pastime to those who try to learn something themselves of the flower world about them. I have written nothing about fruits and vegetables, but the remarks upon the cultivation of these in other parts of this book apply to the town garden. As a rule, however, there is no space for the culture of either."

GOOD TREES AND SHRUBS

THERE are now so many beautiful trees and shrubs available for garden decoration that it has become difficult for those who are not intimately acquainted with them to make a suitable selection. Therefore in the following list only those kinds which are of the greatest beauty and usefulness are mentioned, but all those enumerated are adapted for small gardens as well as for those of pretentious dimensions.

During the last twelve years a great many new trees and shrubs have been introduced, and the opportunity has been seized of including a number of the more useful ones with the older and better-known kinds which were included in the first edition of this work.

In gardens where a representative collection of trees and shrubs is grown there is something of interest to see throughout the year. For during the earlier days of January several showy and interesting plants are at their best, and it is only necessary to allude to the quaint blossoms of the various *Hamamelis*, the fragrant flowers of *Lonicera fragrantissima* and *L. Standishii*, the golden beauty of *Jasminum nudiflorum* and the fragrant blossoms of the Winter Sweet, *Chimonanthus fragrans*, to remind one of the variety to be obtained at that early period.

Before the flowers of these are well over we find *Garrya elliptica*, the Mezereon, early Heaths, the common Dogwood, and various other shrubs coming into bloom, to be closely followed by Forsythias, other Heaths, *Spiræas*, *Magnolias*, *Berberis*, Plums, and Cherries, and many other choice plants, until during May and June we reach the climax with *Rhododendrons* and *Azaleas*, which form perhaps the most brilliant display of all, although the various garden Lilacs flowering about the same time run them close for popularity. From the end of June onwards the number of shrubs in flower decreases, but some continue right on to late autumn, when the early subjects take their places.

Another feature which is worth considering in connection with trees and shrubs is the bright colour of the bark of

certain kinds, which is seen to advantage during winter. *Cornus alba*, with red bark ; *Salix alba vitellina* and *S. a. cardinalis*, with golden and red bark respectively ; *Rubus biflorus*, *R. lasiostylus*, and *R. Giraldianus* are conspicuous by reason of their white bark ; *Philadelphus Lemoinei* has bright brown bark ; *Leycesteria formosa*, green bark, and so on.

Then the decorative value of various coloured-leaved trees and shrubs needs consideration, for by the judicious grouping of these kinds excellent effects are produced. Here the various Japanese Maples show up strongly ; and the purple Nuts, Plums, and Berberis, the Silver Atriplex, Santolina, Acer Negundo, and Euonymus are as important as the golden-leaved Catalpa, Golden Nut, Elderberries, and Euonymus ; whilst numerous other plants of a like nature may be obtained.

The popularity of the pergola has made it possible to cultivate climbing plants to a greater extent than formerly, and every garden may have its ornamental Vines, Clematises, Climbing Brambles, Roses, and Honeysuckles.

The forcing of trees and shrubs for greenhouse and conservatory decoration in spring has made rapid strides of late years, and the cultivation of plants for this purpose alone has become a very important business. Hence, in whichever way one turns, one is confronted with the important part played by trees and shrubs in the modern garden, and it will be clearly recognised that the beginner in gardening must be prepared to give the subject his keenest attention.

Propagation.—The propagation of hardy trees and shrubs is work of great interest, yet it is not only much neglected but imperfectly understood by amateurs. It is essential to raise young plants constantly to replace those which become unsightly, die out from old age, get too big for certain positions, or must be removed for some purpose. A knowledge of the different methods of propagation is of great value. Keen observation and great patience are necessary in one who aspires to become a successful propagator.

There are various ways by which the object referred to can be attained, and the enthusiastic amateur should be master at least of some of them. When he finds that it is desirable to increase the stock of some choice kind, the importance of knowing the proper season and the best means of doing so cannot be overestimated. It is also pleasant to raise one's own plants.

The principal methods of increasing trees and shrubs are—(1) seeds, (2) cuttings, (3) budding, (4) grafting, (5) layering, and (6) root cuttings.

1. By Seeds.—This, of course, is the most natural means of reproduction. All seed cannot always be relied upon to reproduce its kind, in which case recourse is generally had to one or other of the methods referred to. Artificial heat in the raising of seedlings is in many cases necessary, particularly in the case of plants with rather tender constitution, and therefore the question of a propagating house, heating apparatus, soil, drainage, and so forth must be considered.

In nurseries where trees and shrubs are made a specialty of, houses devoted entirely to the production of plants are common enough, and the one that finds most favour is a low, span-roofed house, placed beyond the influence of cold winds. A walk down the centre, with cases and movable lights along one side, answers admirably, the other side being left free for plants. Hot-water arrangements should be ample, and the ventilation so arranged that little damage will ensue even in bad weather. The door should face south or south-west, as cold currents of air rushing into the house are injurious to tender growth. It will be found convenient to divide the frame into two, three, four, or more partitions, as the heat can be kept more uniform and easily confined than would be the case were fewer or no partitions introduced. Hot-water pipes should rest in a tank of water beneath the bed, and the tank should never be allowed to get dry.

It is important that seeds should not be harvested too early, but allowed to hang upon the trees and bushes until they are quite mature. Badly ripened seeds cannot be expected to produce good results. All seeds should be thoroughly cleaned before sowing, some being surrounded by fleshy matter, and others encased in shells varying in thickness and hardness according to the kind. Some seeds, like that of single-flowered Roses, should be sown immediately they are ripe.

When and How to Sow.—Broadly speaking, the best time to sow the bulk of tree and shrub seeds under glass is towards the end of February and beginning of March, as the seed will, in the majority of cases, germinate quickly, and with proper care good plants will result before winter. Clean pans, boxes, or shallow pots are best adapted for sowing seeds in, and the soil used should be light, sweet, and moist, but not wet. Drainage is of the utmost importance, because if this becomes clogged and the water cannot pass away freely, the soil gets sour, and consequently the seeds fail to vegetate. Over the drainage place a layer of coarse turf, covering this with rough soil, and filling up with finer compost, which should have been

under cover a day or so before sowing. Sow the seed thinly, and just cover it with soil that has been passed through a very fine mesh sieve. This remark applies to all very minute seeds falling under the tree and shrub portion of this work. Larger seeds, of course, do not require such particular attention. After sowing, the pans should be immediately placed in position in the house or frame, where they are to remain until the seedlings push their way through the soil, the latter always being watered with a very fine rose water-pot. Water given to seed pans should be "lukewarm." It is a capital plan to place tiffany or similar thin material over the seed pans, as this breaks fierce light upon the surface soil, and also prevents excessive evaporation.

When the seedlings are large enough to handle, prick them off into suitable soil, and later on remove to a cold frame, so as to harden off ready for planting out in nursery rows. If transferred to the open ground while growth is being made, much benefit will result from occasional overhead waterings until the roots are able to take up nourishment from the fresh soil. When a spell of hot, dry weather follows planting, feathery boughs placed over the plants to protect them from the sun will be of great assistance until they are established.

Seeds Sown out of Doors.—In the first place, the position the seed-beds are to occupy must be considered. These should be thoroughly well drained, and raise them just above the level of the surrounding ground. The soil should be in good workable order, as probably some seeds will remain in the ground eighteen months or two years before germination. The surface soil should be fine and quite level, and if drought follows the sowing, frequent waterings through a fine nozzled hose or rose water-pot will be beneficial.

Seeds are usually sown broadcast in beds, four feet wide, with alleys about 16 inches wide between them, and occasionally in rows or drills, the distance between the rows varying from 8 inches to a foot. Then certain kinds of trees—Carya or Hickory, Walnut, and others of similar character, possessing long tap roots and few fibres, are generally better for being sown in positions where the trees are intended to remain permanently. Birds and vermin are often responsible for considerable damage to seeds; the first-named can be kept off by nets, and traps settle the latter. Seed-beds should always be kept free from weeds, which, if allowed to grow unchecked and perfect their seeds, become troublesome and rob the ground of nourishment required for the seedling trees and shrubs.

Conifer Seeds.—Conifers, the cones of which are in some instances very hard, need special attention before the seed can be separated from them. The cones of some species are ready to gather in about twelve months, but others should not be taken off the trees for two years. Cones should be kept in a warm, dry place to liberate the seeds. With sun and artificial heat the scales open more readily, and opening is also facilitated by soaking them in water for a day or so, and by burying them in sand, &c., in February or March for six weeks or two months, by which time the seeds may be liberated and taken out with comparative ease. Hard cones are often placed in kilns to get them to open quickly. If the last-named method be adopted, sow the seed immediately it is set free, or it will soon lose its germinating power. The seed in the cones remains good for several years, provided the scales are not opened, and when sown out of doors, March and April are the best months for the purpose.

Conifer seeds vary much in size, and it is curious that some of the loftiest members of the family produce the smallest seed. For instance, that of the Mammoth Tree of California, *Sequoia gigantea*, is smaller than the seed produced by many shrubs less than four feet high. Seed should only be collected from trees that are thoroughly healthy and vigorous, as seedlings raised from seed taken from weakly trees are liable to disease.

As a rule, Seedling Conifers are rather slow in growth for the first two or three years, but with proper attention, reasonable progress is made afterwards. When the seedlings are of sufficient size, lift them out of the seed-beds, and plant in suitable soil in nursery rows, protecting them from the sun with small spruce branches, until they have established themselves in their fresh quarters.

Some Conifers make better specimens raised from seeds than raised from cuttings or by grafting. To illustrate what we mean, it is only necessary to mention *Cunninghamia sinensis* as a typical example that should not be raised by either of the last-named methods, for the reason that the plants generally become flat-headed, whereas seedlings always possess a leader. It is, however, well-known to practical men, but not to the ordinary amateur, that the leading shoots of some plants, particularly those raised from lateral growths, must be cut back before a really good leader can be secured. The tops are sometimes bent over and tied down with the same object in view, and after a time fresh growth will appear at the desired place. When the original leader is a few inches

in length, it should be removed and the new one allowed to take its place.

With seeds of certain kinds of trees, the following treatment, on account of the length of time they lie dormant in the ground, is worthy of consideration. Such examples as Thorns, Hollies, and Mountain Ash are included in this category. By the method described below, much ground is saved, and labour which would be required to keep the beds in good order avoided. When the seeds are gathered, place them in heaps and mix with sand of about their own bulk, each kind being kept separate, and turned over with a spade once a month, or at least once in every six weeks, to prevent excessive evaporation. When the proper time for sowing has arrived, separate the sand from the seeds by means of a sieve, and sow in the usual way. Seeds like the *Gleditschia* (Three-thorned Acacia) which are enclosed in very hard shells, should be soaked in water for a day or so before sowing. Some seeds germinate irregularly of a period of twelve or eighteen months. When this happens, carefully take the biggest seedlings out of the bed with a small three-pronged hand-fork or trowel without damage to the remaining plantlets. Plant out in rows 10 inches from each other, and 4 inches from plant to plant in the rows.

Cuttings.—The raising of plants from cuttings is undoubtedly the most popular of artificial methods of propagation. There are three essentials to success, viz. heat, light, and moisture. With such a wide range of subjects as we are now dealing with it is difficult to individualise, and we must rest content with general remarks. We shall, therefore, consider cuttings taken at two seasons, *i.e.* first in early summer, when the wood is young and half ripe, and secondly in autumn, when it is quite mature. The first-named period is the best, provided circumstances permit. The under-mentioned list will give some idea of the class of subjects falling under this group : Escallonias, Spiræas, *Itea virginica*, Genistas, Hypericums, Skimmias, Cistus, Veronicas, Loniceras, Deutzias, Berberidopsis, Philadelphus, Cornus, Forsythias, Caryopteris, Dier villas, Hydrangeas, Vincas, Helianthemums. Broadly speaking, the best time to take cuttings of those just mentioned and similar ones is when the wood is getting firm, which will, in most cases, be from early summer to midsummer. Sturdy, sharp-jointed pieces should be selected, ranging in length from 4 inches to 6 inches, and if they can be procured with a heel of the old wood attached so much the better, as this greatly assists root formation; but if this cannot be

managed, make a clean cut just below an ordinary joint. It is necessary to be particular in every case, as some emit roots more readily than others, but it is as well to take proper care, because valuable and scarce kinds may be treated in a haphazard way and many failures recorded. When the cuttings are severed from the bushes prepare and plant them at once. If they are exposed to sun heat or allowed to get dry flagging will result, and the chances of success greatly reduced. It may be noted here in passing that plants from which cuttings are taken should be healthy and vigorous.

Whether the cuttings are dibbled in pans, boxes, or pots makes little difference; but whatever receptacle be used it should be clean, dry, and well drained. Do not place the cuttings sufficiently close to cause damping, or, if they have to remain in the pots long, to cause the young shoots to become weak through overcrowding. After the cuttings have been properly inserted in the soil, and the pots plunged in a warm close case up to the rim in cocoanut fibre or similar heat-retaining material, they should be watered overhead and shaded from the sun until rooted. When the roots pierce the soil and touch the sides of the pots, take them out of the case and place upon the side stages of the house, preparatory to potting off and transferring to a cold frame.

Too much stress can hardly be laid upon the value of making cuttings quite firm at the base. This is a point of greater importance than is generally supposed, and with certain sorts of trees and shrubs success or failure largely depends upon this simple fact.

To dry up superfluous moisture and sweeten the air of the case open the lights for half an hour or so every morning, and at the same time remove the moisture that may have collected upon the glass during the night with a cloth, sponge, or wash-leather. When the atmosphere in the frame is kept in a high state of saturation there is danger of the cuttings damping off. Another plan is to allow the bottom of the light to rest upon a small piece of wood an inch or so in circumference for ventilation and the escape of excessive moisture.

Soil for Cuttings.—Cuttings, like growing plants, prefer certain kinds of soil, and, broadly speaking, all belonging to Ericaceæ (Heaths) and Vacciniaceæ do best in a peaty soil, and it is well to remember this at the proper time. A compost suitable for the majority of tree and shrub cuttings is composed of light soil with sufficient sharp silver sand to keep it porous.

Those who do not possess a propagating house may root

their cuttings under hand-lights in a made-up soil on a shady border, and if protection from the sun be afforded roots will appear in a few weeks' time. Another satisfactory way of dealing with cuttings without bottom heat is to make up a bed of light soil in a sheltered part of the garden and cover with a low light frame. The made-up soil should be about six inches deep, moist, and sufficient silver sand incorporated with it to carry off superfluous water. The bed should be made quite firm and level and surfaced with silver sand. Dibble the cuttings in straight rows down the frame, moisten lightly overhead about every second or third day, and shield from the sun. The latter arrangement is specially recommended for such Conifers as *Cupressus*, *Thuyas*, *Retinosporas*, and *Biotas*; but these should not be put in until about the first week in September, as the wood is rather too soft before that time. Under such treatment the writer has succeeded in striking about 95 per cent. of cuttings of the Conifers named above and those of similar character. Whenever terminal shoots for cuttings can be procured they should be used, as they make the most shapely plants. Such trees as *Araucaria imbricata* and *Cunninghamia sinensis* are not satisfactory generally unless the cuttings are taken from the principal growths.

Hollies, *Olearia Haastii*, Veronicas, and Skimmias root readily in cold frames. There are, however, certain sorts of trees and shrubs which are by no means easy to increase by cuttings at any time, and it may perhaps be just as well to mention as illustration the *Chimonanthus fragrans* (Winter Sweet). Plants of the *Chimonanthus* have been raised from cuttings, and the writer once succeeded in raising a plant, but although it threw out roots it made very little growth, and eventually died. It was treated thus: a small twig was taken off during the summer with a bit of the old wood adhering to it, inserted in a small pot in moist soil, plunged in a close (not hot) case, and sprinkled overhead occasionally with lukewarm water.

Dibbles.—Box and Yew make admirable dibbles for inserting the cuttings in the soil, as the wood is very durable and does not require constant paring like that of a softer nature. The knife used for cutting should always be sharp, as cuttings made with a knife having a good edge throw out roots more freely, and in less time than those made with a blunt one.

Rooting Cuttings in the Open Border.—This is a form of propagation adopted in autumn with certain sorts of vigorous

growing shrubs and trees, of which the following serve as examples: Laurels, Roses, Willows, Tamarisk, Privet, Philadelphuses, Flowering Currants, and Cornus. The cuttings may vary in length from 10 inches to 18 inches according to the vigour of individual kinds. They should be planted in rows a foot or so apart, allowing two or more inches between each cutting in the rows. The bed or border should be carefully prepared, the cuttings planted in a perpendicular (not slanting) fashion and trodden quite firmly at the bottom. During dry weather occasional waterings will assist new growth. Keep the beds free from weeds and the surface soil loose.

Budding and Grafting are subjects that hardly come within the scope of a beginner's book, and many flowering trees and

FIG. 17.—How to layer a Tree or Shrub. Dotted lines=Soil.

shrubs are propagated in this way when there is no occasion to do so. Whenever possible trees and shrubs should be increased by seeds, cuttings, or layers, a very good method, performed in a similar way to layering, advised for the Carnation and explained by the accompanying diagram.

SELECTION AND DESCRIPTION OF THE BEST TREES AND SHRUBS

Abelias.—There are really only two *Abelias* sufficiently hardy for the London district; in fact, *A. chinensis*, better known perhaps as *A. rupestris*, is the only one, because *A. floribunda* suffers unless some pro-

tection is afforded during severe winters. The Himalayan *A. triflora* may be grown against a warm wall. *A. chinensis* (*A. rupestris*) deserves careful consideration, for in the months of August and September, when it is laden with its small delicate pink, delightfully fragrant flowers which hang from the tips of the current season's growth, it is remarkably pretty. The flowers are serviceable, too, for placing in vases for table decoration, as they may be cut with their own foliage, which is small, glossy green, and forms an admirable setting for the flower colouring. Look over the plants yearly, and remove worn-out growths, and thus make room for young wood which should always be encouraged. The soil *Abelias* delight in is one composed of peat and loam, with the addition of a good quantity of sweet leaf-mould. Good drainage is essential. No matter how rich the soil may be at planting time, the plants are never happy unless ample drainage is provided to carry off superfluous water. If the ground is not naturally drained, take out soil at planting time to a sufficient depth, and throw in a few broken bricks, crocks, &c., at the bottom, covering these with rough turfy loam, over which put the made-up soil. Give water to settle the soil about the roots.

Acers (*Maples*).—These form an important group of hardy trees and shrubs. They come from North America, Japan, and Northern Asia principally, and vary considerably in size from trees twelve feet in height to those one hundred feet or more. The Maples vary considerably in leaf formation, and in the manner of growth, some being bushy, round-headed trees, and others erect, spreading, and even weeping. The following is a selection of the finest for small and medium sized gardens. No more delightful group of hardy foliage shrubs exists than the varieties of *Acer palmatum*, popularly called Japanese Maples, and it is strange that they have not been used more freely in gardens and parks. They are regarded by some as short-lived and tender, but this is quite a mistake. With a judicious selection of varieties, and care in placing them, little fear of death from cold need be entertained. They should never be planted in water-logged soil, or where they are likely to feel the effects of east winds, both of which are injurious. Neither should they be planted anyhow in the ordinary shrubbery border, where more vigorous things would grow over them. Light and air are necessary to develop the true leaf-colour. Glorious effects can be obtained by planting on mounds sloping to the south or west, and although the Japanese Maples give the best results when planted in rich soil, that of poorer quality will suffice, provided the points referred to above have not been overlooked. As single specimens on the fringe of the lawn, and for growing in pots or tubs for indoor decoration, their value cannot be overestimated. The great variety in form, size, and leaf-colour is almost bewildering, and the following list represents only the cream of the family. *A. palmatum aureum* is a sturdy grower, with large yellowish leaves which in autumn change to shades of orange, scarlet, and gold. *A. p. sanguineum* creates a brilliant picture in the setting sun. In growth it is bushy and free, and its leaves are deep crimson. The soft green deeply-cut leaves of *A. p. linearilobum* are very pretty, and those of *A. p. roseo-marginatum* are

bright green, irregularly margined with rich rose and pink. It is a dainty variety of slender growth. *A. p. septemlobum* is a beautiful Maple with cut leaves, and *A. p. s. elegans* is another handsome form. In spring its leaves are delicate green, gradually passing through shades of pink and rose to crimson. *A. p. s. atropurpureum*, with its crimson-purple leaves, is highly ornamental, while those of the variety named *laciniata* are deep green, flushed with rose and pink. *A. p. s. marmoratum* and *A. p. s. tricolor* are also good. The *dissectum* group possesses fern-like leaves, the colours of which are exceedingly rich and enduring. Those of the type are bright green, *ornatum* bronze-purple, and *roseo-marginatum* purple-bronze, stained with rose and white.

The Silver Maple (*A. dasycarpum*) from North America makes a beautiful avenue tree, as it is of good growth, the leaves large, palmate, silvery white on the under sides, and set on long footstalks. When disturbed by the breeze they seem silvered all over. *A. grandidentatum* is useful for its effectiveness; it is of free growth. *A. macrophyllum*, also from North America, is one of the best Maples for planting on gravelly soils, as it makes excellent growth. Its bold leaves are bright green, and the flowers and showy fruit are produced abundantly. *A. circinatum* is another dry soil loving species. It is neat in habit, and forms a medium-sized round-headed tree, and in autumn its bright scarlet leaves are remarkably handsome. For this reason alone it deserves consideration. The Sugar Maple (*A. saccharinum*) is of upright growth, vigorous and handsome. Its leaves are large, bright green, and covered with a thick glaucous hue on the under sides. The autumn tints are very fine. *A. rubrum* is a well-known showy-leaved Acer, particularly in autumn, when its foliage is heavily shaded with orange and scarlet. It is of elegant habit, and often reaches a height of twenty-five feet or more when planted in a position favourable to good growth. It makes considerable headway in dry, hungry soil, and in spring, when displaying its clusters of deep red flowers, it is one of the most striking of American Maples. *A. pennsylvanicum* (the Snake-barked Maple), also known in gardens as *A. striatum*, flourishes in dry soil and is quite distinct, as its bark is freely striped with white. It is not often more than twenty-feet in height, and its heart-shaped leaves are very beautiful. For general effect *A. pictum rubrum*, sometimes labelled *A. calchicum rubrum*, should be remembered. It is of free growth, and its bright green leaves change to shades of purple and crimson in autumn—a tree to plant for its autumn colouring.

All the varieties of *A. Pseudo-platanus* (Common Sycamore) are worthy of mention, but only a few can be mentioned. The variety named *Leopoldi* is fairly well known, and its silver variegated leaves and red petioles are showy. Although of vigorous growth it can be kept within bounds by a free use of the knife, the growth resulting from such treatment being strong and the leaves highly coloured. Another variety (*atropurpureum*) is suitable for pleasure grounds. Its branches are stout, and the leaves dark purple. The variety named *elegantissimum variegatum* is a choice tree of vigorous growth. The large cream-coloured leaves are

suffused with delicate pink and rose. *A. P. flavo-marginatum* (Corstorphine Plane) has golden variegated leaves, and is worth growing. *A. Negundo* is a first-rate tree, but its silver-leaved form is showier and quite as hardy and free in growth. It is an excellent tree for small gardens, and unlike many variegated trees does not burn in hot suns, and succeeds famously in dry soil, but it must not be used recklessly. Its colouring is very decided, and when the tree is planted very freely the effect is "spotty." *A. N. californium aureum* makes an excellent companion to it, being perfectly hardy, vigorous, and the bright golden leaves remain true to colour throughout the summer. *A. N. elegans* is another showy variety, but unfortunately planted sparingly. It is perhaps of rather freer growth than the one just referred to. The strong growths are of a conspicuous glaucous hue, and the leaves tender green, margined and striped with yellow and cream white. *A. platanoides Schwedleri* is a splendid tree, and perhaps the most beautiful of Norway Maples. It is tall, vigorous, free in growth, and has delightful foliage, its bronzy-red deepening with age. *A. p. rubrum* is of much merit with reddish tinted leaves. It is of excellent growth, and, like the last named, very beautiful in autumn. *A. argutum*, from Japan, forms a neat specimen, and is suitable for the outskirts of the lawn. It is rather slow in growth, and has tinted, deeply-lobed leaves, which change to bright colouring in autumn. *A. japonicum* is a much branched tree of small stature, and well adapted for small gardens. Its colours in autumn are remarkably brilliant, and as the leaves hang upon the trees long after those of many species have fallen, its value for effect is increased. Within the last twelve years several new species have been introduced from China; distinct ones are *A. Davidii*, *A. Henryi*, *A. Olingianum*, and *A. longipes*. All promise to be of value for the garden.

The **Actinidias** are hardy climbers, well suited for training over arbours, bridges, pergolas, and similar structures. *A. Kolomikta*, from Eastern Asia, is perhaps the most familiar kind. It is vigorous in growth, and soon covers a large space. Although its white flowers are not showy they are produced freely, and the young leaves are of a pleasing shade of green, eventually changing to rich orange and yellow. *A. polygama* is also a strong grower with white flowers, but the most ornamental species is *A. chinensis*, a strong-growing Chinese plant of recent introduction. It bears yellow flowers, and large leaves, which when young are covered, together with the young shoots, with conspicuous, reddish hairs. Ordinary soil suits these rampant climbers.

Ægle Sepiaria, introduced from Japan about 1870, deserves mention not only for its quaint growth, but also for its small, sweet-scented, white, orange-like blossoms, which are borne along the spiny branches. It is slow in growth, and should, if possible, be planted in small groups on the turf, selecting of course a sunny position so as to ensure thorough ripening of the wood. It succeeds best in turfy loam, with which has been incorporated a quantity of leaf-mould. Good drainage is of much importance, because it fails when the roots travel into sour soil.

Æsculus Hippocastanum (*Horse Chestnut*) is the noblest of all

hardy-flowering, vigorous trees for the pleasure-ground. Its beauty at flowering time is proverbial. It has been planted extensively in some parts of the country, and is an excellent avenue tree. Its native country is supposed to be Greece, whence it was brought to this country so long ago as 1629. Although it succeeds in most soils, it seems to delight in a rich, light loam. There are varieties with double flowers, others with beautifully cut leaves, and some have golden variegated foliage, all of which are ornamental. *Æ. indica*, well known as the Indian Horse Chestnut, is a free-growing tree, with numerous branches and great quantities of white flowers marked with red and yellow. It blossoms in July. The one named *rubicunda* or *carnea*, as it is now recognised, deserves greater popularity. It grows upwards of twenty feet in height, and comes from North America. Its showy scarlet flowers, borne on substantial spikes, remain in beauty for several weeks. *Brioti* is a variety of the last named, and certainly quite as free in blossom; the large rose-coloured flowers carried on long erect spikes are quite distinct and lasting. It is a grand tree. *Æ. californica* (*Pavia californica*) is a spreading tree a dozen feet or so in height, and in July white, flushed pink flowers appear in profusion. It is very uncommon, perfectly hardy, attractive, and valuable for its lateness. *Æ. parviflora* (*Pavia macrostachya*), indigenous to North America, is a superb kind, and exceptionally free-flowering. Its sweet-scented white flowers appear about the end of July and early part of August, and are borne on long racemes with conspicuous stamens and red-tipped anthers, give additional beauty to the bush. It does not grow to tree form like most other kinds. *Æ. flava* (Sweet Buckeye), also known under the names of *Pavia bicolor* and *P. flava*, bears pale yellow flowers. It grows upwards of twenty feet in height.

Ailanthus glandulosa (*Tree of Heaven*) is one of the most desirable of vigorous trees, but requires plenty of light, space, and air to bring out its real value. It produces a straight trunk, from which are given off numerous long branches clothed with much divided leaves, four and sometimes five feet long. By no means particular as to soil, it makes the best growth in deep, well-drained loam, and in autumn, when bearing its great clusters of brown-winged fruits, it is one of the most conspicuous of trees. It is valuable, too, for the sub-tropical garden under certain treatment, and for this purpose it should be grown on the single-stem system and cut hard back every year. The growths that follow this treatment are vigorous, and the leaves larger than those of uncut trees.

Akebia quinata is an uncommon Chinese evergreen climber of free growth, with glossy green leaves divided into several leaflets. In April and May it produces small, dull purple flowers in short axillary racemes, and although not individually conspicuous they are very fragrant, especially at night. A deep, moist, well-drained soil is necessary, and a position where it is not exposed to biting winds, as these check young shoots, and sometimes, especially when accompanied by late spring frosts, kill the tender growths outright. It is a beautiful plant for clambering amongst the branches of old trees and hiding

ÆSCULUS PARVIFLORA, A DWARF HORSE CHESTNUT THAT FLOWERS IN JULY.

THE AMELANCHIER (SNOWY MESPILUS) WITH UNDERPLANTING OF STAR DAFFODILS.

trellis work. Where the climate is cold grow the Akebia in a cold-house, as it is well adapted for clothing pillars, rafters, &c., and its purple, fragrant flowers, borne in drooping spikes, remain long in beauty. *A. lobata* is another useful strong-growing climber. It may be distinguished from the other species by its three-lobed leaves.

Amelanchiers (*Mespilus*).—This a small group of hardy shrubs and trees of small stature. No garden of any pretensions can be considered complete without one or more trees of the Snowy Mespilus. It is very beautiful in spring when thousands of small white flowers open to the sunshine. A healthy tree in April and May is a cloud of wavy white petals. The value of Amelanchiers in the landscape is not confined to spring alone, because the gorgeous colouring of the decaying leaves in autumn is quite as welcome as the flower cloud of the early year. Amelanchiers are not fastidious. There is hardly a soil in which they refuse to grow, but a deep, rich, moist loam seems to answer best, and if shelter from cold winds can be given so much the better, because the flowers sometimes suffer in rough weather. *A. vulgaris* (Common Amelanchier), indigenous to Southern Europe, is one of the brightest of early spring-flowering trees. It is free in all ways. *A. canadensis* (Snowy Mespilus), also known as *A. botryapium*, is an old favourite, having been introduced from Canada upwards of 150 years ago. It is rather slow in growth, but reaches in the course of years a height of between thirty feet and forty feet. It forms a round-headed tree with long and somewhat pendulous branches, and when young its smooth leaves are tender green, changing to a deeper shade, and in autumn assume exquisite shades of yellow and orange. The snow-white flowers are in graceful racemes and succeeded by crimson fruit, from which plants can be readily raised, but when layered the trees flower a season or so before those raised from seed, indeed before they are two feet high. Little trees of this kind are welcome in the conservatory as well as for massing on the grass. The variety *oblongifolia* is a gem and late flowering. It is much dwarfer in habit and generally ten days or a fortnight after the type in coming into bloom. The flowers appear in short racemes. *A. oligocarpa* is a dwarf-growing shrub of considerable beauty, but unfortunately very uncommon. It grows about four feet high and bears large, pure white flowers generally in pairs on well-matured wood. For small gardens the dwarf June Berry (*A. alnifolia*) is worth remembering, as it rarely exceeds eight feet high and flowers rather late in the season. Its flowers, like those of *A. canadensis*, are produced lavishly, and the autumn-tinted foliage is strikingly beautiful.

Amorphas.—These are in their way useful shrubs, the best of which is *A. canescens* (Lead Plant), introduced from Missouri in the early part of the present century. It grows about three feet high, flowers in autumn, is quite hardy, and free both in growth and bloom. Its deep blue flowers are borne in panicles and last a long time in fresh condition, and its silky white pinnate leaves are very attractive. A sandy soil with an open sunny aspect suits it admirably, and considering the

great time the Lead Plant has been in cultivation it is far from common in gardens. *A. fruticosa* (False Indigo), a well-known deciduous shrub, is more common than the last-named species. It is vigorous and grows half a dozen feet high when planted in sandy soil, and produces purplish-blue flowers in rather short spikes during summer. This shrub flowers more freely when cut back every year, as the blossom produced on young growths is much finer than that on neglected bushes.

Andromeda polifolia (*The Marsh Rosemary*) is a pretty shrub when seen at its best, but it is not suitable for every garden. There is an idea that this low-growing evergreen shrub seldom develops more than fifteen inches, succeeding only in peaty soil. This is a mistake, because it flourishes and flowers profusely in loamy soil provided lime is absent and the soil moist. Its wiry shoots, bright green leaves, and its pale pink flowers borne in racemes are distinct, enduring, and very beautiful. The varieties, *major* and *angustifolia*, are practically described by their varietal names.

Aralia chinensis (syn. *Dimorphanthus mandschuricus*) is a Chinese tree introduced to this country upwards of sixty years ago. In a deciduous state its long, spiny, branchless stems are by no means attractive; but during the growing season, and in autumn when bearing its huge terminal panicles of small cream-white flowers, it is very effective, and has quite a tropical look. It is quite hardy and flourishes in poor soils. The varieties *albo-marginata* and *aureo-marginata* have silver and golden variegated leaves respectively. Both form handsome plants. The Angelica tree (*A. spinosa*) was introduced from Virginia more than two hundred years ago, and like the last-named it blooms in autumn, in fact its cream-coloured flowers may be frequently seen as late as the middle of October, and even after that time. To see the full beauty of this plant it should be allowed plenty of room and generous treatment.

The **Arbutuses** (*Strawberry Trees*) are delightful subjects for the garden, especially if the soil is peaty, moist, well-drained, and the position screened from the north and east. Not only are they valued for their flowers, but also for their berries. The strawberry-like fruit of *A. Unedo* is very showy, and as the white bell-shaped flowers are borne at the same time the effect of a good-sized tree is very telling when suitably placed. *A. Unedo*, the most frequently planted kind, is of moderate growth, rarely developing more than twenty feet in height, with bright green leaves, forming a round-headed, well-balanced tree. It can be well recommended for planting on the outskirts of the lawn and near the sea-coast. It flowers in autumn. Several varieties differing from the type have been raised, and are now in gardens. They differ either in habit of growth, size, or colour of flowers, and are fairly described by their varietal names. For instance, *A. U. quercifolia* has leaves not unlike those of some oaks. The variety *microphylla* is not only small in growth, but its deep green leaves are the smallest of all the Arbutuses. It is of slow growth and a serviceable evergreen shrub for small gardens. The variety *rubra*, also known as *A. Croomii*, is of more than ordinary merit. It grows freely and has large handsome leaves, while the young

bark is of a pleasing shade of reddish brown, and quite distinct from that of any other member of the family. The flowers are much larger than those of *A. Unedo*, and in colour almost red. *A. Menziesii* (syn. *A. procera*) is a free-growing tree, with beautiful rich green leaves coloured with a glaucous hue on the obverse sides, and the white fragrant flowers are carried in panicles. The orange-red fruit is not so large as that of the common Strawberry tree, but it is attractive all the same. *A. Andrachne*, occasionally met with under the name of *integrifolia*, is quite as hardy as the type and certainly very ornamental. It was introduced from the Levant in 1874, is vigorous, with large leaves, and bears dull white flowers abundantly in May and June. The bark of the young shoots is tinged with red. *A. hybrida* (*A. photinifolia*), supposed to be a cross between the last-named and the type, is very handsome and bears some resemblance to both parents. Its leaves are very leathery and rich green, and the greenish-yellow flowers are produced profusely. Its crimson-stained fruit is conspicuous in spring.

Arundinaria. See *Bambusa*.

The growth of Ornamental Grasses should be encouraged, as they are graceful and beautiful, and although the

Arundos are not the most elegant, they possess a distinct charm which appeals to the planter. The type *A. Donax* (Great Reed) grows about a dozen feet in height, with stout, almost erect stems and long, narrow, glaucous leaves. It delights in a moist soil, such as one finds near the edges of water, a sunny position in preference to a shady one, as the growth is always better for being exposed to the sun, especially if delugings of water can be given during summer. The silver variegated form (*A. D. variegata*) is less vigorous than the type, but very beautiful. Its leaves are short, tender, green, and streaked with cream white. This kind should never be planted in cold soil and bleak situations, as it is apt to lose colour and become disfigured by cold winds. It succeeds well as a pot plant for indoor decoration, but when root room is restricted, it should never be allowed to want for water. The variety *macrophylla* is vigorous, hardy, and elegant, and a grand plant for the sub-tropical garden. Its strong stems are clothed with glaucous leaves. The New Zealand Reed (*A. conspicua*) is a fine species, and when bearing its graceful, feathery plumes during summer and autumn, is remarkably pretty. Its arching leaves are long and narrow.

Aucuba japonica and its varieties are familiar garden shrubs, very useful and ornamental both in foliage and in fruit. Be careful to get plants of both male and female kinds, so that the flowers of the latter may become fertilised, because if berries are desired, both sexes must be in association. They are excellent shrubs for town gardens, as they endure fog and smoke better than the majority of evergreens. They are also serviceable for placing upon balconies, for winter bedding, and can also be recommended for planting in the shade of trees. They thrive in any well-drained soil.

Azaleas. See *Rhododendrons*.

Azaras come from Chili, and, north of London, require pro-

tection during severe winters—usually that afforded by a wall being sufficient. They succeed in ordinary soil, provided it is well drained. *A. microphylla*, introduced nearly thirty years ago, is the most graceful member of the group, and grows freely in most situations, provided it can be screened from east winds. It forms a dense shrub, with long branches of graceful outline, and numerous small, dark green leaves. In favourable seasons thoroughly established plants produce small, in-attractive, but very sweet-scented flowers. *A. Gilliesii* is vigorous, but, unfortunately, rather more tender. It should be represented in the wall garden. Its holly-like leaves are very handsome, toothed, glossy green, and its rich yellow flowers are borne in axillary panicles.

Bamboos.—To facilitate reference, *Bambusa*, *Arundinaria*, and *Phyllostachys* are here brought under the general heading of Bamboos, as they are closely allied to each other. No plants give a more tropical appearance to the landscape than suitably placed, healthy Bamboos.

During the past few years considerable interest has been aroused in this family, the effect of plants in certain positions, hardiness, and general ornamental qualities being referred to in the horticultural press. To prevent disappointment, a few preliminary remarks respecting culture and aspect may not be without value. In the first place, a position screened from the east and north is essential, also a deep, rich, moist soil in which leaf-mould forms a large part. A yearly top-dressing of manure or leaf-mould greatly benefits them, and while growth is in progress frequent soakings of water will be of immense value. A mistake, unfortunately too often made in the culture of these graceful plants, is, that they are disturbed at the root at the wrong time of the year. Never move them in winter, but wait until the end of May or even the month of June before dividing them, because at that time fresh growth is being formed, and they then move with ease and certainty, the roots are quickly re-established, and the plants grow away as though they had not been interfered with. They are very graceful by the water margin, as well as single specimens on the lawn, and also for sub-tropical gardening. *Bambusa tessellata*, also known under the name of *Ragamowski*, a fairly well-known kind, is of close, compact, dwarf habit, and very distinct. Its broad, rich green leaves are quite fifteen inches long. *B. marmorata* also belongs to the dwarf section, and requires a warm spot to bring out its true beauty, a cold, bleak situation being most unsuitable for this dainty little Bamboo, with its slim dark stems and short, rich green leaves. *B. palmata* spreads rapidly, and delights in partial shade. Its broad, bright green leaves are large and handsome. The smallest of all Bamboos is *B. pygmæa*, well adapted for the wild garden, and is also serviceable for permanent edgings. It spreads with exceptional freedom, and soon forms a dense carpet of greenery.

Arundinaria Falconeri, with its slender stems eighteen feet or more long, supplied with rich green leaves, is pretty if planted in a sheltered ravine, but it is only suitable for the milder parts of the country. *A. Hindsii* is also conspicuous for its erect stems and dark green foliage, but it is surpassed in beauty by its variety *graminea*. *A. Fortunei*

(*Bambusa Fortunei variegata*) is a neat and ornamental grass, a foot or so high, suitable for adorning the front of the shrubbery, or for growing in pots for placing in cool greenhouses. It is quite hardy, and its narrow, pale green leaves, striped with white, are very effective. *A. auricoma*, better known as the golden form of *Bambusa Fortunei*, is indigenous to Japan, and grows about three feet high. It spreads rapidly, and its yellowish-green leaves are regularly striped with green. *A. japonica*, well known as *Bambusa Metake*, is the most frequently planted kind, and certainly the least exacting of the vigorous Bamboos, because it not only grows luxuriantly in damp soils, but is quite a success in dry situations. Its long growths, and broad, deep green leaves are graceful and distinct. As it increases quickly at the base, it should not be restricted for root room. *A. Simoni* (*Bambusa Simoni*) is vigorous, graceful, and perfectly hardy. It grows from a dozen feet to sixteen feet high, and its upright shoots, and long, narrow, light green leaves are pretty. *A. nitida*, with its purplish-brown stems, short branches, and pale green leaves, is one of the most handsome of Bamboos when suitably placed. It prefers partial shade to full sunlight, and as it is of vigorous growth, plenty of head-room should be allowed for its graceful outline. *A. Veitchii* (syn. *Bambusa Veitchii*) is dwarf, vigorous, and very attractive, and its broad leaves are of a pleasing shade of green.

Phyllostachys nigra (*Bambusa nigra*), with its long dark purple stems, is one of the most pleasing of vigorous Bamboos. *P. castillonis* (*Bambusa castillonis*) produces long stems clothed with bright green leaves marked with white. It is of good growth and thoroughly hardy. Another particularly handsome sort is *viridi-glaucescens*, with long elegant growths and glaucous leaves. *P. Quiloi* is another tall-growing species, with arching growths and deep green leaves. *P. aurea* (*Bambusa aurea*), the Golden Bamboo, is very showy. It grows upwards of a dozen feet in height, and its graceful stems, as well as its leaves, are of a golden-yellow colour, hence the name Golden Bamboo. *P. fastuosa* is, however, the most stately of all hardy Bamboos. Rising to a height of eighteen feet, it forms plume-like branches with dark green leaves which keep their colour later in the spring than those of other Bamboos.

The **Berberis** family forms an attractive group of hardy shrubs of medium growth. They all flower in spring and early summer, and some are remarkable for the free display of showy fruits in autumn, which in some cases hang upon the leafless bushes until Christmas. The decaying foliage assumes gorgeous tints. They do not need special care in the preparation of soil or position; in fact, it is well to remember that the purple-leaved form of the common Barberry always gives the best results in rather dry, gravelly soil, because if planted in very rich compost it is apt to become coarse and lose much of its purple tint. Experience proves that the best colour effects are obtained if the whole of the vigorous shoots of this ornamental shrub are cut down every year close to the soil, because the leaves are bigger and the purple colour more intense than is the case with plants left uncut. For the sake of its brightly-coloured fruits in autumn the type is too valuable to pass

by unnoticed. It should be planted in the pleasure-grounds. *B. vulgaris brachybotrys* and *B. v. macrocarpa* are attractive at flowering-time. *B. v. amurensis* has glowing scarlet berries, which are borne with great freedom during the autumn. It is of good growth. Another variety of the common Barberry noted for its beauty is named *asperma*; it is very bright, with strings of scarlet berries, and is a shrub of upright habit. *B. Thunbergii* is the most brilliant autumn coloured Barberry grown, and was introduced from Japan. It is an excellent shrub for small gardens, as it seldom grows more than three feet high. It bears small drooping flowers, and in autumn its leaves are aglow with subtle shades of orange, chocolate brown, crimson, &c. Few shrubs have such autumn foliage as this. *B. sinensis*, a Chinese species, is very free and pretty in autumn when laden with its showy fruits, at which time its brilliant crimson leaves stand out conspicuously in the shrubbery. It is of dense, bushy growth. *B. aristata*, from Nepal, has reddish-coloured bark, and creates a pretty picture in winter. It grows six feet high, with stiff branches and bright green leaves. The rich yellow flowers, borne in racemes, are succeeded by scarlet berries, and these alone entitle it to consideration. *B. virescens* is another Barberry with brightly-coloured bark, and makes an effective winter shrub by the water side. *B. wallichiana* is quite distinct from all the foregoing. Free in growth, delightful in blossom, it forms a neat, much-branched bush, with clusters of shining leaves and masses of drooping flowers.

Darwin's Barberry (*B. Darwinii*) is the best-known member of the evergreen group, and certainly one of the most useful. It is serviceable for hedge-making, and when grown in masses on a sunny bank the effect at flowering-time is magnificent. It grows from six to twelve feet in height, with strong shoots clothed with small glossy green leaves, and from about the middle of April to the end of May bears great quantities of orange-yellow flowers in rather short drooping racemes. *B. congestiflora hakeoides*, an uncommon early-flowering Barberry, bears deep yellow flowers profusely. It is of sturdy habit, rather slow in growth, and dislikes dull, shady positions. For general effect none surpass *B. stenophylla* either in graceful outline, abundance or beauty of flower. It is a hybrid raised between Darwin's Barberry and *B. empetrifolia*, a small-leaved, trailing, rock-garden shrub. The progeny is of excellent growth, with very long arching shoots and narrow deep green leaves, and during May and June produces a wonderful profusion of dainty yellow flowers. *B. buxifolia*, also known as *B. dulcis*, has large, drooping, light yellow flowers and tiny, deep green, box-like leaves. This showy Chilean shrub is, unfortunately, seldom met with outside good collections of trees and shrubs. *B. Aquifolium*, known also as *Mahonia Aquifolium*, is quite common. It is an ornamental berry-producing plant, and the autumn and winter colouring of its leaves is charming. It is a valuable shrub for planting beneath the shade of trees. The varieties *rotundifolia* and *fascicularis* are handsome too. *B. japonica* is distinct, vigorous, and very ornamental. It produces a strong stem and large spiny leaves, composed of many leaflets and sweet-

scented yellow flowers in winter and early spring. *B. nepalensis* is another beautiful kind deserving attention. It is free in growth, floriferous, and bears an abundance of purplish-coloured berries. *B. nervosa* (*B. glumacea*) is suitable for the rock-garden, as it is dwarf and very pretty. Its leaves are deep green, and it bears racemes of flowers from October onwards. Several useful and decorative kinds of *Berberis* have been received from China within the last few years, notably *B. Wilsonæ*, a dwarf, deciduous shrub with numerous small leaves and long spines, amongst which the golden flowers appear in May to be followed by rich red berries, which ripen in autumn; *B. polyantha*, a bush five feet high with yellow flowers and red fruits; *B. dictyophylla*, conspicuous by reason of its white stems, the silvery under-surface of its leaves, its yellow flowers and scarlet fruits; and *B. verruculosa*, a dense evergreen bush two feet or so high with thick, ovate leaves, yellow flowers, and purplish fruits.

Bryanthus erectus is a dwarf evergreen for the rock-garden, as well as a permanent edging to dwarf shrubs. Although it grows in ordinary soil, it makes the best growth and yields the greatest profusion of small, delicate, rose-pink flowers in terminal clusters in peaty soil, and a position just beyond the influence of fierce sunlight. If the ground is properly drained, partially shaded, and occasional soakings of water are given while growth is young, a brilliant flower display follows. This exquisite little shrub is far too seldom seen. *B. empetriformis* is also delightfully free, and, like the last named, of dwarf growth; it is very uncommon. Its rosy-purple flowers are borne in early summer.

Buddleia globosa (*Orange Ball Tree*) is the hardiest member of a rather extensive family. In addition to its hardiness, it is also easily placed, and flourishes in almost any soil. It is an excellent seaside shrub, in which situation it not only grows luxuriantly, but blossoms profusely. It does not often grow more than twelve feet high, but a plant of such a size, when displaying its wealth of orange-coloured, ball-like flowers, is the most conspicuous shrub in flower in late summer. It is half an evergreen, and its long, pointed green leaves are covered with a glaucous tomentum on the lower surface. *B. lindleyana* differs from *B. globosa* by reason of its dwarfer habit, somewhat tender constitution, and purplish-red flowers, borne in long, terminal racemes. It should be planted against a wall. During late years several new sorts have been introduced. The best species is *B. variabilis*, but it is better to grow the varieties *Veitchiana* and *magnifica* than the type. Both produce long terminal panicles of lilac-coloured, honey-scented flowers during July and August, the inflorescences often being eighteen inches long. They require rich loamy soil and the best results are obtained by cutting the plants back almost to the ground-line every February. An older and more tender shrub of great beauty is *B. Colvillei* from Sikkim. It bears large, terminal racemes of bright-coloured flowers which resemble small Pentstemons, but may only be grown in the milder parts of the country.

Buxus (*Box*).—The native Box Tree (*Buxus sempervirens*) is so

familiar that it is not necessary to consider it at any length here, but some of its distinct and ornamental forms may be well referred to. The silver variegated variety is very handsome, keeps its colour well, and, like the type, succeeds in nearly all situations. Its pale green leaves are speckled with cream-white. A good companion to the last named is *B. s. aurea variegata*. Similar in habit, its leaves are heavily marked with yellow and white. The variety *rotundifolia* is of sturdy, bushy habit, and very distinct. The golden-leaved form of *B. japonica* is excellent for winter bedding. It is of compact habit, and its golden colour is permanent. The Minorca Box (*B. balearica*) delights in a dry bank facing south-west. It is of excellent growth when thus placed, and, as autumn approaches, its thick, polished green leaves are touched with bronze.

Cæsalpinia japonica is a pretty and uncommon leguminous shrub from Japan. It is suitable for massing, and its glossy green leaves are composed of numerous leaflets, while its rich, yellow flowers, with conspicuous anthers, are borne in long racemes with great freedom. It grows luxuriantly in loam, provided the drainage is good and the position open to the sun, but, at the same time, out of reach of cold easterly winds. It is a pity that such an attractive, free-growing shrub should be so seldom seen in gardens.

Calluna vulgaris (Ling).—A native shrubby plant common on hill-sides and waste ground in many parts of the country where lime is not prevalent. It and its numerous varieties are of the greatest use in the garden for they bloom freely from early August until the end of September. *Alportii* and *rubra* have red flowers, and *alba*, *Hammondi*, and *alba Serlei* are good white flowered kinds. *Aurea* has golden foliage and the leaves of *cuprea* are copper-coloured. *Hypnoides*, *Foxii*, and *pygmæa* are very dwarf and moss-like. This is also dealt with on p. 184 under "The Heath Garden."

The **Calycanthuses** (*Allspice*) form a small group of American deciduous shrubs, varying from six feet to twelve feet in height. All have flowers of different shades of red, and some are more fragrant than others. They succeed in soils of various descriptions and aspects, but produce the best results when in a cool, moist soil, with the additional advantage of partial shade. *C. floridus*, the most popular of Allspices, was introduced to this country from America in the seventeenth century. It is perfectly hardy, compact in growth, and its bright red, deliciously-scented flowers are about the size of a five-shilling piece, and borne freely. *C. accidentalis*, which is the same as *macrophyllus* (Western Allspice), is more vigorous, and with larger flowers than the first named. The lively green leaves are also larger as well as the deep crimson flowers, but these are unfortunately rather scantily produced on small plants. To some the fragrance of the flowers of the popular Allspice is unpleasantly strong, but those of *C. glaucus* are not so fragrant. The colour is reddish-purple.

Caraganas are good town garden shrubs, and excellent for dry soils. The Siberian Pea Tree (*C. arborescens*) is the best known of the

THE CATALPA IN FLOWER IN A LONDON GARDEN.

THE CATALPA IN FLOWER IN A LONDON GARDEN.

SEED PODS OF CATALPA BIGNONIoidES.
*These are not often produced in this country, but during the hot
summer of 1911 they were found in several places.*

group, and the freest in growth and flower. Bright yellow is the colour of its pea-shaped flowers.

Carpentaria californica.—Wherever this charming Californian shrub can be successfully grown it should be represented, as it bears beautiful flowers. It delights in peat, loam, and leaf-mould in equal proportions, and good drainage is of great importance. Be careful, too, not to expose it to cold east and north-east winds, as these do considerable damage to young growth. It grows about a dozen feet in height, and has greyish-green leaves, whilst its sweet-scented, pure white flowers with conspicuous golden-yellow stamens in the centre, are produced in clusters at the points of the growths in June.

Cassandra calyculata (*Andromeda calyculata*).—A freely-branched, low-growing North-American shrub, producing a good effect when planted in large masses near the edge of water, as it succeeds best in a cool, moist root-run. Its wiry shoots are clothed with small bright green leaves, and in early spring small bell-shaped flowers appear in quantity. It is thoroughly hardy and prefers full exposure to partial shade.

Cassinia fulvida, also known under the name of *Diplopappus chrysophyllus*, hails from New Zealand, and forms a medium-sized, much branched shrub, with slender bright yellow stems and tiny green leaves, bright yellow on the under sides. It bears creamy-white flowers in terminal panicles in autumn, and these are conspicuous for two or three months. It is a good seaside shrub, and an open sunny spot favours good growth and the production of flowers.

Catalpas are handsome trees for the garden, delighting in poor soils, and flowers appear when few trees and shrubs are in bloom. They are excellent for planting on the lawn, and can be well recommended for towns. *C. bignonioides*, not infrequently called *syringæfolia*, the well-known Indian Bean Tree, is a North-American species of vigorous growth, and often reaches twenty-five feet high, with a dense-spreading head. Its V-shaped leaves are bright green, flushed with bronze towards the margins, and quite downy on the under sides. During summer it bears at the branch tips erect spikes of blush white flowers, suffused with violet and purple in the yellow throat. It is very free. The golden-leaved variety (*aurea*) is less vigorous, but exceedingly ornamental. It is a yellow-leaved counterpart of the type, and may be planted in the shrubbery or as single specimens on the lawn with telling effect, and if the shoots made during the previous year are cut hard back in February the foliage is larger and richer in colour. *C. cordifolia* (*C. speciosa*) is even more ornamental than the first named, and perfectly hardy. It also blooms early, and the flowers are larger and brighter in colour. It is free in growth, and a first-rate shade tree. Catalpas like moisture, and this is the reason why the trees are so luxurious and shapely in the gardens of the Thames valley. Several new species have been received from China during the present century, which differ from the older kinds by having rosy-purple or reddish-purple flowers. Two of the best are *C. Fargesii* and *C. Daclocxii*.

Caryopteris Mastacanthus produces pretty light blue flowers over

a considerable period in autumn, a time when shrubs in flower are scarce, consequently its value is enhanced. It is not, unfortunately, hardy generally, but is well worth a place against a wall. Avoid planting in cold, bleak situations, and use, if possible, a soil consisting of fibrous loam and leaf-mould, with the addition of a little coarse silver sand or grit. To ensure a thorough ripening of the wood, select a sunny position. The white-flowered form is not so hardy as the type, and the flowers are produced rather sparingly.

The **Ceanothuses** are delightfully free-flowering shrubs, but unfortunately not sufficiently hardy for general outdoor planting north of London, as they suffer in severe winters. For clothing warm walls, especially if the soil is fairly rich and the drainage ample, they are excellent, and few shrubs are more brilliant in summer. *C. americanus* (New Jersey Tea) comes from America, and bears an abundance of white flowers; it is very hardy and ornamental. *C. Veitchianus*, from California, is of free growth, and very showy when bearing its clusters of bright blue flowers. *C. dentatus* has deeply-toothed leaves and rich blue flowers, borne in advance of those of the last named. It is very free-flowering, and continues in blossom for about four months. *C. papillosus* and *C. verrucosus* are very floriferous and ornamental. *C. rigidus*, with deep blue flowers, is one of the most beautiful of all. It thrives on a wall with soil, west or south exposure. *C. azureus*, introduced from Mexico early in the nineteenth century, is a compact, free-growing shrub, often many feet in height when suitably placed. Its bright blue flowers appear from midsummer onwards. The writer is acquainted with a gardener at Ealing in Middlesex, where the shrub has grown to the roof; the aspect is south. Of the many beautiful garden forms belonging to this species the following are worthy of mention here. Gloire de Versailles is the most popular. It is free in growth, with large leaves, and bright blue flowers, borne in long racemes. Marie Simon is another good kind; and Albert Pettitt, Indigo (a rich indigo colour), Lucy Simon, Albidus, and Arnoldi are noteworthy too.

Cercis Siliquastrum (*Judas Tree*) is a beautiful tree when laden with its wealth of rosy-purple blossoms, which appear in spring before the kidney-shaped, glossy green leaves. It is a small growing, freely branched tree, and succeeds fairly well in dry sandy soil, but it produces the best growth by the lake or stream side, and in such a position the flowers are not only deeper in colour, but they remain in good condition for a much longer time than those produced in sandy soil. It may be planted also against a wall.

Chimonanthus fragrans (*Winter Sweet*).—This should be represented in every garden where hardy shrubs are treasured for their flowers. It was introduced from Japan upwards of one hundred and thirty years ago, and is of strong growth, especially when planted in deep, rich, moist soil, and as its soft yellow flowers are produced in mid-winter along the leafless twigs, it should be given a prominent place to reveal its beauty. The variety *grandiflorus* bears larger flowers than the type, but they are not so strongly scented. The *Chimonanthus*

THE LARGE-FLOWERED WINTER SWEET (*CHIMONANTHES
FRAGRANS GRANDIFLORA*).

A BEAUTIFUL ROCK ROSE (*CISTUS LORETII*).

flowers are borne on wood of the previous season's growth, consequently all pruning and thinning of the shoots should be attended to in early spring, as the full growing season is then available for the production of wood.

Chionanthus virginicus (*Fringe Tree*) is a charming deciduous shrub with fragrant white thread-like flowers in great drooping clusters. It is a North-American shrub; succeeds best in cool soil and partial shade. It has lately been used for forcing with considerable success for indoor decoration during winter. Hard forcing should be avoided, and the plants never allowed to want for water.

Choisya ternata (*Mexican Orange Flower*) is a precious shrub with bright evergreen foliage, and in spring each matured shoot bears a terminal cluster of white sweet-scented flowers, which are well adapted for placing in bowls for room decoration, as they can be cut with their own foliage. It also blooms in autumn and during very mild winters. The Mexican Orange Flower is hardy in most parts of the British Isles, is bushy, of free growth, and flourishes in ordinary soil. It should be planted liberally, as it is one of the gems of the shrub garden. It is not advisable to expose it to cold east winds, and a few plants in pots make a welcome addition to shrubs suitable for forcing. In very cold localities space should be reserved for it against a wall. Cuttings of young shoots taken off about midsummer and planted in light soil and placed in a warm case emit roots in about a fortnight.

The **Rock Roses**, or **Gum Cistuses**, are excellent shrubs for dry banks, particularly if facing south or south-west, because it is only on perfectly ripened shoots that flowers are produced, and although the latter are of such fleeting duration they are borne in profusion over a long period. *C. florentinus* is a charming kind, neat in growth and very free-flowering. Its white flowers are blotched with yellow. *C. ladaniferus*, the typical Gum Cistus, has thick sticky leaves and bold white flowers blotched with purple. A grand plant for the sea-coast, *C. villosus*, bears lilac-coloured flowers suffused with purple. *C. laurifolius* is another pretty free-flowering kind, and quite hardy. Its flowers are white.

Clerodendron trichotomum.—Here we have another autumn-flowering shrub or small tree, introduced a hundred years ago. It is vigorous and distinct both in foliage and in flower, its ovate deep green leaves changing in autumn to shades of orange and red, and its sweet-scented flowers appear abundantly in terminal cymes, the conspicuous purple calyces affording additional beauty. It delights in a rich, well-drained soil, and protection from piercing winds is essential.

Clethras.—Few hardy Clethras are cultivated in this country, still they are exceedingly ornamental, easily grown, and all have fragrant flowers. They grow well in fibrous loam, but prefer a moist, peaty soil. *C. alnifolia* (the Alder-leaved Pepper-Tree) is rarely more than five feet high, and bears a great profusion of small white flowers towards midsummer. The variety *tomentosa* should be grown for its flower display. It is of similar habit to the type, but the flowers are bigger and borne at least three weeks later.

The **Coluteas** (*Bladder Sennas*) are very accommodating shrubs, as there is scarcely a position in which they refuse to grow. No soil, however poor, comes amiss to them, as they grow freely and flower profusely in wet as well as in dry situations. They are also excellent shrubs for smoky districts. It is a good plan to cut them hard back every spring, as vigorous growth follows close pruning. There is a profusion of bladder-like seed-pods, at first red, then changing to orange-yellow in autumn.

The **Dogwoods** (*Cornus*) are deciduous shrubs of free growth. They comprise silver, gold, and green-leaved forms, and some, like *C. florida* and *C. Kousa*, are valuable flowering shrubs, and *C. alba* is one of the most effective of red stemmed shrubs in winter; it is an excellent kind for planting along the water margin, as the reflection of the bark in the water in winter makes warm colouring in the garden. *Sibirica* is a good variety. *Spæthii* is a brilliant golden-leaved shrub, and does not burn in hot suns as in the case of the majority of yellow-leaved shrubs. Its delicate pale green leaves are marked with yellow and irregularly bordered with a deeper shade. *C. macrophylla* has bright green leaves, which in autumn are heavily shaded with red. It is conspicuous in early summer when bearing its large clusters of white flowers. The Cornelian Cherry (*C. Mas*) is a small growing tree of erect bushy habit with slender branches, and in February bears clusters of small yellow flowers. It grows freely in dry soil. *C. Nuttallii*, a native of California, forms a large tree which is conspicuous by reason of the six large white bracts which surround each flower head and by the brilliant colour of its foliage in autumn. It is only known as a bush in this country.

The genus **Corylopsis** contains several uncommon deciduous shrubs of much merit; they are quite hardy, dwarf, and delightfully free, well deserving a place against a west wall, as the flowers are seen there to better advantage than when on plants in the open shrubbery. They do well in almost any properly-drained soil. *C. spicata*, a Japanese shrub, is the choicest member of the genus, and in February carries sweet-scented yellowish flowers in drooping spikes. *C. himalayana* is taller and more vigorous than the last named, and *C. pauciflora* is not, as its name leads one to suppose, shy flowering. It is a welcome free-flowering shrub.

Cotoneasters.—Here we have a group of useful trees and shrubs, thoroughly hardy, free in growth, and charming when laden with their clusters of richly-coloured berries in autumn. Ordinary soil suits them. The vigorous *C. buxifolia* has small deep green Box-like leaves, bears an abundance of white flowers, and bright red berries in autumn. *C. rotundifolia*, a Himalayan species, grows about four feet high, is rather slow in growth, free in blossom, and retains its richly-coloured berries throughout the winter. *C. microphylla*, also from the Himalayas, is a close growing evergreen shrub of excellent habit, and the best of the Cotoneasters for clothing ugly walls. Its leaves are small, very deep green, and its delicate blush white flowers are succeeded by attractive berries. *C. frigida* is very pleasing in flower as well as in fruit. It forms a small tree.

C. Simonsii, also free in growth, is another conspicuous autumn shrub. Its berries are bright red and borne in great profusion; a most useful kind for town and country gardens. *C. horizontalis* is a very pretty shrub in autumn. It bears a quantity of bright berries, and the foliage dies off with resplendent hues. It is of low-spreading habit, and delights in a sunny spot to bring out its leaf colours. Several new species have been introduced from China during the last twenty years. Of these *C. bullata*, a strong-growing shrub with rather loose branches, bears large, dark green leaves and is very showy in autumn by reason of large axillary clusters of bright red berries. *C. applanata* is another very beautiful shrub; its fruits are bright red also, and are borne in profusion. *C. pannosa* grows at least eight feet high and bears scarlet berries lightly covered with white down. *C. Franchetii* is likewise a vigorous-growing species somewhat like the last named. Both are from Yunnan. *C. angustifolia* resembles the common *Pyracantha* in many respects but bears orange-coloured fruits.

Cratægus (Thorn).—A lovely group of free-growing small trees, well adapted for the small garden. They vary considerably in habit of growth, as well as in the colour and size of flower, and are essentially spring-flowering. Few trees of similar growth are more effective at that period of the year. Many of them, too, bear a profusion of brilliant fruits in autumn and winter. *C. Crus-galli* (Cockspur Thorn), from North America, has long stiff spines, with which the branches are beset. Its large flowers are white, and succeeded by numerous clusters of crimson fruits, which are sometimes retained upon the leafless branches until spring. The brilliant tinted foliage also hangs upon the trees for a long time. The varieties *prunifolia* and *ovalifolia* are also showy autumn trees. *C. Azarolus* makes an admirable specimen for the lawn, being of graceful habit and flowering after many of the thorns have lost their blossom beauty. Its large yellow fruits are showy and borne with great freedom. *C. pinnatifida* begins growth early in spring, and in autumn its deeply cut leaves are heavily suffused with orange-yellow. Its fruits are large and handsome. *C. coccinea*, the North-American scarlet-fruited Thorn, grows freely in moist soil, forming a well-balanced head, and when laden with its white flower-clusters in April and May it is strikingly beautiful. It seldom grows more than twenty-five feet in height, and its rich green leaves change in autumn to brilliant crimson, at which time its showy fruits appear in profusion. *C. macrantha* is another very fine autumnal tinted tree. *C. heterophylla*, known also as *C. multiflora*, is of excellent growth, very free, and bears crimson fruit. *C. tanacetifolia* (Tansy-leaved Thorn) is very beautiful, having much cut grey leaves and sweet-scented flowers and yellow fruits. It blooms quite late. *C. Carrièrei* is free in growth and very ornamental. Its large orange-red fruits are showy and hang upon the tree generally until spring. *C. Douglasii* is vigorous, flowers early, and has dark fruits. The Washington Thorn (*C. cordata*) is a conspicuous autumn tree with great corymbs of white flowers late in spring and showy fruit in autumn. Amongst the numerous varieties of the Common Thorn the following are especially

good: *Lucida*, flowers double white; *flore pleno coccineo*, flowers double scarlet; *flore pleno roseo*, flowers double, rose coloured; *flore puniceo*, flowers single red; *atrofusca*, weeping habit, flowers white. Paul's Scarlet is a very bright kind. *C. Pyracantha* (Evergreen Fire Thorn) is a well-known shrub, usually planted against a wall, and is one of the most attractive of shrubs for this purpose. The berries are borne in clusters, and if birds are kept off, will remain fresh for the greater part of the winter. All the Thorns thrive in any good soil.

Cytisus (Broom).—This is a fairly large group of shrubs, with pea-shaped flowers. Ordinary soil suits them, and they succeed well in dry situations. Those mentioned are perfectly hardy and satisfactory in all ways. *C. biflorus* is of sturdy growth and very free-flowering. Its bright yellow flowers are borne in clusters. The Black Cytisus (*C. nigricans*), from Austria, bears rich yellow flowers in erect racemes towards midsummer. *C. præcox*, a hybrid between *C. albus* and *C. purgans*, is a grand shrub for massing. In habit it is less vigorous than the White Broom. The flowers are sulphur yellow. *C. capitatus* is a much branched bush, four feet high, with bright yellow flowers at the points of the growths. *C. purgans* is a charming free-growing and free-flowering dwarf shrub. Its flowers are bright yellow. *C. purpureus* is another good dwarf spreading shrub, which bears dull purple flowers during May and June. The flowering branches must be cut away as soon as the flowers fade. As it is of procumbent habit it deserves a place in the rock-garden. *C. kewensis* is another rock-garden Cytisus, raised by crossing *C. Ardoinii* with *C. albus*. It is of creeping habit, and bears a profusion of cream-coloured flowers. *C. albus* (White Broom), *C. scoparius* (Yellow Broom) are too well known to need description, and *andreas*, a variety of the last named, also known as *Genista andreana*, is very showy and blooms profusely. *C. Beanii* is a dwarf, golden-flowered hybrid suitable for the rockery and *C. Dallimorei*, a hybrid between *C. scoparius andreas* and *C. albus*, bears a profusion of rosy-purple flowers and grows four or five feet high. Groups of White and Common Broom are very beautiful and are the shrubs to plant in rough places, where one wants to preserve a wild free growth.

Daboecia polifolia (*St. Dabeoc's Heath*), and its varieties, *alba* and *bicolor*, are exceptionally pretty free-flowering dwarf evergreens, which seem to flourish best in damp peaty soil. They are just the kind of shrubs for planting in masses at the foot of the rock-garden, as their neat habit fits them for such a position. The drooping flowers of each are borne in erect terminal racemes in summer and autumn. The type has crimson-purple flowers; *alba*, white; and *bicolor*, white and purple on the same plant (see also p. 185).

Daphnes.—These are low-growing, deciduous, and evergreen shrubs, native of Europe, Japan, China, &c. The family is a fairly large one, and many species are suitable for open-air culture in this country. They should be planted in rich soil of good depth, and as they require plenty of water while growth is being made, perfect drainage should be provided. It is also advisable to shield them from cold winds. Few shrubs are more

THE EARLY-FLOWERING BROOM, *CYTISUS PRÆCOX*.

DAPHNE GWENKA, A RARE HARDY SHRUB WITH LILAC-BLUE FLOWERS.

welcome during winter and early spring than the Mezereon (*D. Mezereum*), when its sturdy leafless branches are crowded with small clusters of rosy-purple, deliciously-scented flowers. It is a good shrub for grouping, and flowers most freely in an open spot shielded from the sun in the hottest part of the day. There is a variety with white flowers (*alba*), and another with red flowers (*autumnalis*). The last named is a good garden shrub, not only for its richly-coloured flowers, but because they are produced over such a long period. It is not unusual for it to keep up a succession of bloom for about four months. *D. Genkwa*, from Japan, should be planted extensively, as its hardiness is thoroughly established, and its flowers are of distinct colour. It forms a loose, bushy, free-growing shrub, with slender branches, and when laden with its delicate lilac-shaded flowers is very handsome. One of the most dainty of evergreen Daphnes is undoubtedly *D. blagayana*, introduced nearly forty years ago from Syria. Notwithstanding its hardiness, freedom, and the fact that its sweet-scented, ivory-white flowers appear in March, it is by no means common. *D. alpina* is a charming little plant from the European Alps, and quite at home in the rock-garden. It is neat in growth, and bears pinkish-white blossoms in early spring. The Garland Flower (*D. Cneorum*) is another fine rock-garden Daphne; it is dwarf, compact, free in growth, and has delightful blossoms. Few flowering shrubs of similar growth create a better effect than the Garland Flower when displaying its rose-coloured fragrant blossoms at the ends of the growths, and these remain fresh and attractive for a considerable time. *D. Laureola* (Spurge Laurel) and *D. pontica* are valuable principally because they flourish under the drip of trees. The flowers of both species are greenish-yellow and fragrant. *D. sericea*, known also as *D. collina*, is a distinct and beautiful species of dwarf habit, with deep green leaves and large clusters of sweet-scented, rose-coloured flowers.

Desfontainea spinosa should have a place against a warm wall, as it is not sufficiently hardy to endure open-air culture in all parts of the British Isles. It is a sturdy, holly-like shrub from Chili, and when planted in rich soil and well supplied with water in spring produces a wealth of drooping scarlet and yellow flowers.

Deutzias.—These are ornamental deciduous shrubs with, as a rule, white flowers. They are quite hardy, free in growth, floriferous, and useful for forcing as well as for giving variety to the shrubbery border. *D. gracilis*, a slender-growing shrub two feet or so high, is in great demand for forcing, as its flowers readily respond to gentle heat. Its variety *Lemoinei* is of erect sturdier growth, and its pure white flowers appear in neat trusses. *D. corymbiflora* should be included in a select list of Deutzias. It is a distinct kind, with large graceful panicles of snow-white flowers. *D. crenata*, erroneously known as *D. scabra*, is vigorous and very handsome. Its pure white flowers are borne in racemes freely and it grows about eight feet high. The variety *punctata* is very showy, has variegated foliage; and the double-flowered form, named *flore pleno*, is heavily shaded with reddish-purple. Pride of Rochester is another excellent variety with double flowers, but in this case they are pure

white. The introduction of *D. discolor* and its variety *purpurascens*, both natives of China, gave an opportunity for the hybridist to raise a number of beautiful hybrids. These two kinds have large purplish flowers, and many of the new kinds have pink or purple shaded blossoms. Good ones are: *floribunda*, *campanalata*, *carminea*, and *multiflora*. Crossed with other species such kinds as *kalimæflora*, *Boule de Neige*, and *Avalanche* have originated, all of which are showy shrubs. A new species from China, *D. Vilmorenæ*, is remarkable for its vigorous growth and fine flowers. Growing at least six feet high, it bears large inflorescences of white flowers. *D. Wilsoni* is another new Chinese species. Its flowers are white and borne in large corymbs. Two species with purple flowers have but recently been brought to notice. These are *D. longifolia* and *D. Veitchii*. Both are from China. All like moderately rich well-drained soil.

Diervillas, better known in gardens as Weigelas, or Bush Honeysuckles, form a delightful group of free-growing shrubs with bell-shaped blossoms of varied colour. They are quite hardy and succeed well in sandy soil; but the greatest display is obtained when planted in fibrous loam with which has been incorporated a good quantity of leaf-soil. Bush Honeysuckles love a sunny position. The stock can be readily increased by cuttings taken off in June and planted in sandy soil and placed in gentle heat. Beyond the removal of worn-out growths and the sappy shoots little or no pruning is required. *D. grandiflora* flowers early and remains attractive for several weeks. It has rose-pink flowers in abundance. *Rosea* bears rose-coloured flowers in April and May. *Hortensis nivea* has pure white blossoms, and is very free and lasting. *Looymansii aurea* is conspicuous, as it has golden-coloured foliage, which fortunately does not burn in the sun. In spring the leaves are bright yellow and in autumn heavily stained with brown. Abel Carriere is a beautiful variety with large reddish-carmine flowers, produced abundantly. Eva Rathke is decidedly the best of the later flowering kinds, and should be in all gardens where attractive deciduous shrubs are admired. It is of bushy growth, free-blooming, and its medium-sized flowers, of a deep purplish-crimson hue, are borne from midsummer until late autumn.

Dipelta, a group of shrubs closely allied to the *Diervillas*. Several species, all natives of China, are known, and two, *D. floribunda* and *D. ventricosa*, have been introduced. Both have tubular flowers, those of the former being white with a rose-coloured flush on the outer side and yellow-marked within, and those of the latter reddish-purple outside and white and yellow inside. They require similar soil and cultivation to the *Diervillas*.

Elæagnuses (Oleasters).—These are valuable, and include deciduous and evergreen kinds. They are of the simplest culture and thoroughly hardy. For planting on dry banks the variegated evergreen Oleasters are a success, and if the position is a sunny one the leaf coloration is particularly bright during winter. They are also excellent for planting as single specimens on the fringe of the lawn, and few shrubs are better

adapted than the evergreen Oleasters for clothing ugly walls. *E. angustifolia*, from Southern Europe, forms quite a tree, and needs plenty of head room to display its true beauty. It has narrow leaves, light green with a white reverse, and its clusters of delightfully fragrant full yellow flowers borne in the leaf axils are succeeded by showy fruits. *E. longipes* grows about eight feet high and as much or more through, and flourishes in hungry soils. It is a very handsome shrub when in fruit, and is worth planting largely for this reason. The North-American Silver Berry (*E. argentea*) is another beautiful deciduous species, with sweet-scented flowers. It has silvered leaves, and the clusters of yellowish flowers are followed by roundish berries. *E. umbellata* is an ornamental Japanese species. It is of good growth, and during summer bears cream-coloured flowers. *E. macrophylla*, a Japanese species of robust growth, has a lavish display in winter of greenish-yellow flowers. Its bright green leaves are powdered on the under sides with white, and when ruffled by the wind a pleasing effect is created. *E. pungens* is a bold green-leaved winter-flowering species; but its golden-leaved form (*aurea*) is the showiest of the group. It is strong in growth, and the greater part of its leaves are rich yellow slightly margined with pale green. A grand shrub for the lawn.

Empetrum nigrum (*The Native Crowberry*) flourishes in soil suitable for Heaths. It is a neat evergreen shrub, well adapted for edging beds, and is also worthy of a place in a shady nook in the rock-garden. It has small pink flowers and dark berries.

The hardy **Ericas** (*Heaths*) are quite unfamiliar in many gardens. The general belief that they only make satisfactory growth in peaty soil is wrong, as they grow freely and flower abundantly in loamy soil provided it is sweet, suitably drained, and free from lime. If an annual surface dressing of leaf-mould can be given much good will result. They may be used in a variety of ways with excellent effect. For instance, the dwarf, cushion-like Heaths are serviceable for edgings to beds of low-growing American shrubs, while the taller growing kinds are not out of place in the shrubbery provided sunlight and air are not shut out. The flowers appear over a long period, and some of the kinds—viz. *lusitanica*, *mediterranea*, and its varieties—are produced when flowers are by no means plentiful out of doors. The following is a list of pretty Heaths suitable for the open garden, and it may be taken as representing the various groups. *E. lusitanica*, from Spain and Portugal, is rather tender, and at flowering time—between February and May—few Heaths are more pleasing. The drooping flowers are pale pink, almost white, and appear on almost every small twig. The Tree Heath (*E. arborea*) grows eight or nine feet high and flowers about the same time as the last named. Its flowers are white, a noble kind. *E. Tetralix*, a native cross-leaved species, carries a profusion of delicate pink flowers towards mid-summer. The red and white varieties are very beautiful, too, and delight in moist soil. *E. mediterranea* is a free-growing species, often reaching three feet in height, and is beautiful in mid-January with its pink flowers. The variety *hybrida* is an improvement on the type. It

flowers early, is of erect habit, and exceptionally free. The pale pink flowers are very lasting. The Grey Heath (*E. cinerea*), a native species, grows about a foot high, and at midsummer has a profusion of purple flowers in terminal racemes. *E. carnea* (Winter Heath) is a jewel. It is neat in growth, wonderfully free, and flowers in the dead of the winter, the colour being a pleasant shade of rose-pink. The variety *alba* also deserves mention, as it flowers at the same time. Planters should make a note of these fine Heaths (see also p. 179).

Escallonias are seaside shrubs, and some of them are very free. They form neat bushes, and for their foliage alone deserve greater recognition. In very cold localities plant them against a wall, as they are apt to suffer in very severe winters. Most of them are evergreen and flourish in ordinary soil, but dislike positions exposed to east winds. *E. macrantha*, the most frequently planted evergreen kind, is very handsome and sturdy, with bright glossy green leaves and clusters of red flowers produced freely during summer. *E. philippiana* is not only the hardiest, but one of the most distinct and pleasing of Escallonias. It is a native of Valdivia, and was introduced to this country nearly thirty years ago. It is bushy, of free growth, with long arching shoots, narrow bright green deciduous leaves, and its dainty pure white blossoms appear in profusion. *E. langleyensis* is a most attractive hybrid raised by crossing *E. philippiana* with *E. macrantha*, the former being the seed parent. Its small flowers are of a rose-pink shade, and as they are borne so liberally the plant, when in full flower, is particularly bright. *E. floribunda* bears white flowers, generally after the majority of the kinds have finished flowering, for which reason it is valuable for prolonging the display. It grows freely, and is of neat habit.

Eucryphia pinnatifolia, an uncommon shrub, introduced from China about 1870, bears white flowers with bright yellow stamens in the centre. It blooms in summer, and its handsome, bright green, pinnate leaves are tinged with brownish-orange and crimson in autumn. It requires a rich, perfectly drained soil and sheltered position, but at the same time one exposed to full sunlight is essential, because it never blooms well unless the wood is thoroughly matured. It forms a sturdy bush, and is rather slow in growth.

Euonymuses (*Spindle Trees*).—These include deciduous and evergreen shrubs, or small trees indigenous to Europe, North America, &c. Every one is of simple culture. None are conspicuous for showy flowers, but the deciduous kinds, particularly the Spindle Tree (*E. europæus*) and its varieties, are remarkably pretty in autumn with their richly coloured capsules. Many an English hedgerow is made bright with the ruddy berries. The autumn-tinted foliage, too, is very bright. *E. europæus* is well known, but some of its varieties are less frequently seen, the most important of which are: *Atropurpurea*, which differs from the type in having deep purple leaves, shaded with orange in autumn. It has showy capsules and prominent seeds. The leaves of *aucubifolius* are bright green, spotted with yellow. The broad-leaved Spindle Tree (*E. latifolius*) is a fine shrub for the garden, and altogether finer than

ESCALLONIA LANGLEYENSIS, A BEAUTIFUL HARDY SHRUB WITH BRIGHT ROSE FLOWERS.

THE GOLDEN BELL (FORSYTHIA SUSPENS A) A BEAUTIFUL
HARDY, SPRING FLOWERING SHRUB.

E. europæus both for its foliage and berries. Of the evergreen kinds, the following list comprises a few of the best: *E. japonicus latifolius albo-variegatus* has pretty silver leaves; Duc d'Anjou, green and gold; *macrophyllus*, broad deep green; *aureus*, yellow and pale green. *E. radicans* is well adapted for edging borders, as it stands the shears well, and is always of neat appearance. It also makes an excellent wall shrub. The variety, Silver Gem, is much stronger in growth than the type, and well deserves greater popularity. Its leaves are silvery white and pale green; a bright little plant for winter bedding. The other variegated forms are useful too.

Eurybia. See *Olearia*.

Exochorda grandiflora (*Pearl Bush*), known also as *Spiræa grandiflora*, is a Chinese species, perfectly hardy, of free growth, and flowers abundantly. In May it carries long racemes of snow-white flowers. It is a much branched shrub, and grows from six to ten feet high. *E. Alberti* is pleasing and rarer than *E. grandiflora*. It is of stiff habit, and bears pure white blossoms, but they are not produced so freely as in the first named. A Pearl Bush in flower is very beautiful, like a drift of snow; will grow in any good garden soil.

Forsythia (*Golden Bell*).—This is a small group of bright early spring-flowering deciduous shrubs. They are quite hardy and grow in ordinary soil. The most useful kind is *F. suspensa*, a shrub with long slender growths, and in March when its drooping bell-shaped, rich yellow flowers appear, it is most effective. Planters should remember that the Forsythia flowers are borne in advance of the leaves, on which account care should be exercised at planting, and a suitable background secured to bring out the full beauty of the golden bells. It is amenable to various forms of culture. For instance, it is well adapted for training against a wall, securing only the principal growths and allowing the others to fall at will; and for covering pergolas, pillars, and similar arrangements it is of much use. *F. viridissima* is of very different growth to the last named. It is a sturdy, bushy shrub, with bright yellow bell-shaped flowers, and useful for planting in groups in the front of the border, but should never be placed where it is likely to get choked by taller and more vigorous things. *F. suspensa* is easily kept within reasonable bounds by a free use of the knife, as it stands hard pruning. Any cutting back should be done in spring just after the flowers have faded, as the plants then have the full growing season for the production of fresh wood. There is a useful hybrid between these two species called *intermedia*. It is very floriferous, but is surpassed in this respect by its variety *densiflora*.

Fraxinus excelsior (*Common Ash*) is at home more in the park and pleasure-ground than in the garden, but if space permits, room should be reserved for one or two of its varieties, especially that with golden bark so beautiful in winter. Its golden leafage is conspicuous in summer too. The silver-leaved variety (*foliis argenteis*), with tender green leaves profusely speckled with white, is a good summer companion to it, and that distinct Ash (*F. e. heterophylla*), known also as *simplicifolia*, deserves attention. It is vigorous and decidedly ornamental. Then

there is the pendulous form of *Fraxinus excelsior*, one of the best of trees of weeping habit. Amongst Flowering Ashes, *F. Ornus* grows upwards of twenty-five feet high, and is well adapted for planting on the lawn. It carries immense clusters of cream-white flowers in early summer. *F. floribunda* (*Ornus floribunda*) is perhaps more vigorous, and certainly one of the best of Flowering Ashes. There is an uncommon Chinese species named *Mariesii*, which is very beautiful and distinct, but not so free in growth as those already referred to. Its pure white flowers appear rather late.

Fremontia californica.—This Californian deciduous shrub is too valuable to pass by notwithstanding its rather delicate constitution. Only in specially favoured localities should it be planted in the open shrubbery, as it is too tender for general use out of doors. It will give satisfaction, trained against a wall if planted in sandy loam, taking care not to choose a place exposed to east winds. It grows about twelve feet in height, and bears bright yellow flowers two inches across in early summer.

Garrya elliptica.—Few evergreen shrubs are more ornamental in winter than a large wall plant of this Californian Shrub when covered with its elegant catkins, varying in length from six inches to eight inches, and borne at the tips of the previous season's growth. When planted in the ordinary shrubbery it seldom grows more than six feet high, but given rich soil and copious supplies of water while growth is in progress, it develops more strongly.

Gaultheria procumbens (*Creeping Winter Berry*).—A neat evergreen carpet shrub, introduced from North America; delights in a cool, moist, peaty soil, and partial shade. Towards midsummer it bears masses of small white drooping flowers, and in autumn and winter its small red berries are very bright. Its autumn-tinted foliage is another bright feature. *G. Shallon* is quite distinct from the last named, and grows about three feet high; it is a good evergreen for planting under trees, and small white flowers precede the purplish berries.

Genistas.—These are hardy shrubs of simple culture. *G. pilosa*, a procumbent British species, should be grown in the rock-garden and in the ordinary shrubbery. The same remark applies to *G. sagittalis* and *G. prostrata*. All have bright flowers. The Spanish Broom (*G. hispanica*) is a treasure for dry banks, also as marginal lines to the shrubbery. It is a dense growing prickly shrub, and its rich yellow flowers appear in July, a succession being maintained for several weeks. *G. radiata*, occasionally met with as *Spartium radiatum*, a native of Southern Europe, grows about eighteen inches high, and bears yellow flowers in terminal heads in July. *G. ætnensis*, popularly known as Mount Etna Bloom, is an old garden shrub, and in late summer, when bearing its wealth of golden-coloured Pea-shaped flowers, produces a striking effect. It should be planted in groups, as the effect in a mass is more telling than that produced by the wretched "dot" system. *G. virgata* is the best of the taller growing species for planting in poor, hungry soils. It is of free growth, and its bright yellow flowers are not only borne abundantly, but they remain attractive for a considerable period.

CATKINS OF *GARRYA ELLIPTICA*.
A hardy evergreen shrub for winter effect.

BRANCH OF THE SNOWDROP TREE (*HALESIA TETRAPTERA*).

Halesia tetraptera (*The American Silver Bell Tree*), introduced to this country about the middle of the seventeenth century, is happy in moist soil, such as that found near lake and stream side. Its pendent Snowdrop-like flowers appear in clusters in spring, at which time it is very pretty. It is a valuable small deciduous tree for the garden, and in autumn its winged fruit gives additional beauty. *H. hispida*, occasionally met with under the name of *Pterostyrax hispidum*, indigenous to Japan, has white flowers which appear in long racemes after those of the first named. *H. corymbosum*, formerly known as *Pterostyrax corymbosum*, also from Japan, grows about twelve feet high and has long panicles of white flowers touched with pink.

Hamamelis (*Witch Hazel*).—*H. virginica* may be planted in damp soils. It is of dense bushy growth, and in early winter bears small yellow flowers, individually not showy, but a large bush laden with blossom is attractive. The Japanese Witch Hazel (*H. arborea*), a charming hardy tree, dwarf but welcome, because it blooms in winter; the flowers are made up of long, narrow, wavy, golden yellow petals, with a reddish-coloured calyx. We enjoy a tree in full bloom in January and February, when the brown leafless shoots are covered with golden blossom. A rather rare species from Central China, named *mollis*, makes a valuable addition to early-flowering shrubs. It differs from the last named in being of slower growth, possessing deeper coloured flowers and larger leaves; it is very free. The Witch Hazels are deciduous and blossom while the branches are leafless. Plant in front of evergreens, as this enhances the beauty of the flowers. Soil consisting of loam and leaf-mould, with the addition of a few lumps of broken peat, suits them admirably; but special attention must be paid to drainage, because if water is allowed to lodge about the roots the trees soon get unhealthy.

Hedysarum multijugum is a valuable shrub of the Pea family. It flowers long after the majority of shrubs and trees, and requires a sandy soil, good drainage, and sunny position. When in happy circumstances it grows four feet or five feet high, and has purplish-coloured flowers in long racemes, usually from midsummer to the middle of September, and in very fine seasons the display is continued to the early part of October.

Helianthemums (*Sun Roses*).—Dwarf-growing evergreen plants, thoroughly hardy and very useful for planting on dry sunny banks or as edgings to low-growing shrubs. They flourish best in sandy soil, and should never be planted in cold sunless positions. Good drainage is of immense importance, as Sun Roses are never a success in cold water-logged soil. *H. vulgare* and its single and double-flowered forms are very free and adapted for the rock-garden. *H. formosum*, from Portugal, has bright yellow flowers blotched with reddish-purple. It grows about three feet high and is very free.

Hibiscus.—Few thoroughly hardy-flowering shrubs are more beautiful in autumn than the form of Hibiscus, or Shrubbery Althæas as they are sometimes called. No soil seems too bad for them, and they blossom profusely in partial shade as well as in exposed situations. *H. syriacus*

(Syrian Mallow) forms a round-headed bush six feet to eight feet in height, and at the end of summer bears masses of purplish flowers blotched with crimson. The under-mentioned are a few of the best varieties : Painted Lady is very conspicuous ; flowers large, delicate rose, with large red blotches at the base of each petal. *Totus albus* is a remarkably pretty and distinct pure white free-flowering variety ; should be far more popular. The flowers are smaller than those of the type. *Cælestis* is a dainty variety, with medium-sized, bright blue flowers blotched with purple. The flowers of *puniceus plenus* are semi-double, rosy-purple with a deep purple base, and those of *cærulea plena*, also double or semi-double, are mauve with a purple base.

Hippophæ rhamnoides (*Sea Buckthorn*) is one of the finest of berry-bearing shrubs for winter effect. It is very cheap and perfectly hardy. Although usually considered a seaside shrub only it can be recommended for inland planting, and if grown in masses near the edge of water the effect in winter, when the long shoots are smothered with round brilliant orange-shaded fruits, is very striking. It is quite a success in sandy soil, and its berries remain bright for a long time. It is also an attractive standard tree, and its silvery-grey leaves are quite distinct. It must not be forgotten that one male plant should be planted to every group of six female ones, otherwise no fruit will be produced. Complaints are frequent of the Sea Buckthorn not fruiting, and this failure may generally be attributed to the absence of the male form.

Holboëllia latifolia, formerly known as *Stauntonia latifolia*, is a vigorous Himalayan evergreen climber, growing upwards of a dozen feet in height, and bears clusters of delightfully fragrant purplish flowers. Protection from biting winds is necessary, and rough turfy loam forms a good soil for planting it in. In spring and early summer it is much benefited by copious supplies of water, for which reason ample drainage should be provided.

Hydrangeas form a group of hardy shrubs of considerable importance, not only in the outdoor garden but under glass. One of the most useful is *H. Hortensia*, known also as *H. japonica*, and is the most frequently planted kind ; it flourishes amazingly near the sea line, and it is quite hardy in a sheltered nook inland. We need hardly describe a shrub so leafy and showy when in flower. Of the many garden forms of this Chinese shrub the following are particularly meritorious : Thomas Hogg produces great heads of white flowers, and *Lindleyi*, better known perhaps as *japonica roseo-alba*, also deserves mention, and *stellata*, with its bright pink flowers touched with rose, is too valuable to pass by unnoticed. Iron in the soil turns the flowers to that deep, beautiful blue, so conspicuous in the autumn landscape, and a preparation containing iron is now sold for the purpose and can be recommended. *H. paniculata grandiflora* is unquestionably the best of the autumn blooming kinds, and worthy of a place in the small garden. It is a noble shrub for massing, and if planted in deep, fertile soil and the young shoots cut back close to the old wood before growth commences in spring a superb display may be expected in autumn. The thin sickly

HYDRANGEAS IN THE SOUTH-WEST.

THE LARGE PANICLED HYDRANGEA (*HYDRANGEA PANICULATA GRANDIFLORA*).

shoots should be removed altogether, and if a top dressing of manure can be given in summer additional strength will be given to the plants. The flowers are white and borne in dense panicles about a foot long and remain attractive for about two months, eventually dying off a reddish-brown colour. *H. radiata* (*H. nivea*) is an ornamental-leaved American species, with bright green leaves, the under sides being covered with white tomentum. It is grown more for its attractive leaves than for its flowers. Good loamy soil and thorough drainage are essential for these shrubs.

Hypericum (*St. John's Wort*).—Some of these are old garden favourites, well adapted for a variety of purposes, and succeed in ordinary soil. Those here mentioned comprise a few (by no means all) of the best for general planting. *H. hookerianum*, known also as *H. oblongifolium*, is the most attractive of the vigorous growing evergreen species, and towards the close of summer bears large, substantial, beautifully-shaped, deep yellow blossoms about the size of a crown piece. It is a Himalayan species of erect habit and excellent for grouping. *H. patulum* is rather uncommon and very beautiful. It produces slender arching shoots, with deep green leaves and medium-sized flowers. *H. calycinum* (Rose of Sharon) is a spreading half-evergreen shrub, and succeeds under the shade and drip of trees, for which purpose we advise it to be planted. It is a splendid carpet plant and delights in a cool soil. *H. moserianum*, a cross between *H. calycinum* and *H. patulum*, bears large, rich, yellow flowers of great substance. It is bushy, dwarf, very free-flowering, and the best of the later additions to the St. John's Worts. *H. androsæmum*, *H. uralum*, and *H. hircinum* are good kinds too.

Idesia polycarpa.—A remarkably handsome Japanese deciduous tree, very rare and quite hardy, but liable to get injured from cold winds in spring, unless a sheltered place can be found for it. It is of sturdy growth in deep rich naturally drained soil, and its vigorous branches, with large, bright green, heart-shaped leaves, and crimson petioles, are quite distinct from those of any other hardy tree. Its small yellowish green flowers are in pendulous racemes, and very fragrant.

Ilex Aquifolium (*The Common Prickly-leaved Holly*) and its numerous varieties are in the front rank of evergreen shrubs and small trees. As a hedge plant the Holly is unrivalled, and is used extensively in all parts of the country, as it succeeds in various kinds of soil. The winter effect of a large tree of the Common Holly standing alone in the pleasure-ground is very beautiful, either with or without its rich scarlet berries. In addition to the green-leaved forms, some have silver and golden-coloured leaves, and a few are of decidedly weeping habit, all of which may be advantageously used even in small gardens. It is a good plan to frequently transplant Hollies during the first few years of their growth to encourage the production of fibrous roots. Early autumn and late spring are the best times for lifting Hollies. Propagation may be effected by seed, which should be mixed with sand immediately it is gathered and laid by in a heap until spring, the whole being turned over three or four times in the interval. Sow in drills, or in well-drained beds, just covering

the seed with very fine soil. Cuttings of well-ripened shoots may be taken off in late summer, and planted in sandy soil in a cold frame. Water with a fine rose water-pot occasionally, and shade in bright weather. Budding is carried out in summer, and grafting under glass in spring, but it should not be forgotten that plants on their *own roots* are the most satisfactory. The under-mentioned list comprises some of the most attractive of green-leaved Hollies: *Wilsoni* is vigorous, with large, glossy green leaves, and an abundance of berries. *Fructu-luteo* differs from the type in having yellow berries instead of red. *Shepherdii* is splendid for town gardens and avenues; its leaves are large, and the shrub berries freely. *Camelliaefolia* is a noble Holly, with large shining green leaves. *Ovata* is a medium-sized variety, with beautiful rich green leaves. *Handsworthensis* and *Mundyi* are very fine. Of variegated Hollies, *Watereriana* (Waterer's Dwarf Golden Holly) is a charming variety, neat in growth, with smooth golden-coloured leaves; this is a grand variety for planting on the fringe of the lawn. Another excellent golden-leaved variety is named *aurea regina*, popularly called Golden Queen; it is more vigorous than the last named, and one of the showiest of its class. Golden King is another free-growing variety, with highly coloured leaves. *Flavescens* is distinct and very beautiful; its leaves are heavily marked with yellow. *Argentea regina* (Silver Queen) is a choice Holly, and a silver counterpart of Golden Queen. *Argentea medio-picta* (Silver Milkmaid) should be represented, as it is very ornamental, with cream-white leaves, margined with green. Handsworth Silver is a splendid variety. Weeping Hollies should include the green-leaved variety of the type; very handsome, and well adapted for planting on the outskirts of the lawn. The golden-leaved variety (*aurea*) is remarkably pretty, and quite distinct from all other trees of weeping habit. There is also a good silver-leaved weeping variety named *argentea*.

Indigofera gerardiana.—A pretty pea-shaped flower; is sufficiently hardy to plant in the garden, although the greatest flower display is produced when planted in sandy soil at the foot of a sheltered wall. Its pink flowers are in racemes two inches to three inches long, and quite pretty in summer. Except in very warm counties, a south wall must be chosen for the *Indigofera*.

Itea virginica.—A thoroughly hardy North-American shrub, four feet or five feet high, and very attractive in midsummer when carrying its racemes of white flowers. It prefers a damp soil and partial shade. Not only are the flowers produced in profusion, but they keep fresh for a considerable time, and as they appear when few hardy shrubs are in bloom it should be carefully noted.

Jamesia americana.—A strangely neglected, dense growing deciduous shrub from the Rocky Mountains, flowers in early summer, and needs no protection even in very severe winters. Rather slow in growth, it seldom develops more than four feet or five feet high, and is quite distinct, with rather rough, oval, greyish leaves, its terminal clusters of pure white flowers being very pretty. It succeeds well in dry soil, but prefers a moist rich one and a shady position.

THE SEA BUCKTHORN AS A TREE.

AN AGED LABURNUM IN FLOWER.

Kalmias.—Here we have a small group of ornamental evergreen, free-flowering American shrubs, delighting in soil favourable to the Rhododendron. Chalk or lime in the soil, or water supplied to them, is injurious. They are neat in growth, and suitable for massing; and by planting bulbs like lilies between them a rich display is obtained with little trouble in autumn as well as in spring. They are usually grown as bushes, but *K. latifolia*, the broad-leaved Mountain Laurel, makes a handsome standard—a form by no means common in gardens. Its great terminal clusters of soft rose-coloured, wax-like flowers are very pretty and lasting. The Swamp Laurel (*K. glauca*) grows about two feet, is of rather loose growth, and bears a wealth of lilac-purple clusters. *K. angustifolia*, also known as the Sheep Laurel, is quite distinct from the foregoing. The flowers are deep red, smaller than those of the *K. latifolia*, and borne with greater freedom. There are several decorative varieties of *K. angustifolia*, and all may be identified by the varietal names—*i.e.* *rubra*, bright red flowers; *rosea*, rich rose-colour; and *ovata*, with ovate leaves. Kalmias are favourite shrubs for forcing. Hard forcing is not necessary, as the flowers respond to gentle heat if the atmosphere is kept moist. As the buds begin to open remove the plants to a cooler structure so as to prolong the season of flower.

Kerria japonica (*Jews' Mallow*), occasionally met with under the name of *Corchorus japonicus*, has yellow flowers, and the silver-leaved form (*foliis variegatis*), although not quite so vigorous, is very ornamental. The double *Jews' Mallow* (*K. j. flore pleno*) is the commonest kind, and succeeds admirably in sandy soil. It is a good shrub for planting against a wall and for grouping in the shrubbery. The bright yellow double flowers are borne abundantly. There is another very rare variety, named *major*, with remarkably fine double yellow flowers. It flowers freely and continuously.

Laburnums.—Planted with discretion the Laburnums produce delightful pictures in the garden. In spring and early summer, when the long drooping racemes of *L. vulgare*, the common kind, are at their best, few small trees are more graceful. In addition to the perfect hardihood and accommodating nature of the Laburnums, there is scarcely a soil or position in which they will not grow satisfactorily. *L. alpinum*, known also as *Cytisus alpinus* (the Scotch Laburnum), is a fine tree for decorative planting. It flowers late, and is of great value for this reason; it grows twenty feet high. The variety *autumnalis* flowers, as its name indicates, in the autumn, and *Parksii* is another excellent form, with slender racemes of flowers often a foot long. *L. Adami* (*Cytisus Adami*) is remarkable because it bears dull purple and yellow flowers on the same tree. It is a graft hybrid between *L. vulgare* and *Cytisus purpureus*, and we have seen this planted in the hedgerows. Of the varieties belonging to *L. vulgare* the undermentioned are the most distinct:—*Carlieri* has narrow racemes of flowers generally a fortnight after those of the type; *quercifolium* has deeply-cut leaves; and *foliis aureis* bright yellow foliage; while *pendulum* is of good weeping habit.

Laurus nobilis (*Sweet Bay*) should be planted beyond the influence

of cold winds, and the soil most favourable to good growth is one composed of turfy loam, peat, and good leaf-soil in equal proportions. As it is considerably benefited by copious supplies of water in spring just as fresh growth appears, ample drainage should be provided to carry off superfluous water. In localities too cold for planting in the open air it is worth growing in tubs for the cool-house.

Laurustinus. See *Viburnum Tinus*.

Ledums.—These are compact evergreen shrubs, thoroughly hardy, distinct, and ornamental. They flourish in ordinary soil, but prefer one composed largely of peat. *L. latifolium* (Labrador Tree) is vigorous and free in all ways, with its great clusters of white pink-tinted flowers. The Marsh Ledum (*L. palustre*), a European species, grows about three feet high and forms a dense bush with small green aromatic leaves covered with a thick tomentum on the under sides, and in early summer its clusters of small pink flowers are welcome.

Leiophyllum buxifolium is a dainty little evergreen shrub introduced from the sandy plains of New Jersey upwards of 150 years ago. It is little known, exceedingly beautiful in flower, and well adapted for the rock-garden. It should always be planted in a peaty soil. The Sand Myrtle, as it is sometimes called, does not exceed one foot in height—in fact, it is not often more than six inches high; is of dense compact habit, with tiny deep green leaves, and in early summer terminal clusters of small white flowers and rose-pink buds.

Lespedeza bicolor, also known as *Desmodium penduliflorum*, an uncommon deciduous shrub of graceful habit, is hardier than is generally supposed. It is indigenous to China and Japan, and bears an abundance of reddish-purple flowers in long slender racemes. It grows upwards of six feet high, and succeeds best in peat, loam, and leaf-mould, and requires good drainage. In very cold localities it should be planted against a wall.

Leycesteria formosa, a fairly well-known Himalayan deciduous shrub, has pendulous racemes of white flowers touched with purple, and conspicuous purple bracts hang from the axils of the leaves in autumn. The flowers are followed by showy berries. It flourishes in ordinary soil, and is quite a success under the shade of trees. It may be planted as a cover for game.

Ligustrum (Privet).—No soil seems too poor or position too exposed for the ordinary forms of Ligustrum or Privet. As a hedge-plant *L. ovalifolium* (Oval-leaved Privet) is planted by the million; but care is necessary, as it has often been injudiciously used. Although the golden-leaved form, *L. o. foliis aureis*, sometimes met with as *californicum*, is not so free in growth as the type, it is very effective when used with discretion. It dislikes full sunlight and succeeds admirably in towns. *L. sinense*, a much branched half-evergreen shrub from China, is not only welcome for its abundance of cream-white flowers, but also for its black berries, which as a rule hang upon the bushes for several months. *L. lucidum*, introduced from China more than a hundred years ago, has charming flowers. It is erect and grows about twelve feet high, and in autumn bears loose panicles of white flowers in profusion.

The variety with variegated leaves, named *tricolor*, is very showy, but less vigorous than the type. *L. Quihoui*, also from China, a splendid shrub for dry soils, is of rather straggling habit, and looks best planted in groups. As it flowers so late in the season it should be planted largely in public parks and open spaces. Its flowering period is from September to the middle of October, but in mild seasons blooms on until early November. Its flowers are cream-white, sweet scented, and borne in rather slender panicles. *L. japonicum* is of sturdy habit, six feet or so high, with glossy green leaves and large panicles of white flowers about the middle of July.

Liquidambar styraciflua.—The value of this rather slow-growing North American Sweet Gum-tree is not in its flowers, for they are far from showy, but in its autumn effect in the landscape, as its smooth leaves at that season of the year assume mahogany-brown, crimson, and allied colours. It is a splendid tree for small avenues, succeeding best in rather moist deep soil, and when the position is fully exposed to the sun the autumn-tinted foliage is very handsome.

Liriodendron Tulipifera (*Tulip Tree*) is a vigorous North American Tree, handsome for its broad distinct leaves, and large Tulip-like sweet-scented yellow flowers in August. In growth it is erect, and its grey bark is streaked with white. The leaves change in autumn to yellow. There are several varieties, but the one with golden leaves, named *aurea*, is the most effective. It is very showy, grows well, and its bold leaves are heavily blotched with yellow. A new form has been introduced from China under the name of *chinensis*.

Loniceras (*Honeysuckles*).—The Honeysuckle is too familiar to need description. Its pretty slender growths and fragrant flowers are the glory of many an English hedgerow. There are climbers and bush kinds, the latter being useful for the border and the climbers for draping walls, tree stumps, pergolas, and similar erections. Of the border kinds, *L. Tormentella*, a fairly well-known kind, is valuable principally for its late flowering, its small pink flowers appearing in pairs generally in July. *L. fragrantissima* is one of the few hardy shrubs to flower in winter out of doors. As a wall shrub it is very satisfactory, as it is free in flower and growth too, and although its white flowers are small they are deliciously scented. *L. Standishi* is another winter-flowering Honeysuckle, with delightfully fragrant flowers. Where sweet-scented winter-flowering shrubs are required planters will do well to remember these two Honeysuckles. *L. Alberti*, a dwarf kind, is very rare, and from the middle of June to the middle of July displays its dainty rose-coloured flowers. *L. involucrata*, known also as *L. Ledebourii*, bears yellowish red flowers freely in June. *L. tatarica* forms a dense bush, six feet or so high, and in May and June is very pretty with its wealth of rose-coloured flowers. Honeysuckles thrive in any good garden soil.

Loropetalum chinense.—This is a Witch Hazel-like shrub, very rare, pretty, early flowering, and of dwarf growth, with cream-white flowers composed of long slender petals. Ordinary well-drained soil suits it, and select a sunny position to enable it to thoroughly mature its wood.

Magnolias.—A large and beautiful family of shrubs and trees,

valued for their bold and variously coloured fragrant blossoms. Although perfectly hardy, some of them, i.e. *M. conspicua* and *M. stellata*, flower early, for which reason protection from cold winds and sharp frosts is essential. They do not require special soil as they make good growth in the ordinary garden, provided ample drainage is secured, and the points already referred to are not forgotten. Magnolias transplant best in spring, as the roots are sparsely furnished with fibres. Give a good watering immediately after planting. *M. glauca* blossoms in summer. It is of bushy habit, eight feet to twelve feet high, with half-evergreen leaves, silvery on the under sides, and with medium-sized flowers. It prefers a moist soil. *M. Campbelli*, from the Himalayas, is unfortunately not sufficiently hardy for all gardens, besides which it does not flower when young. For planting in the warmer parts of the country it can be recommended, as its large rosy-crimson flowers are very handsome. *M. macrophylla* is a vigorous tree, with large leaves, often three feet long, and immense cream purple-centred flowers. It comes from the United States, and grows upwards of thirty feet high. *M. conspicua* (Yulan) is a familiar Chinese spring-flowering tree of branching habit. A tree a dozen feet or so in height is very pretty in March when laden with bold snow-white fragrant flowers. This is the kind of tree for a lawn. Of the Yulan there are several beautiful varieties, but of these only two need be mentioned here. Perhaps the finer of the two is *Soulangeana*, the flowers of which are heavily tipped and shaded with purple, the inside being flushed with pale pink. Its flowers are very lasting, and appear after those of the type. *Lennei*, with its reddish-purple flowers, is quite distinct and very free. *M. stellata*, occasionally labelled *M. halleana*, is a dainty Japanese shrub, bushy and free. Its sweet-scented, star-shaped flowers, with long white petals, are produced before those of any other Magnolia, and remain in good condition for several weeks. Quite small plants will bloom. The pink-flowered form (*rosea*) is similar to the species, except that the flowers are rose. *M. Watsoni* is an uncommon species, with large, sweet-scented, ivory-white flowers, and a cluster of red filaments. *M. parviflora* is another rare and dwarf species also with white flowers. *M. grandiflora* is the only evergreen kind that will be referred to. It is a noble-looking tree, with large, polished green leaves, and in summer, bold, deliciously scented, cream-white flowers. Although usually treated as a wall shrub, it is a success planted as an isolated specimen on the lawn provided shelter from east winds is given.

Micromelis Folgnieri pendula is a new tree from China closely related to *Pyrus*. It has elegant, drooping branches, clothed with silvery leaves, and bears good-sized heads of white flowers freely in May. Cultivation is similar to that required by the ornamental Crab Apples.

Mistletoe. See p. 261.

Negundo. See *Acer*.

Nuttallia cerasiformis (*Osoberry*).—Grows well in hungry soils. It is a native of California, deciduous, bushy, and very free-flowering, with small white flowers produced in pendulous racemes in February and early March.

MAGNOLIA SOULANGEANA, A VERY BEAUTIFUL SPRING-FLOWERING TREE.

MAGNOLIA STELLATA (EARLY SPRING).

Nyssa sylvatica.—For the garden this North American tree should not be overlooked. It succeeds best in moist soil and a sunny position, when the wood becomes sturdy and well-ripened. It is not conspicuous for showy flowers, its decorative value resting almost entirely upon the glorious autumn tints of the decaying foliage.

Olearias.—The Olearias form a small and pleasing group of New Zealand evergreen shrubs. With the exception of the Daisy Bush (*O. Haastii*), all require some slight protection during severe winters, that afforded by a wall being usually quite sufficient. It is a stiff bushy shrub, four feet or five feet high, with small thick leaves, and in midsummer a profusion of white fragrant flowers. It is a good shrub for massing. *O. gunniana*, a slender species, is particularly pretty when bearing its small pure white blossoms. It is very free flowering, and succeeds better against a wall than in the shrubbery, unless a favoured spot is reserved for it.

Ozothamnus rosmarinifolius is a distinct and beautiful Australian evergreen shrub, with long slender growths, and small narrow leaves. Its small flowers are white, produced freely, and remain attractive for several weeks during summer. It should be planted in rich soil and a sunny spot, and is usually regarded as a shrub suitable only for the mild counties of Devonshire and Cornwall. We have, however, recently seen it growing and flowering well in heavy clay soil in Essex, and no doubt it is much hardier than is generally supposed.

Parrotia persica (*Iron Tree*).—A rare deciduous tree from Persia, succeeding best in a rather dry soil on a slightly raised mound facing south. It is a low-growing, much branched tree, with green Witch Hazel-like leaves turning to brilliant shades of crimson, purple, and bronze-yellow in autumn. Individually the flowers of the Iron Tree are small, with crimson-tipped stamens, produced abundantly in February and March while the branches are leafless.

Paulownia imperialis is a noble tree, and under certain treatment proves a valuable addition to the sub-tropical garden. Grown naturally in the pleasure-ground, where growth is unrestricted, it makes an imposing picture, its large leaves being quite distinct. Its sweet-scented, violet-coloured flowers rarely come to perfection in these Isles, as they appear early and nearly always suffer from late frosts. It often grows forty feet high, and succeeds best in moist soil. When grown in the sub-tropical garden it should be kept to a single stem, which should be cut down close to the base in autumn, and in spring several growths will break from the old stool. Allow the best to remain and remove the others. Leaves produced on shoots treated thus are considerably larger than those on trees left to grow naturally.

Pavia. See *Æsculus*.

Pernettyas, known also as Prickly Heaths, are the showiest and most useful of small berry-bearing evergreen shrubs, and it seems strange that a group of plants so attractive, hardy, and easily grown should be so neglected in gardens. They may be grouped on the turf, and grown in pots for the greenhouse. Peaty, well-drained soil suits them best,

with full exposure to the sun, and an abundance of water in spring and early summer. The varieties here mentioned are all of bushy habit, and the berries are of various sizes and colours—*alba*, blush-white ; *atro-coccinea*, dark scarlet ; *carnea lilacina*, pale pinkish-lilac ; *rosea lilacina*, rose-lilac ; *rosea major*, bright rose ; *rosea purpurea*, rose and purple ; *atrosanguinea*, rich crimson ; *carnea*, flesh-coloured ; *purpurea*, bright purple ; *atro-lilacina*, dark lilac ; *coccinea*, rich scarlet.

Philadelphuses (*Mock Oranges*) are white-flowered shrubs of the simplest culture. The type, *P. coronarius*, was at one time planted extensively, but of late years considerable attention has been paid to the family by the hybridist, with the result that many beautiful varieties have been grown, and the old forms planted more sparingly. The silver-leaved variety, *foliis argenteo-variegatis*, keeps its distinctive character provided it is not planted within the shade of trees or in very wet soil, and few golden-leaved shrubs of dwarf habit are more conspicuous on warm soils than a group of *P. c. foliis aureis*. It is very bushy, of free growth, and the bright yellow leaves are attractive from spring to autumn. *P. grandiflorus* bears large, pure white, very fragrant flowers in abundance. *P. gordonianus* should be planted freely as it blossoms late in the season, usually about July. It is vigorous, and its pure white flowers are not too strongly scented, which, of course, is a point worth remembering, as some people consider the fragrance of Mock Oranges overpowering. *P. microphyllus*, from Mexico, is the smallest of the group, and may be planted in the front of the shrubbery as well as in the rock-garden. It is bushy, between two feet and three feet in height, with twiggy branches, tiny leaves, and small white flowers. Between this and *P. coronarius* there are several excellent hybrids, the undermentioned being the best :—*Lemoinei*, the first of the set, quickly followed by *L. erectus*, *Gerbe de Neige*, *Boule d'Argent* (semi-double), *Mont Blanc*, and *Candelabre*. *Lemoinei* is as pretty as any.

Phillyræa.—All the Phillyræas mentioned are thoroughly hardy, of easy culture, and very ornamental, evergreen shrubs, suitable for planting under large trees. The Laurel-leaved (*P. decora*), known in nurseries as *P. vilmoriniana*, is conspicuous for its long, leathery, bright green leaves—the largest of all the Phillyræas. It is a fine foliage shrub, of spreading habit, and its small, white, sweet-scented flowers remind one of those of Hawthorn ; they are borne in clusters in the axils of the leaves, and are succeeded by round black berries in summer. The shrub when in berry must be netted or birds will soon relieve the bushes of their burden. *P. angustifolia*, a narrow-leaved kind, grows well ; and *P. media* is a shrub of pretty habit, and a success in cold situations.

Pieris.—These evergreen shrubs are ornamental, hardy, and succeed best in peaty soil and positions shielded from cold winds. *P. japonica* (*Andromeda japonica*) blossoms early, its pure white, pendulous racemes appearing in great profusion on medium-sized plants. Of this there is an attractive variegated variety, with well-defined silver leaves. It is not so vigorous as the type, and is well worth a place in the rock-garden. The white Lily of the Valley-like flowers of *P. floribunda*, also known as

PERNETTYA SHOOT WITH BERRY CLUSTERS.

MOCK ORANGE, *PHILADELPHUS CORONARIUS*.

Andromeda floribunda, appear in spring in terminal racemes. It is so easily grown that it is employed extensively for the greenhouse during winter. *P. formosa* (*Andromeda formosa*), from the Himalayas, is a glorious white-flowered shrub, but hardy only in the warmer parts of the British Isles.

Piptanthus nepalensis.—The so-called evergreen Laburnum is only a half-evergreen; it loses a great number of its trifoliate glossy green leaves every winter. North of the Trent it succeeds best against a wall, and produces in June terminal racemes of yellow pea-shaped flowers. Ordinary soil suits it so long as it is sweet and well drained and the position beyond the reach of cold winds.

Platanus acerifolia (*The Popular Plane Tree*) is undoubtedly the best of all hardy trees for planting in towns, as it makes headway in places where many other things would merely exist. *P. orientalis* (Oriental Plane) and *P. cuneata* are good kinds too. The Plane is much planted in the streets of cities.

Polygala Chamæbuxus (*The Box-leaved Milkwort*) is a neat evergreen creeping shrub, six inches high and quite at home in the rock-garden. Its fragrant creamy-white flowers are borne in short racemes in spring. *P. C. purpurea* is an excellent companion to the type, from which it differs by reason of its reddish-purple flowers. Peaty soil suits these best.

Pterocarya caucasica (*The Caucasian Walnut*) is a beautiful deciduous tree of dense branching habit, with long leaves composed of numerous deep green leaflets. Planted in moist soil it usually grows between twenty feet and thirty feet high.

Prunus.—There are in this family some of the most charming of hardy spring-flowering trees and shrubs. The genus *Prunus*, according to the latest botanical classification, includes the Almonds, Peaches, Apricots, Cherries, and Plums. Here is a wealth of material for the amateur gardener, and as some of them blossom at a season when flowers out of doors are very scarce and welcome, they should be used freely. Remember that those mentioned here are deciduous, and the flowers appear while the trees are leafless, for which reason discretion should be used at planting time to see that they are in association with suitable evergreens so as to bring out their full beauty. Protection from cutting winds is essential. *P. Amygdalus* (the common Almond) is happy in suburban gardens and flourishes in town squares. It is a much-branched tree, and in early March known by its delicate pink blossoms. Of this there are several beautiful varieties, amongst which are *amara* (Bitter Almond), flowers white, flushed with rose; *dulcis* (Sweet Almond), flowers before the last named; *flore pleno*, flowers double, rose-pink; *macrocarpa*, flowers very large, pale pink; *persicoides*, flowers, rose-pink, borne early. *P. nana* is a delightful little shrub for the shrubbery border in early spring. It is very bushy, rarely ever more than four feet in height, and in February and March smothered with rose-coloured bloom. *P. Persica* (the Peach Tree) is too familiar to describe; but its double-flowered varieties, *alba* and *rosea*, are deserving of extended culture. *P. davidiana alba* is a

remarkably pretty pure white-flowered Peach, and the first of the group to flower. It is of upright growth, and is so white that one is reminded of a snowdrift when it is in flower. *P. Simoni* also bears white flowers in great profusion about the middle of February.

The purple-leaved Plum, *P. cerasifera atropurpurea*, better known as *P. Pissardi*, gives colour to the shrubbery with its deep purple leaves. It grows freely and bears blush-coloured flowers. *P. divaricata* is a favourite tree for the lawn; it is of graceful outline, and bears small pure white flowers in the early part of the year. For clothing walls of medium height *P. triloba flore pleno*, from China, can be well recommended. It is perfectly hardy and free in every way; in fact, so thick are the flowers in March and April that the shoots upon which they are borne are completely wreathed. Their colour is rose passing to delicate pink. Although recommended for wall culture it does not need protection; but when grown thus the flowers are more protected than in the open shrubbery. *P. pennsylvanica* is exceedingly graceful, and in May carries clusters of small white flowers. *P. Chamæcerasus*, a European species, is rarely seen in gardens, notwithstanding its undoubted beauty. It is of elegant habit and quite distinct; flowers white.

The double white-flowered form of the Gean (*P. Avium*) is one of the loveliest of vigorous ornamental Cherries, the pure white flowers hanging in great clusters, and lasting long in beauty. *P. japonica flore pleno*, known also as *P. sinensis flore pleno*, is a neat shrub, conspicuous for its abundance of small perfectly double white flowers. An excellent shrub for flowering under glass in winter. *P. serrulata* is often represented by its double white-flowered form, but it has many varieties, of which James H. Veitch is particularly useful, as it flowers later than the type, and on this account should be planted to prolong the season. The large flowers are considerably deeper in colour than those of the last-named, and carried in drooping clusters, the leaves of a pleasing bronze-green. Two other useful varieties are *Watereri*, with double rose-pink flowers, and *flore luteo pleno*, with yellowish blossoms. *P. Mahaleb* (the Mahaleb Cherry) is a lovely small white-flowered Cherry for the lawn. It is thoroughly hardy, and of elegant growth. *P. Padus* (the European Bird Cherry) is a pretty tree at flowering time. Its racemes of white flowers load the woodland with an almost unpleasantly strong odour; it is very strong, and grows to a considerable height.

Pyrus.—Few groups of hardy shrubs and small trees are more beautiful in flower and fruit than the different forms of *Pyrus*. Beyond protection from cold winds, they need no special soil or culture. *P. japonica* (the Japanese Quince), better known, perhaps, in gardens as *Cydonia japonica*, is an old-fashioned garden shrub. It grows into a large bush, and its long, strong shoots are pretty in early spring. The flowers are scarlet, almost crimson, and appear in advance of the leaves. In addition to its value for the shrubbery, it may be (and is in some places) planted against a wall. Of this accommodating shrub there are several excellent varieties, differing in the size and colour of the flowers. For instance, one bears the name of *cardinalis*, and has larger, brighter,

and more substantial flowers ; while the colour of those of *rosea* is indicated by the name ; *nivalis* is blush-white ; *P. Maulei*, from Japan, is a slender shrub, with flowers not so large as those of *P. japonica*, and distinctly shaded with orange. *P. baccata* (*Malus baccata*), the Siberian Crab, is not only a flowering tree of rare beauty, but in autumn is bright with richly coloured fruits. Of this there are several beautiful varieties with variously coloured fruits. This is a Crab for every lawn, large and small.

P. floribunda, a native of Japan, is one of the prettiest of the family for the garden. Its long branches are smothered in spring with pink flowers and unopened rose-coloured buds. The fruit is small and not very showy. The semi-double flowered variety *flore pleno*, also met with occasionally as *Parkmannii*, has rose-pink flowers. *Atrosanguinea* is deeper in colour, and very charming. *P. Malus* is well known in gardens, and its varieties, *coccinea*, *rosea*, *nervosa*, and *pendula*, are grand for decorative planting. *P. prunifolia* is a vigorous tree, with large pink flowers, and scarlet fruits in autumn. Of the last named there are varieties with red, crimson, yellow, orange, and green fruits. *P. sikkimensis* should be planted freely for the sake of its dainty white and pink flowers. It is of excellent habit, and by no means common. The same remark also applies to *P. Scheideckeri*, one of the loveliest of spring-flowering trees. The flowers are large and rich pink. The double-flowered form of *P. coronaria*, the sweet-scented Crab from North America, is a very choice tree, with large, long-lasting, pale-pink or rose-coloured flowers. *P. Ringo* (*Malus Ringo*) is a dwarf, bright, spring-flowering tree. It is freely branched, of slow growth, and with pink flowers. *P. spectabilis*, another kind of great value, forms a round-headed tree with long branches, and in spring has clusters of rich pink semi-double flowers. *P. Aucuparia* (Mountain Ash) and its varieties are splendid trees for autumn effect. The type bears a profusion of white flowers, generally in April and May, and handsome clusters of richly-coloured berries in autumn. The variety *fructo luteo* has yellow berries, and as they almost weigh down the branches, one may imagine the effect of a good specimen. *P. Aria* (White Beam) is a European tree, with white flowers in May, and orange-scarlet berries in autumn and winter. The varieties *sulphurea*, *græca*, and *lutescens* are worth notice. *P. vestita* (Nepaul White Beam) is one of the most handsome of White Beams. The large leaves are covered with a white woolly-like substance.

Quercus (Oaks).—The Oaks are familiar garden trees. The autumn effect of such kinds as *Q. coccinea* (the American Scarlet Oak) is magnificent. Its foliage in September and October turns to crimson and scarlet. Another oak with gorgeous coloured foliage in autumn is the Red Oak (*Q. rubra*), with large handsome leaves. *Q. conferta*, known also as *Q. pannonica*, is distinct. In spring its leaves are bright green, and in autumn change to shades of brown and yellow. *Q. castaneæfolia* is a remarkably fine kind, with large polished green leaves. Of the Turkey Oaks (*Q. Cerris*), one named *variegata* should be grown in preference to any other silver-leaved variety. It has silvery-grey leaves. Amongst

the golden-leaved Oaks, *Q. pedunculata concordia* is the best of its class. Of the English Oak (*Q. pedunculata*) there are several varieties of much beauty, that named *purpurascens*, or *atropurpurea*, is very showy, and of free growth. *Q. filicifolia* has deeply cut leaves. *Q. laurifolia*, with its large leaves, creates a pretty effect in autumn when its foliage is tinged with yellow and deep red. There are many evergreen Oaks, but the following may be taken as representing a few of the best for general effect. *Q. Ilex* (the Holm Oak) is the most frequently planted. It forms a large dense head with long spreading branches. There are several distinct varieties, all of which are better for being often transplanted in a young state, as the roots are not furnished with many fibres. The Cork Oak (*Q. Suber*) merits attention for its very rough bark and neat habit. It is quite a small tree. *Q. ballota* (Sweet Oak) is slow in growth, and has rough greyish bark. *Q. cuspidata* and *Q. c. variegata* are ornamental, and quite hardy.

Raphiolepis japonica is a sturdy growing evergreen shrub for a wall in localities where it is likely to suffer in the ordinary shrubbery in severe winters. It is rather slow in growth, and the deep green leathery leaves are set off in spring by terminal clusters of white sweet-scented flowers, these being succeeded by round black berries. For forcing into bloom for the greenhouse in early spring, this rather uncommon Japanese shrub can be recommended. It flourishes in ordinary soil, and dislikes stagnant water near its roots.

Rhododendrons.—Formerly Rhododendrons and Azaleas were kept distinct, but they are now botanically classed under one heading. No group of hardy shrubs is more varied in colour or more attractive at flowering time than these, and as they succeed in nearly all well-drained soils which do not contain lime or chalk, there seems little reason why the better kinds should not enter more largely into the decoration of public parks and gardens. We like to see these shrubs in groups or masses with a suitable background for the delicately tinted flowers, and beyond the reach of cold winds, as the flowers of some, especially the deciduous kinds, appear early, and are apt to suffer from late frosts. The shrubs receive much benefit from a yearly top dressing of leaf-mould, and while growth is in progress water should be supplied freely. The deciduous sorts prefer partial shade to full sunlight. Rhododendrons are easily propagated by seed, cuttings, layering, and grafting. As the seed is very fine, be careful not to cover it too deeply, or the seedling will be unable to make its way through the surface soil. It should be barely covered with soil passed through a fine mesh sieve. For small quantities shallow pans or boxes, placed under glass, are convenient, but where plants are required in great numbers, slightly raised beds out of doors should be resorted to. Shade the beds with Spruce or Fir boughs. It seems strange that plants are not more frequently raised from cuttings. True, they take longer to reach planting size than grafted ones, but there is no trouble in looking after suckers, as is the case with grafted plants. Cuttings of the young half-ripened wood of many of the smaller leaved sorts emit roots if planted in sandy peat in a warm propagating case, but

the large-leaved sorts are not easy to raise from cuttings. Layering is another means of increasing the stock. Select nice well-ripened shoots and peg them into the soil, which should be kept moist. Grafting is resorted to principally in the case of hybrids.

Attention is first directed to a few of the best of the deciduous kinds :—*R. arborescens*, an American species, flowers rather later than most of its congeners. Its sweet-scented flowers are borne freely. *R. viscosum* (Clammy Honeysuckle) merits attention on account of the freedom with which its white scented flowers are borne. *R. occidentale*, the Western Azalea, produces a wealth of white sweet-scented flowers, the base of the upper segments being blotched with yellow. It flowers late in the season, and its autumn-tinted foliage is very bright. *R. Schlippenbachii*, an uncommon species from China, has large delicate pink flowers spotted with crimson. It is quite hardy, of excellent growth, and grand for massing. *R. calendulacea* grows about six feet high when suitably placed. It flowers freely, and is orange-red in colour. *R. rhombicum*, from Japan, is a valuable shrub, and quite hardy. Its rosy-purple flowers appear in April, and are welcome because few other species are in flower at the same time. *R. Vaseyi* is another free-flowering kind from America. Its delicate white and pink flowers are carried in loose clusters. *R. dauricum* belongs to the very early-flowering section. It is of rather straggling habit, three feet high, and bears purplish-coloured flowers in abundance. *R. flavum*, better known as *R. pontica*, is a showy plant in spring. Its large flowers are borne in clusters, and the colour is yellow or orange, and *R. sinense* is another attractive kind. The gorgeous coloured hardy hybrids and varieties have originated principally through the crossing and intercrossing of such species as *R. calendulacea*, *nudiflorum*, *occidentale*, *viscosum*, *flavum*, *sinense*, &c., the progeny, of course, being worked again in the same way.

The hardy Azaleas or Rhododendrons, as they are called, should be planted in all gardens of sufficient size. In spring the tier-like growth is smothered with flowers of spicy fragrance, and in autumn the leaves turn to resplendent colours. The bush spreads out, and in time covers much ground. Owing to their early flowering give shelter from east and north-east winds ; they are not tender in themselves, but late frosts hurt the flowers. Mr. Anthony Waterer, of Knaphill, Woking, has raised a glorious series, the colours of wonderful richness and variety—white, crimson, scarlet, orange, yellow, pink, buff—and this new race is in every way an advance upon the older forms. It is important to group Rhododendrons carefully so as to avoid unpleasant colour contrasts. It is very easy to go wrong, as, for instance, a flower that among shades of rosy amaranth may look a pure pink, if removed from their neighbourhood and put beside a pure pink, that is seen among white or scarlet rose, will be found to be quite out of harmony. This width of colour-range will also enable the buyer to choose the combination that best pleases his eye—whether of clear pink with white and rosy scarlet, of the few shades that incline to salmon-rose, of the strong and very numerous amaranths, or the cool purples which go best with the clear whites and

the best :—*Atrosanguineum*, with its large richly-coloured flowers, lasts a long time in good condition ; *carneum* produces rose-coloured flowers, and those of *albidum* are white or nearly so. *R. aureum* is conspicuous for its drooping racemes of yellow flowers, and in autumn its richly coloured leaves are distinct and showy. The variety *præcox* is a border shrub, and even more valuable than the last named, as it flowers very early. The small, red, Fuchsia-like flowers of *R. speciosum*, formerly called *R. fuchsoides*, are produced very freely, and have long projecting stamens. Although perfectly hardy it is better for a wall, as its tiny flowers are then seen to advantage ; the slender shoots are spiny. *R. gordonianum*, raised between *R. aureum* and *R. sanguineum*, is vigorous and very free.

Robinias (*Hardy Acacias*).—These are trees of much interest, quite hardy, and free-flowering. Of the Common Locust Tree (*R. Pseud-acacia*) there are several good varieties. *Decaisneana* is of free growth, and produces light pink flowers ; *Bessoniana* is a thornless variety, and an excellent tree for town gardens. It forms a dense head, and its bright green leaves hang long after those of other kinds have dropped ; *crispa* has distinctly curled leaves ; and *aurea* is a bright yellow foliaged variety ; while *semperflorens* flowers nearly the whole summer through. *R. hispida*, the lovely North American Rose Acacia, is the most ornamental of the genus, and it is very beautiful towards midsummer, when bearing its drooping racemes of rose-pink flowers. For villa-gardens, or where space is restricted, this should not be lost sight of. Select a sheltered spot for this Acacia, as the branches are rather brittle, and in rough weather are apt to snap off. The variety named *inermis* is very fine too. It is free in growth, with large leaves and delicately-coloured flowers. *R. neo-mexicana* flowers in autumn, at which time it is very distinct. Its rose-coloured blossoms are in dense racemes. *R. Kelseyi* is a new introduction from North America. It assumes a tree-like habit, and bears pretty rose-coloured flowers almost as large as those of *R. hispida*.

Romneya Coulteri (*Californian Bush Poppy*).—Every gardener almost tries to grow this beautiful shrubby plant, which has big, flimsy, fluttering flowers of snowy white, with a centre of golden stamens. The flowers are frequently over six inches across, and a strong plant will bear many expanded at one time. It is not very hardy, but is frequently quite happy in many gardens in the south of England. In the north it should be grown indoors, and is well worthy of glass protection. A warm, sheltered wall is a suitable place for it, and well-drained loamy soil essential. Captain Coleridge, a good gardener at Twyford, in Berkshire, says : “ I leave the old growth as a protection during the winter, but as soon as the new shoots appear at the base the old wood is cut down to the ground like any other herbaceous plant.” Writing in the summer of 1899, Captain Coleridge says that his largest plant had thirty-seven expanded blooms besides numerous buds at one time. “ When I planted it eight years ago it was a very small plant. It was put in a warm corner facing south-west, and it now covers ten feet of ground and is five

feet high. It has no protection, and blooms freely every year." A newer species, which is still rare, is *R. trichocalyx*. It closely resembles *Coulteri*, and needs the same treatment and soil.

Rubus.—The Bramble family is a very large one, and contains many handsome garden plants in addition to the kinds such as Raspberry, Blackberry, Loganberry, and Lowberry, which are grown for the sake of their fruit. Some of the species have been in cultivation for a very long period, but a great many have been introduced during the present century. The latter are mostly of Chinese origin, and comprise plants of trailing habit, others with long slender branches suitable for clothing the pillars and crossbars of a pergola, and still others which grow into bush form. The difference in the leafage is quite as remarkable as the habit, whilst some are conspicuous by reason of their white bark. Like the older kinds, they require good loamy soil which must be enriched occasionally if the best results are desired. An annual pruning is necessary, that being done as soon as the fruiting season is over. All old branches are then cut away except in the few kinds which continue to flower and fruit from young wood from the same old branches each year. Good kinds to grow are :—*Odoratus*, the North American purple-flowered Raspberry ; it grows freely, and during July bears fragrant flowers in terminal corymbs. *R. deliciosus* (the spineless Rocky Mountain Bramble) forms a good bush, and its white flowers are two inches or so across, with a central cluster of yellow stamens. It requires very little pruning other than thinning, and should be planted in bold groups. *R. biflorus*, a free-growing, white-stemmed species, is effective in winter after its leaves have fallen. It is frequently called the whitewashed-stemmed Bramble. Others which have showy white stems are *R. biflorus*, var. *quinqueflorus* and *R. lasiostylus*, both of Chinese origin. *R. bambusarum*, *R. flagelliformis*, and *R. Omeiensis* have all long slender branches clothed with pretty leaves. They may be planted against a pergola with advantage. Other distinct Chinese sorts are *R. Giral dianus*, *R. chroosepalus*, *R. Playfairii*, and *R. Veitchii*. An old kind of considerable decorative value is found in *R. thyrsoideus flore pleno*. It has semi-double pink flowers, and blossoms freely during July and August. Mature bushes are often eight feet high and ten feet through. For planting out of doors in southern counties the Japanese Bramble (*R. phænicolasius*) is a success. It is vigorous, with pink flowers carried in long racemes, followed in autumn by scarlet berries. This is called the Japanese Wineberry, too, and is a picturesque-spreading shrub ; its fruits are liked by some for dessert and jam.

Sambucus (Elder).—The Elders will grow in gravelly soil, but do best in moist, loamy soil where there is a little shade. The type, *S. nigra*, need not be referred to here, but a few of its varieties are worthy of consideration. In the first place, the Parsley-leaved variety, *laciniata*, is a handsome cut-leaved Elder, and *foliis aureis* (Golden Elder) has richly coloured foliage, especially if the soil is inclined to be dry and the position a sunny one. The silver-leaved form makes a good companion to it, as it grows freely, and the silvered leaves are quite distinct. *S. racemosa*, a

species widely distributed in the Northern Hemisphere, conspicuous during late summer by reason of its branches of scarlet berries. It has numerous pretty cut-leaved varieties, of which *laciniata* with daintily divided leaves, *foliis aurea* with golden leaves, and *plumosa aurea* with showy golden leaves divided into innumerable segments are the best. All are rank feeders and are best planted in groups.

Skimmias.—These are good evergreen shrubs when in flower in spring or when laden with their bright scarlet berries in autumn. They are quite hardy, neat in growth, with large panicles of fragrant white flowers. Plant in rich deep soil, and avoid cold bleak situations. In cold counties it is safer to grow them in pots or plant out in cool houses in light airy positions. *S. japonica* and *S. Fortunei* are the sorts most frequently seen in gardens, but *S. Foremanii* is particularly valuable, as its large round scarlet berries hang upon the bushes for at least twelve months.

Sophora japonica is an attractive, deciduous tree, with sulphur-coloured, pea-shaped flowers in terminal panicles towards the close of summer. It is graceful in growth, and should be planted in all gardens where a suitable position can be found for it, preferably as an isolated specimen on a lawn where the soil is well drained.

Spartium junceum (*Spanish Broom*) has been grown in this country since about the middle of the fifteenth century. It grows to a height of about ten feet, and is a shrub for planting in dry or sandy soil. Racemes of fragrant Pea-shaped flowers are borne along the slender, almost leafless, branches in late summer. For planting in masses on sandy banks few shrubs are more effective at flowering time.

Spiræas.—Amongst hardy deciduous shrubs of dwarf growth, few offer such a pleasing variety of flower colour as the Spiræas, which are reasonable in price, of simple culture, and sufficiently hardy to stand severe winters. Plant in fairly rich moist soil, and a position shielded from the fierce midday sun is preferable to full exposure. Propagation is readily effected by cuttings of the young wood taken off in August, planted in sandy soil, and placed in a warm, close case for a fortnight or so. *S. hypericifolia*, from Asia Minor, is a dainty species with white flowers. Its long, slender shoots and small white flowers create a pretty effect in May. *S. discolor (ariæfolia)*, a well-known border shrub, produces lavishly its cream-white flowers, in long, graceful panicles, about midsummer. In order to see the full beauty of this shrub, plant it in an open spot, where it is not cramped for space, as in many shrub borders. *S. media*, better known under its garden name of *S. confusa*, has quantities of white flowers in corymbs all over the plant. It is a twiggy shrub, and largely used for forcing. *S. prunifolia flore pleno*, the double-flowered, plum-leaved Spiræa, is a precious spring-flowering kind, but, unfortunately, not much grown. Its small, white flowers appear in abundance. *S. Douglasi*, from North America, is fairly well known. It has terminal panicles of rosy-red flowers in July. *S. Thunbergii*, a Japanese species, grows about three feet or four feet high, and in early March, sometimes even in February, its clusters of fragrant white flowers are welcome. Its autumn-tinted foliage is very pleasing. Space should be reserved in

the rock-garden for *S. bullata*, known also as *S. crispifolia*, an uncommon Japanese species, much too dwarf and slow in growth for the ordinary shrubbery. Its leaves are small, deep green, and its rose-coloured flowers appear in dense corymbs. *S. japonica* Anthony Waterer is a delightful late-flowering Spiræa. It is dwarf, bushy, and its rich crimson flowers remain showy for a long time. Few shrubs are more appropriate for massing. *S. j. glabrata* is rare, and very beautiful; flowers pink, borne in large corymbs. *S. arguta* is the most charming of white-flowered Spiræas. It is perfectly hardy, and its small snow-white blossoms are very lasting. *S. Van Houttei*, raised from *S. media* and *S. triloba*, also bears white flowers in great abundance. *S. lindleyana*, a magnificent species from the Himalayas, bears terminal panicles of white flowers late in the season. When suitably placed, it grows nine feet high, and is well worth a place in the garden as a foliage shrub alone, its graceful pinnate leaves being of a refreshing shade of green.

The **Staphyleas** (*Bladder Nuts*) are pretty, spring-flowering, deciduous shrubs, six feet or more high, and thoroughly hardy. Ordinary, well-drained soil suits them perfectly, and if frequent doses of water can be given while growth is young much benefit ensues. *S. colchica*, from the Caucasus, is finer than the European species, *S. pinnata*, and when bearing its pendulous racemes of white flowers, it is remarkably effective.

Stuartias.—The Stuartias are not happy in every garden. They are rather tender, perhaps, and greatly dislike east and north winds, especially in spring. A rich, loamy soil, to which has been added leaf-mould and peat, favours the best growth. Anything like stagnant water about the roots is fatal. *S. virginica*, from North America, is perhaps the best known. Its cream-white flowers, between two inches and three inches across, are white, with prominent brownish-red stamens. *S. Pseudo-camellia*, a Japanese species, is exceedingly attractive when displaying its bold, snow-white flowers with yellow stamens. The autumn-tinted foliage is distinct and showy.

Styrax japonicum produces a wealth of snow-white, sweet-scented, drooping, bell-shaped flowers, relieved by yellow stamens. It is quite hardy, and suitable for planting on the fringe of the lawn. It is a much-branched, rather loose shrub, requiring a rich, well-drained soil and sunny position to ensure a thorough ripening of the wood, without which a full flower display cannot be expected. *S. Obassia* is another excellent tree. Its leaves are large and ornamental, whilst its white flowers are quite as beautiful as those of the other species.

Symphoricarpus racemosus (*Snowberry*).—This deciduous North American shrub, usually four feet or five feet high, is not conspicuous for showy flowers, its decorative value depending upon its round white berries, which remain upon the branches long after the leaves have fallen. It is of the simplest culture, and quite a success under the shade of trees.

Syringas (*Lilacs*).—As a garden shrub the Lilac is familiar, few things being more easily grown, or more effective at flowering time. With the exception of *S. persica*, all those here mentioned have been

raised principally from *S. vulgaris*, the common Lilac. *S. persica* is a neat-growing species of slender habit, and bears a profusion of small lilac-coloured flowers. Of garden varieties the following is a good selection:—Double-flowered sorts: Michael Buchner, large truss delicate, lavender, edged with pale rose; Virginité, blush pink; *Mme. Lemoine, cream-white passing to pure white, large and substantial; Mme. Jules Finger, pale rose, large, and very fragrant; La Tour d'Auvergne, violet-purple, sweet scented; Alphonse Lavallée, pale blue, touched with violet. Single-flowered sorts:—*Alba grandiflora, large pure white flowers, borne in handsome trusses; Marie Legray, another excellent white-flowered kind not quite so vigorous in growth as the last named; *Souvenir de L. Spath, purple; Charles X., rosy purple. President Grevy, Louis Van Houtte, and Princess Marie are good sorts, too. Those marked with an asterisk should be chosen first.

Tamarix can be thoroughly recommended for the sea-coast. They are of free growth in sandy soil, and bear slender spikes of small flowers in great abundance towards early autumn. *T. gallica* is very feathery and graceful. In favourable positions it grows at least a dozen feet high, and the flowers appear like veils of misty pink. *T. Pallasii rosea* is a delightful kind. It forms growths three feet high during summer, which throughout late July and August are covered with pretty rose-coloured flowers. It must be pruned hard back in February each year.

Tecoma grandiflora, sometimes met with as *Bignonia grandiflora*, a native of China and Japan, deserves generous treatment, as its flowers are very handsome, appear in great terminal clusters, and the colour is rich orange-red. In very cold localities it needs the protection of a wall, and must have well-drained rather light soil. *T. radicans* (*Bignonia radicans*) is better known than the first named, and a much older inhabitant of our gardens. It is a midsummer flowering climber, vigorous, quite distinct, and highly attractive. It is serviceable for training against walls, up old trees, pergolas, &c., and the tubular-shaped orange-red flowers are borne in great profusion.

Tilia.—The Limes are noble trees. All are perfectly hardy, and delight in moist rich soil, and a position screened from cold winds. The Common Lime is an excellent avenue tree, and bears quantities of delightfully fragrant yellowish-white flowers. The Silver-leaved Lime is vigorous, and exceedingly ornamental. Its bold bright green leaves are covered with white tomentum on the under sides.

Ulex (*Gorse, Furze, or Whin*).—The type is a native shrub and well known, but the double-flowered variety is less frequently planted. Its double yellow flowers are very bright, and remain a long time in fresh condition. *U. nanus* is welcome, as its flowers appear in early autumn, and a succession of blossom is maintained until December. It grows about fifteen inches high. Furze plants dislike much interference at the roots. They succeed in poor soils and exposed situations, and are readily propagated by cuttings planted in sandy soil on a shady border, or by seed. Strong seedlings are very reasonable in price. No shrub is more

DOUBLE GORSE (*ULEX EUROPÆUS FLORE-PLENO*).

THE JAPANESE SNOWBALL TREE (*VIBURNUM PLICATUM*).

suitable for clothing rough banks. The French Gorse (*U. Gallii*) is worth growing on dry sunny banks on account of its dwarf compact habit and free-flowering qualities. The flowers appear during late summer and autumn.

Veronicas.—The New Zealand kinds are neat shrubs, with evergreen leaves and spikes of variously coloured flowers. Although not sufficiently hardy for general planting throughout the British Isles, they may be placed in a sheltered nook in the garden, especially in the south and west of England. Avoid planting in positions exposed to the east, as cold winds are harmful. The soil should be rich, not too moist, and thoroughly well drained, as sour soil is most injurious to them. *V. Andersoni variegata* is very handsome, with silver leaves. It is used largely in the flower-garden, and for growing in pots for winter decoration few shrubs are more attractive, or more easily grown. *V. Traversii* is a neat-growing species, with deep green leaves, and in late summer bears spikes of pale blue or white flowers. It grows four or five feet high, and succeeds admirably near the sea-line. *V. speciosa* bears long racemes of rich purplish-blue flowers. It is of good growth. The garden varieties, Silver Star, Blue Gem, and Purple Queen, are very attractive.

Viburnums (Guelder Rose).—These are quite hardy shrubs and very free, especially such kinds as *V. Opulus sterile*, *V. plicatum*, and *V. macrocephalum*. Deep loamy, well-drained soil suits them best, and to encourage a thorough ripening of the wood a sunny position should be selected. They are familiar border shrubs and admirably adapted for blooming in winter under glass. *V. Opulus*, the native Guelder Rose, is a valuable berry-bearing shrub. In October the leaves change to lovely shades of crimson and orange. The variety *sterile* is perhaps the most familiar Snowball Tree, very ornamental, of easy culture and good habit. Its round heads of flowers are borne in great abundance and remain attractive for a long time. *V. plicatum* (Japanese Snowball Tree), so far as purity of flower is concerned, is superior to the last named, but the plant is not nearly so graceful in habit. It blossoms usually in June, and its snow-white flower clusters are produced at the points of the small twigs along the shoots. It may be used with excellent effect as a wall covering, and for flowering under glass during winter it can be well recommended. It is a grand shrub for massing. *V. macrocephalum*, an uncommon kind, is a native of China and deserves wall protection, as it is a trifle tender and too valuable to pass by unnoticed. Its large heads of white flowers are very beautiful, and a good-sized, well-grown plant at flowering time is strikingly handsome. It is an admirable shrub for greenhouse decoration during early spring. *V. acerifolium*, an old inhabitant of our gardens, bears an abundance of white flowers in spring and richly-coloured berries in autumn, at which time its tinted foliage is very bright and distinct. It seldom grows more than five feet or six feet high. The well-known Laurustinus (*V. Tinus*) is an evergreen shrub of bushy habit, with small pleasing green leaves; and in winter, when bearing its wealth of pinkish-white flowers, is welcome in the border.

Plants lifted in autumn and put into pots flower naturally towards Christmas, on which account they are most useful for the greenhouse. The variety *lucidum*, which bears large clusters of pure white flowers, and *purpureum*, with its dark leaves, are worthy of mention. The wild Guelder Rose or Water Elder (*V. Opulus*) is one of the most beautiful of all shrubs, native or otherwise. Though the Guelder Rose is more showy than the Water Elder when it is in flower, it lacks the autumn beauty of the wild plant when it is loaded with the bunches of brilliant red berries. The native plant grows by the sides of streams and ditches in a strong alluvial soil, where it is often a shrub of rather rank growth and straggling habit; transplanted into drier garden ground it becomes a neater bush, and most seasons its wealth of berry makes it one of the best things in the September garden. It is a bush to plant by the lake side. The leaf begins to colour at the same time as the berry, and by the end of the month is a glory of rich crimson. The new species *V. rhytidophyllum*, *V. utile*, and *V. Carlesii* should all be grown. The first is remarkable for its large, handsome, evergreen leaves, flattened heads of cream-coloured flowers, and red and black fruits; the second is a very showy flowering shrub, whilst the last-named bears rounded heads of white, pink-tinted flowers which are deliciously fragrant.

Vincas.—The Periwinkles are trailing evergreen shrubs, and succeed in dry as well as in moist soil. For planting under the shade and drip of large trees they are used largely with considerable success. They can also be relied upon for clothing sandy banks and rooteries. *V. major* spreads quickly, its polished green leaves are pretty, and in May and June its rich blue flowers are borne freely. Of this there is a variegated form with showy leaves, and quite as hardy as the type. The small-leaved Periwinkle (*V. minor* and its varieties) are not so vigorous as either of the last-named; they are, however, attractive, neat-growing trailers. Propagation may be carried on by division or by cuttings.

Xanthoceras sorbifolia is a Chinese shrub with deciduous pinnate, bright-green leaves; it grows about fifteen feet high when suitably placed. Its cream-white flowers, stained with red in the centre, appear in profusion in racemes just as the leaves are beginning to unfold. A sheltered position and fairly rich soil encourage the best growths. In cold localities it should be grown against a wall.

Yuccas.—These are amongst the most handsome of ornamental evergreen hardy shrubs for general outdoor planting. They are quite at home in the shrubbery border, and add colour and effect to the flower-garden, and for planting on the outskirts of the lawn, as well as for sunny banks and the rock-garden, few evergreen things create more beautiful effects. For winter bedding, too, they are a success. They do not require special culture, ordinarily well-drained soil suiting them admirably. They are not, however, partial to wind-swept positions. *Y. gloriosa* (Adam's Needle) is of strong growth, hardy, with broad, long, sharply-pointed stiff leaves and whitish bell-shaped flowers, borne on large stout spikes. *Y. recurvifolia*, sometimes met with as *Y. pendula*, is of distinct

habit. It is free in growth, with broad deep-green arching leaves ; an excellent plant for winter bedding. *Y. filamentosa*, the North American Silk Grass, is a beautiful species, nearly stemless, with long, narrow, rich green leaves, conspicuous for the numerous thread-like appendages along the margins. Of this there is a distinct and pretty form with cream-coloured variegation ; but it is only when planted in a warm, rather dry soil that the true leaf colour is revealed. *Y. angustifolia* is another narrow-leaved sort of much beauty.

Zenobias.—Two kinds of Zenobias are found in gardens, viz. *Z. speciosa*, and its variety *pulverulenta*. [Of the two the last-named is decidedly the best, as it is quite as hardy as the type, and produces an abundance of snow-white, drooping, bell-shaped flowers in axillary clusters. It forms a much-branched shrub four feet high, and the under sides of its leaves and stems are powdered with white. The flowers of the type (*speciosa*), formerly known as *Andromeda cassinefolia*, are smaller, and produced a week or so after those of the variety referred to above. Although peaty soil is usually considered necessary for these charming Heathworts, one composed of loam and leaf-mould suits them admirably, provided the drainage is good and lime is not present in the soil. They are sub-evergreen. Seed ripens freely in this country, from which plants may be raised in quantity. Sow in fine soil in shallow pans or boxes, and, as the seed is very small, be careful not to bury it too deeply. With the variety *pulverulenta*, cuttings or layers answer best.]

Mistletoe.—There is something strangely attractive about this plant, something mysterious that arouses the imagination. It is attractive, and yet, at the same time, slightly repellent, for it has somewhat of a vampire nature in that it sucks out and lives upon the life-blood of some honest tree. Moreover, it is both ugly and pleasant to see, for it hangs in rather ungainly bunches and masses, and yet is beautiful in detail. In form it is so simply constructed that it gives one the impression of being low in the scale of vegetable creation. It is built almost as simply as a scant weed, but there is a rare and strange kind of beauty in the individual twigs, and especially in the relation of colour between the golden green leaf and the pearl white berry. The trees it most frequents are Lime, Apple, Poplar, Thorn, and Mountain Ash. The seed can be sown by fixing the berry either in an artificial slit, or a crack in the bark of any likely tree, preferably on the under side of a branch, and place a little strip of linen over for a time to prevent birds eating the seed. Such sowings are often ineffectual, because the seed is used before it is ripe. It is no use taking it from boughs and sowing about Christmas time, for the seed is not ripe till quite two months later. Mistletoe abounds in some English west country orchards, but is in still greater profusion in those of Brittany.

BEAUTIFUL CRAB-APPLES

The Crabs are among the most picturesque and beautiful of trees for the orchard garden and lawn, and there are many kinds to select from : John Downie, brilliant, with crimson fruits in autumn ; the Dartmouth, Siberian, and many others, all shapely trees for the outskirts of the lawn. Mr. Bunyard of Maidstone writes : " We find that the Dartmouth and John Downie make admirable bushes on the Paradise stock, and they require but little pruning when once the trees are shaped, as the festoons of elegant fruit appear to the best advantage on the two years' shoots. To take the Siberian or Cherry Apple race first, we have the Scarlet Siberian, which is the best known. This forms a pretty, open tree, but is liable to mildew in the foliage, and thus looks rather bare at times, but this enables the thickly-set fruit in branches to appear to advantage, and very handsome they look in the months of August and September. There is one of great beauty, wonderfully free in bearing, sent out by Cheal & Sons under the name of Scarlet Crab. The fruit is smaller than the Siberian, but very thickly set on the branches, and the colour is intense and striking. The tree is more upright than the Siberian, with ample foliage. We consider it a great addition. The yellow Siberian has rather larger fruit than the type, and, as a contrast, is well worth culture. John Downie has more the growth of an apple, sturdy, with ample foliage, and its fruit is oval and produced in festoons, which give it a striking appearance. It is larger than the Siberians, and of an intensely bright scarlet on the sunny side, and orange on the shaded positions. As a decorative tree it stands in the front rank, and its fruit is also useful for table decorations and harvest festivals.

"The Orange Crab is a very pretty pale yellow fruit, larger than the Siberian, and more like a cherry in shape. To come to the larger fruited kinds, the Fairy Apple makes a splendid garden bush, and fruits very freely on the Paradise stock ; its fruit is lemon-coloured with pink flesh, and of a crab shape." Mr. Bunyard then alludes to the beauty of the Mammoth and Montreal Crab and Transcendent Crab from America, and the old English transparent Crab. "The most beautiful of all is the Hyslop or Dartmouth Crab from America ; this gives plum-like fruit of a mulberry crimson colour, and carries a rich bloom, so that it is often taken for a plum. It is a splendid

sort for decoration, grows freely, and produces a heavy crop. The whole of these are beautiful in flower in May, and their double claims of flower and fruit commend them to all planters. But they have a third virtue—they make most delicious jellies and jams when the seeds and carpels are removed, the best plan being to squeeze the pulp through a cheese cloth. When slightly sweetened they form a fine sweet sauce for game, and when well sweetened a very much relished conserve, while in syrup they are sweetmeats of the first class."

HOW TO ARRANGE ORNAMENTAL TREES AND SHRUBS

NUMEROUS trees and shrubs of a deciduous and evergreen character are conspicuous by reason of their coloured foliage. Unlike flowers, fruits or the autumn tints, which are all more or less of short duration, trees and shrubs with coloured foliage last in good condition for a long time, the deciduous ones throughout the summer and the evergreens the whole year round. In small gardens it may be only possible to plant a few single specimens or mix in a few coloured-leaved shrubs with the green-leaved kinds in the shrubbery border. Used in this way they are pretty, but the effect obtained is nothing approaching their liberal employment in the pleasure grounds and parks of large estates. Here large groups or masses of one kind may be planted to form a feature in the landscape, perhaps on sloping ground or by the lakeside.

A border or large bed of mixed coloured-foliaged trees and shrubs gives a charming picture from spring till autumn, providing the grouping of the colours is carefully done. Fig. 18 represents a plan of such a border at Kew, 120 feet long and 40 feet wide, and will give readers an idea of the grouping. At first sight the plan appears to be crowded, but it is quite easy to go over such a border in March each year and shorten the long growths of those which are trespassing into the space which should be occupied by their neighbours. In this way comparatively large shrubs, and in some instances trees, are kept trimmed to a moderate size. By cutting back the young shoots of the Golden-leaved Elder, *Sambucus nigra foliis aureis*, to within one or two eyes of the old wood each spring, vigorous young shoots push up, with plenty of leaves which colour better than those on old wood. The subjects planted at the back of the bed illustrated are somewhat shaded by trees in the vicinity, and are planted with the idea of furnishing in addition to colour effect. In front of the bed there is a wide stretch of lawn. The bed faces south; while behind

it, on the north side, are a number of large trees, the green leaves of which form a useful and effective background.

While it is possible by using Hollies, Yews, Box, conifers and other evergreens with coloured foliage to form coloured clumps which are beautiful throughout the year, it will be found by experience that the foliage of deciduous trees and shrubs is, generally speaking, more brilliant in colouring than those with persistent leaves. Those mentioned below have brightly-coloured foliage, and are very suitable for the purposes referred to in these notes.

Deciduous Trees.—

The Golden Maple, *Acer Negundo californica aurea*; Variegated Maple, *Acer Negundo variegata*; Golden-leaved Indian Bean, *Catalpa bignonioides aurea*; Yellow-leaved Thorn, *Crataegus Oxyacantha aurea*; Purple-leaved Beech, *Fagus sylvatica purpurea*; Golden-leaved Laburnum, *Laburnum vulgare foliis aureis*; Purple Myrobalan, *Prunus Pissardii* (*P. cerasifera atropurpurea*); Moser's Purple Plum, *Prunus Moseri flore pleno*; Purple-leaved Peach, *Prunus persica purpurea*; Golden-leaved Oak, *Quercus pedunculata Concordia*; Golden-leaved American Oak, *Quercus rubra aurea*; Purple-leaved Oak, *Quercus pedun-*

FIG. 18.—Plan of a large bed of ornamental-leaved shrubs arranged for effect.

culata purpurea; Golden Elm, *Ulmus antarctica aurea*; Variegated Elm, *Ulmus montana variegata*; and Van Houtte's Golden Elm, *Ulmus Louis Van Houtte*.

Deciduous Shrubs.—Japanese Maples, *Acer japonica aurea* and *A. palmatum* varieties; Purple Barberry, *Berberis vulgaris foliis purpureis*; Variegated Dogwood, *Cornus alba sibirica variegata*; Späeth's Golden Dogwood, *Cornus alba Späethii*; Variegated Dogwood, *Cornus controversa variegata*; Golden-leaved Nut, *Corylus avellana aurea*; Purple-leaved Nut, *Corylus maxima atropurpurea*; Golden Privet, *Ligustrum ovalifolium foliis aureis*; Variegated Privet, *Ligustrum lucidum aurea variegatum*; Golden Elder, *Sambucus nigra foliis aureis*; and Variegated Snowberry, *Symphoricarpos orbiculatus variegatus*.

Evergreen Shrubs.—Gold and Silver Hollies, *Ilex Aquifolium* varieties; Variegated Box, *Buxus sempervirens* varieties; Golden Euonymus, *Euonymus japonicus* varieties; Variegated Elæagnus, *Elæagnus pungens* varieties; Lavender Cotton, *San-tolina Chamæcyparissus*; Lavender, *Lavandula spica*; United States Sage Bush, *Artemisia tridentata*; Tree Purslane, *Atriplex Halimus*; several Tree Ivies, *Hedera Helix* varieties; and numerous conifers, especially varieties of Cupressus.

PRUNING HARDY FLOWERING SHRUBS

MANY readers of this book have written to me about the pruning of hardy flowering shrubs, and asking for a few notes to guide them in an operation of which they are wholly ignorant. Pruning generally seems to be a rock upon which many beginners come to grief, and one is surprised to find that even with instructions as clearly and simply expressed as possible, the subject is little understood. Hardy flowering shrubs are in most gardens either left to themselves completely or subjected to a pruning that would be more appropriate to a Grape Vine, viz. a hard and indiscriminate cutting back, with the result of an absence of flowers the following year. Pruning often signifies a flowerless time in the following year, for the reason that growths that produce blossom are removed through ignorance of their blossom-bearing capacity. The shrubberies of a former age were quite different to the free grouping of beautiful shrubs and small trees that add grace and beauty to the English garden. The old shrubbery was a choke-muddle receptacle for many things or a few things of small interest—Privet, Conifers, and the like, but of Conifers in particular, a race of shrubs at that period in high favour with rich and poor, with unfortunate results, as few Conifers will live with comfort near large towns.

It is the rule rather than the exception to find in gardens a collection of beautiful flowering shrubs composed of the fragrant Mock Oranges, the Lilacs, Brooms, Rhododendrons, and the many other species and varieties noticed in the special chapter devoted to these in this book. All these require judicious treatment, and this given will be repaid a thousand-fold in a freer and more lasting flower display. Flowering shrubs must be, so to speak, "cultivated," and by this is meant keeping the ground clean, restricting the too vigorous growths of neighbouring things, and giving an annual pruning. Someone will say, "Well, I know all that; but when is the time to prune?" This is one of the most important details of all, as every race of shrubs requires in a large degree different treatment to others, some needing attention in late winter,

others in early spring; whilst those flowering on the previous year's wood must remain until the blossoming time has passed.

Four forms of pruning are desirable, *i.e.* shortening of the branches, disbudding, the removal of seed heads, and root pruning. The object is the same in all cases, namely, to encourage shoots to give the best flowers. In some instances, one, for example, where a few branches only are made, the result is obtained by the first method; in others, where the shoots are many in number, it is needful to reduce the number considerably to allow light and air free access to the wood for the purpose of thorough ripening. In other cases, such as the *Rhododendron*, superfluous buds and old flower-heads must be removed, and where rank shoots are made at the expense of flowers, prune the roots.

When pruning use a very sharp knife. Leave no jagged cuts, but cut all wounds perfectly clean, and no snags should be left; but cut the shoots to the base. After pruning, all wounds of any importance must be dressed at once with coal-tar to prevent evil results until they are quite healed over. Among the many families of shrubs in our gardens, the following have been selected to treat separately as representative of the others.

Ceanothus.—Although very few species of *Ceanothus* are grown, they need to be pruned at various times of the year. In the case of *C. azureus*, *C. americanus*, and the many beautiful garden varieties, they should be pruned in spring. This pruning should consist in thinning out the shoots and shortening those that are left. It is often desirable to spur them back to two or three eyes. All the above-mentioned flower in summer and autumn on young wood. On the other hand, *C. divaricatus*, *C. papillosus*, *C. rigidus*, and *C. veitchianus* flower in spring on the previous year's wood, and require pruning after the flowers are over. Generally the shoots do not require spurring back; it is only necessary to thin out and shorten the growths.

Cytisus and Genista.—These families are so much alike that they can be considered in the same paragraph. As in the case of the *Ceanothuses*, there are two distinct sets, one that flowers on the old wood, and the other upon young shoots. To the former group belong *C. albus*, *C. biflorus*, *C. præcox*, *C. purgans*, and *C. Scoparius* (the common Broom), and of the last-mentioned group, *G. nigricans*, *G. tinctoria* and their varieties are types. After the flowers are over, the first-named group should be thinned and pruned into shape;

whilst cut the latter set fairly hard back in the spring just before growth commences. Branches of these shrubs should never be cut back into beyond the two-year-old wood or they will not break well. It is wiser to confine pruning to one-year-old shoots. Two notable exceptions to pruning are *G. ætnensis* and *G. virgata*. Except when young, these require little or no pruning, and a much longer time elapses before they reach maturity. Remember also that most of the species must be renewed every few years.

Philadelphus (*Mock Orange*).—A few years ago it was a common belief that to prune the Mock Orange was to destroy the promise of flowers. Experience has, however, proved otherwise; the method has been at fault. Shortening back of the branches was practised, whereas thinning is the correct treatment, especially in the case of the dwarf *P. Lemoinei* group, which are becoming popular in all gardens, especially those of small size. When the flowers of this group are over, remove all old flowering wood, that is, wood upon which flowers have been borne, to strong young shoots, leaving only sufficient to form a shapely bush. The result will be, during summer strong shoots three feet long, which will ripen well in autumn, and flower profusely during the following June. By merely shortening the shoots without thinning, or by leaving the plants alone, bushes four years or five years old have become thickets of growth to the loss of all natural grace and beauty. The taller growing shrubs may also be thinned after flowering.

Syringa (*Lilac*).—Lilacs are rarely attended to in any way. They are permitted to remain undisturbed for a generation, with the unhappy result that the shoots get sadly entangled and poor. The soil is full of suckers, and the result of all this unnecessary development is a few scattered flowers which betray an exhausted soil and growth. Lilacs should be free from suckers and possess well-developed heads of sturdy branches. Go over the bushes several times in early summer and reduce the number of shoots, leaving only those that are strong and well placed. Through this removal of superfluous shoots increased strength is given to the flower buds, and more light and air admitted to the branches. Naturally the flower branches are larger, more numerous, of better colour, and richer in fragrance.

Forsythia.—It is possible to have a glorious display of this yellow flower, a raining down of golden blossom, without any pruning whatever, but the display is much richer when judicious pruning is given. Prune directly the flowers are over,

and spur last year's wood back to within a few eyes of the old wood. In this way *F. suspensa* makes strong shoots 4 feet to 5 feet long, which flower from base to summit. *F. viridissima* and *F. intermedia* should be treated in the same way.

Prunus.—The method of pruning practised for the Plums we use for the dessert and kitchen is suitable for most of the ornamental species and varieties. There are, however, one or two exceptions. *P. japonica, flore pleno*, is improved by an occasional hard cutting back. This gets rid of old worn-out flowering wood and encourages strong shoots, which flower with great freedom. After flowering spur the shoots back, and prune severely once in every five years. *P. tribola*, when grown on a wall, should be spurred back after flowering, and long strong shoots encouraged.

Spiræa.—In this family the chief point to attend to is thinning. Most of the species grow naturally into dense bushes, many of the inner shoots being unable to develop through want of space and light. These shoots should be removed to the ground line, leaving only sufficient to form a well-balanced shrub. In the *S. japonica* group more pruning is necessary. The flowers are borne in large heads on strong, soft shoots of the current season's growth, consequently in addition to well thinning-out the plants, the flowering shoots of last year should be shortened to about half their length, as by this means stronger shoots are made than if no shortening is practised. Strong wood signifies also a greater wealth of finer flowers. Those who possess *S. arguta* should peg some of the shoots to the ground when thinning out, as a more effective display results. The double-flowered *S. prunifolia* may be cut back after flowering to strong back shoots.

Rubus.—Whether grown for their flowers, fruit, or winter effect given by the coloured stems of some species, all are benefited by an annual removal of old wood as soon as flowers and fruit are over. The effect of a group of the beautiful *R. deliciosus* is quite spoiled when the old wood is left year after year until it becomes a choked muddle of dead wood, with here and there a patch of living growth. By pruning the shrub is kept light and graceful, and it has a longer existence through this timely attention.

Pyrus.—Many are the beautiful Apple trees for lawn and pleasure grounds. The Dartmouth, Fairy, and Siberian and other Crabs. All these need similar treatment to the Apple tree of the orchard.

Rose.—Sufficient is written about Rose-pruning on pages 71-73 to satisfy the ordinary rosarian.

Rhododendrons and other members of the Erica or Heath tribe are greatly improved by careful thinning of the buds when an unusually heavy flower display is promised, and also by removing all flower heads as soon as the flowers are over.

Hydrangea paniculata and **p. grandiflora** should be spurred to within an eye or two of the old wood in March, and the young shoots which follow should be thinned to ten or twelve to each plant if large flower heads are desired. **Deutzias**, **Viburnums**, **Cornus**, **Loniceras**, **Berberis**, &c., are all improved by thinning of the shoots, and the same may be written of almost all shrubs. By spurring back

Wistarias, free-flowering bushes are obtained, and in the case of

Pyrus japonica, by thinning only.

Magnolias rank amongst the few shrubs and trees which require little or no pruning. They dislike intensely interference at root and branch, consequently disturb them as little as possible. The time to prune when any is required is in summer.

Such shrubs as the coloured-stemmed Willows and **Cornus** (Dogwood) are improved by hard pruning, the colour upon one-year-old shoots being richer than on older growths. It is, however, unwise to cut back very old **Cornuses**; the better plan is to plant young ones, and prune from the beginning. Some coloured-foliage shrubs, such as the Golden Elder, are improved by an annual cutting back, the colour of the leaves being finer on young, strong shoots than on old wood.

Root-pruning.—This is necessary when too much wood is being made. It is a frequent task in the orchard, and should be performed when leaves are made at the expense of flowers. Growth can be curtailed and the desired object attained by lifting and replanting. If this is impossible, make a trench round the plant and remove some of the strongest roots.

HARDY CLIMBING PLANTS

MANY of the prettiest pictures in the garden are those in which climbing plants play a large part. The Rose, of course, is queen of climbers, but as useful in their way are the Clematises, Honeysuckles, Jasmines, Vines, Wistarias, and others.

Ampelopsis. See *Vitis*.

Aristolochia Sipho, commonly known as the Dutchman's Pipe from the shape of its drooping yellow-brown flowers with their upturned ends, though not conspicuous for its blossoms, is a handsome plant, soon covering a wall with its large heart-shaped leaves. It is a deciduous climber, and may be propagated by seed. Does best in sandy loam.

Azara microphylla is not very hardy, but sufficiently so for southern counties. Its glossy green leaves, hiding wiry spreading stems, are very handsome. Needs well-drained loam.

Berberidopsis corallina (*The Coral Barberry*), from Chili, is a pretty evergreen for planting against a wall, but it is rather tender and apt to suffer from frost unless slight protection can be given. Planted in well-drained loam, its glossy green, prickly leaves are not only distinct but ornamental, and its numerous drooping, coral-red, Berberis-like flowers, borne in the axils of the leaves, remain attractive for a considerable part of the summer. It delights in a somewhat shady position.

Bignonia capreolata is a free grower and climber introduced from America nearly two hundred years ago, and hardy only in sheltered quarters. For training against a warm wall, or for clothing rafters in unheated greenhouses it is well adapted, and in such positions its orange-coloured trumpet-shaped flowers are seen to perfection. It should be planted in rich soil, and as it delights in copious supplies of water in the early part of the growing season, efficient drainage should be provided to carry off superfluous water, and thus help to keep the roots healthy and the soil from getting sour.

Calystegia pubescens flore pleno is usually called a Convolvulus, and is now grouped with that family. It does not grow tall, but is pretty for arbours and screens, and will thrive in any soil.

Celastrus articulatus is a free-growing Japanese twiner, and conspicuous for its brightly-coloured berries in winter; they are displayed upon the leafless branches in great profusion. Excellent for clothing arbours, tree stumps, verandahs, &c. *C. scandens* (Staff Vine) is another

CLEMATIS OVER GARDEN ARCH.

THE MOUNTAIN CLEMATIS, C. MONTANA.

rapid-growing climber, and a distinct autumn and winter shrub. It loves a cool soil.

Chimonanthus fragrans.—This is hardly a climbing plant; it is more one of those deciduous shrubby things that one puts against a wall for the sake of its flowers or leaves. The *Chimonanthus* is called the "winter sweet" because of the sweet spicy perfume of its flowers in winter; their lemon-yellow colour is very quiet, but their fragrance is perceptible for many yards away. The way to increase it is by seed, suckers, and layers. Suckers become established with moderate rapidity when detached with a few roots from the parent plant. When layering choose the strong shoots from the base of the plant; they should be put down in autumn or after flowering. Cut each shoot halfway through on the underside, pegging it firmly in the soil, and keeping the cut part open. Cover over with soil and leave the layers for a year. Layering is the method of propagation we advise. The shrub must be carefully pruned. Cut the shoots back in spring to within about four inches of the main branches. Upon the new growths from these shoots the flowers appear. *Grandiflorus* has larger flowers than the type. Good loamy soil suits it best.

Clematis.—In almost every garden there is a *Clematis*, as a rule the rich, purple-flowered *C. Jackmani*. The majority of the *Clematis*es are quite hardy, and the best known are

Clematis balearica, which bears yellowish-white flowers, spotted with purple in the interior, about two inches in diameter. In the south of England it often commences to flower as early as January. *C. coccinea* bears scarlet, bell-shaped flowers. Several hybrids of this *Clematis* have lately been raised which are valuable for the greenhouse. *C. Flammula* (the Virgin's Bower), perhaps the commonest of the family—with the exception of *C. Vitalba*, the Traveller's Joy or Old Man's Beard, which grows wild in our hedgerows—bears small, white, scented flowers in great profusion during the month of August, and is useful for covering trellises, archways, and arbours. *C. florida*.—The type of this species bears large white flowers. Several varieties have, however, been raised by nurserymen bearing both single and double flowers of different tints, among the best of these being Duchess of Edinburgh, double, white; John Gould Veitch, double, lavender-blue; and Lucy Lemoine, double, white. *C. graveolens* is a yellow-flowered species from China, bears its flowers in July, and is a very rapid climber, the flowers being followed by feathery seed-vessels. *C. Jackmani*, a hybrid, is well known by its large, purple flowers, and is grown in almost every town and village in England. Some of the best varieties of this *Clematis* are the type, *Jackmani alba*, white; Gipsy Queen, velvety-purple; *rubro violacea*, maroon; and *velutina purpurea*, blackish mulberry. *C. lanuginosa* bears the largest flowers of any *Clematis*, some of these exceeding seven inches in diameter. Anderson Henryi is the best white; while Otto Fröbel, pale lavender-white; Fairy Queen, flesh-colour with pink stripe; La France, violet-purple; and the two doubles, Venus Victrix, lavender; and Enchantress, white, are also beautiful flowers. *C. montana*.—This is a very

charming kind. It flowers in May and June, and bears an abundance of ivory-white blooms two inches in diameter. It is very vigorous in growth, and admirably adapted for rambling over old trees and evergreens. The variety *rubens* has rose-coloured flowers, and should find a place in every garden. *C. paniculata* is very similar to *C. Flammula*, but flowers a month earlier. *C. patens* bears large white flowers. Good varieties of this Clematis are: Duke of Edinburgh, violet-purple; Fair Rosamond, white; Mrs. Crawshay, pale pink with bronze stripe; and Stella, pale violet. Of the large-flowered Clematises the Patens group is the earliest to bloom, commencing in May. They flower from the old wood.

The only pruning they require is the cutting away of dead wood. The Florida group commences flowering a fortnight or so later. The plants require the same treatment as the Patens varieties as regards pruning. The Lanuginosa group begins to bloom in June and flowers on short summer shoots. Moderate autumnal pruning is requisite. The Jackmani group is the last to flower, blooming from July to October. The plants flower on the new wood and should be cut down to within twelve inches of the ground during the winter.

Clematises Dying Off.—It is perplexing and disappointing to find Clematises dying off without any special reason. Mr. Jackman, the well-known raiser of Clematises at Woking, in a lecture given some time ago, makes some useful observations as follows:—

“There is no doubt that frost is the cause of some deaths, and too much water and bad drainage others, but I cannot agree that either of these is the sole cause of all the losses. My experience is that the plants mostly succumb during the summer months when the ground is driest and the sun has most power, and in the majority of these cases I could not detect any sign of the plants having had too much nourishment or water, or that the drainage was bad. . . . Grafting also cannot be put down as the direct reason, as plants on their own roots go off in the same manner.

“I do not think, however, that *C. Vitalba*, which is so generally used as a stock, is entirely suitable for some of the large-flowering hybrids. The roots differ from those of the latter, being of a hard, wiry character, the hybrids appearing, after they have had sufficient time to get established on their own roots, to ignore the stock, which eventually decays. . . .

“I am of the opinion that is mainly due to loss of constitution through over-propagation, which has been brought about by the great popularity of, and consequent demand for, the hybrids, and, being of a soft, succulent nature, have responded only too freely to the treatment. My other reasons for coming to that conclusion are, as already mentioned, that the plants mostly go off on the hot, bright days of summer, and in many cases after having made several feet of growth, and are forming the flower-buds, which seems to me to imply that they are wanting in vital power, and are unable to withstand the extra call upon their strength and the extreme heat. If it is not loss of constitution, why was the ‘dying off’ not noticed twenty-five years ago, and why

AN EFFECTIVE METHOD OF GROWING CLEMATISES OVER RUSTIC POLES.

THE
GARDEN

ORNAMENTAL VINES TRAINED ON PILLARS (See Page 278).

has it increased of recent years, not only in this country but on the Continent, and how is it we do not see the rampant, robust growths of former years? Again, it seems strange that whilst the large hybrids have been so badly affected, I have never seen *C. montana*, *C. Flammula*, *C. Viticella*, or *C. Vitalba* collapse in the same manner, unless my contention is correct that over-propagation is the cause. I might also mention that I have not yet seen signs of the dying off amongst the new hybrids from *C. coccinea*.

"As a decorative plant the Clematis is almost unequalled. Few climbers can surpass it for covering a wall or porch of a house, or training over trellis work, commencing with *C. montana* early in May, and followed throughout the summer and autumn by the large hybrids of the Patens, Florida, Lanuginosa, Viticella, and Jackmani types. To these must be now added the new Coccinea hybrids, *C. Countess of Onslow*, *C. Duchess of Albany*, *C. Duchess of York*, *C. Grace Darling*, and *C. Sir Trevor Lawrence*, which, with those of the last type, remain in bloom till frost comes.

"The Clematis is also at home planted out or grown in pots, in the conservatory, cool greenhouse, or glass corridor, if the situation is not too shady or confined. Those of the Patens or Florida types are often more appreciated in these positions than when grown out of doors, coming into bloom as they do at a time when flowers are somewhat scarce, through escaping the May frosts which sometimes spoil those growing outside. Rambling up pillars and poles, over rootery or rock-work, they are alike elegant, and when bedded out produce a most gorgeous effect; but when this is done it is desirable that those of the Viticella and Jackmani types should be selected on account of their profuse blooming properties. Some of the smaller-flowered species, such as *C. Flammula*, *C. graveolens*, *C. montana*, *C. Vitalba*, or *C. Viticella* are also quite in keeping with wild scenery when scrambling over ruins, arbours, tree stumps, banks, hedges, and bushes, whilst several of the herbaceous and sub-shrubby species and varieties are worthy of a place in any herbaceous or mixed border."

Hedera.—This is the well-known Ivy. Few hardy climbers or creepers offer such a diversity in leaf formation and pleasing colours as Ivies. Beginning with the silver-leaved sorts, *marginata elegantissima* should be made note of. Hardy, free in growth, its light green leaves flushed with white are margined with cream white. *Crippsii* is one of the showiest of the group, as it is of excellent growth, and has handsome silvery-grey leaves and prominent veins. The silvered leaves of *marginata rubra* change to lovely shades of red in winter. *Maderiensis* is rather tender, and should only be planted in sheltered spots. Its leaves are broad and beautifully variegated with silver. There are not many good yellow-leaved varieties, but *chrysomela* is always satisfactory, provided it is not planted in too much shade. Its leaves vary from greenish-yellow to rich yellow. *Spectabilis aurea* is also a fine yellow-leaved variety, and *angularis aurea* is far too seldom seen in gardens. It is neat in habit and very showy.

Green-leaved Kinds.—*Dentata* has larger leaves than any other Ivy, is of free growth, and very handsome; *nigra*, better known perhaps as *atropurpurea*, is a beautiful variety for winter effect. It is of quick growth, and its bright green leaves change to blackish crimson in winter. It is one of the best of the green-leaved Ivies. When the winter Jasmine can get its trails of yellow flowers amongst this Ivy, the effect is very charming. *Amurensis*, known also as *macrodonta*, is a quick-growing kind with large, thick V-shaped leaves, deep green in spring, passing to bronzy brown in winter. Emerald Green is a splendid variety for edging walks, as it is of close, compact habit, with rich glossy green leaves. The Bird's-foot Ivy (*H. pedata*) is so named on account of its leaves resembling the feet of a bird. They are light green, with conspicuous silvery veins; *taurica*, *himalaica*, and *angularis* are good sorts too.

Ivies, Tree.—These make excellent plants in pots for decorating rooms, &c., and for winter bedding they are splendidly adapted. *H. arborea* is the well-known Tree Ivy, and needs nothing more than passing reference. The golden-leaved variety—*aurea*—is constant in colour and of free growth. The silver-leaved form and the yellow-berried variety well deserve notice. We enjoy a group of the Tree Ivy with China Roses planted amongst it.

Jasmines.—Three kinds of Jasmine prove good climbing plants in England. The sweet-scented Jasmine (*Jasminum officinale*) that perfumes the air with its white flowers around cottage porches, its variety *affine*, the yellow-flowered *J. revolutum*, an evergreen, which, being a native of India, was formerly treated as a hothouse plant, but has proved hardy, and the winter-flowering *J. nudiflorum*, which bears sweetly-scented yellow flowers along its leafless shoots in winter. Shoots with buds about to open, placed in water in the house, expand delightfully. It will grow anywhere, even in a London garden; it is one of the brightest and most welcome of climbing plants, and should have a background of ivy or evergreens. Jasmines, besides being placed against walls, may be allowed to ramble over old tree stumps, arbours, pergolas, or planted in groups, say of threes, against rough, stout stakes put into the ground triangular fashion, several feet from each other, and the tops secured with twine. The effect of this at flowering time is very pretty. *J. fruticans*, from Southern Europe, is a neat evergreen species, and quite happy on a shady lawn. Its yellow flowers are succeeded by round black berries. With regard to the pruning or thinning out of the growths of Jasmines they must not all be pruned at the same time. Shorten the growths of the winter-flowering Jasmine and remove weakly ones as soon as the flowers are over.

Lonicera (Honeysuckle).—Of climbing sorts the evergreen Trumpet Honeysuckles (*Lonicera sepervirens* vars.) are rampant in growth and have showy flowers during summer. Those of the type are scarlet outside and yellow in the tube. *Plantierensis* is a remarkably fine hybrid, with larger flowers than those of the last-named. The colour is bright orange and scarlet. Where variety is wanted, *Brownii* and *superbum* may be added. The Trumpet Honeysuckles should be planted in a sheltered

WISTARIA MULTIJUGA GROWING OVER A SPRUCE FIR IN A BERKSHIRE GARDEN (See Page 278).

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SEED-PODS OF *WISTARIA CHINENSIS*.
These were formed during the hot summer of 1911.

part of the garden. *L. japonica aurea reticulata* (syn. *L. brachypoda aurea reticulata*) is a sun-loving climber. Its small green leaves are heavily netted with rich yellow. The variety named *flexuosa* bears sweet-scented pink and yellow flowers abundantly, and *L. etrusca*, a European vigorous species, is very free, the flowers orange-yellow. *L. flava* is another strong grower, but it is only a success in warm situations. Honeysuckles may be propagated by cuttings inserted in sandy soil in a sheltered position outdoors in October.

Lycium europæum (*European Box Tree*) is a well-known cottage garden plant of free growth, even on poor soils. Its long spiny shoots, clothed with small light-green leaves, carry many small reddish-coloured flowers, which are succeeded by small berries. Suitable for clothing dry banks. *L. barbarum* is a beautiful seaside shrub, slender in growth, with violet-coloured flowers and orange-scarlet berries. Of the last-named, there is a form with pretty silvery foliage.

Passiflora (*Passion-Flower*).—The blue Passion-Flower and its white variety, Constance Elliot, are most effective climbers for covering a large space in a short time, and are practically evergreen, only losing their foliage while the young leaves are starting in the spring. During the whole summer they are covered with their large, starry flowers, and in the autumn are thickly hung with golden fruit in sheltered sites. Propagated by cuttings inserted in cold frame in summer. Prune Passion-Flowers in February by shortening to about one-third the strong shoots, but remove weakly growths. These do best in well-drained sandy loam.

Polygonum baldschuanicum.—This is a very popular climbing plant of rare beauty. We have read disparaging paragraphs concerning it, but the plant's failure occasionally to come up to expectations is due probably to many seedlings having been raised, and these are not always true to the original type. It has one merit, that of flowering in the autumn. Planted against a pergola, pillar, or stout post, it quickly makes growth, and in autumn the stems are clothed with misty masses of pink-tinted flowers. Sometimes it gets cut down to the ground in winter, but springs up again the following spring. The flowers last well when gathered for the house. It bears some resemblance to *P. molle*, but is quite distinct. It is excellent for rambling over old trees, especially evergreens.

Solanum jasminoides is a beautiful climbing plant that is covered with white flower-clusters through the whole of the summer and autumn. It is not strictly hardy, but does well in the south of England, and has withstood the winter as far north as Derbyshire.

Tropæolum speciosum (*The Flame Nasturtium*).—This is an exceptionally brilliant flowering climber, which dies down each winter. It succeeds better in the north than in the southern counties; and, where it is established, affords a marvellous display of colour, draping the boughs of evergreens with its scarlet flower-trails. Propagated by division of roots. It loves to run through shrub growth. It may be frequently seen in the Highlands of Scotland covering the cottages with a crimson dress of flowers.

Vitis.—For beauty of leafage the Vines excel all our deciduous climbers. They may be used for covering pergolas, arbours, trellised walks, or for garlanding the trunks of old trees. There are many ornamental kinds, of which the following form a good selection:—*Vitis Coignetiae*, a recent introduction, which bears leaves, often one foot across, that assume a rich bronzy-crimson in the autumn. *V. californica*, *V. Labrusca*, *V. Romaneti*, and *V. vinifera purpurea*, all of which are characterised by rich autumnal tinting. *V. laciniosa* bears very deeply-cut leaves, while *V. heterophylla humulifolia*, the Turquoise-berried Vine, in addition to its handsome foliage, has the further merit of producing a profusion of pale-blue fruit. The Japanese Vines are glorious climbing plants; their big leaves are a blaze of colour in autumn, and everyone knows how graceful the Vine is—beautiful, not merely for its foliage and tendrils, but for its foot-clusters too. The Virginian Creepers, formerly known as Ampelopsis, are now included in the *Vitis* family, the common Virginian Creeper being called *V. quinquefolia*, while the clinging *Ampelopsis Veitchi*, so largely used for covering house-walls, is named *V. inconstans*. *Ampelopsis*, or *muralis*, is a very beautiful form, which does not cling so closely as *Veitchi*, and turns to brilliant autumn colours. The new species, *V. armata*, *V. Thomsonii*, *V. henryana*, *V. lecoides*, *V. megalophylla*, and *V. flexuosa Wilsonii*, should all be grown.

Wistaria Chinensis, with its long tassels of scented, lavender flowers, is one of the choicest of our spring-blooming climbers, and is equally adapted to covering walls, arches, and pergolas. There is a white variety and also a double form of this charming plant, but the type is the most beautiful. *W. multijuga* is a species much grown in Japan; it produces extremely long flower-racemes and does well in many gardens in this country. Wistarias may be propagated by layering the young shoots in the summer. When well-established the plants make rapid growth, but cases often occur where they fail to make vigorous shoots for some years, in which event their roots should be exposed and afforded a dressing of rich soil. Prune by shortening back the shoots in the early year.

PART II

THE GREENHOUSE AND CONSERVATORY

THE greenhouse is an indoor garden. It may be a pretty creation or a muddle of anything and everything, and there is a general and unfortunate tendency to attempt too much. When many plants are brought together, some requiring distinct treatment to others, failures must occur. This does not mean that it is impossible to grow a beautiful and varied collection of plants, but the selection must be right, and the requirements of individual things carefully studied. The word greenhouse, regarded from the practical gardener's point of view, signifies a glass structure, in which no fire-heat is given during the summer, and only sufficient in the winter to prevent the temperature falling below 40 degrees. At that season the structure is used for storing such plants as Pelargoniums, Heliotropes, Petunias, Fuchsias, and a host of other things that need almost entire rest during the winter. For maintaining a supply of flowers throughout the winter a temperature of 50° to 60° F. will be necessary. In the case of the amateur, however, the greenhouse is a more general plant home. The building itself, size, shape, position, and other particulars, depend upon the surroundings to a great extent.

The Most Satisfactory Shape is the span roof, as the light is then distributed equally on both sides, the result being plants of better shape than can be grown under other conditions. The great objection to a span-roof structure in a small place is the amount of room it occupies, hence what is known as a lean-to greenhouse is popular. This may be erected against any wall of sufficient height, and is frequently attached to the dwelling-house. In such a structure the plants grow quite one-sided, unless they are occasionally turned round.

In erecting a greenhouse, whether large or small, it should be plain and substantial. A complicated design, with more or less coloured glass, is a death-trap to many plants. The arrangement of the staging in a span-roof greenhouse will to a certain extent depend upon the width of the structure. When it is ten feet wide, three feet may be set apart for a centre path, with a stage on each side three feet six inches wide.

In narrower houses these dimensions may be proportionately reduced. For a house sixteen feet wide a central stage is necessary. It may be four feet in width, with a walk of three feet on each side, and an outside stage of the same dimensions—sixteen feet in all. Ample ventilation is essential, and this should be provided for by means of lifting or sliding lights on the top, and also in the sashes around the sides, while if it is to be heated by hot-water pipes, a few wooden traps in the wall close to the pipes are serviceable. By means of these a little air may be given in the winter, when the pipes are hot, without lowering the temperature to any extent, the cool air admitted by this means serving to neutralise the drying effects of the hot pipes.

For a lean-to greenhouse the question of ventilation applies with equal force, but, of course, the arrangement of the staging is quite different from that of a span-roof structure. The usual plan is to have a stage along the front, then the path, and at the back of the house a stage arranged in a step-like way, so that the plants can obtain a full amount of light and air.

Various materials are used for staging, one of the neatest and most permanent being slates, but their cost is frequently prohibitive. If the stage is made of ordinary deals, two good coats of red-lead priming must be given before applying the paint. Flat stages should be covered with a moisture-retaining material, and for this purpose nothing is better than the sea shingle, largely composed of cockle shells, used so much for paths, &c. Besides retaining the moisture, it is sweet, clean, and does not harbour insects. Other materials may be used, such as fine gravel, with the sand sifted out, ashes, &c., but shingle is the most satisfactory.

Position.—Where a choice of position exists—an unusual occurrence, except in large gardens—a span-roof structure should run north and south, so that both sides of the house will be exposed to the sun some time during the day. With a lean-to one must take advantage of an existing wall, therefore it by no means invariably faces the south; indeed, it is sometimes almost entirely shaded. Even when a greenhouse is shut off from the sun it may be made attractive, though the selection of plants for this purpose will be different from that in a sunny spot. Hardy Ferns would succeed in a shaded house.

Shading.—Though, as stated, a greenhouse in a quite shaded place is suitable for only a small collection of plants, yet full sun is injurious to so many subjects that shading is absolutely necessary, and that not only for the sake of the plants themselves, but for comfort too. The most desirable form of shading material is some kind of canvas fastened on rollers, so that it can be drawn up when not required. This needs constant attention, therefore many prefer permanent shading. Numerous mixtures are sold for the purpose. One that can be thoroughly recommended is known as "Summer Cloud."

A good home-made permanent shading can be formed by placing seven pounds of size in a pail, and standing it over the fire until dissolved, then stir in a knob of whiting, pounded fine, and one pound of Brunswick green. This must be applied, while still warm, on the out-

side of the glass with a painter's brush, and if the sun is shining on the glass at the time so much the better. This shading gradually thins, so that by the autumn, when the sun loses power, there is little left.

In a sunny spot when the shading is on rollers it may be used during the brightest part of the day from the middle of March onwards. Flowering subjects last much longer thus treated, but permanent shading should not be put on before April.

So many horticultural builders now make a specialty of greenhouses for the amateur that even if it be intended to put up the structure one's self the most satisfactory way will be to obtain the materials from a trustworthy firm, and supplied ready for putting together. After the house is put up two or three good coats of paint both inside and out should be given, as these preserve the wood.

Heating.—During the greater part of the year artificial heat is unnecessary for the greenhouse; it is required more or less throughout the late autumn, winter, and early spring months. Various devices have been employed to keep the structure at a given temperature during frosty weather, but the usual way is to have a boiler outside to heat a certain quantity of hot-water pipes within the greenhouse. Several prominent manufacturers have devoted much attention to the production of a boiler that needs little attention and will burn for many hours, with the result that some most effective boilers can now be obtained. The quantity of pipes necessary to protect from frost and their arrangement depend so much upon the situation of the structure and many other items that the most satisfactory way is, after having selected the form of boiler, to ask the maker's advice. Of course all particulars must be supplied, as in this way only a correct opinion can be formed. In the case of boilers of all kinds much depends upon the way they are managed. Cleanliness is an important item, and this applies not only to the boiler itself, but to the flues connected with it. In frosty weather the most critical time is usually about daybreak, hence the boiler should if possible be attended to then, and if it has remained untouched through the night it will contain little fire. This must be freed from ashes and clinkers, when it burns freely, and soon causes the water to circulate briskly in the hot-water pipes at that important moment. Care should be taken, however, not to make the pipes too hot, as they then give off an enervating dry heat injurious to plants, though it encourages the insects that prey upon them. Such being the case it is better to spread the heat over more pipes than to keep those in use too hot. Whether coal or coke is used it should be broken small and slightly damped, as it will then last longer and give greater heat. Attention to these minor details makes the successful stoker. In the case of an amateur with a small greenhouse two great objections to the above-named systems of heating are: firstly, the expense; and secondly, the fact that stoking, even if carefully done, is dirty work, and irritating late in the evening, when during frost the fire must be attended to. This has led to a great increase in the use of

Oil Lamps for keeping out the frost, and the firm of Ripplingille, so

noted for their oil stoves of all kinds, have brought out some good forms for heating greenhouses. Though varying in power the principle remains the same; it is that of an upright boiler, connected by means of hot-water pipes with a standard of the same height as the boiler. This allows a free circulation of water, and of course the heat given off is considerable. The heating apparatus consists of a large sliding tank for the oil and one or more burners. A sufficient quantity of oil is stored to burn from sixteen to twenty hours, thus avoiding soiled hands and unpleasant work late in the evening. Of course the lamp requires regular and careful trimming, a remark that applies with equal force to an ordinary table-lamp. Even a table-lamp of the duplex kind will protect the plants in a small house from danger during a sharp frost. The different forms of hot-water apparatus heated by oil are perfectly free from smoke and smell, provided always that the lamp is thoroughly trimmed. It is portable, therefore can be readily shifted to that part of the structure requiring the greatest amount of heat. As the lamps require no chimneys, flues, or fixtures of any kind, and the dirt and inconvenience of stoking are entirely obviated, the different forms of oil stoves may be recommended to the amateur. A little experience will determine the best position for the stove, which should not be closer to the plants than can be helped, consistent with being in the best position for heating the greenhouse.

As with proper attention the lamps are quite clean and free from smell, these oil stoves can be used where the greenhouse or conservatory is attached to the house, with a communication between the two. They are not in the least unsightly; indeed, some of the better forms are quite ornamental. There are also several forms of boilers heated by gas, these being very convenient and effectual, provided the gas cannot have access to the structure. When heating a greenhouse too high a temperature must not be maintained during winter. The object is simply to keep the plants free from frost and not to unduly excite them, for those that experience a period of comparative rest during the winter grow with greater freedom than those which have been placed under warmer conditions at the dull period of the year. For an average greenhouse, with the usual occupants of such a structure, a night temperature of 45 degrees is quite sufficient; indeed, it may during very severe weather drop another 5 degrees without injury. As previously stated, however, if a display of flowers is needed, a night temperature of 50 degrees must be ensured. Even in the depth of winter artificial heat may be frequently dispensed with for days together; but after a spell of wet, dull weather, even when no frost is likely to occur, it is sometimes advisable to light the stove for a short time to dry up superfluous moisture.

Many forms of propagating cases for seeds and cuttings are heated with an oil lamp; but an objection to these is that they give off too much heat, hence the young plants quickly become debilitated, and are not so strong as those raised in the ordinary atmosphere of the greenhouse.

Potting Soils.—The preparation of soils for potting is important,

and often sadly neglected. It is a common practice to dig up a little garden soil for this purpose, the result being unhealthy plants, and general disappointment.

The potting composts, which are blended in various ways according to the requirements of the plants, are technically known as loam, peat, leaf-mould, decayed manure, sand, and cocoanut fibre refuse.

Of these the most important is—

Loam, as it forms the principal portion of the compost for nearly all classes of plants. It is really the common earth of the fields and meadows, and in some districts good loam is easy to obtain. Loam should be fairly adhesive, but sufficiently friable to break up if rubbed between the fingers. Some loams are of a more clayey nature than others, but this may be neutralised by mixing in an increased quantity of peat or leaf-mould, which are described later on. Too near an approach to clay will, however, render the soil useless for potting. The best loam, that generally used in high-class gardens and in nurseries, is obtained by taking the top spit of a meadow and making it into a stack with the grass side downwards. This must remain in bulk for at least a year (and two years are better), until the grass is quite dead, and only the fibres which serve to keep the soil porous remain. Some localities, particularly in Surrey and Hampshire, are famous for their loam, which is sent to all parts of the country for potting.

Peat is principally obtained from commons, on which the Heath and Bracken flourish, the neighbourhood of the New Forest being noted for the superior quality of its peat. It is dark in colour, and principally composed of decayed vegetable matter, roots of various kinds, and sand. Peat is naturally of an open nature, and water passes easily through it. It is mixed with loam to form a compost that is readily drained, as stagnant moisture is detrimental to successful plant-culture.

Leaf-mould is formed of decayed leaves which are collected in a heap and turned over occasionally until the leaves themselves disappear into a dark-coloured mould. Where leaves and dung are mixed together to form a hot-bed, this matter, when thoroughly decayed, is most useful for potting. The leaves of the Oak and Beech are among the best for the production of leaf-mould, which is used for the same purpose as peat.

Manure in a fresh or crude state is too violent in its effects to go with potting soil, but cow manure is, when thoroughly decayed, a valuable stimulant. It must, however, be quite dry, otherwise it is often infested with worms to such an extent that successful plant-culture is rendered impossible.

Sand is of great service in increasing the porosity of soils, and is useful for cuttings, small seedlings, and any subjects with tender and delicate roots. Silver sand is principally used, but in many districts sand of good quality is deposited by the side of small running streams.

Cocoanut Fibre Refuse.—This is a valuable but little understood substance. By many it is regarded as a manure, but this is a mistake. Cuttings of many subjects strike root readily in a mixture of cocoanut

fibre refuse and sand, but they must be potted into soil soon after the roots are formed, otherwise they are apt to decay. It may also be mixed with loam where peat or leaf-mould are not available, but the last two are preferable. For covering the surface of small beds of flowers, either to prevent too rapid evaporation, or to save the flowers from being splashed by the rain, cocoanut fibre refuse is excellent, while it is used largely to plunge pots in, so that the roots do not dry so quickly as when fully exposed.

The Mixing of Soils is an important item, the proportions employed depending upon the plants for which the soil is intended, and also upon the consistency of the loam. A few items of general advice, however, will be of great service to the beginner. For the majority of plants, such as Fuchsias, Pelargoniums, Heliotropes, Petunias, and a host of similar subjects, a suitable compost may be formed of two-parts loam to one-part leaf-mould, or, failing this, peat, and about half a part each of sand and decayed manure. None of the ingredients should be sifted, but the lumps broken up with the hand; indeed, the sieve is frequently a mistake, as it deprives the soil of the matter which renders it porous. For cuttings, seed-sowing, and transplanting tiny seedlings, the soil should be passed through a sieve with a quarter of an inch mesh, but for general potting it must not be sifted. When the mixture above mentioned is thoroughly incorporated together, it is fit for use. In potting, see that the soil contains the requisite amount of moisture, as if too dry or too wet future success is unlikely. A good guide is to take a handful of soil and press it tightly together. It should be sufficiently moist to retain its shape, and yet dry enough to crumble to pieces when rubbed. If dry soil is damped, it must stand twenty-four hours before use, in order to allow the mass to be in one condition of moisture.

Though these directions as to the mixing of soil, &c., are given, the amateur with limited space who happens to reside in the neighbourhood of a nursery or florist, will be able to obtain suitable soil for general purposes already mixed at a cheap rate, and will find this a convenient method to adopt.

Seed Sowing and Propagation by Cuttings.—Many beautiful flowering plants can be raised from seed, including not only many available for the greenhouse itself, but also that large class known as tender annuals, which should be raised under glass and planted out later on. Such popular flowers as China Asters, Zinnias, Balsams, and Celosias may be treated in this way. Whether seeds are sown in boxes, pans, or pots, the method of procedure remains the same. Thorough drainage is necessary, therefore ensure this by putting a layer of broken crocks in the bottom of the pot, pan, or box. On this place the soil and press it down moderately firm to about half an inch below the rim. Make it level, but do not pat the surface smooth, as this prevents the roots from entering readily into the soil when the seed germinates. Having prepared the receptacles, sow the seed by sprinkling it on the surface of the soil, taking care not to sow too thickly. There is a great tendency to do this, especially in the case of small seeds that retain their

vitality well, and if crowded together the seedlings quickly become weakened, and never attain the vigour of those that are allowed ample space from birth. After sowing cover the seeds by a sprinkling of soil that has been passed through a sieve with a quarter of an inch mesh. The depth of the covering depends greatly upon the size of the seeds, a good general guide being to bury the seed at its own depth below the surface of the soil. This in the case of minute seeds means merely a slight sprinkling. Some seeds, such as those of Acacias and Cannas, are very hard, and frequently take a long time to germinate if sown in the ordinary way. To assist germination the seeds are sometimes filed, but there is some risk in this, a more satisfactory plan being to soak hard seeds for twenty-four hours in warm water. It should be kept if possible at a temperature of 80 degrees to 85 degrees. This treatment will have a considerable effect on the seed, which must be sown directly it is taken from the water. The soil must not get too dry after sowing as the seeds will be just on the point of starting into growth, and in this stage are soon injured by drought.

In the case of very tiny seeds such as Begonia, Gloxinia, Lobelia, and others a different course of treatment is needed. After sowing the seed thinly on the moistened surface of the soil, which has been watered through a fine rose just beforehand, the only covering needed will be a pane of glass laid over the top. This should be allowed to remain until the seeds germinate. When this is done the sun must not shine on the glass, otherwise the small space between it and the surface of the soil will be so hot as to roast the tender seedlings. As soon as they have formed the cotyledons, or seed-leaves, remove the glass and inure the young plants to the ordinary atmosphere of the greenhouse. With regard to the length of time occupied by seeds before they germinate no hard-and-fast line can be given, as some remain much longer in the ground than others; while much also depends upon the seed itself, for if kept a long time before sowing its germination is, as a rule, more irregular than if sown soon after it is ripe. Thus *Primula* seed will often germinate in a fortnight or so after sowing, but it may remain for a year and finally grow.

The seeds of all that section of plants known as dicotyledons, which include most subjects grown for the greenhouse, first push above the surface a pair of cotyledons, or seed-leaves, as they are often called. Then from the centre of these appears the first proper leaf, and as the plants develop the cotyledons finally die away. A critical time with many seedlings is just as the first true leaf develops, the young plants being apt to topple over and decay. This kind of decay is known as "damping off," and is frequently due to an excess of moisture or too close an atmosphere, but however carefully seedlings are looked after it is very liable to happen, especially if crowded. To stop this damping off transfer the young seedlings to other pots or pans, using a pointed piece of wood known as a dibble in the case of small kinds.

Pricking off the Seedlings.—The process referred to in horticultural publications as "pricking off" is carried out in the following manner:—

The pots or pans are prepared as for seed-sowing, then with a pointed piece of wood one of the seedlings is carefully lifted without injuring the roots. With the dibble held perpendicularly, make a hole sufficiently deep to take the young plant, burying the stem almost to the cotyledons. Never make the hole deeper than is necessary, otherwise a cavity will remain at the bottom. To close the soil around the seedling when it is placed in position, insert the dibble exactly as before, but from a quarter to half an inch from the little plant, towards which the soil must be pressed. By this means the buried portion of the stem is held in position throughout its length, and not merely on the upper part as is so often practised. When this is finished the soil must be watered through a fine rose, sufficient being used to settle everything in its place, after which shade the plants for a few days until the roots recover from the check sustained during transplanting. When the young plants crowd each other either put them into small pots or plant them out.

In the case of seedlings of strong growing plants, such as Cannas, no pricking off will be necessary, the young plants being simply transferred from the pots or pans in which they have been sown and potted singly into small pots.

The process known as

Hardening off—that is, gradually inuring plants to changes of condition and of temperature—is of great importance, for if plants grown under glass and partially shaded are suddenly transferred to the open ground they are sure to suffer, while if the change is gradual they will not be affected. In the case of seedlings that have been raised in the greenhouse for planting out in the open ground later on, take advantage of a dull or showery day for the work, as then they quickly recover from the check occasioned by removal.

Cuttings.—Many plants can be propagated by cuttings, and though some require different treatment from others, a few simple rules will generally suffice to achieve success. As the cuttings when separated from the parent plant quickly flag if fully exposed to the air, a small frame is necessary, air-tight, or nearly so, and fitted with glass lights. This, which is usually like an ordinary garden frame in shape, is known as a propagating case; but failing this a home-made article may be improvised that will answer the same purpose. A shallow box, about seven or eight inches deep, slightly higher at the back than at the front, with a few squares of glass laid over it, forms a good propagating case for most greenhouse plants. The glass must be removed each morning to drain off accumulated moisture, and also to allow for the removal of any decaying leaves, while the soil when dry may be watered.

The majority of greenhouse plants, including such popular subjects as Fuchsias, Heliotropes, Petunias, Begonias, Coleus, and many others, all strike root readily with the following treatment:—Take some clean four-inch pots, place one crock (that is, a piece of broken pot) in the bottom, so as to cover the hole, then over this a few smaller pieces. Then make a mixture of equal parts of loam, leaf-mould, or peat, and silver sand, and pass the whole through a sieve with a mesh of a quarter

PELARGONIUM CUTTINGS BEFORE AND AFTER
INSERTION.

PLANTS RAISED FROM CUTTINGS.

THE
GARDEN
AND
THE HOUSE

A WINTER-FLOWERING BEGONIA RAISED FROM A CUTTING.

to half an inch. The result will be a sandy mixture without large lumps. With this fill the prepared pots moderately firm to within a quarter of an inch of the top, and they are then ready for the cuttings. The spring is the busiest period with the propagator, but cuttings may also be put in successfully throughout the summer months. The best cuttings as a rule consist of the young growing shoots, taken off at a length of about three inches, and when the bottom leaves are removed they are ready for insertion. The cuttings must be put in with a dibble exactly as directed for pricking off seedlings, and care must be taken not to overcrowd them, as if this is done, decay is liable to set in. At the same time, space within the propagating case is usually in demand, so that no room must be wasted. Seven cuttings of such subjects as Fuchsias and Heliotropes may be, as a rule, accommodated in a four-inch pot. Directly they are put in give them a good watering through a fine rose. The warmest part of the greenhouse should be chosen for the propagating case, and when this structure is kept at a slightly higher temperature the cuttings will root more quickly. Even when the greenhouse is shaded, lay an additional sheet of paper over the propagating case until the cuttings are rooted. As soon as this takes place more air must be given, and the cuttings gradually inured to the ordinary atmosphere of the greenhouse, when they should be potted singly into small pots. Many cuttings strike root in three weeks or so, so that from even a small case a considerable number of things can be turned out during the season. By many people bottom heat is considered necessary for propagation by cuttings, but this is not the case, though, of course, they strike in less time with the additional warmth.

Though cuttings of most plants may be struck according to the directions above given, there are exceptions, one of the most important being the Pelargonium, or Geranium, as it is often called, which is represented in our gardens by innumerable varieties. For these prepare the pots as just recommended for other subjects, but the cuttings are treated differently. They should be cut clean off just below a joint, with a sharp knife, and the bottom leaf removed. Then take off the small leaf-like scales that are formed on the stem, as these otherwise frequently prove a source of decay. The cuttings should then be inserted in the pots prepared for them, give a good watering, and stand on a shelf or a similar position in the greenhouse. Though the leaves will flag, and many of the cuttings after a few days look unhappy, they soon root under this treatment, not damping off or becoming attenuated as would result in a close case. Of course the soil must be kept moderately moist. When a pot is prepared for cuttings it is finished off by some growers with a layer of clean silver sand on the top, but this is not recommended, as if at all exposed the sand quickly dries, hence a mistake is often made of watering the cuttings when the soil below the layer of sand is sufficiently wet, and this may lead to disastrous results.

Another class of plants requiring still different treatment comprises those of a succulent nature, which will not flag however exposed. The cuttings of these should not be inserted for a day after being separated

from the parent plant, as when full of sap they are liable to decay. These remarks apply to the numerous flowering Cacti, *Rochea falcata*, *Crassula*, or *Kalosanthes coccinea*, and such subjects. The best cuttings of these flowering Cacti are furnished by the shoots from four inches to six inches long, pulled off at the base from their point of union with the main stem. A little brick rubble mixed with the soil is in their case an advantage.

Propagation by cuttings must be resorted to in order to increase any particular variety among the numerous florist's flowers, for such things as Fuchsias, Pelargoniums, Begonias, and similar subjects cannot be raised from seed with the knowledge that the progeny will resemble the parent plant. Raising seedlings of such things is, however, very interesting, and there is always the chance of obtaining something good.

Potting.—This is an important operation in plant-culture, and success depends upon the way in which this work is managed. The first consideration is to see that the pots used are thoroughly clean. When dirty, wash them inside and out, and allow them to get quite dry again before use. Proper drainage, too, is essential. This is provided by placing a piece of broken flower-pot, known as a crock, over the hole in the bottom, and a few other smaller crocks around it. Oyster-shells form a good substitute for broken crocks; indeed, by many they are preferred. Whichever is used, place them with the concave side downwards, as by so doing surplus water runs away freely, whereas, if the convex portion is placed directly over the hole, a very little soil will stop the drainage. The soil employed must be in an even condition of moisture, as mentioned under the head of potting-soils. The operation of shifting a plant

FIG. 19.—Shows Drainage in Flower-pot.

On this, composed of broken potsherds, should first be placed a little moss, or turfy soil, before filling with mould.

from the pot in which it has been growing into a larger one is carried out in the following manner :—First take care that the ball of earth of the plant that one is going to shift is neither too wet nor too dry; then remove it from the pot by turning it nearly upside down, supporting what was the upper surface of the ball of earth with the left hand, and holding the pot in the right. A sharp tap of the edge of the pot on the potting-bench will bring the entire ball of earth out of the pot, and, as its weight then falls directly on the left hand, take care that at that moment it does not drop. Then remove the crocks, without bruising or injuring the roots in any way. This done, loosen with a pointed stick some of the principal roots that are wound round the ball of earth, so that they will more readily take possession of the new soil when potted. Of course, this must be carried out carefully; but a little practice will soon determine the extent to which the roots can be disturbed without injury, in fact, to the future benefit of the plant, which will be now ready for the new pot. Its size will, of course, depend upon the kind of plant to be potted and its condition, but generally a good healthy plant, when shifted, should be put into a pot sufficiently large to allow a space of an inch

between the ball of earth and the side of the pot. The actual potting is then performed by taking a handful of the coarsest of the soil and placing it immediately over the crocks, then further adding sufficient soil, so that the upper part of the ball of earth will be about half an inch below the rim of the pot. Fill in the soil around the sides, pressing it down firmly and evenly. If cavities are left, failure will probably result. In pressing down the soil, particularly if a lesser space than an inch is allowed, a piece of wood, such as a lath, will be useful. The sharp edges of it should be smoothed down, otherwise the roots may be injured. The potting operation is complete when the new soil is worked all around, and the old ball of earth slightly covered with it. Allow half an inch or so from the level of the rim of the pot to the old ball, but for large pots give an inch space. When potting is completed, well water the plant through a rose to settle the soil thoroughly in its place, and, where it can be managed, newly potted plants are benefited by being kept rather closer for a few days until the roots recover from the check they have experienced. When several cuttings and seedlings are together in one pot, the operation of separating and putting them into single pots is known as—

Potting Off.—This should take place before the roots get much matted together, otherwise bruising will result when they are disentangled. Potting off means turning the ball of earth out of the pot, and singling out each plant with as little damage to the roots as possible. Then repot in suitable soil, burying the naked stem of seedlings almost to the cotyledons. For cuttings or seedlings pots from three inches to four inches in diameter are suitable, and as just advised in the case of those that are repotted, the young plants should be kept rather close and shaded for a few days until they take hold of the new soil. Plants that have sustained a check at the roots, and sometimes this is unavoidable, are much refreshed by light syringings, rapid evaporation being arrested. In the case of plants with roots which do not take a very firm hold of the soil, moving them about will result in injury unless the stems are secured to a stick. The stake should be rounded and thoroughly pointed to avoid injury to the roots. Then push it down to the bottom of the pot perpendicularly, otherwise when it is withdrawn and reinserted damage to the roots may result. In tying plants, particularly those of quick growth, future growth must be allowed for, so that whether the material used be raffia, thread, or string, it must not be tied too tightly round the growing shoots.

General Treatment of the Greenhouse throughout the Year.—Position and other surrounding features will to some extent influence the treatment to which the occupants of the greenhouse are subjected, for in some places a drier atmosphere exists than in others. During the winter greenhouse plants are partially at rest as a rule, hence they must be kept drier than when in active growth. At the same time extreme drought will work considerable havoc, for it is necessary to keep the soil moderately moist. Such things as Tulips, Hyacinths, Azaleas, and others, with flowers that develop in the spring need, of course, more water than plants at rest. Too great a heat must be avoided; a mini-

mum night temperature of 45 degrees with a rise of 5 degrees to 10 degrees during the daytime being sufficient. When the weather is very severe the thermometer may fall five degrees lower than the temperatures given without injury. As spring advances and the sun gains power a moister atmosphere is necessary, and to maintain this the plants should be occasionally syringed, and the floor and exposed portion of the stages damped. By the middle of March if the greenhouse is fully exposed to the sun, shading for a few hours during the brightest part of the day is beneficial to plants in flower, and unless the structure is differently situated, it may be kept up until October. Shading, however, should only be given as a protection from the full sun, because, used at any other time, it tends to weaken the plants. Permanent shading alluded to previously cannot be recommended for this reason. By the end of May many greenhouse plants that have finished flowering may be placed out of doors, and the structure used for numerous summer blooming plants. Such things as Azaleas, Heaths, and Rhododendrons set their buds in preparation for a future display of bloom more readily in the open air than when grown altogether under glass. Remember, however, that by the end of May the sun is very powerful. Shading from bright sunshine will be necessary for a few days for the plants brought from the greenhouse, otherwise the foliage is apt to turn brown, and being permanent, injury of this kind is serious. Water must be cautiously given to greenhouse plants placed out of doors, particularly during showery weather, for with the surface slightly moistened, one is apt to be deceived as to the condition of the soil, and two or three hours' sunshine and wind will work havoc. As worms quickly injure many plants by choking up the drainage, stand the pots on a firm and level bed of coal ashes or some other rough material. The trouble of watering is greatly lessened if the pots are plunged, but this should not be done in ordinary garden soil. Ashes are vastly preferable, or cocoanut fibre refuse may be used. About the middle of September is a good time to return again to the greenhouse those plants that have spent the summer out of doors, as by then frosts and heavy rains frequently occur. A free circulation of air should, if possible, be allowed for a week or two after their change of quarters, as if kept too close many leaves are liable to drop.

Insect Pests were at one time a source of great tribulation when the only method of destroying aphides or green-fly was by means of fumigation, but the different forms of vaporising—that is, distributing the nicotine in the form of steam—are now so simple and effectual as to occasion no personal discomfort whatever. The XL-All Vaporiser has been before the public for some years, and grows in favour. A small spirit-lamp is the medium of disseminating the steam. Not only are aphides destroyed by this insecticide, but thrips also, while mealy-bug is greatly checked by its occasional use. Scale that stick principally on the under sides of the leaves and on the stems may be removed by one of the various washes sold for the purpose, but the greatest care must be taken to carefully follow the instructions given with the preparation. It is always safe to err on the weak side.

USEFUL GREENHOUSE PLANTS

BELOW is given a list of the finer greenhouse plants, with simple directions as to their culture.

Abutilon.—The Abutilons are shrubby plants six feet or more high, and will flower well when about eighteen inches high, and in pots five inches or six inches in diameter. They are also valuable for training to the roof of a greenhouse, or for clothing the back wall of that structure, in which positions their drooping, bell-shaped blossoms are seen to advantage. The flowers vary in colour from white to deep red, through different shades of yellow and pink, while in a few kinds the leaves are prettily variegated. In a warm structure they will flower almost throughout the year, but in an ordinary greenhouse need much the same treatment as a Fuchsia. Cuttings strike root readily by following general details previously given, and ordinary potting soil will suffice for their successful culture. A few good kinds are :—Boule de Neige, white ; Golden Fleece, yellow ; Royal Scarlet, and Sanglant, red ; Anna Crozy, pink ; Emperor, purplish. With variegated leaves—*Darwini tessellatum*, *Nævium marmoratum*, *Sellowianum variegatum*, Souvenir de Bonn, Sowitzi, Thomsoni, and *Vexillarium variegatum*. The white Boule de Neige is as useful as any ; its bell-like flowers are quite white, and vigorous plants seems always in bloom.

Acacia.—A family of trees and shrubs, for the most part natives of Australia, and producing their yellow flowers during the spring months. They succeed in a mixture of equal parts of loam and peat, with a little sand. Cuttings are difficult to strike except in nurseries, where there are ample appliances for the purpose ; and though seeds can often be obtained, plants raised in this way must attain a large size before they flower. *Acacia dealbata* is the plant so well known as “Mimosa,” cut sprays of which form such a familiar object in London and provincial towns during the early months of the year. They are sent from the Mediterranean shore, where this *Acacia* grows into large trees. The following kinds produce thin little globular tufts of golden blossom in great profusion, even when the plants are quite small : *Acacia armata*, *grandis*, *platyptera*, and *pulchella*, while in *A. Drummondii* the flower clusters are in the shape of a bottle brush. *A. riceana* is a pretty climbing kind, with pale yellow blossoms. All the *Acacias* may be placed out of doors during the summer months.

Achimenes.—Pretty, little, soft growing plants that flower during

the summer and pass the winter in a dormant state, when they must be kept dry. The underground portion consists of small, elongated tubers, which about March should be shaken away from the old soil, and repotted in a mixture of equal parts of loam and leaf-mould with a little sand. Half a dozen tubers may be put in pots five inches in diameter, and these are sufficiently large for the *Achimenes*. When larger masses are desired deep pans may be used. They are also suitable for hanging baskets. In a warm house *Achimenes* will flower by the end of spring, but in a greenhouse they are at their best during the latter half of the summer. The flowers of all consist of a narrow tube, and a widely expanded mouth. The varieties are numerous with white, pink, mauve, scarlet, and purple blossoms.

African Lily. See *Agapanthus*.

Agapanthus.—Plants of bold growth with long, strap-shaped leaves, from among which are pushed up during the summer heads of pretty blue flowers, borne on stems three feet or four feet high. The commonest is *A. umbellatus*, to which the white *albus* affords a pleasing change. There is also a double-flowered kind (*flore pleno*), while the miniature form known as *minor* is worth growing for the sake of variety. The *Agapanthus* are useful for large pots or tubs for standing out of doors on steps, terraces, or similar positions during the summer months, and the flowers appear at that time. These tub specimens will keep in health for years without repotting, indeed, they do much better when the roots are closely confined. *Agapanthus* are dormant during the winter, when they can be successfully wintered under the stage of a greenhouse, in a shed, coach-house, or similar position, providing they are free from frost. Ordinary potting-soil is suitable.

Agathæa cœlestis.—A free-flowering shrubby plant about eighteen inches high, that bears throughout the greater part of the year Daisy-like flowers of a pleasing shade of light blue. Known as the Blue Marguerite. Likes loam with a little peat and sand.

Agave.—The best known of the *Agaves* (a numerous class) is the American Aloe (*Agave americana*), a plant of symmetrical growth, and with huge fleshy leaves, furnished with large spines, disposed naturally in the shape of an immense rosette. It is sometimes called the Century Plant, from its reputed habit of never flowering until a hundred years have elapsed. This is quite a mistake, as the most casual observer knows. The leaves contain a strong fibre which is very valuable for rope-making. There is a variegated variety in which the leaves are striped with pale yellow. The American Aloe is just the thing for standing on steps, balconies, &c., as advised in the case of the *Agapanthus*. Loam, sand, and some small pieces of old crushed bricks suit the *Agave*.

Aloysia citriodora.—The lemon Verbena, or Sweet Verbena, as this is often called, is popular, and no wonder, for its leaves are delightfully fragrant. In the milder districts of England it may be trained to a wall outside, but in most parts it needs the protection of a greenhouse, where, with the same treatment as a *Fuchsia*, it succeeds perfectly. Cuttings of the young shoots should be taken in the spring. The leaves

when bruised give off an odour of fresh ripe lemons. Soil: loam, peat, and sand.

Amaryllis. See *Hippeastrum*.

American Aloe. See *Agave americana*.

Aralia Sieboldi.—This is a stout growing plant, with large deep green leathery leaves. It is easily grown, is hardy in many districts, and most useful for sitting-rooms, draughty corridors, and similar places. It is often confounded with the Castor Oil Plant (*Ricinus*), a quite different thing. There is a variegated form of this *Aralia* in which the leaves are marked with white. Ordinary potting-soil.

Araucaria.—A class of large trees nearly related to the Firs, and very symmetrical in growth. The most generally grown is the Norfolk Island Pine (*A. excelsa*), which has bright green branches produced in regular tiers. This plant must not be put in too large a pot, as effective specimens may be grown in a comparatively small size. Other rarer kinds are *A. Bidwilli*, *A. Cunninghami*, and *A. Cooki*. Ordinary potting-soil.

Arum Lily. See *Richardia*.

Asparagus.—A beautiful class of climbing plants, many of which are remarkable for their delicate, frond-like branches. From this circumstance *A. plumosus nanus* is known as the Asparagus Fern, though it is in no way related to the Fern family. Grown in small pots these make effective decorative plants for a long while before they commence to climb. They need ordinary potting compost, and should be freely syringed during the summer months. The best are *A. plumosus*, *A. plumosus nanus*, *A. retrofractus*, *A. Sprengeri*, and *A. tenuissimus*.

Asparagus Fern. See Asparagus.

Aspidistra lurida.—A well-known and popular plant for the dwelling-house, with dark green leathery leaves. There is also a variegated variety. No plant is more useful for smoky towns and under other adverse conditions; its principal requirements are an occasional sponging and water when necessary. It succeeds in ordinary potting compost, and is increased by division, which should be carried out during the latter part of April or early in May.

Azalea.—The species that requires the protection of a greenhouse is that known as the Indian Azalea, of which there are many varieties, the different tints of white, pink, purplish-rose, and bright red being represented. They are largely grown in Belgium, and are sent to this country every autumn in considerable quantities in the shape of neat little bushes studded with flower-buds. They are usually grafted on to clear stems from six inches to nine inches high. When received these Azaleas are potted firmly into sandy peat, and placed in the greenhouse, where, if properly supplied with water and occasionally syringed, the roots will soon start into the new soil. They flower during the spring months, and to have them in good condition for the following season directly the blossoms are over, straggling branches must be cut back. Then, as soon as young shoots are visible on the cut portions, the plant must be potted if necessary. For this purpose sandy peat alone

should be used, and in potting it must be rammed down firmly. The plants must then be returned to the greenhouse for a time, carefully watered, and liberally syringed. Never use too large a pot, and as the plants get old they will stand for years, keep in good health, and flower well, without being disturbed at the roots. Whether repotted or not the Azaleas must, after flowering, be syringed three or four times a day if possible, except during dull weather, to encourage a free growth. By the end of May or in June place them out of doors, and lightly shade them at first from the full rays of the sun. Take care that they are well supplied with water throughout the summer, and syringe morning and evening. Under such conditions the plants will not only grow freely but plenty of flower-buds will appear, which, during the following spring, will expand and make a bright display. Get the plants under cover before the autumn frosts. So treated Azaleas may be kept year after year in good condition. In a too dry atmosphere the leaves are liable to an attack of thrips, which can be eradicated in the way previously advised.

Balsam. See *Impatiens*.

Begonia.—The Begonias form an extensive class, which may be readily divided up into several distinct sections. First, we have the tuberous-rooted varieties, single and double, which are now so popular both for bedding out and for the greenhouse; then there are the dwarf-growing forms of *B. semperflorens*, which are much used for bedding, and the several distinct kinds, valuable for their winter flowers, which in many instances are also produced in spring. Lastly, we have the numerous forms of *B. Rex*, remarkable for their large, handsomely-marked leaves. *B. Rex* is more delicate than the others, and although the plant will succeed in the greenhouse during the summer it cannot be depended upon to successfully pass the winter in that structure, though if the thermometer does not go below 45 degrees, and the atmosphere is at the time fairly dry, the more robust kinds of this section will, as a rule, be safe. Tuberous-rooted Begonias are generally increased by seeds sown early in the spring, though the particularly choice forms are propagated by cuttings. The seed is very minute, and full directions for sowing it are given on p. 287.

Tuberous Begonias, particularly in a young state, prefer a light compost; hence a mixture of equal parts of loam and leaf-mould with a little sand will suit them well. After the seeds germinate and the young plants are pricked off into a pot or pan, the next shift will be into pots three inches in diameter. When they are large enough they should be shifted into pots five inches in diameter, and unless there are a few specimens of exceptionable vigour this size of pot will be sufficient for the first season. Plants raised in this way will, as a rule, flower well during the latter half of the summer, particularly if they have a dose of weak liquid manure every fortnight after the pots get full of roots. In the autumn as the plants go to rest the water supply must be diminished, and the underground tubers will pass the winter in a dry state, provided they are not parched up. A fairly cool spot, where they are quite free from frost, is

just the place for wintering tubers of *Begonia*, such as underneath the stage of the greenhouse, where it is free from drip, or a moderately dry cellar may be utilised for the purpose. Where the *Begonias* are few in number they may be allowed to remain throughout the winter in the pots they have grown in ; but in the case of a considerable quantity economise the space by turning them out of the pots, freeing the tubers from the old soil, and laying them thickly in a shallow box or pan, then covering them with some dry mould. The size of first season's tubers will vary from that of a farthing to a penny, and when these are grown on the second season they yield the best results. March is a good month to take them from their winter's quarters and repot. They should be put into small pots at first, and shifted into larger ones as soon as required. After the tubers are potted the soil should be kept slightly moist until the young growth appears above ground. When too wet some of the tubers will decay. The double-flowered varieties may to a certain extent be increased by seeds, but particular forms cannot be propagated in this way. When the seed is saved from the finest double flowers it will be necessary to fall back upon the semi-double blossoms to supply the pollen. Artificial fertilisation is needful to insure the production of good seed, hence the progeny will be somewhat mixed. Both the single and double kinds can be propagated by cuttings put in during the spring months. When *Begonias* are used for bedding, lift them at the first sign of frost, and lay them out for a few days on the greenhouse stage or in a similar position to dry. The stout succulent stems will in a short time drop away from the tubers, which can then be laid in boxes of soil as recommended above.

The dwarf-growing forms of *Begonia semperflorens* are more grown for bedding than for the greenhouse. One of the best known is Vernon, which is only a few inches high. The flowers are red, while the leaves become tinged with crimson of various shades, according to the season and the position in which they are placed.

An extensive class consists for the most part of varieties with fibrous (not tuberous) roots, the majority of which are of considerable value for the winter. Some of them have a thickened root stock, but they do not produce tubers like the summer-flowering kinds. These must be grown on during the summer and early autumn, and as the pots get full of roots weak liquid manure once a fortnight will be helpful. To flower these *Begonias* well a minimum temperature of 50 degrees during the winter is necessary. The best of this class are Carrieri, white ; Gloire de Sceaux, pink ; Ensign, rose ; Fuchsioides, bright red ; Lynchiana, red ; Paul Bruant, deep rose ; Weltoniensis, pink ; and Knowsleyana, blush. The winter-flowering varieties obtained by the intercrossing of *Begonia socotrana* and other kinds form a numerous and much appreciated class. After the flowering season is over they need a period of rest by being kept rather dry and somewhat cooler than before. After that as spring advances they will, under the influence of additional moisture and a higher temperature, push out young shoots freely. Taken as cuttings these will soon root, and shifted into larger pots when necessary will form good

flowering plants by autumn. To this class belong: Gloire de Lorraine, pink; Turnford Hall, blush; Glory of Cincinnati, rose; Elatior, rosy-carmine; Emily Clibran, orange-salmon; John Heal, carmine-rose; Mrs. Clibran, soft pink; Mrs. Heal, carmine-scarlet; and Winter Glow, fiery red.

Bermuda Butter-cup. See *Oxalis cernua*.

Blue Gum. See *Eucalyptus globulus*.

Boronia.—This is a class of hard wooded plants, natives of Australia, and needing much the same treatment as that recommended for the Indian Azalea. The best Boronias are: *B. elatior*, rosy-red; *B. heterophylla*, carmine, a very pretty flower; and *B. megastigma*, with small, powerfully and sweetly-scented, brownish-yellow, bell-shaped flowers. All form neat little bushes, and all flower in the spring.

Bottle Brush Plant. See *Callistemon salignus*.

Bouvardia.—A popular class of greenhouse shrubs that may be propagated from cuttings of the young shoots in the spring after the manner of a Fuchsia, grown on during the summer, and will flower in the autumn and winter. Their neat clusters of wax-like flowers are in great favour for button-holes and similar purposes. The pure white *B. Humboldtii corymbiflora* has deliciously fragrant blossoms. Others are: Hogarth, scarlet; Mrs. Green, salmon; President Cleveland, brilliant scarlet; Queen of Roses, pink; and Vreelandi, white. Alfred Neuner, white; President Garfield, pink; and Hogarth fl. pl., have double blossoms. Soil: loam, leaf-soil, decayed cow-manure, and sand.

Browallia.—An easily grown free-flowering class of plants, the best of which are: *elata*, deep blue; *speciosa*, bluish-violet; and *viscosa*, deep blue, white eye. Ordinary potting-soil.

Calceolaria.—The showiest and most popular Calceolarias, or Slipperworts, as they are sometimes called, are known as "herbaceous," in which the large, inflated pouches, suggesting in shape a fisherman's basket, are richly and quaintly coloured. Herbaceous Calceolarias are raised from seeds, the best time of the year to sow being about mid-summer, and the young plants so obtained will flower during the following spring. The seeds are very minute, hence they should be sown as advised for such seeds mentioned on p. 287. When the young plants are large enough to handle prick them off into pots or pans, and when sufficiently advanced transfer singly to small pots. A mixture of equal parts of loam and leaf-mould with a little sand will suit them well for the first potting, after which the amount of loam should be increased. The young plants must be kept in a light, airy position to prevent a weakly growth. Pots six inches in diameter are suitable to flower the plants in, and the strongest may be put in their flowering pots by the end of the summer, while the smallest should be left until early in March, when they will form a succession. In all stages aphides or green-fly must be especially guarded against, as they soon ruin the plants, but are easily kept down by vaporising. The varieties with smaller flowers, generally yellow, but sometimes reddish, are of a more woody texture than the herbaceous kinds, and can be struck from cuttings

A HANGING PLANT OF *CAMPANULA ISOPHYLLA ALBA*.
This measured 5 ft. 3 in. from base to summit.

FINE PLANTS OF THE CHIMNEY BELLFLOWER, *CAMPANULA PYRAMIDALIS*.

in the spring in the way of a Fuchsia. They are often used for bedding out, but can also be well grown in pots, for which purpose some of them are admirably adapted. Summer flowering kinds are the distinct creamy-white Veitchii and the rich yellow Clibranii, which is in growth one of the most graceful of all Calceolarias. Two distinct kinds—*C. deflexa* and *C. amplexicaulis*—will flower during the autumn and winter, as also will *C. Burbidgei*. The two last named are often used for summer bedding.

Calla. See Richardia.

Callistemon salignus.—This, often known as *Metrosideros floribunda*, is called the Bottle Brush Plant. The flowers, with their long scarlet stamens, are arranged around the shoots in the form of a bottle brush. It needs the same treatment and soil as an Azalea.

Camellia.—The shining green leaves of the Camellia are ornamental at all seasons, and in spring, when the flowers appear, the different varieties are bright and effective. Many of the Camellias are hardy in several parts of the country, hence a cool greenhouse is all that they require. After the flowering season is past they may be kept under glass until the middle of June to allow the young shoots to become moderately firm, when they should be placed out of doors until the autumn, and if possible in a position where they are somewhat shaded from the full rays of the sun. A mixture of two-thirds loam to one-third peat with a little sand will suit them well, but take care not to put them in too large a pot, as the Camellia will stand for years and flower well without being shifted. As the buds develop a little weak liquid manure will be of service, while bud dropping, frequently a source of trouble, is often caused by an insufficient circulation of air. Apart from its culture in pots or tubs, the Camellia does well planted out in the greenhouse or conservatory, provided a well-drained border is prepared for the roots. For covering a back wall it is one of the most beautiful plants we have, as winter and summer alike it is clothed with foliage. There is a long list of varieties, the old double white (*alba plena*) being still a general favourite. Single-flowered Camellias continue to increase in popularity, the blossoms being altogether lighter and more elegant than the double ones, and the central tuft of golden anthers impart quite an additional feature to the flower. Good single kinds are *alba simplex*, white; Jupiter, rosy-red; Mercury, crimson; Mars, rosy-red; Snowflake, pure white; and Waltham Glory, deep scarlet.

Campanula.—Most of the Campanulas, or Canterbury Bells, are hardy, but the creeping kinds—*C. isophylla*, with blue flowers, and *C. isophylla alba*, with white, as well as the newer *C. Mayi*, with hoary leaves and pretty porcelain blue bells, form delightful plants when grown in suspended pots or baskets, and with attention they will flower throughout the greater part of the summer. They are increased by dividing the plants in the spring just before growth recommences. The peach-leaved Bellflower (*C. persicifolia*), and its varieties, *grandiflora*, in particular, are well adapted for pot culture. The Chimney Bellflower (*C. pyramidalis*) is also useful, and it is surprising that amateurs do not grow plants of such pronounced beauty more freely. It is simply neces-

sary to sow seeds in pans in a cold frame in March, and when the seedlings are of sufficient size prick them out into the border, choosing a rich bit of ground, and there they may remain until the following spring. Then they must be lifted, potted, and placed in the open air until the flower-spikes are seen. It is wise then to transfer them to the greenhouse. The species is quite tall, six feet to seven feet, but by selection a dwarf strain has been got, and the blue and white colouring of the flowers is very pretty. In potting the plants, pot firmly, and use for soil a mixture of half sandy loam, and a quarter-part each of road-grit and leaf-mould. It is most important to give water judiciously. An over-supply for any length of time will result in absolute failure, and a little soot water occasionally will assist growth. When the spikes are running up weak liquid manure should be given, but prepared chiefly from cow droppings, not stable drainings.

Canna.—Of late years the production of a race of Cannas of dwarfer growth, and with larger flowers than those formerly used for bedding out during the summer, has led to their frequent use for the greenhouse during the summer and early autumn months. Many of the flowers are of gorgeous colours, and though the individual blooms do not last long, a succession is maintained for a considerable time. The plants need liberal treatment, a suitable compost being two-parts loam to one-part each of leaf-mould and manure. As the pots get full of roots, liquid manure given occasionally is of value. In winter the Cannas go to rest, when the soil must only be kept slightly moist, but quite free from frost. On the return of spring, shake the roots almost free from the old soil, and when an increase of stock is required, divide the underground stems, leaving, however, a bud, or eye, to each. Then repot, but take care not to over-water until growth recommences.

Carex.—Pretty grassy plants of which there are two or three forms with variegated leaves that are valuable for grouping, and will succeed in the dwelling-house for a long time. They are of easy culture, and need plenty of water when growing. Soil: loam and leaf-soil.

Cassia corymbosa.—An evergreen shrub with shining green pinnate leaves and clusters of golden-yellow flowers. It blooms over a considerable period of the year. Soil: loam and peat.

Castor Oil Plants. See *Ricinus*.

Celosia.—The brilliantly coloured plume-like flowers of *Celosia pyramidalis* are much admired, and the plants are welcome in the greenhouse, or bedded out of doors. The colours vary from pale yellow to crimson through various intermediate shades, some of the tints being remarkably vivid. Another *Celosia* is the Cockscomb, whose large, velvety-like crimson heads are strangely picturesque. All the *Celosias* are sown in a gentle heat in spring, and grown on freely in good, rich soil. They are not very easy to grow.

Celsia.—There are two species of *Celsia*, both of which are valuable for the decoration of the greenhouse. *Celsia cretica* grows to a height of four to five feet, and is studded for the greater part of that distance with golden-yellow blossoms, while *C. Arcturus* is only about half the

height and more branching. Both produce seeds freely, which should be sown in spring in ordinary soil.

Century Plant. See *Agave americana*.

Cherry Pie. See *Heliotrope*.

Chorizema.—A pretty class of slender growing shrubs, natives of Australia, all of which bear in profusion small pea-shaped blossoms of yellow or red colours. They need much the same treatment and soil as the Indian Azalea, which see.

Chrysanthemum frutescens. See *Marguerite*.

Chrysanthemums. See special chapter, p. 353.

Cineraria.—A wealth of blossom is furnished by the huge massive heads of the garden varieties of *Cineraria*, among which many different tints are represented. White flowers are, of course, always popular, and in direct contrast to this an intense purple-blue often occurs among the *Cinerarias*. An objection urged by some against these *Cinerarias* is their lumpy style of growth. Such objection, however, cannot be urged against some of the newer hybrids, obtained by the crossing of a few of the original species. These are taller in growth than the others, and the individual flowers are much smaller, but they are borne in great profusion, and the entire plant is light and graceful. The long sprays, too, are valuable for cutting.

The usual method of increasing the *Cineraria* is by means of seed, which should be sown about May, though, when grown in quantity, two or three sowings are needful to maintain a succession. The seed is small, and care should be taken not to sow it too thickly. If sown lightly, it will soon germinate, and when the young plants are large enough put them out singly into small pots. A light, airy position in a frame will suit them in this stage, and when sufficiently advanced they may be shifted into the pots in which they are to flower. Some prefer pots six inches in diameter for all the *Cinerarias*, but good examples may be grown in five-inch size, using, however, the larger size for the vigorous plants. A mixture of two-thirds loam to one-third leaf-mould, with a little sand, is very suitable for the *Cineraria*. In all stages of growth they are liable to be attacked by aphides or green-fly, which quickly injure them; but, at the same time, these pests are easily kept under by vaporising.

Clematis.—The different forms of *Clematis* are well known as beautiful, hardy climbers, but one species (and a good one too) requires the protection of a greenhouse. This is *Clematis indivisa*, a native of New Zealand; its white, starry blossoms, an inch or so across, are borne in great profusion in March. It is a free-growing climber, and for training to the roof or rafter of a greenhouse is most useful. *C. i. lobata* is a good form of it. Good rich loam with a little peat is suitable soil.

Cobæa scandens.—A very strong-growing climbing plant, suitable for clothing large spaces. The purplish-coloured, bell-shaped blossoms appear freely during the summer months. There is a pretty variety of this with variegated leaves. Ordinary potting-soil.

Cockscomb. See *Celosia*.

Coleus.—A class of plants with prettily marked leaves, some of which form a pleasing feature in the greenhouse during the summer. They are of very easy culture, and cuttings strike readily in the spring in heat. Ordinary potting-soil.

Cordyline australis is a plant of symmetrical growth, with long ribbon-like leaves. It is suitable for vases, pedestals, or prominent positions, as the long, arching leaves are then seen to great advantage. Good loam and leaf-soil.

Crassula coccinea.—This, which is also known as *Kalosanthes coccinea*, is a succulent plant that needs much the same treatment as a Pelargonium. It grows about eighteen inches high, and the tubular flowers are borne in clusters on the point of every shoot. In the common kind they are deep scarlet in colour, but there are pink and white forms. Soil: loam and sand with a little old mortar.

Cyclamen persicum (*Persian Cyclamen*).—The forms of Cyclamen now in cultivation are endless, and the difference is not restricted to the flowers alone, as the leaves are richly marked. During the winter the Cyclamen is particularly valuable, and is obtained from seed sown in July. When large enough to handle, the plants must be potted singly into small pots, and shifted on when necessary. Pots five inches or six inches in diameter are large enough for them to flower in. Good flowering plants can be obtained in from fifteen to eighteen months from the sowing of the seed. After blooming, the old corms should be kept rather dry for a time, then, about July, they must be shaken clear of the old soil and repotted. A mixture of two-parts loam to one-part leaf-mould, with a fair sprinkling of well-decayed cow manure and sand, will suit the Cyclamen well. There is a pretty group with fringed flowers.

Cyperus alternifolius.—This is about eighteen inches high, the bright green stems being terminated by a quantity of long, narrow leaves, arranged like the ribs of an umbrella. There is also a variety with variegated leaves. Being nearly related to the Sedges, this Cyperus needs a copious supply of water and a mixture of loam and peat.

Cytisus racemosus.—A very popular greenhouse shrub of which neat flowering examples may be grown in five-inch pots. The sweet-scented golden flowers are borne in spring. Another species, namely, *Cytisus filipes*, from Teneriffe, is an exceedingly graceful plant. Its flowers are white, and produced in winter and spring. Soil: sandy loam.

Daphne indica.—This Daphne is a general favourite, because of the delicious fragrance of its flowers. It is a neat-growing little evergreen that flowers in the depth of winter. A mixture of loam, peat, and sand, and a shady position in the greenhouse, suit it well.

Echeveria.—Succulent plants of symmetrical growth, and near relatives of the House-leek. A prominent feature of some of the kinds is the metallic or bluish tint, while one, *E. fulgens*, has pretty nodding clusters of red and yellow blossoms. Soil: loam with some old mortar.

Epacris.—The Australian representative of the Heath family, of

which there are many distinct forms. They flower during the early months of the year, at which time the long shoots are thickly studded for some distance with pretty little tubular-shaped blossoms. In colour they vary from white to red, some of the pink tints being very pleasing. All the Epacrises need very firm potting in sandy peat, and they may be placed out of doors during the summer months. Directly after flowering, the long shoots should be cut back to within a couple of inches of their base, and as soon as growth recommences the plants must be repotted. They will thus be well established before the time comes to turn them out of doors. In potting take care that there is good drainage, and in all stages of growth do not allow any extremes of drought or moisture at the roots.

Erica (Heath).—This is the Heath family, most of which are natives of South Africa, and though some of them are difficult to cultivate successfully, others may with care be grown in a satisfactory manner. They need much the same treatment as the Epacris just mentioned. Several of them are valuable for their winter flowers, notably *E. gracilis*, rosy-red; *E. caffra*, white; *E. hyemalis*, purplish-rose; *E. hyemalis alba*, white; *E. melanthera*, blush; and *E. willmoreana*, red and white. Among the easiest grown of the summer-flowering kinds are: *E. ventricosa*, pink; *E. ventricosa coccinea*, reddish-pink; *E. propendens*, purplish; *E. cavendishiana*, yellow; and *E. spenceriana*, blush. Though very chaste and beautiful, and with care they can be grown successfully, neither the Epacrises nor the Ericas can be exactly recommended to the beginner, at all events till the rudiments of watering, potting, &c., are thoroughly mastered. Both are increased by cuttings, but it is a difficult matter, and successful only in the hands of skilled propagators. *E. hyemalis* is perhaps the most popular of the family. Sandy peat and firm potting are essential.

Erlangea tomentosa.—An easily grown Ageratum-like plant from Central Africa, that will produce its heads of pretty lilac-coloured flowers throughout the winter months. Soil: good loam and leaf-soil.

Eucalyptus.—The Blue Gum (*E. globulus*) is naturally a large tree, but it is a well-known pot shrub. The peculiar bluish green of the leaves, and their warm aromatic fragrance, combined with the reputation it possesses as a febrifuge, all serve to render it popular. It is readily raised from seed, and the young plants obtained therefrom will make rapid progress in ordinary potting soil. A second kind, *E. citriodora*, has a pleasing lemon-like fragrance, but it is not so robust as the other.

Eulalia.—The Eulalias are a group of Japanese Grasses, valuable for decoration. The best is *E. japonica albo-lineata*, that reaches a height of two feet to five feet, the leaves being freely striped with white. It is a great favourite with the London floral decorators. In the second kind the leaves are transversely barred with yellow. Both succeed in ordinary soil, and are increased by division.

Eupatorium.—The different members of this genus can be readily grown out of doors during the summer months; when taken into the greenhouse they will flower in autumn and winter. The blossoms,

which are also suggestive of those of the *Ageratum*, are for the most part white, but *E. ianthinum*, which does not bloom till spring, has lilac flowers. The best greenhouse *Eupatoriums* are *riparium*, *petiolare*, and *vernale*. Soil: good loam with a little peat.

Ficus (*India-rubber Plant*).—The well-known India-rubber Plant is *Ficus indica*, which at one time was more generally grown than it is now. The tendency to lose its leaves at the base has led to such subjects as Palms, *Aspidistras*, and other things being more generally used for indoor decoration. The India-rubber Plant should be potted in a mixture of loam, peat, and sand, and the leaves kept regularly sponged. At the same time care must be taken not to put the plant in too large a pot, as this often leads to many of the leaves dropping. Over-watering, too, must be guarded against. There is a form with variegated leaves, but it is not so effective or so robust as the commoner kind. In direct contrast to the huge leaves of the India-rubber Plant we have the tiny *Ficus ripens* and *minima*, both of which are valuable for clothing a dark, damp wall in the greenhouse, as they will attach themselves to it in the way of Ivy, and render it green and attractive at all seasons.

Francoa.—There are two kinds of *Francoa*, both of which are pretty greenhouse plants. In *Francoa appendiculata* the long slender spikes are clothed with pinkish-red blossoms, and in *F. ramosa* they are white. Both are of easy culture, and readily increased by seed sown in the spring. Soil: loam and leaf-soil.

Freesia.—A charming group of greenhouse bulbs with flowers of various colours. The best known is *F. refracta alba*, whose pure white blossoms are deliciously scented. In some the flowers are white with a golden throat, while the newer kinds vary in colour from white to carmine through various intermediate shades of pink, rose, and lilac. Of the better-known kinds the best bulbs are grown in the Channel Islands, and reach here in August. They should be potted at once and grown as cool as possible, consistent with freedom from frost. They will flower in the greenhouse in early spring, and after the blossoms are past must be carefully attended to for water, &c., till the leaves die down in order to perfect the bulbs. When quite dormant keep them dry till August, then shake clear of the old soil and repot. Soil: loam, leaf-soil, and well-decayed cow-manure.

Fuchsia.—The *Fuchsia* is a well-known greenhouse plant, and is useful for outdoor culture during the summer. Cuttings of the young shoots strike root readily in the spring, and the plants so obtained may be grown in various ways. If their tops are pinched out two or three times when the plants are young they form neat bushes; next, allowed to grow at will with the leading shoot tied to a stake, they assume naturally more or less of a pyramid habit; while standards, which are admired by many, are formed by tying the plant upright, and removing all the side shoots until the required height is attained, when the upper portion of the plant which is to form the head may be allowed to branch out. Any attempt to form shoots on the lower part of the stem must be suppressed. Some of the more vigorous *Fuchsias* form a delightful feature

when trained to the roof of a greenhouse, their pendulous, gracefully disposed blossoms being seen to great advantage under such conditions. Ordinary potting compost with a little liquid manure as the pots get full of roots is very suitable for the Fuchsia.

Gerbera (*Barberton Daisy*).—Beautiful Marguerite-like flowers of various colours. Need a cool greenhouse and soil composed of good loam and well-decayed manure.

Gloxinia.—Given the same treatment and soil as the Achimenes the Gloxinias will flower freely during the latter half of the summer, but to induce the plants to bloom earlier than that they need more heat. They are increased by seed sown in the spring, but as they require a warm structure during the early stages the better way for the beginner will be to obtain a few dormant tubers during the winter or early spring before they start into growth.

Grevillea.—These are all very pretty flowering shrubs for the greenhouse, but are not much grown. One species, however—*G. robusta*—is very popular as a foliage plant, the leaves being divided and subdivided in quite a Fern-like manner. Soil: loam and peat.

Heath. See *Erica*.

Heliotrope.—This is known as Cherry Pie, from its fragrant blossoms. It is a very popular plant, as easily grown as a Fuchsia, and valuable for bedding out, or for growing as neat little bushes in the greenhouse, whilst a wall in that structure may be clothed with it. Few plants are more popular for that purpose. Soil: good loam and leaf-soil.

Hibbertia.—The best of the Hibbertias is *H. dentata*, with pretty bronzy foliage, and bright golden blossoms a couple of inches across, borne during the first three months of the year. It is a valuable climber. Soil: loam, peat, and sand.

Hippeastrum.—A beautiful class of bulbous plants, more generally met with under the name of Amaryllis. They are characterised by strap-shaped leaves and gorgeous Lily-like blossoms, borne on stout erect stems. In the different varieties the colour of the flowers varies from white to deep crimson, through numerous intermediate shades, while in some they are striped and netted in a remarkable manner. They flower during the spring months, after which repotting should be done if required. A mixture of loam, leaf-mould, and sand will suit them well. Throughout the early part of the summer they should be kept in the warmest part of the greenhouse, and encouraged to grow freely by the occasional use of stimulants. Towards the end of the summer expose them to sun and air in order to ripen the bulbs. In autumn the leaves die down, and when quite dormant water should be withheld. In winter they may be safely kept in a minimum temperature of 45 degrees, provided the soil is quite dry. In February give a little water, and increase it gradually as the plants grow. Propagation is effected by means of seeds and offsets. These should be taken off carefully and put in separate pots. Seedlings take about three years to attain flowering size. When small they must not be dried off in the winter.

Hydrangea.—Though hardy in favoured districts the common

Hydrangea, with its huge heads of pink blossoms, is a good greenhouse plant. By giving an occasional supply of a weak solution of alum water, the flowers acquire a bluish tinge. The handsome *H. paniculata grandiflora* is much used for greenhouse decoration, although quite hardy. This shrub produces huge pyramidal-shaped heads of creamy-white flowers. The Hydrangeas strike root readily in the spring from cuttings of the young shoots treated much in the same way as those of a Fuchsia. The plants require copious supplies of water during the growing season.

Imantophyllum.—Sturdy growing plants with long, dark green strap-shaped leaves, and large heads of orange-red or terra-cotta coloured blossoms, borne in the spring. The foliage is ornamental at all seasons. Seed frequently ripens, from which young plants are readily raised. *I. miniatum* is the full name. There are several good forms of it. It is surprising that more amateurs do not grow this plant, which is also known by the name of *Clivia miniata*. Soil: good loam and sand.

Impatiens.—The best-known member of this extensive family is the common Balsam (*I. Balsamina*), which is popular either for the greenhouse or for bedding out. The seed should be sown in March, and the seedlings potted off as soon as sufficiently large. Pots six inches in diameter are a convenient size in which to flower the Balsam, which needs a good light soil, such as equal parts of loam, and well-decayed manure, with a little sand. Seed from good varieties is very necessary in order to obtain superior Balsams. Besides the common Balsam above referred to there are several other beautiful greenhouse kinds, chief among them being Sultanii, rose; Holstii, vermilion; Herzogii, orange-salmon; and Oliverii, mauve. These will flower for months together.

India-rubber Plant. See Ficus.

Indian Shot. See Canna.

Isolepis gracilis.—A pretty little grass-like plant, with dark green leaves that droop around the pot and almost hide it. For edging of groups and similar purposes it is very useful, and easily grown in ordinary soil.

Ixia.—A class of small bulbs, whose bright-coloured blossoms are borne on tall wiry stems. They should be potted in August or early in September, and from their slender nature half a dozen bulbs must be put in a five-inch pot. May be treated as Freesias.

Jasminum.—The best greenhouse Jasmine is *J. grandiflorum*, a larger and bolder plant than the common hardy Jasmine, which it somewhat resembles. The white flowers, tinged with purple, are deliciously fragrant, and borne throughout the greater part of the year. *J. primulinum* is a newer greenhouse species with large yellow flowers. Soil: loam, peat, and sand.

Kalanchoe flammea.—A succulent plant from Somaliland, with oval-shaped leaves and large flattened heads of scarlet flowers. Individually the blooms are not unlike those of a Bourardia. It flowers during the summer, and although not many years have passed since first

introduced it has already become a general favourite for decorative purposes. A white-flowered species, *K. Dyerii*, blooms in winter. Soil: loam, leaf-soil, and sand, with a little old mortar.

Kennedya.—Slender climbing plants, suitable for the roof or rafters of the greenhouse, with pea-shaped blossoms. The best is *K. Marryattæ*, which has scarlet flowers borne during the first half of the year. Soil: loam and peat.

Lachenalia.—Popularly termed Cape Primroses, these are pretty little bulbous plants that should be potted in August, when they will flower in the spring. Soil should consist of loam, leaf-soil, and old cow-manure. They are pretty either in pots or suspended baskets. There are many new and expensive kinds. Of the older ones the best are aurea, yellow; pendula, red and yellow; tricolor, green, red, and yellow; and Nelsonii, fine golden yellow, unsurpassed by any of the others.

Lantana.—Dwarf, shrubby plants, with flowers somewhat like those of the Verbena, but rather smaller. Lantanas will bloom throughout the summer, the flowers being white, yellow, pink, scarlet, and crimson. These Lantanas can be recommended to the amateur, as they strike readily from cuttings in the spring, grow well with ordinary treatment and soil, and flower continuously throughout the summer.

Lapageria.—The two Lapagerias—*alba*, white, and *rosea*, pink—are among the most beautiful of all greenhouse climbers, their flowers being bell-shaped, and of waxy texture. They need a well-drained soil, principally composed of rough sandy peat, copious supplies of water during the summer, and a position shaded from the sun. They are effective whether trained to the roof or to the back wall of the greenhouse.

Lemon Verbena. See *Aloysia citriodora*.

Lobelia.—The different forms of *Lobelia speciosa* are generally used for bedding during the summer, but at the same time they form a pleasing feature in the greenhouse, the loose-growing kinds being particularly useful for suspended baskets. Lobelias are readily raised from seed sown in the greenhouse in March. A striking species is *Lobelia tenuior*, with large cobalt-blue flowers. It is rather tall in growth, and in a suspended pot or basket its loose habit displays its charms to the best advantage. Soil: good loam and leaf-soil.

Maiden's Wreath. See *Francoa ramosa*.

Marguerite.—This is the term usually applied to the different forms of *Chrysanthemum frutescens* that are largely grown for decoration. They succeed in any ordinary soil, and their large daisy-like blooms appear in great profusion throughout the greater part of the year. They all strike very readily from cuttings put in during the spring. Some of the later varieties have double flowers, one of which, Mrs. F. Sander, has become exceedingly popular both for greenhouse decoration and for summer bedding.

Maurandya barclayana.—A quick-growing climber that, if raised from seed in the spring, will produce its purple Foxglove-like flowers throughout the latter half of the summer. Ordinary potting-soil.

Metrosideros floribunda. See *Callistemon salignus*.

Mignonette.—The delicious fragrance of the Mignonette (*Reseda odorata*) renders it a general favourite, and good plants of it are often grown in pots. Pretty little plants for autumn and winter flowering may be obtained in pots five inches in diameter, but the seed must be sown in July and August. A suitable compost is two-thirds loam to one-third well-decayed manure, with a little sand. The pots must be well drained, and the soil pressed down very firmly to within an inch of the rim. In sowing the seed take care not to sprinkle it too thickly, as five healthy plants are sufficient for one pot. A frame out of doors is a good place for the seed-pots, as the lights will serve to keep off an excess of rain, which must be especially guarded against. Plenty of air should be given, and as the plants develop a little liquid manure will be of service. A light position and a good circulation of air are necessary to the Mignonette in autumn and winter. There are several forms, the variety Machet being one of the best.

Mimosa. See *Acacia dealbata*.

Mimulus.—The garden forms of *Mimulus*, known as the Monkey Flower, are in many cases curiously marked. They grow readily from seed in the spring, and pretty little examples may be obtained in five-inch pots. The common Musk (*Mimulus moschatus*) is a general favourite, readily increased by division, as is also the larger-flowered form known as Harrison's Musk.

Monkey Flower. See *Mimulus*.

Musk. See *Mimulus moschatus*.

Myrsiphyllum asparagoides.—A slender climber, with small, bright shining green, heart-shaped leaves. It is the plant commonly known as Smilax, and has long sprays so much used for table decoration. It succeeds in ordinary potting compost.

Nerine.—A beautiful class of greenhouse bulbs, the different members of which flower in the autumn, perfect their growth during the winter, die down towards the end of spring, and rest during the summer, when they must be kept quite dry and fully exposed to the sun. They should be given soil mainly composed of leaf-mould and sand, and will stand for years without repotting. The best are *Nerine corusca*, with flowing orange-scarlet flowers; *N. Fothergilli major*, vivid scarlet; *N. sarninsis* (Guernsey Lily), carmine-rose; and *N. Bowdenii*, pink, with deep coloured stripe down the centre of each segment.

Nerium Oleander.—This, known popularly as the Oleander, is a loose-growing evergreen shrub with Willow-like leaves and showy blossoms, usually rose or white, in some cases single and in others double. In was in olden days a very popular conservatory plant, large examples being often grown in tubs and stood outside during the summer. Plenty of sunshine is essential to its flowering.

Norfolk Island Pine. See *Araucaria excelsa*.

Ophiopogon spicatum variegatum, with white, striped leaves, and *O. Jaburan variegatum*, in which they are marked with yellow, are two dense-growing, grass-like plants, very pretty for indoor decoration.

Oxalis.—A dwarf class of clover-like plants, most of which spring

from small tubers. The flowers of some of them are very pretty. *O. cernua*, with yellow flowers about the size of a shilling, is called the Bermuda Butter-cup, from the fact that it is extensively grown in Bermuda and sent to this country in early autumn. It is popular for the greenhouse. *O. Bowieana*, rose; *O. enneaphylla*, white; *O. floribunda*, rose; *O. Deppei*, reddish-purple; and *O. variabilis*, white and red, are among the best forms. Soil: sandy loam and peat or leaf-soil.

Palms.—Of late years Palms have greatly advanced in popularity, being now largely used for the stove and the greenhouse as well as for the dwelling-house, where some of them will keep in health for years, provided they get a reasonable amount of attention. Good loam, lightened by a little leaf-mould and sand, is suitable for the different Palms. Care should be taken not to give too much soil, for good specimens may be grown in comparatively small pots. They must never be allowed to suffer from drought, though stagnant water is very injurious. It is important to keep the leaves sponged with tepid water regularly. The best greenhouse Palms are:—*Areca Baueri*, *Areca sapida*, *Chamaerops excelsa*, *Fortunei*, and *humilis*; *Corypha australis*, *Kentia belmoreana*, and *K. fosteriana*, *Latania borbonica*, *Phœnix canariensis*, *P. Roebelinii*, and *Rhapis flabelliformis*.

Passiflora (*Passion Flower*).—Well-known climbers, flowering principally during the summer months. *Passiflora cœrulea*, blue; *P. Constance Elliot*, white; *P. Lawsoni*, light purple; and *P. Imperatrice Eugenie* are all good. These strike from cuttings in the spring. Soil: loam and peat.

Pelargonium.—Owing to the many sections of Pelargonium now in cultivation they form a most extensive class, and the uses to which they can be put are varied. At one time the name of Pelargonium was, at least from a popular standpoint, applied only to the large-flowered show section, the term Geranium being generally used to indicate the Zonal, Ivy-leaved, and others of this class. The Zonal Pelargonium or "Geranium," as it is popularly called, is represented by numerous varieties with flowers varying from pure white to crimson. This plant can be put to many uses. It is admirably adapted for the greenhouse or conservatory, and if the structure be kept at a temperature of 50 degrees to 60 degrees the plant will flower throughout the winter. It is largely used for bedding out during the summer months, while large, old plants will yield a wealth of blossom if planted out of doors at that period, as one may see from the noble specimens put out for the summer in the London parks. There are now a great number of double-flowered varieties belonging to this Zonal section. These are valuable for flowering in pots, but as a rule they do not bloom with the same freedom as the single kinds if bedded out.

Ivy-leaved Pelargoniums.—The members of this section have become very popular within the last few years, and the double-flowered forms are now universally grown. Some of them are valuable for clothing the pillars or back wall of the greenhouse, while for hanging baskets they are largely used. Their drooping habit fits them for

window-boxes, the margins of large vases, and similar purposes, while secured to a few sticks they form neat little bushy specimens for the greenhouse.

The large-flowered *Pelargoniums* are now classed under the different heads of Show, Spotted, French, Regal, and Decorative, but no hard-and-fast line can be drawn between these groups. The fancy varieties are known by their slender yet dense growth and profusion of small flowers. Scented foliage kinds form a distinct class, the flowers, as a rule, being insignificant, but the prettily-cut, highly-fragrant leaves render them popular, especially where the old-fashioned nosegay is still in demand. These are handsome in large tubs or pots for the terrace in summer. Variegated-leaved varieties, principally of the Zonal section, are numerous, but they are more used for bedding out during the summer than for the greenhouse.

The *Pelargonium* is increased by cuttings, a subject dwelt upon in a previous chapter. With regard to soil, a mixture of two-thirds loam to one-third well-decayed manure or leaf-mould, or a mixture of both, with a sprinkling of rough sand will suit them well. In all stages of growth a good light position and free circulation of air are necessary, as a stagnant atmosphere will soon cause many of the leaves to turn yellow and drop. During winter the roots may be kept as dry as is consistent with safety, and the plants so treated will start into growth in the spring more readily than those that have been kept excited throughout the winter season. Aphides or green-fly are particularly troublesome to some sections of *Pelargonium*, but they may be easily kept down by using XL-All Vaporiser.

Zonal *Pelargoniums* for winter-flowering should be grown throughout the summer in a spot fully exposed to the sun, and pick off the flower-buds until the autumn. The varieties of *Pelargonium* are almost innumerable, hence a selection of names is difficult to give, and better results will be obtained by inspecting a good collection during the flowering season, or by obtaining the catalogue of a well-known *Pelargonium* grower.

Petunia.—The *Petunias* form a pretty class of soft-wooded plants. Both single and double flowers occur amongst them, the single kinds being useful for bedding out, for balconies, and for window-boxes, while they also form a pleasing feature in the greenhouse. The double flowers are too heavy for the outdoor garden, but for growing under glass they are very showy. The single kinds are readily increased from seeds sown in the greenhouse in the spring, but the choicer double kinds are propagated by cuttings. Given the same treatment as a *Fuchsia* they strike root readily. Ordinary potting compost will suit them well.

Plumbago capensis.—This is a charming plant for training to the roof of a greenhouse, in which position its delightful porcelain blue blossoms are produced throughout the summer months. As a bush, too, it is equally as attractive. There is a white-flowered variety, but it is not so pleasing as the ordinary form. The *Plumbago* is as easily grown as a *Fuchsia*, and needs much the same treatment and soil.

Primula.—The Chinese Primula is one of the most popular of greenhouse plants in winter and spring. The seed should be sown about midsummer, and as soon as the young plants are large enough to handle they must be pricked off. Then pot them singly into small pots, and as these get full of roots the plants may be shifted into pots five inches in diameter, in which they will flower until the end of September. A cold frame is better than the greenhouse, but before autumn frosts set in they should be removed indoors. The double-flowered varieties are increased by surrounding the stem with a mixture of moss, loam, and sand, into which they will root, and as soon as they are sufficiently advanced the plant may be divided and the several pieces potted. The propagation of double Primulas requires considerable care. With regard to the single varieties, unless they are needed for seed the plants may, after flowering, be thrown away, as young plants give better results than old ones. A good soil for the Chinese Primula is two-parts loam to one-part each of leaf-mould and decayed manure, with a liberal sprinkling of silver sand. In all stages of growth the watering of these Primulas must be carefully done, as an excess of moisture or of drought is equally fatal. Pretty semi-double flowers can be readily obtained from seed if it is saved from a good strain. Besides this, several other Primulas are valuable for the greenhouse, notably, the Auricula, which blooms in the spring, the Japanese *P. cortusoides Sieboldi*, of which there are many pretty varieties, flowering at about the same period, and

Primula floribunda, which produces its pretty golden blossoms almost throughout the year, while the sulphur-coloured *P. verticillata sinensis* flowers in the spring. From these two species a hybrid was raised at Kew, and it is now under the name of *Primula Kewensis* very widely distributed. Its habit of growth is free, and the golden-yellow flowers are borne over a lengthened period. *Primula obconica*, whose blooms were originally lilac in colour, has now given rise to numerous forms, the blooms of whom vary in colour from white to crimson. It is a very desirable Primula for the greenhouse, and we hear much less now about the irritation of the skin caused by handling it than we used to do. The Star Primula (*P. stellata*) is a name applied to a very graceful form of the Chinese Primula; it is quite a break away from the ordinary kind. It is taller and more slender in growth, the whole plant being far more elegant than the ordinary Chinese Primula.

Primula malacoides, a recent introduction from China, has already become a favourite, its small lilac-coloured blossoms, borne in whorls on slender stems, being borne in great profusion and over a long period. There is a white variety of it. Both are easily raised from seeds sown in the spring. Same soil as Chinese Primulas.

Rhododendron.—This is a large group of beautiful flowering shrubs, many of which do not flower until they have grown to a considerable size. Some of the hybrids, however, flower well in a small state, among the best being Countess of Derby, Countess of Sefton, Duchess of Sutherland, Lady Alice Fitzwilliam, and Princess Alice. All of the above have large white or blush-coloured and very fragrant flowers.

These Rhododendrons need the same treatment as their near relatives the Azaleas, which see. All of them flower during the spring months.

Richardia.—The most popular of the Richardias is the Arum Lily (*R. æthiopica*), also known as Lily of the Nile or Calla. It has handsome white trumpet-shaped spathes, which are in great demand for wreaths, vases, and similar purposes. The foliage, too, is conspicuous, and good plants form a striking feature in the greenhouse. The flowering season varies according to the treatment given, but in a general way these big white spathes are most appreciated in winter and early spring. To obtain them stand the plants out of doors during the summer, and keep them dry for a time. Then about the middle of July shake them clear of the old soil and repot in a mixture of loam and decayed manure, after that giving more water and keeping them out of doors until the autumn frosts threaten danger. It must be borne in mind that the Arum Lily grows naturally in ditches in South Africa, hence a liberal supply of water is essential, except when actually at rest. There is a miniature form known as Little Gem, which is not so free as the type. Two golden-flowered Richardias have been introduced into cultivation of late years, but they need more careful treatment than the Arum Lily. They pass the greater part of the winter in a quite dormant condition, flower in the spring, perfect their growth, and early in autumn go to rest, at which period they must be kept quite dry.

Ricinus.—This is the Castor Oil Plant. Its large, divided leaves make a good show either in the greenhouse or bedded out during the summer months. The plants are readily increased by seeds sown in heat in the spring. Any good soil.

Roses.—The culture of the Rose in pots is dealt with on p. 83.

Salvia.—The best of the Salvias are quick-growing plants that may be placed out of doors during the summer, and treated much in the same way as the Chrysanthemum. They flower during the autumn and early winter. A selection would include :—*S. Bethelli*, pink ; *S. Pitcheri*, blue ; *S. rutilans*, red ; and *S. splendens*, scarlet ; the last-mentioned is a most effective plant, and should be grown more frequently. Of it a variety known as Pride of Zurich has become very popular of late years. It is distinguished from the type by its dwarfer habit, extreme floriferousness, and the fact that it may be had in bloom earlier in the season. On this account, it is largely used for summer bedding, but is equally effective in the greenhouse.

Scarlet Geranium. See Pelargonium.

Schizanthus.—Pretty annuals, the markings of the flowers suggesting those on the wings of a butterfly. Sow the seed in gentle heat early in the spring.

Slipperwort. See Calceolaria.

Smilax. See Myrsiphyllum.

Solanum.—The bright red berries of *Solanum capsicastrum* render this a favourite plant for decoration throughout the winter months. It is readily raised from seed early in the year, and when finally potted into five-inch pots may be placed out of doors during the summer, as in

this way it will flower and set its berries freely. A climbing kind—*S. jasminoides*—will produce pretty white flowers throughout the greater part of the year in the greenhouse. In mild countries, as in the south of England, it will stand the winter in the open. Soil: good loam and a little peat.

Streptocarpus.—A charming class of plants nearly related to the *Gloxinia*. The cultural requirements of the two are much the same, except that as the *Streptocarpus* does not form tubers it must not be kept quite dry during the winter.

Tacsonia Van Volxemii.—This is a free-growing climber somewhat like a *Passiflora*, but the starry flowers which hang suspended on long stalks are magenta-scarlet in colour. Soil: loam and peat.

Tropæolum.—The climbing *Tropæolums* are very pretty, and the *Lobbianum* section will succeed almost anywhere. Good kinds are: *Ball of Fire*, scarlet; *fulgens*, deep scarlet, both single; and *Beauty of Darmstadt*, scarlet and orange, double. These must be increased by cuttings. Rather poor loam is best.

Tuberosa.—The *Tuberosa*, *Polianthes tuberosus*, is generally regarded as a subject for forcing, but at the same time it will grow and flower in the greenhouse, though of course its rate of progress will be slower than when more heat is given. The white highly-fragrant flowers are much admired. The bulbs should be obtained early in the year and potted one in a five-inch pot, in a mixture of loam and peat.

Vallota purpurea.—This, known popularly as the *Scarborough Lily*, forms a bright feature in the greenhouse in August and September. The reddish-scarlet funnel-shaped flowers are borne in a good-sized head on a stem a foot or so in height. Like the *Nerines* it comes from South Africa, and much the same treatment will do for both.

Verbena.—Some of the *Verbenas* form a charming summer feature in the greenhouse, and since the advent of the large-flowered rich pink variety, *Miss Willmott*, they are now extensively grown. *Boule de neige*, white; *Crimson King*, *Purple Queen*, and *King of Scarlets* are also good varieties. A mixture of loam, sand, and peat suits them.

Veronica.—The different shrubby *Veronicas* are hardy in warm districts, and in others they are valuable for greenhouse decoration. They bloom in autumn, the flowers being borne in Bottle-brush like spikes. In colour they vary from white to crimson, some of the pink, blue, and purple shades being very pleasing. They can be stood outside during the summer months. Any good potting-soil.

A selection of climbing plants for the greenhouse:—*Abutilons* of sorts; *Clematis indivisa*; *Cobæa scandens*; *Hibbertia dentata*; *Jasminum grandiflorum*; *Lapagerias*, red and white; *Maurandya Barclayana*; *Passifloras* of sorts; *Pelargoniums*, Ivy-leaved; *Plumbago capensis*; *Roses* of sorts; *Solanum jasminoides*; *Tropæolums*; *Tacsonia Van Volxemii*.

HARDY BULBOUS AND OTHER FLOWERS FOR
THE GREENHOUSE

Many hardy bulbous plants are valuable for the greenhouse during the early months of the year. They flower naturally in the spring, and when given the protection of a glass structure and a little heat, can be obtained in flower in many cases soon after Christmas. Under this head are included Hyacinths, Tulips, many kinds of Narcissus (Daffodils), *Scilla sibirica*, Chionodoxas, and Snowdrops, Crocuses, and others. The bulbs can be obtained during the autumn, and all need much the same treatment. Pots five inches in diameter are the most convenient, and unless for special reasons the better way will be to use this size. The pots must be thoroughly drained, but at the same time no more broken crocks should be used than are absolutely necessary. One bulb of a Hyacinth should be placed in a five-inch pot. With regard to Tulips, as a rule five or six will be sufficient, Narcissus from three to five, *Scilla sibirica*, eight or nine, Chionodoxas and Snowdrops the same. They should all be potted at such a depth that the bulb is completely covered. Then after potting, stand them out of doors on a firm bottom of ashes, give a good watering, and cover all with cocoanut fibre refuse or ashes, sufficient being used to just hide the pots entirely. This maintains an even state of moisture around the bulbs, a condition particularly favourable to the formation of healthy roots, without which bulbs will not flower well. In a month or so the pots will be full of roots, and they may be taken into the greenhouse at any time from then to Christmas. Where a succession of flowers in the early months of the year is desired, the pots must not be taken into the greenhouse all at once, but at intervals of a week or so. They must be freely supplied with water, not saturated, but sufficient given to keep the soil moist, as if allowed to get dry they seldom flower well. A suitable soil is one-third each of loam, leaf-mould, and well-decayed manure, with a sprinkling of sand, and the whole thoroughly mixed together. In some cases a little support will be needed as the flowers develop, and the beauty of the plant depends upon this being neatly done. Thus the sticks should be as slender as possible, consistent with supplying the proper support, while the ties should not be conspicuous. In tying Hyacinth spikes, or in fact any other bulbs, it is important that the material used should

not be drawn too tightly, as the stems swell and lengthen rapidly, hence they will be soon crippled unless constantly attended to, whereas if ample room be allowed, no damage will result. The little, pure white Roman Hyacinths which are grown in Italy and the South of France, reach this country at the end of July and in August, and if potted early they will flower in November and December.

A practice now much in vogue is that of growing bulbs in ornamental bowls filled with fibre instead of soil. As the bowls are for the most part glazed and watertight, the difficulty is to maintain the fibre or whatever rooting medium is employed in an even state of moisture. Owing to this the flowering of bulbs in fibre is not as a rule so uniformly successful as when they are grown in pots of soil in the ordinary way. Of bulbs that flower later in the season than those above mentioned may be named the early-flowering GLADIOLI, of which half a dozen bulbs may be potted in a six-inch pot. They will flower in early summer. A few good kinds are: The Bride, pure white, much grown for cutting; Adonis, orange-scarlet, blotched white; Colvillei, rosy-purple; delicatissima, white, blotched crimson; Emperor William, purplish-scarlet; Prince Albert, salmon-scarlet; and Queen Victoria, deep red, marked white.

Lilies.—The best Lilies for greenhouse culture are *Lilium longiflorum*, whose long silvery trumpets, with their delicious perfume, are always admired; *Lilium auratum*, the golden-rayed Lily of Japan; and *Lilium speciosum*, represented by varieties with different coloured flowers. These should all be potted at the latest by the end of January, and grown on until the flowering season in a good light position in the greenhouse with plenty of air. Flowers of these Lilies may be had all the year round, and the way they are obtained outside of the normal season is to retard the bulbs in refrigerators, so that they do not start into growth. When removed from their cold quarters they commence to grow when placed under favourable conditions, and flower about three months afterwards.

Of plants other than bulbs that are particularly valuable for the greenhouse must be noted—

The Lily of the Valley (*Convallaria majalis*), which is a universal favourite. In order to obtain flowering examples early in the season it was at one time the practice to subject them to considerable heat, but as the crowns are now retarded in the same way as the Lilies above referred to they can now be obtained at almost any season without difficulty.

Spiræas.—The feathery plumes of *Spiræa japonica* and the nearly-related kinds are always admired, while the fresh green deeply-cut leaves are also handsome. Spiræas give but little trouble, providing they have ample supplies of water when growing. The newer pink forms—Queen Alexandra and Peach Blossom—afford a pleasing variety to the others.

Solomon's Seal (*Polygonatum multiflorum*) is very ornamental

when several crowns are put together in a good-sized pot, as the shoots dispose themselves in a very graceful manner.

Dielytra spectabilis, sometimes termed the Bleeding Heart, is very much grown for flowering under glass, to which purpose it readily adapts itself.

While this enumeration of "Hardy Bulbous and other Flowers for the Greenhouse" includes the most suitable, there are many others available for the same purpose.

Selection of Hyacinths for Pots—

Single White.—La Grandesse, L'Innocence, Mme. Van Hop (late), Albertine (early), Baroness Von Tuyl (early), Mr. Plimsoll, La Franchise, Granderia Merveille.

Single Red.—General Pelissier, La Victoria (early), Roi des Belges, Moreno, Lady Derby, Jacques, General de Wet, Fabiola, Gigantea.

Single Blue.—King of the Blues, Moué, Menelik, Schotel, Lord Derby, Czar Peter, Blondin, Potgieter.

Single Yellow.—King of the Yellows, Ida, Orange Blossom, City of Haarlem, Jan Steen, Daylight.

Single Mauve and Purple.—Distinction, Lord Mayo, Hon. Mr. Balfour, Laura.

Double White.—La Tour d'Auvergne, Princess Metternich (blush), La Grandesse.

Double Red.—Chestnut Flower, Noble par la mérite, Kohinoor (semi-double), Princess Louise.

Double Blue.—Louis Philippe, Bloksberg, Van Speyck, Lord Raglan, Mme. Marmont.

Narcissi for Pots—

Trumpets.—Henry Irving (very early), Golden Spar (early), King Alfred (early), Stromboli, Emperor, W. P. Milner, Victoria, Coronet, Madame de Graaff, Princeps, Duke of Bedford, Weardale Perfection.

Short Trumpets and Cups.—Lady M. Boscawen, Sir Watkin, Queen Bess, Cynosure, Barrii conspicuus, Seagull, Autocrat, Crown Prince, Mrs. Langtry, Blackwell, Firebrand, Duchess of Westminster, Diana, Lucifer.

Poeticus Varieties.—Ornatus, Homer, Horace, Ben Jonson, Grandiflorus præcox.

Bunch Flowered.—Campernelle jonquils, Elvira, Alsace, Aspasia, Orient, Irene, Paper White, Mont Cenis, Grand Monarque, Soleil d'Or, Dr. Holland, Bazelman major.

Tulips best adapted for pot culture are as follows :

Single.—Scarlet Duc Van Thol (very early); Vermilion Brilliant (bright scarlet, early); Brunhilde (syn. Unique), (white with yellow

flames on outer petals); Cottage Maid (rosy-pink and white); Duchess of Parma (orange-red, bordered yellow); Jenny (lovely cerise red); Lady Boreal or White Joost v. Vondel (pure white); Keizerskroon (red and yellow); La Remarquable (claret edged silvery white); Pink Beauty (very large rose and white); Macs (scarlet); Prince of Austria (orange-red); Proserpine (carmine-rose, early); Queen of the Violets (pale purple); Rose luisante (deep rose and white); Thomas Moore (orange and yellow); Princess Helene (pure white); Prince de Ligny (tall pointed yellow); Van der Neer (purple); White Hawk (pure white); Yellow Prince (yellow).

Double.—Murillo (blush); Couronne d'Or (yellow, shaded orange); Cochineal (bright crimson); Sofrano (pinkish yellow); Schoonoord (pure white, extra good); Tournesol (red and yellow); Vuurbaak (orange-scarlet); Salvator Rosa (semi-double, rose and white); Parmesiano rosy-red).

ORCHIDS FOR BEGINNERS

ORCHIDS are no longer charmed flowers—their classic beauty shines in the plant-house of the amateur gardener ; but once, not many years ago, this quixotic plant was reserved only for those whose flower-loving propensities were not hampered by financial considerations. Collectors, brave men, have scoured the world in search of the air Orchids, the Epiphytes, whose lives are spent amid the tree branches of the jungle, and sent them home in cartloads from all quarters of the globe—from the mountains of Mexico, from the swamps of the Tropics and from the pleasant mountain heights ; the family, through their cosmopolitan distribution, requiring, when brought under home influence, treatment of a varying kind. Of course, the tyro in things botanical or horticultural knows that in these little isles of ours many charming Orchids are happy in chalky downs or cliffs, or in the lush meadow, and of these the Bee Orchis and Spotted Orchis occur to mind as flowers worthy of a special place in the rock-garden. An Orchid flower is an interesting study, and its fertilisation one of the most fascinating experiments to the botanist, or he who strives to raise new forms by joining together two species to produce a hybrid. Though the Orchids apparently differ so greatly from each other, they are botanically of the same family, and the flowers assume many strange, grotesque, and beautiful forms—some almost deceiving the careless observer by their resemblance to some insect, others rejecting the common mode of sustenance by seeking the tree branches, to which they cling by their thick white roots, deriving from the moist atmosphere their life's support. Orchids are not parasites. A parasite is a plant that lives upon its host, but to the Epiphyte the tree is simply a support. A wonderful organ of the flower is the lip, or "labellum," to use botanical language, and this assumes many strange shapes, sometimes reminding one of a pouch, as in the *Cypripedium* or Lady Slipper, and sometimes it is so lightly attached to the main part of the flower that the least breath of wind causes movement, whilst in the waxy *Angræcums* the lip is lengthened into a spur filled with

nectary, for the long proboscis of insects to drink the sweet contents. It is also noticeable that the colour is frequently concentrated in this labellum, probably to attract the attention of insects, who are thus drawn to the flower to seek for nectar, and innocently fertilise it by removing pollen, which, when the intruder enters another flower, results in fertilisation; hence seed is obtained.

Many of the most beautiful Orchids in cultivation are the result of hybridisation by human agency. The hybridist, as he is called, sees two flowers likely to produce a distinct or beautiful offspring, and fertilises the two to effect his object. But so much has been written upon this subject by Darwin, that it is needless to make further reference to it in a simple work of this kind.

When Orchids were first exported from their native haunts to the hothouses of Europe they were destroyed in cartloads by improper treatment. This is no exaggeration. Everything that came from over the seas was regarded as exotic, and that meant a stewing temperature at complete variance to the natural conditions surrounding the plant. Of course the unfortunate Orchids died wholesale. To treat an *Odontoglossum* coming from the snow-line as an exotic is, of course, to exterminate it; but happily we know more of the world than we did sixty years ago, when Orchid-hunters sent over their possessions to Europe; and the following notes about the best kinds for the beginner to consider, with cultural hints, will, it is hoped, prove the means of preventing many failures. It is not pleasant to fail, especially when the death of a plant means a financial loss. Beginners with limited means are strongly advised to commence with quite the cheaper kinds, and by cheap we do not mean flowers of little beauty. Many of the most precious Orchids, the lovely *Odontoglossum crispum* as an example, are ridiculously cheap, costing little more when imported than the scarlet Geranium of a cottage window.

The House.—The house in which to grow the plants must necessarily receive first consideration. This need not signify an expensive outlay. A house in which the temperature can be maintained at from 45 degrees to 50 degrees in cold weather will be found suitable for many of the most useful, beautiful, and interesting species of the Orchid family. One of the chief considerations should be the matter of

Ventilation, but it is the usual system now in the construction of glass-houses to make ample provision so as to ensure ventilation in the side walls almost opposite the hot-water pipes, and also in the roof, so that a free circulation of

air can be provided. This is as necessary for cool-house Orchids in summer as the protection against frost during the colder months of the year. With regard to the plants which require intermediate and stove-house culture, the ordinary conditions usually provided for warm greenhouse and stove plants will be found ample to meet the requirements of these sections of Orchids.

Orchids as Town Plants.—It is a most interesting fact that many of the largest and best collections of Orchids in this country, both in trade and private establishments, are in London and other large towns and smoky districts. Fogs and absence of light are drawbacks, causing loss of bloom during the winter months, otherwise there is little to complain of. In fact, the Orchid plants withstand the unfavourable atmospheric conditions above mentioned far better than soft-wooded, greenhouse, and ornamental foliaged stove plants generally grown by amateurs. The writer has been employed amongst Orchids in town districts for the greater part of the last twenty-five years. It must be admitted that the flowers are destroyed wholesale by fog, especially among the warm-growing sections, but the majority of the species and hybrids, which are the most suitable subjects for beginners, belong to the cool and intermediate-house, and are, therefore, not so susceptible to unfavourable atmospheric conditions.

Their Culture.—A good collection of cool and warm-house Orchids can be procured as cheaply and cultivated with equal success as a house of Ferns or other plants. When, however, the collection is large and expensive, a man of experience is indispensable. Any enthusiastic plant cultivator who can successfully cultivate other plants may prove successful with Orchids also. To make the cultural conditions of the various species plainly understood, particulars are given of each species as they are referred to.

Anguloa (The Cradle Orchid).—This handsome Orchid in all its varieties may be successfully grown in the cool intermediate-house. The plants require plenty of moisture at the roots during the growing season, but as soon as the growths have matured give only sufficient to prevent the pseudo-bulbs from shrivelling. The flowers are produced with the young growths in the early summer, and the best time to repot is when the new roots are coming from the base of the young growth. The potting compost required consists of two parts peat to one of sphagnum moss. Ample drainage must be afforded.

Cattleyas.—These are among the best of the Orchids for beginners,

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SIZES.

and require similar soil and treatment to that recommended for *Lælias*, which see. Repotting should be done just as new roots begin to form, generally in the spring. The work is described in the illustrations.

Cymbidium.—Such species as *C. Lowii*, *C. giganteum*, *C. tracyanum*, and *C. eburneum*, may be accommodated in the fernery or cool intermediate-house. The plants are useful and interesting. They bear their flower-spikes early in the spring, and remain for several weeks in perfection. A compost of one part fibrous yellow loam and the remaining portion made up of fibrous peat, dried cow manure, sphagnum moss, and rough sand or broken crocks is required. The plants should have ample pot room, and, being strong rooting, should not be disturbed oftener than is really necessary. They must have ample drainage, require a liberal supply of moisture during the active season of growth, and must never be allowed to suffer from want of moisture at the roots. A cool, moist atmosphere suits them best during the summer months of the year.

Cypripediums (*Lady's Slippers*).—There is not a more varied and easily cultivated class of Orchids than the cool and intermediate-house Cypripediums of the eastern section. The geographical distribution of the various species is confined to a limited space within the Indian monsoon region, where they sometimes follow mountainous chains, on which the species occur in groups of twos or threes, or are isolated at great distances from each other. Others are confined to islands or groups of islands. In the former case they usually occur at considerable elevation, where the rainfall is copious and frequent and the dry seasons are of short duration.

The kinds that are confined to islands grow at a much lower elevation. These naturally require higher temperatures than the mountain species. It is therefore to the cool-growing section that the beginner's attention is directed. The majority of these lend themselves readily to artificial conditions, and with a few exceptions, the cool-growing kinds, not only retain their normal vigour, but the cultural effect is apparent by increased size, substance, and more highly-coloured markings of the foliage. The flowers also are in many cases larger, and the usual one-flowered scape occasionally becomes twin-flowered. This, no doubt, is caused by the more liberal and regular treatment that can be afforded the plants when cultivated in our glass-houses.

The intermediate-house section requires a temperature of 55 degrees. The following species and hybrids will be found suitable :—*C. barbatum*, *C. callosum*, *C. bellatulum*, *C. venustum*, *C. Charlesworthi*, *C. niveum*, *C. concolor*, and the natural hybrid *C. Godefroyæ*, *C. Druryi*, *C. hirsutissimum*, *C. spicerianum*, and the hybrids that have been derived from the intercrossing of the above-mentioned species, also those derived from the influence of one of the hot or the cool-house section.

The potting material required differs according to the locality. In districts where the atmosphere is pure and free from the poisonous gases such as prevail during the winter months in the neighbourhood of large towns, the compost may be two parts fibrous peat to one of sphagnum

moss. To this may be added a liberal sprinkling of fibrous loam and sufficient rough sand, or finely broken crock, to retain an open and porous condition. In town districts the use of loam must be avoided. *C. bellatulum* and its allies may be potted only in lime rubble, or the latter mixed with fibrous peat. The plants should also have a light position close to the roof glass. The pots used should be drained to two-thirds their depth with clean broken crocks, and only be sufficiently large to contain them comfortably. After the plants have been put in position the potting compost may be pressed moderately firm about the roots, mounding slightly towards the centre, and finishing with the base of the plant just below the rim of the pot. After potting water thoroughly with soft rain water, which should be poured through a moderately coarse rose on the can. Rain water is most necessary, as when hard water is used it soon kills the moss, which quickly turns sour, and, decay thus commenced, quickly spreads into the remaining portions of the compost. Water must be carefully given until the roots get hold of the new compost, then more liberal conditions may be afforded. Damp down the floors and staging twice a day in winter when the temperature is normal. When the temperature is low, owing to unfavourable conditions outside, the atmosphere must not be too moist. During the hotter months of the year charge the house heavily with atmospheric moisture, which may be easily provided by frequent dampings. The house may also be freely ventilated when the temperature has advanced above 60 degrees. In ventilating take care to avoid direct draughts, and give careful shading in bright weather.

The cool-house *Cypripediums* require a temperature of about 50 degrees Fahr., and their requirements may be provided by anyone in the possession of a greenhouse, where the above-mentioned temperature can be maintained in cold weather. The potting compost is the same as advised for the intermediate-house section. The cool-growing kinds are perhaps the most useful of the whole of the *Cypripediums*; they bloom when other flowers are scarce, *i.e.* during the winter months from the end of October to the beginning of April. Their varied characteristics, combined with good substance and lasting qualities, render them useful for market and to use as cut flowers. Plants may in most cases be procured for a modest outlay of a few shillings. One of the best is *Cypripedium insigne*, a species which was until recently regarded as almost too common to grow; but since Orchids have become more popular for cutting it has proved one of the most useful kinds for the purpose. So much is it valued that one of the largest market growers says that even in the glut of the season he could easily procure threepence each for the flowers, and after the New Year they realised much higher prices. Later importations of *C. insigne* have yielded some wonderful varieties, among them many of dark colours and heavily spotted forms of large proportions, others delicately tinted with green and yellow. Several among them, though purchased for a few shillings, have proved of most priceless value, as much as 150 guineas having been paid for small plants in some instances. This illustrates

the desirability of procuring imported plants. One could quote several instances in which the buyer of a single plant, for the modest outlay of less than half a crown, has obtained a form of great value. The importations of this species generally arrive in the early spring.

Other species such as *C. villosum* and *C. Boxallii* require a liberal supply of moisture throughout the year, but during the months from March to October an abundance of moisture also at the roots. They may in each case be kept a little drier at the roots for a few weeks after the flowers have been removed. The repotting of the cool section should be done in early spring.

Propagation.—The best way to increase the stock is by division. If three or more growths, with foliage, are formed successively on the rhizome, the two front ones may be parted by carefully cutting through the rhizome between the second and third; carefully remove these with as much root as possible, leaving the old growth untouched. These back growths generally break freely, and in a short time make good plants. The part removed may be potted up in the usual way. The best period at which to divide *Cypripediums* is when the new roots are being emitted from the base of the young or last-made growth. When divisions are made of plants in this condition, with due encouragement, they quickly re-establish themselves in their new quarters. Freshly potted plants, especially where divisions have been made, should be carefully shaded from the direct rays of the sun.

Dendrobium.—Some of the species of the deciduous section, such as *D. nobile* and its allied species and varieties, will thrive at the warm end of the intermediate-house; but the majority are happier in a hot-house. They are not recommended for cool treatment. *D. infundibulum* and its allied form *D. jamesianum* succeed grown with the *Odontoglossums* in the cool-house. *D. japonicum* may also be grown here during the summer months, but the temperature of the cool intermediate-house is more suitable. The pots should be well drained and the potting compost consist of chopped sphagnum moss and a little fibrous peat. Water freely during the growing season, very little indeed being required after the growths have reached maturity.

Disa grandiflora.—This is one of the finest of cool-house Orchids. It is a native of the Table Mountain of the Cape, and during the growing season requires a free circulation of air at all times. It should be frequently syringed whenever the outside conditions are favourable. The potting compost will also require to be kept moist, especially after the flower spikes commence to develop. They will require a continuation of liberal treatment until the flowers have been removed, after which period only sufficient moisture will be required to keep the tubers plump. Repotting should be carried out in the early spring, using ample drainage and a compost of equal portions of peat and chopped sphagnum, adding a liberal sprinkling of rough sand and pressing the compost moderately firm. They do well in a cold frame, where they must be kept shaded during the summer months and be protected from frost in winter. This is by far the finest species of the South African Orchids. Several hybrids

have been obtained by using *D. grandiflora* as one of the parents. These form charming additions and generally possess better constitutions than the parent species, and are worthy of every consideration. *Watsoni* and *Kewensis* are very free both in growth and bloom.

Epidendrum.—This is a very large family, comprising several kinds that may be regarded as suitable for beginners ; but the only one selected from which the greatest amount of pleasure will be derived is *E. vitellinum majus*. This is one of the most charming of cool-house Orchids, producing brilliant orange-scarlet flowers on graceful racemes, which last for months in perfection. It succeeds well with the Odontoglossums, requiring similar conditions as regards potting and during the active season of growth. When the resting time arrives, that is, after the flowers have been removed, water may be almost entirely withheld, as the moisture in this division is sufficient to maintain a plump condition of the bulbs. When growth commences give liberal treatment to encourage a free growth.

Lælia.—The Mexican Lælias form a delightful group of late autumn and winter flowering Orchids. They require almost full sun, with free ventilation in summer, and a temperature of not less than 55 degrees Fahr. in winter, until the flower-spikes are removed, after which, under drier and resting conditions, 50 degrees, or even less, will not be hurtful. The potting compost should consist of equal parts of fibrous peat and living sphagnum moss, and to this may be added a liberal sprinkling of broken crocks. Give plenty of drainage, as the plants require an abundance of root moisture during the growing season, and avoid stagnation. After repotting, thoroughly water the plants with soft rain water, keeping them slightly shaded for a few days, until the new roots take hold of the material, after which, providing there are ample facilities for free ventilation, little shading will be required. Syringe the plants overhead, once or twice in the morning, when the weather is bright, and again in the afternoon, as soon as the sun goes down. The house should be closed previously to syringing in the afternoon, as by so doing a hot, humid atmosphere is obtained. This must be done sufficiently early to allow the foliage of the plants to become dry, and the atmospheric moisture condensed before the cool night temperature sets in. The best time to repot is when the new roots make their appearance at the base of the last made growth. The best kinds for the above treatment are *L. albida*, *L. anceps*, *L. autumnalis*, *L. cinnabarina*, *L. furfuracea*, *L. harpophylla*, *L. majalis*, and *L. superbiens*.

Under the more shady conditions of the intermediate-house, the following kinds will be found most useful. Their compact habit and miniature stature render them desirable for shallow pan or basket culture, so that they may be suspended near the roof. The potting compost required should be the same as recommended for the Mexican section. They require a liberal amount of root moisture during the active season of growth, but only sufficient will be required while dormant to retain a normal condition of the pseudo-bulbs—*L. dayana*, *L. pumila*, and *L. præstans*. These three species may be purchased im-

ported, in their proper season, for a few shillings. They form a most useful and desirable class of plants. Cattleyas and Lælias require a winter temperature of not less than 60 degrees Fahr. The yellow-flowered *Cattleya citrina* may be successfully grown suspended on blocks near the glass in the cool intermediate-house.

Masdevallia.—The majority of the Masdevallias that may be grown by beginners belong to the large-flowered section. The Masdevallias are alpinists of the Andes of South America, being found on the higher slopes above the forest, some of the species occurring near the snow-line. The majority are found at an altitude of from 9000 to 12,000 feet elevation, where the atmosphere is constantly charged with moisture arising from the hot plains below. The days are temperate, but the nights exceedingly cold. This section may be easily cultivated in a cool fernery or a shady house, where an abundant supply of moisture may be obtained during the dry summer months. The normal night temperature of the house during the winter should be 50 degrees or less in cold weather, but with low temperatures the plants must be allowed to become drier at the roots, and the atmospheric moisture reduced accordingly. The plants are not injured by a cool degree of temperature for a time, when they are dry at the roots.

The day temperature should be 5 degrees higher than the night. In summer keep the house as cool as possible by free and early ventilation, heavy shading and constant damping down of the floors, staging, &c. The large-flowered Masdevallias may be purchased for a modest outlay, well within the reach of the most humble amateur. They require a potting compost of two parts sphagnum moss to one of fibrous peat. The pots used should be drained to two-thirds their depth with clean broken crocks, and after the plant has been placed in position, work the compost about it, keeping the base just below the rim of the pot, and slightly mounding the compost towards the centre. The best time to repot is September and October. After potting thoroughly water the plants with rain water poured through a moderately coarse rose on the water can. During the winter, after the plants have become re-established, little water will be required, only sufficient to keep them plump, but with the return of spring new growth begins, when they will require an abundance of moisture. Ventilation and shading must at all times be governed by the external conditions prevailing, but with ordinary observation no difficulty whatever should be experienced in successfully cultivating this section. They are a success under the same conditions as provided for *Odontoglossums*, if placed on the shady side of the house. The best kinds to commence with are *M. amabilis*, *M. harryana* in its varied forms, *M. ignea*, and *M. Veitchii*. There are many varieties of miniature growth that are not interesting. These are suitable for basket or pan suspended from the roof. The potting compost and treatment should be similar to that recommended above. The most interesting of these are *M. polysticta*, *M. armenaica*, *M. caudata* (*Shuttleworthii*), *M. muscosa* with its sensitive lip, *M. simula*, *M. rosea*, *M. triangularis*, and *M. wagneriana*. There are also numerous hybrids

derived from the intercrossing of these sections, that are worthy of every attention. The *M. chimæra* section and those belonging to the thick-leaved varieties allied to *M. leontoglossa* are best grown in a temperature of not less than 55 degrees in winter, and are most suitable for basket culture.

Maxillaria.—Several varieties of Maxillarias are suitable for beginners, especially those that thrive well in the cool-house, either grown with the Odontoglossums or with the Masdevallias. They require the same potting material, and should in all cases have ample drainage. They require an abundance of water at the roots during the growing season, and should never be allowed to suffer from want of moisture at the roots whilst dormant. The best kinds for amateurs are *M. venusta*, *M. grandiflora*, *M. luteo-alba*, and *M. sanderiana*. The last-named kind should be placed under slightly warmer conditions from October and April.

Miltonia.—With few exceptions the species and hybrids, both natural and raised at home, may be grown successfully in a house where the temperature does not fall below 50 degrees Fahr. at night. The most easily cultivated is *M. vexillaria*. This Orchid produces flower-scapes, bearing several flat pansy-like flowers in various tints from white to rose. This species and its varieties are amongst the most perfect and distinct in colour of the entire race of Orchids. They require a potting compost of two parts living sphagnum moss to one of fibrous peat. The pots should be drained to two-thirds their depth with clean broken crocks and the plant placed in the centre of the pot, so that the base of the new growth is level with the rim. After spreading out the roots, work the compost carefully among them and press moderately firm, and finish off with a mounding slightly to the centre, but be brought up sufficiently high so that the new roots may be just beneath the surface. They will thus grow quickly away and establish themselves in the new material. The best time to repot *M. vexillaria* is in the spring, when the new growth is commencing to form the bulb. This is the period at which the new roots are being emitted and just before the flower-spikes are produced. After repotting water freely with soft rain water. The plants will require plenty of root moisture from now until the flowers are expanded, and when these commence to fade gradually decrease the moisture at the roots until the new growths are about three inches long. Only sufficient moisture should be given to maintain a plump condition of the pseudo-bulb until the young growths get well away from the base, after which more liberal treatment may be afforded. They should have a position within reasonable distance of the roof-glass. Although they need protection from the direct rays of the sun, an abundance of light is appreciated. The same remarks apply to nearly all the kinds except *M. Roezlii* and *M. Phalænopsis*, which need a temperature of not less than 60 degrees Fahr. in winter. Those belonging to the *M. spectabilis* section require plenty of strong light to induce them to flower satisfactorily, and may be grown under the same conditions as the Mexican *Lælias*.

Odontoglossum.—As Orchids for amateurs none are so charming,

useful, or more easily grown than the various species of *Odontoglossum*. If kept cool during the hot summer months they may be easily cultivated in the ordinary greenhouse; but in the neighbourhood of large towns, owing to the subdued light during several months of the year, it is almost impossible to obtain flowers of firm texture. Especially is this the case when the flower-spikes are developing during the winter to reach their full beauty in early spring. Fortunately the seasons vary, and under favourable conditions many of these difficulties are overcome.

Considering the high prices now realised for exceptional varieties of *O. crispum* the beginner should purchase imported plants of this species. There is always more pleasure to be derived from imported plants than from those in which the variety has been determined. The purchaser of a bag of plants for half a crown may procure varieties of sterling merit. The writer witnessed the sale of a plant some few years back which was bought with two others in a bag at the above-mentioned price. When it flowered for the first time, less than two years afterwards, it was again submitted to auction in Steven's Rooms and realised £165. Many instances of this kind could be pointed out. It is remarkable that the finest spotted varieties of *O. crispum*, which are now so much sought after, have with few exceptions appeared among roots sold in small lots and at a low price. Some profess to know the better forms of the bulb; but in the selection of varieties amongst imported plants the purchaser of a single plant is just as likely to procure the best variety in the importation as the man who buys extensively. In the second place, the imported plants generally grow more satisfactorily than those that are removed from one collection to another after they have become established.

The Treatment of Imported Plants.—The plants, as soon as received, should be laid out on a damp bottom, such as a layer of sphagnum moss, on the stage in a cool, shady position. They may be allowed to remain until the plants begin to regain their normal condition or commence growing. As soon as they show signs of rooting, pot them. Another system is to pot up the plants as soon as received. The pots used in either case should be only sufficiently large to contain the plants, and be drained to two-thirds their depth with clean broken crocks. After the plants have been placed in position in the centre, the remaining space should be filled with the potting compost of equal portions of fibrous peat and chopped living sphagnum moss, which must be pressed moderately firm. Where it can be procured, chop up the large fern roots which are found in the peat, and use this instead of the crocks for drainage. Thoroughly water the plants with soft rain water as soon as potting is finished; they may then be placed in their allotted position on the stage. It is advisable that fresh imported plants be kept on the coolest and dampest side of the house. They must be carefully watered, and avoid excess, as this causes the young growth to damp and die off at the base. As the plants become established, they may want repotting, which is best done when the growth commences to form the new bulb. This is the rooting season, and the plants quickly get hold of the new

compost and become re-established. For repotting *Odontoglossums* choose September. They must be carefully shaded from direct sun after repotting, and the house kept rather closer for a few weeks, with plenty of humidity in the atmosphere.

Odontoglossums require careful summer treatment. It is difficult to keep the plants cool in the hottest part of the day, but with heavy shading, frequent damping of the floors, staging, &c., and ample ventilation, it is possible to maintain the temperature below the prevailing conditions outside. The inside temperature in summer should be retained about 60 degrees, the lower ventilators being allowed to remain open whenever 55 degrees are indicated inside. It is wise to close the roof ventilators when damping for the last time in the summer afternoon, opening again later in the evening after the moisture has had time to condense. Keep the atmosphere well charged with moisture whenever the outside conditions are warm and bright. The plants must not be allowed to shrivel through want of moisture at the roots at any season of the year. During the winter months maintain an even temperature of 50 degrees, and if the temperature falls below this, resort to artificial heat, but do not use more artificial warmth than is absolutely necessary.

The house most suitable for the culture of *Odontoglossums* is a span-roof facing east and west, affording ample means for ventilation both in the roof and along the side walls. During the summer months, when the weather is very hot, provide a trellis to fit the doorway. This prevents birds or animals getting into the house. The blinds should be raised well above the glass, so that a free circulation of air may be procured and the glass kept cooler in hot weather. The lath roller blinds are the most suitable, as they serve two purposes, viz., as a screen from the sun in summer and as a protection on cold nights in winter. Every provision should be made for the storage of rain water. The stages should be covered with coke breeze about two inches deep, and the plants arranged on inverted pots, or another stage be placed above; but it is not desirable that the pots containing the plants should be arranged on the coke.

A lean-to house facing north generally meets the requirements of *Odontoglossums*, but they will require great care during the winter months.

Oncidium.—Many beautiful *Oncidiums* succeed under the same cultural conditions as recommended for *Odontoglossums*, such as *O. incurvum*, *O. ornithorhynchum*, and the lovely species which belong to the *O. macranthum* group. These are a success at the cool and most shady end of the house. The long flower-spikes should be trained as they advance around some sticks. These make a fine display when in flower, and last long in perfection. *O. concolor*, *O. crispum*, *O. Forbesii*, and the lovely *O. marshallianum*, require slightly warmer conditions in winter.

Peristeria elata (*The Dove Orchid*).—This is a lovely late summer-flowering Orchid. It needs, unfortunately, stove or hothouse conditions. Ample drainage is required, the potting compost consisting of fibrous

DENDROBIUM NOBILE WITH 217 FLOWERS (See Page 323).

CŒLOGYNE CRISTATA, A GOOD ORCHID FOR A COOL GREENHOUSE (See Page 330).

loam, brown peat, and a little sphagnum moss. To this should be added a liberal proportion of broken crocks or charcoal, and press all moderately firm. Ample moisture, both at the roots and in the atmosphere, must be afforded during the active season of growth. When growth is complete the plants remain dormant for some months, and during this time only sufficient moisture will be required to keep the bulbs plump.

Phaius.—The *P. grandifolius* section, and the hybrids that have been derived from the intercrossing of the various varieties, may be placed in the intermediate-house. They like a close, humid atmosphere while in active growth, and when the growths have matured they remain dormant for several months, during which period only sufficient water will be required to keep the plants plump. A compost of good fibrous peat, a little loam, and a liberal sprinkling of rough sand meets their requirements, and the drainage must be clean and ample.

Sophronitis grandiflora.—This is the most charming of the miniature cool-house Orchids. The deep orange-scarlet flowers are produced in the depth of winter and through the early spring, when they make a brilliant display, lasting for some weeks. This *Sophronitis* is suitable for growing in pans, which may be suspended near the roof glass. The potting requirements are the same as for the Mexican *Laelias*.

Vanda.—The bulk of the *Vandas*, although closely allied to intermediate-house Orchids, require a warm, close atmosphere during the growing season. There are a few exceptions, and one of the best of these is the azure-blue flowered variety *V. cærulea*. This species may be grown in the cool-house or in a vinery, the shades from the vines in the latter structure being sufficient protection from the sun. An ample supply of moisture during the active season of growth is required, and a dry and cool condition during the resting season. Grow the plants in baskets suspended from the roof, where with the vines they may be freely syringed. The potting compost should be renewed each year, and consist wholly of broken crocks and living sphagnum moss.

Zygopetalum.—Such species as *Z. crinitum* and *Z. Mackayi* are easily procured, and should be grown in the intermediate-house. The potting compost of loam, fibrous peat, and sphagnum should be pressed moderately firm about the roots. The plants should not be disturbed more than is absolutely necessary.

Insect Pests.—Many insect pests infest Orchids, but the pests to be most dreaded are thrips. These get into the central and most tender portions of the plants, and if not detected cause much mischief and anxiety. Small as they are, they soon cause a damping spot such as would be made at first through pricking with a pin. This soon changes colour and results in a brown burnt-up appearance and permanent disfigurement. These are what are termed by gardeners the yellow thrips. Black thrips are larger and are more easily destroyed. The eggs of the latter are deposited on the under sides of the leaves, and may be removed with a soft sponge. The best preventive is to fumigate with XL-All Vaporiser about once a fortnight, and to spray with the liquid pre-

pared for the purpose by the same firm of manufacturers ; but only spray in warm, bright weather, and when the outside conditions are favourable. Scale is destroyed by carefully cleaning with a brush and sponging with weak, soft, soap water. Cockroaches are most destructive to the young roots and tender flowers. These may be trapped by placing jars of treacle and water about the stages, or phosphorus paste "chases." Woodlice are also destructive to the young roots, and may be captured by hollowing out potatoes and placing them on the stages and on the potting compost. Slugs and small shell snails are imported with the moss in the potting compost. Bran or brewers' grain is the most serviceable trap for these pests. Place them about on the stages or pots, a small pinch being put on pieces of glass or broken crocks. The pests will be found feeding in the evening and early morning, and may then be caught and destroyed. Slugs are a sore trial in the cool Orchid house, and will require to be carefully watched, as they inflict damage when the flower-scapes make their appearance.

THE BEST KINDS OF ORCHIDS FOR BEGINNERS

A list of Orchids suitable for beginners and which can be purchased at a cheap rate is herewith appended.

For a cool house, that is to say with a winter temperature of 45 to 60 degrees Fahr., and during hot weather in summer the structure should be kept as cool as possible: *Ada aurantiaca*, *Cattleya citrina*, *Cochlioda Noetzliana*, *Cymbidium Lowianum*, *Cypripedium insigne*, *C. villosum*, *Dendrobium Jamesianum*, *D. infundibulum*, *Epidendrum vitellinum majus*, *Lycaste Skinneri*. *Masdevallias*: *Harryana*, *ignea*, *tovarensis*, *Veitchii*. *Odontoglossums*: *Cervantesii*, *cirrhosum*, *crispum*, *grande*, *Hallii*, *maculatum*, *Pescatorei*, *pulchellum*, *Rossii majus*, *triumphans*. *Oncidium*s: *concolor*, *crispum*, *Forbesii*, *Marshallianum*, *ornithorhynchum*, *tigrinum*, *varicosum*. *Sophronites grandiflora*.

For an intermediate temperature, that is 50 to 65 degrees Fahr. in winter, rising of course later on: *Cattleyas*: *Gaskelliana*, *gigas*, *Harrisonæ*, *intermedia*, *labiata*, *Mendelii*, *Mossiaë*, *Schroderæ*, *Trianaë*. *Ceologyne cristata*. *Cypripedium*s: *Arthurianum*, *callosum*, *Charlesworthii*, *Lathamianum*, *Leeanum superbum*, *nitens*, *Spicerianum*. *Dendrobium*s: *aureum*, *Cambridgeanum*, *crassinode*, *densiflorum*, *Findlayanum*, *formosum giganteum*, *nobile*, *thyrsiflorum*, *Wardianum*. *Lælia anceps*, *L. autumnalis*. *Oncidium*s: *flexuosum*, *Papilio majus*, *sarcodes*. *Renanthera Imschootiana*, *Saccolabium Blumei*, *Thunia Marshalliana*. *Vandas*: *Amesiana*, *cœrulea*, *Kimballiana*. *Zygopetalum Mackayii*.

For a stove temperature of 60 to 70 degrees in winter: *Erises odoratum*, *Angræcum Sanderianum*, *Burlingtonia fragrans*, *Cypripedium Lawrencianum*. *Dendrobium*s: *bigibbum*, *Dearei*. *Phælænopsis Schroderianum*. *Peristeria elata*, *Phælænopsis amabilis*, *P. Rimestadiana*, *Saccolabium bellinum*. *Vandas*: *suavis*, *teres*, *tricolor*.

HARDY ORCHIDS

Many of the most beautiful members of the Orchid family are quite hardy. A group of much interest is that known as the Cypripediums. *C. Calceolus* is a rare native species, and very charming in colouring. The kinds to choose from are *C. spectabile*, the most handsome of all; *C. pubescens*, *C. Calceolus*, *C. parviflora*, *C. occidentale*, and *C. acaule*. *C. macranthum* is difficult to manage. *C. spectabile* makes a dainty group, its flowers white, rose-tinted, especially upon the labellum, or pouch, and the leafy stems grow to a height of two feet. Hardy Orchids appreciate shade, moisture, and a cool place. The best soil is one composed of rough peat, leaf-mould, and equal parts of silver sand and charcoal, whilst a little sphagnum moss is helpful in imparting moisture to the preparation. A cool spot, where Trilliums and moisture-loving things are happy, is suitable for the Orchids.

The Orchises form another group of much importance, and they need similar soil to that recommended for the Cypripediums. *O. foliosa* is very handsome, with its strong spikes of rosy-purple flowers. A deep but not heavy soil is requisite for this, and it may be grown also with great success in pots. *O. latifolia* is the native Marsh Orchis, and *O. maculata* is also a familiar flower in many countries (*superba* is a very handsome variety), conspicuous for its spotted and blotched leaves. Then there are the quaint Bee Orchis (*Ophrys apifera*), the Habenarias and the Fly Orchis (*Ophrys muscifera*), which all enjoy moist soil. Many plants are found in full sun on chalky downs, but it is surprising how much stronger is their growth under less starved conditions. Orchis hunting should be discouraged. There is little harm in removing a few plants from some meadow where they abound, but not some rare species probably almost extinct. The time to transplant hardy Orchids is in the early autumn, not when they are in flower. When an especially fine form is discovered mark the spot, so that one knows what plant to lift.

FERNS

Hardy Ferns.—Ferns are plants which, instead of blossoming and bearing seed, only produce leaves or fronds upon which, usually on the back, little heaps or lines of brownish powder appear. This powder is really tiny pods or capsules, and these pods or capsules are filled with a still finer powder, called "spores." These spores, falling on a damp place, grow into little green scales like green herring scales, and after bearing little organisms on these under sides, far too small to be seen without a strong magnifying glass, tiny ferns grow from these in due course. As some Fern fronds are quite covered with heaps of tiny pods, and each pod may have fifty or sixty spores in it, a single Fern plant may produce millions every season. We may, therefore, usually tell a Fern from a flowering plant by noting that there are no flowers or buds in the first place and then by looking on the backs of the fronds, when if we find such lines or dots we may be reasonably sure it is a Fern.

Another sign of a Fern is seen in the way the leaves or fronds grow. They always begin coiled up tightly into a sort of knot at the top of a stalk; that knot loosens itself, and then we shall see that all the side divisions are coiled up too, so that there is a constant unrolling and spreading out until the whole of the frond is flat and complete. No flowering plant does this; if we look at a plant of Cow Parsley, which is so very like a Fern, we find the leaves push up from the centre in a sharp spiky fashion, and are straight at all stages of growth. Recollecting these two points of difference it will be easy at any rate to say whether a plant is a Fern or a flowering one. Having got so far we shall find that Ferns are of many sorts, their fronds are made in very different ways, and the dots and lines of spores will be found to be always the same upon the same sort of Fern. It has been found that, although the shape and make of the frond may be very different even in the same sort or "species"—that is, finer or coarser cut, or of smaller or larger size—no one species or family will have dots on one

plant and lines on another, and as some species have lines along the frond edges, others along their middles, and others in slanting stripes, while others have round heaps or dots, some with little covers over them and some without, it is easy to see that, knowing what sort of an arrangement a "species" has, we can now go a step further and not only say "this is a Fern," but also "this is a Fern of such and such a family." The Ferns of the world generally consist of a large number of families or genera (plural of genus or kind), and these families are split up into a far greater number of species or members of the family, which, like members of a human family, are very different to each other. Each genus or family has its special way of bearing the spores, and no matter how different its members or species may appear they will all, as we have said, carry their spores in a similar way. Finally, there is often great variety of form among the plants of the same species, so that Ferns are really classed under three heads—genera or families, species or members of families, and varieties or forms of species. Thus, as there are many genera, many species of each genus, and sometimes many varieties of a species, it is clear that there must be thousands of different forms of Ferns taking them altogether. This being so we will first deal only with such Ferns as are to be found in Great Britain, and most of which we may come across in our country walks, especially in our western counties, Devon, Dorset, Cornwall, &c., but in point of fact, they exist all over the country where there is plenty of shade and moisture, and people are sensible enough not to pull them up because they are pretty, as is too often done.

Curious Forms of Ferns.—In Great Britain we have only eighteen genera and forty-five species, but, strangely enough, so many curious forms have been found growing wild among the common ones that certainly *two thousand* varieties exist, and probably many more. Many of these varieties are far more beautiful than the common ones, some bearing beautiful tassels at all their tips, some prettily frilled, some condensed or dwarfed, and some so finely cut as to appear like lovely feathers. Most of us know the pretty Hart's-tongue, with its long, shining, green, strap-like fronds, sometimes growing big in the hedge, and sometimes starring an old wall with small plants. This one Fern has "sported," as it is called, into several hundred different fashions, some like little balls of moss, and some like yard high curly frills, some with cups and pockets at the tips, some branched and tasselled,

and some again with the usually smooth green surface ridged and channelled and adorned in many different ways, or with the edges prettily cut. All the commonest kinds of Ferns have varied more or less in similar ways according to their nature, so that taking our British Ferns by themselves, we can make beautiful collections either in our gardens or indoors, provided we give a little thought to their needs and a little care to their culture. One great advantage possessed by our home Ferns is that they are (all but two rare ones, the Maidenhair Fern and Sea Spleenwort) perfectly hardy, so that we need no hot water piping in the winter as we do for tender Ferns from warm climates.

There is, however, one thing which they cannot stand, and that is drought or want of water at the roots. If we keep our eyes open when among the Ferns in the country, leaving the common Bracken out of the question, we shall always find them in best condition in shady moss lands, under the shelter of the hedges, or in shady but not too shady woods, while if we look a little deeper into the matter we shall note that in very dark nooks the Ferns are drawn up and weakly. In windy sunny places also we shall find their delicate fronds browned by the sun, and ragged and worn by the rubbing together caused by the wind, and from all these facts we shall gather, if we think a bit, that Ferns like (1) Plenty of daylight but little sunshine; (2) Constant moisture at the roots; and (3) Shelter from rough winds.

Finally, if we examine the places where they grow we shall usually find plenty of decayed leaves making an open soil, and that on stiff clay few if any Ferns exist. We shall also note that chinks in rocks and the crevices in old walls and stone dykes are often full of little Ferns, and in time we shall see that some species only grow in such positions and nowhere else, all of which facts teach us something of which the more we remember and apply to the plants we possess the greater will be our success in growing them. A good general compost is a mixture of good loam and leaf-mould, or peat-mould, in equal parts, with say a fifth of coarse silver sand.

Ferns in the Garden.—To grow Ferns satisfactorily in a garden we must recollect what nature has taught us, and choose a spot sheltered from sun and wind as much as possible, but otherwise with plenty of daylight; and we must also indulge them with a soil containing plenty of leaf-mould. Rocky slopes will have taught us also that something in the rockery line will help, but in making a rockery it should never

WILD FERNS IN DEVONSHIRE.

WILD FERNS IN DEVONSHIRE.

W. G. & Co.

HARDY FERNS IN THE WOODLAND.

be forgotten that the Ferns are the main ornament of it, and hence that the rocks, whether real or artificial, should not be mixed up with shells and corals, or similar things which are entirely out of place. To start a Fern rockery, say under a north wall, the ground should be well forked up, and as a foundation any broken brick rubbish may well be mixed with the subsoil to drain it and keep it sweet; if the soil generally be good garden soil and not clayey it will do as it is, though an addition of leaf-mould is always advantageous. The bed should be made nearly a foot higher than is needed, as it is sure to settle, and the rocks or burrs should be well bedded in irregularly, leaving spaces between for planting the Ferns subsequently. When finished water well and let it settle, then plant the Ferns singly close under the edges of the rocks, so that their crowns are just level with the soil but not covered, water them well in, and the work is done. Care must be used in planting, so that small growers are not hidden by larger ones when growth sets in. Finally, having made a pretty rockery in a good place, do not do as nearly everybody does, forget all about the beautiful varieties we have mentioned and crowd up your space with common Ferns, which those who know regard as weeds.

Ferns in the House.—Many of our finest varieties will form lovely specimens in well-lighted north or shaded windows, if grown in pots, kept properly watered, and, above all things, always retained in one position. Ferns, like all other plants, *will* grow towards the light, and arrange their fronds to catch as much of it as they can, the result being a very graceful one, yet innumerable people, ladies especially, who grow Ferns indoors in windows, will keep turning them round to face the company, *i.e.* turn their backs to the light. Now, as many Ferns are practically developing new fronds all through the growing season, and these fronds as they unroll bend towards the light, stiffening as they develop, a Fern thus twisted and turned about becomes in itself twisted and out of shape, and all its native elegance is spoiled. The best plan is to mark the pot itself and keep that mark always either to back or front as the case may be. Much as Ferns like water, it is not well to let them stand in saucers full of it. A good plan is to use a large saucer and insert a smaller one inside it in which the pot stands. The large saucer can then be kept filled and will supply the pot, not by soakage, but by percolation through the smaller saucer, a much healthier way. The more light, but not sun, the sturdier the Fern; no Fern will thrive in a dark corner far

away from the window, and gas fumes are poison to the hardiest.

Ferns in Wardian Cases.—Practically the only satisfactory Ferns for Wardian cases are the Filmies; all others are apt to get drawn or to outgrow the limited space. Our native Filmy Ferns (*Hymenophyllum tunbridgense* and *Wilsonii*), and the lovely Killarney Fern (*Trichomanes radicans*), of which there are several beautiful varieties, do well in a perfectly close case if pegged down on pieces of limestone or sandstone embedded in an open peaty compost. After pegging down, this should be covered with a handful or so of sandy compost and then watered overhead so heavily that this mulching is washed well into them, thus establishing them firmly, but not burying them. This done, they may be left untouched for months together, save a watering when needed. That beautiful New Zealand Fern (*Todea superba*) makes a grand central plant if the case be large, and it is hardy as grass. These Ferns must never see the sun, and drought is absolutely fatal. They are the children of caves and hollows by, and even under, waterfalls, and shrivel at once if exposed to dry air or sunshine. The need for strong light is consequently less, and hence they may be grown in duskier situations than Ferns that love the air. Judiciously aired and well lighted, the Wardian case may accommodate a small rockery containing some of our small growing Spleenworts, such as *Asplenium trichomanes* and its varieties, which constitute a pretty group, and will thrive provided the fronds are *not* wetted and the plants be carefully installed in rocky chinks, limestone for preference, soil sandy leaf-mould. Pretty, temporary arrangements may also be made by filling the bottom of the case with *fresh* cocoanut fibre and bedding small thumb pots therein containing small growing specimens of Hart's-tongues, Spleenworts, &c., which can easily be shifted when growth renders it necessary. Good drainage is essential; water-logged soil breeds a sourness fatal to everything.

Ferns in the Conservatory.—Here, of course, we have ampler room for our plants, but also different conditions. Most conservatories are built for flowers, and hence placed to get as much sunshine as possible, and in such we find the Ferns usually either ignominiously dumped under the staging or stunted and out of condition by uncongenial baking. The ideal Fernery under glass never sees the sun at all, a deep ravine, as it were, with a glass roof. However, few of us being millionaires, we must do with what we can get, and hence if we have a conservatory attached to a house and facing north,

a large part of it will have sufficient shade from the house itself, and the balance we can shade by screen so as to get at any-rate within measurable distance of our ideal. The prettiest way of dealing with a fernery of this class is to build up rock-work within it, broken up by red-tiled paths in any design that permits of easy access to all the plants in the house. This is most essential; plants out of reach invariably become the lurking-places of vermin; or sooner or later get overgrown and neglected. Experience, however, has taught us that rockwork under glass is very apt in time to harbour vermin, and that, consequently, substantial staging and pot culture are preferable. Shifting is easier when growth necessitates it, and in many ways the less attractive appearance is compensated for by greater convenience. Slate shelves, covered an inch or so deep with cinders or ashes, are better than wooden ones, as the pots standing on porous material are less apt to get sour. For hardy Ferns no provision for heating in winter is necessary; they are all the better for a thorough rest, and if excited into growth by warmth before their time become weakly in constitution and liable to vermin. In the autumn those species of Ferns which are deciduous—that is, are not evergreen, but die down for the winter—create, of course, considerable gaps, but as other species are quite evergreen, a little rearrangement rectifies matters. It must be borne in mind that only the fronds die, the plant is only asleep and still has need of water, though to a less extent. To allow the soil in the pots to become dust dry is simply to kill the plants within.

Ferns in Frames.—Ferns can be grown well in frames in two ways, either in pots on shelves, on a tiled bottom, or planted in a leaf-mould bed upon which the frame is merely set. The lights must either slope toward the north or north-east, or be shaded from too hot sun. A very good plan is to dig out a sufficiently large hole or trench, pile the soil up on the south side so as to make a rockery facing south, suitable for Alpine plants, and then put leafy compost in the bottom of the excavation. Plant the Ferns and put on the lights at a steepish slope towards the north; the earthy bank keeps the frame cool, and can be retained in place by roofing slates. In such frames beautiful collections of Polypodies, Blechnums, Spleenworts, and Hart's-tongues can be grown to perfection, but naturally the tall-growing Male Ferns, Lady Ferns, and Shield Ferns require too much head-room. Here again the plants may be bedded in pots sunk in cocoanut fibre, provided this be changed from time to time.

Spore-Sowing and Propagation.—Certainly the most interesting way of increasing Ferns is by the spores, as in this way there is always a chance of getting quite new things. About July, generally speaking, the spores are brown and ripe, and if we take a frond bearing spores and lay it on a sheet of glazed white paper for an hour or two we shall see them shed in great numbers, as a sort of brown stain on the paper. Fill small pans or pots nearly full with fern compost, putting some crocks in first for drainage, top this with a little crumbled loam, place a piece of paper on top to prevent disturbance, and pour boiling water upon it until it runs out of the bottom hot enough to scald the finger. Remove the paper and let the soil cool. Now scatter the spores *extremely thinly* on the top, put a piece of glass over, and place the pot or pan in a cool, damp, shady corner where no worms can get into it. In a week or two a green tint appears, and very soon this will become a mass of small scales, like green herring scales. A little longer and from these will arise tiny fronds which, if the sowing has been thin enough, may be left to develop into larger Ferns, which can then be pricked out and grown on. Hart's-tongues, Lady Ferns, and Male Ferns are perhaps the easiest to raise, and, of course, good varieties should be sown, as there is no advantage in raising common ones. Established Ferns can be multiplied in several ways. Many form crowns from which the fronds arise shuttlecock fashion; in time these crowns split and form twins, or other crowns appear on the side. Each crown is really an independent plant, and can be pulled away, or carefully cut off, and treated as such. Some have creeping roots, such as the Polypodies, which run about in all directions; every growing tip if cut off with an inch or so of fleshy roots and a frond or two will form a plant. Others, like some of the Shield Ferns, bear little plants on their fronds, and in that case the frond should be cut off, and the part bearing the young ones severed and pegged down on good soil, when they will root in, and can, later on, be parted and potted. Finally, all Shuttlecock Ferns grow better and stronger if kept to one crown, and hence when other crowns appear they should be taken off.

BEST VARIETIES

Having now given a general idea of how Ferns should be treated, a short list of those worthy of attention, and such as a beginner may safely start with at little cost, will be useful.

There are a great number of comparatively rare and beautiful varieties in addition, which rank, however, as prizes to which the more advanced students may aspire, space precluding more than a selection of current "gems" in the trade.

The Lady Fern (*Athyrium filix fœmina*).—The best crested or tasselled varieties are *A. f. f. Victoriæ*, *acrodadon*, *cristatum*, *Frizelliæ cristatum* (*applebyanum*), *curtum cristatum*, *superbum cristatum*, and *percristatum*, *corymbiferum*, James; *depauperatum*, *orbiculatum*, *gemmatum*, and *multifurcatum*. The best plumose or extra feathery ones: *A. f. f. pl. Axminster*, *Horsfall*, *divaricatum*, *plumosum elegans*, Parsons; and any of Mr. Druery's strain of "superbum," which are the finest of all. Other "gems" of different sections are the dwarf congested forms.

The Buckler Ferns (*Lastreas*).—The best Male Ferns (*L. filix-mas* and *L. pseudo-mas*) are *L. p. m. cristata* (The King of the Male Ferns) and its narrow form *L. p. m. c. angustata*, *L. p. m. polydactyla*, *L. f. m. grandiceps*, *crispa gracilis* (dwarf), *crispa cristata angustata* (dwarf), *ramosissima*, *ramulosissima grandiceps* *Lovi*, *revolvens*, and *Ballandiæ*.

The Mountain Buckler Fern (*L. montana*) must be grown in moist loam. It has sported freely; the best are *L. m. cristata*, Barnes; and *grandiceps*, *cristata gracile*, Druery; *plumosa*, *Barnesii*, *ramo-coronans*, Barnes; and *congesta*.

The Broad Buckler Fern (*L. dilatata*) has given us *L. d. cristata*, Oscroft; *grandiceps*, Barnes; *lepidota* and *lepidota cristata*, and others.

The Hay-scented Fern (*L. æmula*), a pretty crested form, and *L. æ. cristata*.

The Shield Ferns, or *Polystichums*, being evergreen, are perhaps the most serviceable of all. The beautiful forms of these are innumerable. We can only indicate a few.

The Holly Fern (*P. Lonchitis*).—*P. L. cristata* is very pretty. This can only be grown outside in a moist situation, facing north, and under the shelter of a big piece of rock or burr; so treated it does well, but rarely in the open. The type is pretty, and should be tried first.

The Hard Shield Fern (*P. aculeatum*).—A capital Fern in any of its forms. There are several *grandiceps*, all good, but the prince of the family is *P. ac. pulcherrimum*, which under glass has no equal in its own particular line, a perfectly graceful shuttlecock, four feet high and erect, with exquisite finish.

The Soft Shield Fern (*P. angulare*).—The best are the *plumosa* and *decompositum* sections; *P. a. pl. densum*, *laxum*, *robustum*; *P. a. pl.*, Wollaston; *cristatum*, Wollaston; *grandiceps* (several, all good), *tripinnatum* (several), *acutilobum*, *revolvens*, and *congestum*, represent charming types of which scores of sub-types exist.

The Hart's-tongue (*Scolopendrium vulgare*).—As already stated, the forms of this number hundreds. We can only indicate all the *crispums* as fine frilled varieties, the more beautiful being the fimbriated section of Stansfield and Cropper. Tasselled forms vary from a few finger-like

extensions on the frond tip to division into balls of moss, such as Kelway's *densum*. Some of the fimbriate *crispums* are also beautifully tasselled.

The Polypodies.—The Oak Fern (*P. Dryopteris*), the Beech Fern (*P. Phegopteris*), and the Limestone Polypody (*P. calcareum*), are three pretty little Ferns, which should be grown in pans with plenty of leaf-mould and a little lime for the last. There are no good varieties, but they are too pretty in make and colour to ignore. In the open they want a lot of shelter; best grown under glass—deciduous. The Common Polypody (*P. vulgare*) is a very different plant; it is quite evergreen, and will do well anywhere on loose leafy or peaty compost. It has a thick, fleshy running root-stock or rhizome, and this must be planted near or even on the surface. A good plan is to grow it in largish shallow pans, and to stand these *on* (not *in*) a redware saucer which is kept full of water. This Fern is quite evergreen, and has varied much, so that a pretty collection can be made of its forms. The best are *P. v. cambricum* or the Welsh Polypody, of which the finest types are *Prestonii*, *Hadwinii*, and *Barrowii*. These are true *plumosums* and lovely.

The Hard Fern (Blechnum Spicant) is a pretty evergreen Fern, with two sorts of fronds—lax leafy ones which are barren, and tall, stiff-growing, stalky ones which bear the spores. The Fern must be watered with rain or soft water, as lime kills it.

Of the *Spleenworts* only one species has varied to any extent, viz. the Maidenhair Spleenwort (*Asplenium Trichomanes*). This, as we have said, may be grown in a Wardian case. It has sported into fine charming forms; *A. T. incisum* is the plumose form and Clapham's is the best. The black Maidenhair Spleenwort (*A. Adiantum-nigrum*) has yielded one crested form, *A. Ad. n. grandiceps*, very pretty but rather difficult to grow.

The Royal Fern (Osmunda regalis) is a grand Fern for a moist corner or a large pot. As it is a bog Fern it must be kept well watered, and hence does well by a pond side. It bears all its spores on the frond tips in somewhat flower-like bunches, hence its name of flowering Fern. The variety *cristata* is beautifully tasselled.

Finally, a spare corner or corners in many a garden might well be tenanted by the Bracken (*Pteris aquilina*), not in its common form, but in several splendidly crested and otherwise varied types. It is one of the easiest Ferns to raise from spores, and one of the hardest to shift or to establish after shifting. Spores sown one year in pans make pretty plants the next, and if turned out into the garden in the early autumn will come up freely in the following spring, and soon make handsome clumps, while, curiously enough, if kept under glass and frozen, they are almost sure to be killed.

GREENHOUSE FERNS

The beauty of the plant house and home is derived in a large measure from the cool-coloured and graceful fronds

of Ferns too tender to live in the open garden. Flowers are absent, but the charming tints of the young fronds and the graceful growth of the plants are features restful to the eye. Ferns may be grown in many ways, and the majority will develop rapidly in heat. This fact is taken advantage of by many cultivators who supply Covent Garden market, whence the plants drift to the barrows of the street hawkers. The fact that these plants, after a short period in a greenhouse or living room, quickly lose their freshness is in many cases accepted as proof of their delicate constitution, whereas the fault is in the way they have been treated. This also applies to many plants other than Ferns, the object of the market grower being to get a saleable plant in as short a time as possible. With regard to newly-purchased Ferns, when the conditions under which they have been growing are unknown, it is better to assume that they have been treated as above described, and harden them off when first obtained. Thus they should be kept away from draughts and bright sunshine: indeed, Ferns always require shading from the full rays of the sun. The above directions are given with regard to Ferns purchased from dealers, but to the amateur with a greenhouse there is another way of obtaining them—and that is, given a few to start with, they may be readily propagated from. There are three ways of increasing Ferns, firstly by spores, secondly by division, and thirdly some kinds produce small plants on the tips of the fronds, and it is only necessary to peg them down on a pot or pan of soil, when, if kept watered, these tiny plants will form roots of their own, and in time may be potted singly into small pots.

Propagation by Spores—The spores, which in Ferns are equivalent to the seeds of flowering plants, are usually arranged on the under sides of the fronds in dots or lines; but there are exceptions to this, as in a few cases the spore-bearing frond is quite distinct from the others. Myriads of spores are contained on a single frond. They are covered with what is known as spore cases—that is, enclosed within a kind of scale. When ripe these cases burst, and the contents are then scattered. The spores are so light that they float hither and thither till they finally rest, and if the spot is favourable to their development they commence to grow. In gathering spores for sowing care should be taken to see that the spore cases are not already opened, and the spores themselves discharged, which is apt to happen unless special attention is directed to the matter. To secure the spores cut off the

frond or fronds just as a few of the earliest spore cases commence to burst and discharge their contents. Then fold them up in a sheet of white paper and place in a dry spot. In a few days the spores will be found loose in the paper, like a pinch of the finest dust. For sowing the spores five-inch pots are suitable. They must be prepared by putting two inches of broken crocks in the bottom, and filled to within an inch of the rim with a mixture of loam, peat, and sand passed through a sieve with a quarter of an inch mesh, and pressed down moderately firm and smooth. As a moss-like growth frequently makes its appearance on the surface of the soil and chokes the spores as they commence to grow, if possible bake the soil before it is used, or saturate it with boiling water, and thus destroy all germs of vegetable life. Having thus prepared the pots water them thoroughly through a fine rose, and while the surface is still wet sprinkle on the spores as thinly as possible. Then cover with a pane of glass, and stand each pot in a shallow pan of water, which will serve to keep the soil moist without overhead watering, as, however carefully done, this is apt to wash the spores away. In time (a few weeks in many cases) a dense moss-like growth will overspread the soil. This usually consists of growing spores packed closely together, too closely in fact to allow of their development. They must then be pricked off, and this is carried out by preparing some pots as for sowing the spores, except that the soil must be very lightly pressed down. Then with a pointed stick pick up a tiny tuft of the growing spores, place it on the surface of the soil, and press into position gently with the finger. Water through a fine rose, keep in a humid atmosphere, and give careful attention to shading, &c.; they will continue to grow, and in time push up fronds. When large enough they must be potted off singly into small pots. February and March are the best months for sowing the spores, as there is a long growing season before winter. Although the raising of Fern spores is extremely interesting, and large quantities are obtained in this way in nurseries, it is a method that can scarcely be recommended to quite a beginner, as a considerable amount of care and knowledge is necessary to bring it to a successful issue. Still, in a Fern house where the atmosphere is always kept moist, naturally sown plants will spring up in all directions, the Maidenhair and some kinds of Pteris being as a rule conspicuous.

Propagation by Division.—The second method of propagating Ferns is by division, and is best carried out in the spring.

All Ferns that produce several crowns can be propagated in this way, and, as a rule, division should be practised with a large knife, as any attempt to disentangle a crowded mass of roots is likely to result in greater injury than a clean cut. After potting keep the divided plants in a closer atmosphere, if possible, and additionally shade until the young roots are active in the new soil.

Soil.—With regard to the soil most suitable for Ferns it was at one time considered absolutely necessary that the larger portion of it must be peat, but these ideas have been considerably modified of late years, and some cultivators grow many Ferns in almost pure loam. Still, with few exceptions, the most suitable compost is two-parts loam to one-part each of leaf-mould and peat, and about half a part of sand. When there is no peat its place may be taken by an additional part of leaf-mould, and *vice versa*. Ferns as a rule delight in plenty of water when growing freely, but it is important to drain the soil well, as stagnant moisture is quickly fatal not only to Ferns but to all classes of plants. Among the numerous plants used for the embellishment of the dwelling-house this excess of moisture is more fatal than anything else. Thus when the plants are placed in vases of different kinds which have no provision to allow of the escape of surplus water, they should be removed to be watered, and allowed to drain for a few minutes before returning them to their place.

The highly ornamental and at the same time varied features of the different Ferns render them extremely useful in many ways. In the first place a certain number are absolutely indispensable for the embellishment of the greenhouse or conservatory. Apart from their own intrinsic beauty they serve admirably as a foil to the different flowering plants, whose brightness is accentuated by association with the refreshing green of the different Ferns.

Besides this a house devoted entirely to Ferns forms a feature of interest throughout the year; the different types of fronds, their ever-varying changes of colour during the growing season, with the exquisite beauty of some of the more finely divided kinds, all combine to form a source of great attraction.

Added to this, some of them from their pendulous nature are unsurpassed for growing in suspended baskets, while many of them may be readily cultivated in the dwelling-house.

Out of the vast number of varieties in cultivation a rigid

selection is necessary, the following being among the very best for greenhouse decoration :

Adiantum æthiopicum	Nephrolepis exaltata
„ capillus-veneris	„ todeoides
„ cuneatum	Onychium japonicum
„ cuneatum grandiceps	Osmunda japonica corymbifera
„ decorum	„ palustris
„ formosum	Pellæa hastata
„ fulvum	„ rotundifolia
„ gracillimum	Platynerium alaicorne
„ hispidulum	Polypodium aureum
„ Pacottii	„ glaucum
Aspidium atratum	„ Mayii
Asplenium biforme	„ Schneiderii
„ bulbiferum	„ sporocarpum
„ Colensoi	Polystichum capense
„ nidus	„ setosum
Blechnum brasiliense	„ triangulum
„ occidentale	„ Tsus-Simense
Cyrtomium falcatum	Pteris arguta
„ „ Fensomei	„ argyræa
Davallia brasiliensis	„ Childsii
„ bullata	„ cretica
„ canariense	„ „ albo-lineata
„ Lawsoniana	„ „ major
„ Mariesii	„ „ Mayii
„ tenuifolia	„ internata
„ Tyermannii	„ leptophylla
Doodia asperia	„ longifolia
„ limulata	„ scaberula
Doryopteris palmata	„ serrulata
Lastrea aristata variegata	„ „ Chiswickense
„ atrata	„ „ cristata
„ lepida	„ „ gracilis
„ patens	„ „ major
„ Richardsii multifida	„ straminea
„ varia	„ Summersii
Lomaria ciliata	„ tremula
Lygodium japonicum	„ „ Smithii
„ scandens	„ umbrosa
Microlepia hirsta cristata	„ Wimsettii
Nephrodium molle	„ „ grandiceps
Nephrolepis Amerpohlii	Todea africana
„ cordifolia compacta	Woodwardia orientalis
„ elegantissima	„ radicans

THE
MAIDENHAIR FERN

A BEAUTIFUL VARIETY OF THE MAIDENHAIR FERN.

A NEW GREENHOUSE POLYPODIUM OF DISTINCT GROWTH.

For Hanging Baskets—

Adiantum cuneatum grandiceps	Woodwardia exaltata
„ dolabriforme	„ „ furcans
Anemia rotundifolia	„ „ grandiceps
Asplenium caudatum	„ Piersonii
„ flaccidum	„ Whitmannii
Davallia bullata	Platynerium alcorni
„ dissecta	Polypodium glaucum
„ Lawsoniana	„ Mayii
„ Mariesii	„ phymatodes cristatum
„ rufa	Woodwardia orientalis
„ tenuifolia Veitchii	„ radicans
Microlepia hirta cristata	„ „ cristata
Nephrolepis elegantissima	

Selaginellas.—These are for the most part pretty moss-like plants, nearly related to the Ferns, and succeeding under the same cultural conditions. One species, *Selaginella Kraussiana*, often known as *S. denticulata*, is frequently used as an edging, for the clothing of bare ground underneath stages, or for similar purposes. It is hardy in many parts of the country. The best greenhouse kinds are :

Selaginella amæna, *S. elegans*, *S. Emiliana*, *S. erythropus*, *S. japonica*, *S. Kraussiana*, *S. K. aurea*, *S. K. variegata*, *S. Martensii*, *S. serpens*, *S. variabilis*, *S. Wildenovii*.

Filmy Ferns.—Until the invention of the Wardian case the culture of the Filmy Ferns was a failure, but given a fair start and the observance of a little common sense, there is no class of Ferns which so well repays a minimum of trouble with a maximum of pleasure. The Filmy Ferns, so called from the delicate and diaphanous nature of their fronds, rank decidedly among the most beautiful plants extant. In their native haunts, which are mainly situated in hilly regions, they clothe the rocks, leafy banks, and the trunks of trees and tree ferns with dense masses of translucent frondage, ranging from minute moss-like growths up to the stately fronds of the Todeas, and varying in form from the exquisitely slender hair-like types of *Trichomanes trichodeum* to the broad, kidney-shaped, almost leathery foliage of *T. reniforme* even in one and the same genus. In the vast majority of cases they spread by means of thin, ramifying rhizomes, which cling to rock and other congenial sites and form mat-like cushions of glistening emerald verdure. Wherever they are found, the condi-

tions are such that the atmosphere is constantly saturated with moisture, and it will also be seen that perpetual shade is afforded by the loftier vegetation amid which they thrive. Transport them even for a few minutes into dry air, and they quickly shrivel. From the nature of their habitats, therefore, it is easy to outline their cultural requirements, both as regards soil and aerial conditions, and we can at once perceive that a close Wardian case or even a bell-glass in a cool, shady position, or, better still, a sunken brick-lined and glass-covered pit in a shady corner of the garden, secure the main essentials. The soil, as we have seen, consists entirely of the *débris* of vegetation mixed with more or less broken rocks; or there may be no soil at all, as in the case of the fern-clad tree trunks. In practice, good brown lumpy peat affords precisely the requisite foothold; hence, taking a far-sized Wardian case, we should secure the proper drainage—for the Filmies are not Bog Ferns—by a careful and liberal supply of broken pots and broken bricks, nearly filling the receptacle with these. After this pile up the *lumpiest* peat possible, mingling it liberally with coarse silver sand and lumps of porous stone, and, finally, top the compost with pieces of rock. This done, take the clumps of Filmies and peg them securely down over the rocks in the desired positions, leaving room between the species for subsequent spreading. Then prepare some finer peaty compost mixed liberally with coarse silver sand, and sift this over the clumps until they are fairly buried, finally giving such a drastic drenching from jug or water-can as will wash this compost entirely in and leave the Ferns on the surface again. They are now fairly installed, and all we have to do is to replace the glass, close all openings as tightly as possible, and leave them severely alone. All direct sunshine must be excluded, hence a position close to a north window suits admirably. As a rule, after such an installation, they may be left entirely untouched for several weeks, but no harm will be done by an occasional gentle spraying of pure rain water over the fronds. After a time it will be seen that new fronds are pushing up here and there, and eventually the fresh growth will entirely rectify the effects of disturbance, and all the loveliness of the plants will be gradually developed. One great charm about the Filmy Ferns is their persistent verdure, the fronds in some cases remaining green and fresh through several seasons; hence there is no unsightly seasonal gap such as occurs with their drier kindred. Make the first attempt with our hardy British species, viz., the dwarf-growing *Hymenophyllum unilaterale* and *H. tunbridgense*, which

form dense mats of delicate mossy growth a few inches high at the utmost, and the delightful Bristle or Killarney Fern (*Trichomanes radicans*), which has a stouter rhizome and fronds quite large enough to furnish any ordinary Wardian case. Of this latter there are several beautiful varieties, especially *T. r. dilatatum*, a grand leafy form, with fronds a foot high, and *T. r. Andrewsii densum*, *dissectum*, and *cambricum*, all varied in cutting and make. It is beyond question that no Ferns are so well adapted as the Filmies for case culture in rooms; all other species, however pretty they appear when first installed, are apt to get drawn and out of health before long under such conditions, while a batch of Filmies, once fairly started, thrives well, and if properly selected will never be too large for the available space. For a large case, a central plant of that exquisite yet hardy New Zealander, *Todea superba*, may well be selected, but as a well-grown plant of this may cover a circle of four feet in diameter, it is clear that in time it will overgrow its room. Undoubtedly the easiest way to grow Filmies is to sink a pit in a shady garden nook (*i.e.* toplights but no sun), line it with bricks, red for preference, make a bed as above described, and instal the Ferns, Todeas, and others therein, covering the whole with a well-fitting light. In such a pit the writer has had Todeas, Trichomanes, and Hymenophyllums thriving marvellously, though shamefully neglected and watered once a month at the oftenest, the sunken bed supplying itself from the subsoil and the non-removal of the tight-fitting light retaining the air in the necessary moist condition. Many of the choicest exotic Filmies are hardy, or so nearly so that they will thrive with only sufficient protection to keep out the frost. Those above named British and New Zealand are absolutely frost-proof, and make the bulk of their growth in the coolest times of the year, a clear indication that high temperature is a mistake, and this indeed is often the cause of failure where an exotic and maybe tropical origin misleads the cultivator, who ignores the important facts that high elevation means coolness even in the torrid zone.

THE COLD GREENHOUSE, AND THE FLOWERS GROWN IN IT

"K. L. D.," a clever amateur gardener, sends the following practical and interesting notes about the cold greenhouse :

There are many phases of garden work and countless varieties of plant-houses, but amongst them all it is a matter of regret that more use is not made of the unheated greenhouse. As an early pioneer of cold-house gardening, let me tell the story of my first experiences. It takes a long look back through the vista of years to recall the old tumble-down country rectory which had to be rebuilt, and the hope and despair of having a greenhouse at all, which trembled in turns in the fateful balance of pros and cons, and how, in the end, a fairly good lean-to vinery was built of the window-sashes of the old house. There, in after years, many a good bunch of black Hamburgh Grapes was cut, and many a fine plant grown, though it is the fashion nowadays to say—and with a good deal of truth—that grapes and flowers cannot be grown together. There was nothing better, by way of heating power in this vinery of about twenty-five feet in length, than a slow-combustion stove—far from an ideal mode of gaining a genial plant-growing atmosphere. But it was not the vinery that made me a cold-house gardener. As luck would have it, a mistake in building the new house made it needful, either to block up the side windows of both drawing-room and dining-room which opened upon the lawn, or to build some kind of glass porch or vestibule to enclose them and keep out an unbearable draught. The result was a charming little conservatory, but one in which a boiler and pipes, owing to its position, were quite out of the question. Moreover, the village was situated on very high ground, nine miles from a railway station, and coal cost as much or more than it does now even in these days of high prices. The problem was how to keep this conservatory bright with flowers at all times of the year, and rather a stiff problem it was to solve. I was but a novice in garden work in those

days, but I happened to have two qualifications which stood me in good stead, a strong love of flowers and a fairly good knowledge of hardy perennial plants. So I made up my mind to face the difficulty and to overcome it with my own hands, for the garden was large and there was quite enough for the gardener to do. He was a clever, faithful and handy man, and I had his good help in many a contrivance through a long series of years, but potting and watering, seed-raising, and slip-taking, and all the ordinary work of a greenhouse I learnt to do by practical experience in happy hours of leisure. Space will not allow me to tell of the failures and difficulties of the first year or two—perhaps it is as well that they be buried in oblivion—but success came at last, and folk with big conservatories were sometimes rather piqued to find in the modest little rectory greenhouse new and rare plants which were strangers to their own. A few hints, therefore, from an “old hand” may be of use to beginners. First of all,

One must not attempt too much. Failure generally comes from trying to grow, in an unheated house, plants which require a higher temperature than can be given. One must not expect, for instance, to be able to grow *Pelargoniums* of any sort unless the thermometer can be kept well above freezing-point at all times. It must always be borne in mind that the mere shelter of glass, while it protects from heavy rains and wind, will not keep out hard frost, therefore hardy plants only are suitable for a cold greenhouse. Even the hardiest will look unhappy out of doors in a severe spell of frost or a tearing wind. Have we not all noticed the drooping, downcast look of common *Rhododendrons* when the ground is ice-bound and a chill wind rustles through the stiff-frozen leaves? Yet no sooner does a thaw warm the air and loosen the frost-bands than they lift up their heads as if nothing had disturbed them. It is different with the fine early-flowering sorts, whose foliage is safe enough, but whose crimson and pink blossoms are too fragile to bear the bruising hail or the blustering gale, and who piteously ask for a little shelter that they may fulfil their destiny in peace. In these, we have an example of one class of plants suitable for the unheated greenhouse; such, in fact, as are hardy enough to live through even severe winters, but whose flowering time is too early to resist injury, in most localities, from inclement weather. There are many such which, with mere shelter in a light glass-house, will come into flower, and bring us a welcome foretaste of spring while the garden,

maybe, is yet lying frost-bound. Perhaps this may seem to be somewhat a dull limit to put on the possibilities of the cold greenhouse, but think of the early Azaleas, Camellias, Mezereon, and double-flowered cherry and peach and plum—of the host of hardy bulbs—Narcissus and Tulip, Hyacinth and Lily, and rare Iris, which are so beautiful as to win for themselves a comparison with the gorgeous Orchids of the tropics. Think, too, of everyday flowers—"pale Primrose" with all her sisterhood, the lovely blue Forget-me-Not, and Lily of the Valley, so common yet so precious that florists not only force it into bloom in winter's cold, but lock it up in ice that we may rejoice in it during summer heat; are not such as these always welcome? There is no fear, believe me, that we should lag far behind our neighbour in the matter of choice and fragrant flowers even though we cannot vie with his stove exotics.

It is in the dead of winter—those few weeks that usher in and follow Christmas—that the resources of the cold-house gardener are taxed to the uttermost. Chrysanthemums—admirable plants for the unheated greenhouse if well managed—begin by that time to look uncomfortable and to damp off; and except Roman Hyacinths and the earliest of Van Thol Tulips, it is a little soon for bulbs. It is well, at this dreary season, especially if a conservatory must be kept in good order, to have a supply of evergreen shrubs and ferns, so that greenery at any rate may cheer us, even if flowers be few. Myrtle, both large-leaved and small, Laurustinus, Veronica, Eugenia, and Aralia are all well adapted for this purpose. A hardy Fan-Palm or two may be added, with small-leaved variegated Ivies and evergreen Ferns, such as the finer Hart's Tongues and Welsh and other forms of Polypody. These and such as these are a great stand-by in the way of sturdy foliage plants, and will serve many a good turn at all times of year.

During those same few dark weeks, when all nature is at rest, I am bound to say that a small, movable heat-radiator, set going by a lamp, was of great use in the conservatory, as much for the purpose of drying the air as to keep out frost. It saved the plants from that shuddering look which even the boldest will put on under stress of severe cold, but this was never used and, in fact, was not required except in case of very hard weather. No form of cold greenhouse is more delightful, perhaps, than a

Rose Garden under Glass, and this requires absolutely no thought of heating even of the most temporary kind. It has,

also, the advantage of being the least costly as to furniture, for a central bed and borders at the sides of a span-roofed house may take the place of stage and benches. Here Tea-scented, hybrid China, and Noisette Roses of choicest kinds, planted out, will give endless pleasure to its owner and will rarely be without some fair blooms to reward his care; but space may also be allowed for pots of flowering bulbs to be brought in from outdoor quarters during winter and early spring or, in late autumn, groups of Chrysanthemums, when Roses are scarce. Or the unheated greenhouse may be used as an Alpine garden. The rarest gems of the mountain, Soldanella and Saxifrage and Gentian, even *Eritrichium nanum* itself, that sore puzzle to Alpine lovers, strangely enough, seem to find in the shelter of glass some amends for the snow covering they have lost, and may here be grown with rare success. In fact, there is a wide range—even that of the Temperate Zone—where we may wander in search of suitable plants, but we must take care that our footsteps do not trespass even on the verge of the Tropics, or we may court failure. Two important points of structure amongst many may be just touched upon. These are

Ventilation and Shading—The plants we wish to grow are children of liberty and come from the open plain, the breezy hillside, or the rocky height. Plenty of fresh air, but without cross-currents, is essential to their well doing. Therefore, take care that the cold greenhouse be amply provided with ventilators which can be opened or shut according to the way of the wind. Shading is of scarcely less importance, but in nine cases out of ten is missing altogether. It often happens that bright sunshine treads close on the steps of a hard frost. If it fall on frozen foliage under glass, the most serious mischief follows. Should it be possible to arrange an outside covering of felt on rollers protected by a ridge to be used in case of need, so much the better. It will make all snug in severe weather. But in any case, do not neglect to have inside blinds of some sort, not only to tone down the too fervid rays of the summer sun, but no less to prevent the winter scalding of frozen plants.

The merits of an unheated plant-house are manifold, for they include economy in working, freedom from anxious care and labour of heating, and a vast choice both of beautiful plants and of methods in using them; but its management, perhaps more than of most glass-houses, is a matter of study and forethought. Study, that one may know what to grow and how to grow it; forethought, to prepare early in the year

the plants one wishes to find in flower before its close, but he who thinks in due season and acts upon his thoughts will not regret the time nor find it wasted, that has been spent in the genial atmosphere of an unheated greenhouse. [The list of plants for the cold greenhouse recommended by "K. L. D." is given in the chart, p. 594.]

THE CHRYSANTHEMUM

FEW flowers are more valuable to the beginner in gardening than the Chrysanthemum, and its culture has increased amazingly, until in every town almost in the British Isles, the Chrysanthemum show is an event of some importance in the autumn months. Of course, in the land of the Japanese and Chinese the flower is held in great esteem, and in Japan the Chrysanthemum fête is one of the high festivals of the year. Varieties that create sensations in the show tents have been raised of late years, and the flowers seem to increase in bulk as the years go by, until in the near future no soup plate will hold the long, frequently picturesque, florets. Even quite a small grower may win prizes at the exhibitions, and "showing" is popular at the present day. Those who care little for monster specimens may enjoy a feast of blossom at little expense of time, labour, and money. Growing plants for exhibition requires considerable skill, a thorough acquaintance with the most recently raised varieties, and ample leisure, but those desired merely for the greenhouse, conservatory, or border, are easily managed. As the following notes show, the Chrysanthemum is divided into many groups: Japanese, Japanese incurved, Japanese reflexed, incurved, pompon, Anemone pompon, Japanese pompon, reflexed, single, and even other divisions. We are pleased to find that raisers are giving much attention to the raising of outdoor varieties of good rich colours, and some with single flowers. In the late days of August, throughout September, and a part of October, Chrysanthemums give colour to the border or flower-bed, and with the assistance of such fine kinds as Cottage Pink, Horace Martin, yellow; Etoile d'Or, yellow; Mdme. Marie Masse, lilac mauve; Le Pactole, bronzy yellow; Le Cygné, pure white; Normandie, pale pink; Champagne, ruby red; and Goacher's Crimson, their season is continued far into the autumn.

How to Obtain Good Cuttings.—The best cuttings are those which develop at the base or crown after the plants have finished flowering

and been cut back. It is usual to cut back plants to within a few inches of their base, making an exception in the case of those somewhat shy in the production of cuttings. The reason for leaving a greater length of stem in such cases is that cuttings frequently develop on the stem and must be detached. A good rule with show plants is to shake them out of their flowering pots, then reduce the ball of earth sufficiently to replace them in a pot measuring six inches in diameter. Use some light gritty compost, and avoid too firm potting. After repotting give each plant a watering in, using a fine-rosed can for the purpose. Stand the plants on a shelf near the glass roof of the greenhouse, and if this is not possible, on the greenhouse bench, maintaining a temperature of between 45 degrees and 50 degrees. In a short time a fresh lot of shoots will develop on the plants, and cuttings of this kind are those best calculated to give satisfactory results. Where large quantities of cuttings are required, after shaking the old plants out of their flowering pots, reducing the ball of earth, and at the same time cutting back some of the longer and coarser roots, replant them in a bed of soil made up on the greenhouse bench. This bed of light gritty soil should be from six inches to eight inches deep, and the plants not too firmly bedded out. An even surface should be made, so that when watering the water should be retained and not run off on either side, as is the case unless this simple rule be observed. The same temperature should be given in this case as that advised for plants in pots. Within a period of ten days to a fortnight the cutting should be developing in large numbers. The soil must be kept just moist, neither too pasty nor too dry. Some may not care to treat their old plants in this way; the trouble is too great. If so, cut out any attenuated shoots of comparatively recent growth, also weakly ones. Although the early-flowering varieties appear strong, they are often among the first of the old plants to suffer, and when such is the case their only chance is either to repot them or plant them out on the greenhouse bench—the two methods of increasing the supply of cuttings.

The Best Cuttings.—The best, and in truth the only good, cuttings to be obtained are those which push their way through the soil at some distance from the old stem. These are of recent growth, and generally go ahead immediately they become rooted. The other form of cuttings is produced close to the old stem, and often develops on the stem itself. Varieties rather shy in producing cuttings often have to be perpetuated by stem-cuttings. This kind should not be too long, a desirable length being between two and a half inches and three inches. It should be detached from the old shoot with a sharp knife, and cut straight through immediately below a joint formed by the junction of the leaf-stalk with the stem. The bottom leaf should be removed by the sharp knife also, trimming this off close to the stem of the cutting. This is then ready for inserting in the propagating frame. Stem-cuttings are not advisable, as they are apt to develop buds prematurely, and in consequence completely upset a proper system of high culture, besides causing much inconvenience during their period of propagation.

GOOD CUTTINGS OF CHRYSANTHEMUMS.

CUTTINGS PLANTED IN A SMALL
POT OF SANDY SOIL.

SINGLE-FLOWERED CHRYSANTHEMUMS.

Propagation by Cuttings.—The period for the propagation by cuttings depends upon when the grower requires his plants in flower. If the object be simply large flowers for exhibition, the earlier the work is taken in hand the better. Cuttings of Japanese sorts for this purpose should be inserted in December. The late-flowering Japanese are better if attended to earlier, even in November, while those kinds liable to blossom earlier than the majority, namely, mid-October and late October, give excellent results if the cuttings are put in late in January. The object in varying the date of propagating the exhibition varieties is to ensure the plants flowering for the most part at the same time, namely when the shows are taking place all over the country. The earlier half of November is Chrysanthemum show time, and for this reason, by propagating the later sorts early and the early varieties late, the plants will bloom about one time. Cuttings intended to produce exhibition plants should be inserted singly in what are known as "thumb" pots, and if deep "thumbs" can be obtained so much the better. Wash the pots quite clean, and soak new pots in clean water to absorb moisture. The broken potsherds should also be cleansed, and this is work that must not be neglected. It is by observing such details as this that success is assured. In raising plants for the conservatory, for use also as cut flowers, or for planting in the outdoor border for a rich autumn display, a simpler method of propagation will answer. Half a dozen or more cuttings may be inserted around the edge of a three-inch pot or a larger number in those of increased size. Boxes about two inches deep, fifteen inches long, and ten inches wide, are excellent for raising large stocks of plants in. Another method, and one largely adopted by market men, is that of making up shallow beds inside the cool greenhouse, where a cool bottom can be obtained, and inserting the cuttings in these. Under these circumstances, provided the soil is not allowed to become too moist, failure is almost unknown, and it is remarkable how quickly the cuttings root. Both in the case of boxes and the beds arranged on the stages of the greenhouse, a good system of drainage should be observed. Potsherds and pieces of fibrous turf answer the purpose admirably, keeping the drainage open, and the soil sweet.

Soil for Cuttings.—The compost for the cuttings should be fibrous loam, well-decomposed leaf-mould, and coarse silver sand or road grit in equal proportions. Before these ingredients can be used, pass them through a sieve with a half-inch mesh, and mix them thoroughly afterwards. The residue—the fibrous tufts of loam and the coarser and less decayed portions of the leaf soil—should be taken care of, as this material will be wanted. When the soil is ready place a small piece of crock over the hole in the bottom of the pot, and cover this with a layer of smaller pieces. Cover the crocks with a small layer of the rougher siftings of the compost referred to, filling in the soil afterwards to the rim of the pots, and giving the latter a sharp rap on the potting bench to settle the soil rather firmly. A pinch of silver sand should be placed on the soil in the centre, and then with a cedar-wood pencil, or anything similar in shape, make a hole, carrying down the sand when making it, the hole to be of

sufficient depth to bring the joint of the first leaf-stalk of the cutting on the surface of the soil. The cutting is less likely to fail when the base of the cutting rests upon the soil. Press the soil firmly at the base of the cutting, at the same time giving pot and soil a gentle rap on the potting bench. Label each cutting as it is inserted, noting the date of the operation, which may afterwards prove instructive. Go through all the cuttings in this way until they are completed. When inserting the cuttings in pots, boxes, or on the greenhouse bench, keep them two inches apart and three inches between the rows. Should the compost be fairly moist no water will be required for some hours. When it is applied give a thorough soaking from a fine-rosed can.

Best Place for Propagating.—The custom in most gardens is to place the pots and boxes containing the cuttings in a cold frame outdoors. The pots, &c., should be plunged in ashes, cocoanut fibre refuse, spent hops, and any similar substance, thus keeping the soil in the pots moist, and also affording protection should severe and prolonged frosts prevail. Stable-litter or bracken should be packed round the sides of the frame to render it more frost proof. The material inside the frame should be of sufficient height to raise the pots well up to the frame-light, so that when the cuttings become rooted the young plants are not drawn and weakly. In frosty weather cover the frame-lights with a few layers of mats, and frosts of more than ordinary severity may be kept out by covering the frame-lights with a kind of thatch made of straw or bracken. The cuttings or young plants suffer, and sometimes damp off through being covered up. This is the case when the weather continues hard for many weeks. On fine and mild days the frame-lights may be slightly tilted to ensure ventilation.

To raise plants quickly, and with little risk of failure, place a small frame on the greenhouse or conservatory bench, and plunge the pots in this in the same way as advised for frames outdoors. The temperature of the glass structure should be between 40 degrees and 45 degrees, but never exceed the latter figure. Packing round the frame with litter, &c., is unnecessary in this case, the hot-water pipes maintaining a suitable temperature and anxiety regarding frosts removed. Those who do not possess a frame of suitable dimensions, may easily and quickly erect a temporary one. Put ten-inch planks, about an inch in thickness, cut to any size or shape, together, and keep the boards secure and upright. Laths should be nailed across the frame, and fixed in such a way that sheets of glass may be arranged upon them to form a kind of frame-light. These sheets of glass may be removed at will, and any given plant or number of plants inspected with ease. Within a month many of the cuttings will have rooted, and they may then be taken from the propagating frame to another structure, or temporary frame, without delay.

Treatment of Young Plants.—Place the rooted cuttings, or what may now be called "young plants," in a rough frame on the greenhouse bench, and construct this in a similar way to the one used for propagating described earlier. Put the pots on cocoanut fibre refuse or

sifted ashes, and give each one sufficient space for air to circulate freely around. The frame must be carefully ventilated at first, gradually increasing the ventilation so as to prevent a sickly growth. In a comparatively short time the young plants will bear full exposure to the greenhouse without flagging, and forthwith continue to grow. The more forward plants when sufficiently hardened may safely be placed on the shelves of the greenhouse near to the glass; this will keep them sturdy and stocky. It is a mistake to stand the pots on the bare boards of the shelves, as with the lengthening days after the turn of the year, accompanied with short periods of bright sunshine, the soil quickly dries, and unless one is constantly on the alert many of these young Chrysanthemums receive a serious check. It is a good rule to spread a layer of cocoanut fibre, or any other substance answering the same purpose, on the shelves, first standing the plants on this material. By these means the air is kept cooler than would otherwise be the case, consequently less water is required. Until the whole of the cuttings are rooted, they must be constantly shifted from one structure to another before hardening them off. Ventilate as occasion offers, and special pains must be taken to keep the temperature at about 45 degrees or the plants will become drawn. As the days get warmer admit air more freely, and as soon as the cuttings become rooted in the frames outdoors give ventilation upon all favourable occasions. Advantage must be taken of fine days to increase the supply of air. Plants raised in this way are often sickly in the early season, but by judicious ventilation and careful water-supply an alteration soon occurs. Light overhead syringings on hot days are beneficial.

First Repotting.—As soon as the young plants have filled their small pots with roots shift them into those of larger size. Those, too, which were rooted around the edge of small pots and also propagated in boxes, should receive similar attention when well rooted. Repot plants rooted singly in "thumb" pots into those measuring three and a half inches across, and known as large sixties. Small sixties—pots three inches in diameter—will suffice for the others, and on this account prepare them in good time. It is a good rule to prepare for the next operation as the last one is finished. The pots and crocks should always be cleansed when dirty, and new pots soaked in clean water. The compost for the first repotting should be as follows:—Three parts fibrous loam, one part thoroughly rotted manure, and one part good leaf-mould. To this add half a part of coarse sand or road grit and a dusting of wood ashes or crushed charcoal. Pass the first three ingredients through a coarse sieve, and pull the pieces of fibrous matter apart as far as possible. Then thoroughly mix the whole of the ingredients, and when completed all will be ready. Begin first with the plants which give evidence of being well rooted, and rather defer the potting up of any plant for a day or two than shift it into a pot of larger size before it is ready. Crock with care, covering these with the rougher siftings, which form an admirable drainage and also prevent the soil clogging the crocks. Turn each plant out of its pot, removing the crocks from its base so as not to damage the

tender roots. A layer of soil should cover the drainage material just referred to, and on this place the ball of the repotted plant evenly. Work in the compost between the ball of the repotted plant and the pot, using a stout label for the purpose, or any flat piece of wood about an inch and a half wide and half an inch thick. Ram the soil in firmly with this simple arrangement, and if the pot be rapped occasionally on the potting-bench during the process of repotting, keeping the thumbs on the surface of the ball of earth at the same time, the soil settles down firmly and the operation is complete. The surface of the ball must be sufficiently below the rim of the pot to allow water to be given. When removing the rooted cuttings from the pots and boxes, disturb the roots as little as possible. After the first repotting remove the plants to a temporary frame for a few days, gradually inuring them to the more airy conditions of the greenhouse. They may then be placed on the shelves near the glass, and kept growing steadily until they are removed into frames outside.

Placing Young Plants in Cold Frames.—Early March is a good time to place the earliest plants which were raised in the cool greenhouse outdoors in cold frames. Of course, this depends in a large measure upon the weather. However, when it is possible to do this work, stand the plants on ashes, not pot to pot, and keep them well up under the glass to promote sturdy growth. Admit air carefully, taking advantage of fine days to give a more abundant supply. Avoid draughts from the cutting easterly and north-easterly winds, which quickly interfere with the plants' progress. As the season advances more air may be given, until on fine days in early April, the frame-lights may be removed.

Standing Plants in the Open.—In the south of England, where a sheltered position can be provided, stand the plants outdoors about middle of April, and if the aspect be a warm one—say, south or west—and protection can be afforded from the cold winds from other quarters, no better place could be chosen. Where the situation is low and damp, delay from a week to ten days later before putting out the plants in the open. In the Midlands make the date for placing them outdoors a week later than that first mentioned, and in the north the first week in May is the time to ensure safety.

Subsequent Repottings.—By early April a second repotting will be needful, and if the plants can be well established in these larger pots before they are placed outdoors so much the better. The plants in large sixties (three and a half inch pots) should be potted up into thirty-twos (six-inch pots), and those in small sixties (three-inch pots) into forty-eights (five-inch pots). Spread this operation over some time, as the plants are not all in the same condition, and will therefore need repotting much earlier than those of a less vigorous growth. In this case also see that the pots and crocks are scrupulously clean. For this shift the compost must be richer and more lasting, the following ingredients meeting their requirements at this somewhat early season. Of good fibrous loam, by no means heavy or retentive, take four parts, one part well-decayed leaf-mould, and one part of horse droppings, prepared as

for a mushroom bed. To these add a third part of coarse sand or road grit, a third of a part of crushed oyster shells, and, in addition, a liberal sprinkling of bone-meal and any well-known concentrated manure. The heap should be well mixed, turning it over repeatedly until quite satisfied that each of the ingredients is evenly distributed. In this case it will not be necessary to pass the compost through a coarse sieve, but pull the larger pieces of turfy loam into pieces about the size of a walnut. Crock and pot with increasing care, rendering the soil firmer at each repotting. Cover the crocks as before with the rougher portions of the soil, and when placing the plant in the new pot, keep the surface of the ball of earth well below the rim of the pot. Ram the compost in firmly, otherwise the aftergrowth will be poor. Stand the plants when repotted in a somewhat shady place, allowing them to remain there for a few days, or until they have recovered from the check. When the soil is just moist no water will be needed by the repotted plants for a day or two, unless one is much drier than another. A few hours before repotting the plants water them thoroughly. When watering of the repotted plants is necessary give them a copious supply to ensure the whole of the soil becoming thoroughly moistened. In the course of a few days the plants may be placed in the open in double rows, standing them on boards or a very thick layer of ashes or coke breeze. Place a small hazel stake in each pot to support the plant, the latter being lightly looped to the stake, and not tied tightly as is so often the case. They may be left thus until the final potting is necessary.

Final Potting.—Chrysanthemums are usually placed in their flowering pots during the early summer, but this operation entirely depends upon the condition of individual plants. This final potting is an important cultural detail, and to achieve success pay special attention to the preparation of the compost. This should be composed as follows: Four parts good fibrous loam, one part leaf-mould, half a part of horse droppings, prepared as for a mushroom bed, and a sixth of a part each of wood ashes, or crushed charcoal, and crushed oyster shells. A free sprinkling each of some good concentrated manure, such as Clay's, and a similar quantity of quarter-inch bones, will promote vigorous growth; but as the plants are to remain in these pots for five or six months at least, a lasting compost is, of course, essential. The compost must be well mixed, turning the heap over repeatedly each day for a few days, and keep the mixture outdoors. In the meantime the pots for this final shift should be got ready, washed inside as well as outside, and the potsherds cleansed also. Plants at this time, in six-inch pots, should be transferred into those either nine or ten inches in diameter, selecting those of more vigorous growth for pots of larger size. Those in five-inch pots may go into others eight or nine inches across, observing the same rule regarding the more vigorous sorts as advised for plants just mentioned. Many of the Japanese varieties succeed better in large pots, but for the incurved Anemones, and other large-flowered types, pots nine inches in diameter are excellent. For the Pompons, singles and early-flowering kinds, choose the eight-inch size, as in these they develop into quite

delightful decorative plants for the conservatory. This is also a useful size to select for plants grown to give cut flowers. Crock with care, covering the crock with a handful of half-inch bones or crushed oyster shells, this layer in turn being covered with pieces of turfy loam as before. Place a good layer of soil over the turfy loam just referred to, making it firm; and with regard to other details pot with increased firmness. The compost should be worked well down the sides of the pots, taking care not to damage the roots of the plants, and, as before, keep the surface of the ball of earth being repotted well below the rim of the pot, at least one and a half inches, to facilitate watering. Begin first with the stronger growing and well-rooted plants, and as the operation generally takes some time, the latest batch will succeed in proper order. Stand the plants in groups of about twenty each, and thus keep them cool at the roots. If the plants are not staked by this time, delay no longer. Either insert, temporarily, small hazel stakes about two feet in length, or secure a bundle or two of bamboo canes, which vary in length from about three feet upwards to suit the height of almost any plant. They are neat, lasting, and seem specially adapted for the purpose. Water as advised earlier, and syringe the foliage during hot weather.

Summer Quarters.—An open position is advisable, as full exposure to the sun and free circulation of air between the plants promote sturdy growth. The best place is one with a south and western aspect, where shelter from the south-westerly and other gales can be provided. Stand the plants in rows running north and south and upon boards, slates, or tiles to keep out worms. Stout galvanised wire should be strained between upright stakes at both ends of the rows, and supported by others about ten feet apart. Two rows of wire, one at three feet and another at five feet above the garden level, will answer well; securely tie the stakes in the pots to these cross wires, using tarred twine or thin wire. This done well, rough winds will inflict no damage. Those who cannot devote a portion of their garden to this purpose should use the sides of the gravel paths.

Summer Treatment.—Chrysanthemums require unremitting attention. Watering is of the utmost importance. Water should only be given when the plants are dry at the roots, not dust dry, as this means a serious check. The way to ascertain whether water is needful or otherwise is to rap the pot with the knuckles, or anything to answer the same purpose. When a distinct ring is the result, a full supply of water is required, but the reverse is the case when the sound is dull. When watering always give a copious supply to dry plants, and if any are very dry apply water a second time. As the plants are so much exposed to air and sun, the soil dries quickly; when they are well rooted, it is necessary on hot days to examine them three or four times. As the shoots progress carefully loop them to the stakes. It is a mistake to tie tightly, as the growths are brittle and break off quite easily. A loop-like tie gives sufficient space for the shoot. Tie where the stem is hardening. Earwigs must be trapped as the plants develop, otherwise they eat out the points of the shoots, and the way to catch them is to put thumb pots

with hay or paper in them upside down on the stakes. Inspect the traps each morning, and shake the earwigs into a vessel of boiling water. There are many other contrivances for trapping the earwigs, such as bean-stalks and match-boxes, and all are good in their way. In early May watch for a leaf-mining maggot, which quickly works into the tissues of the leaves. Unless means are taken to check the spread of this pest the plants suffer seriously. The maggot can easily be traced, and when seen removed with a penknife, or else squeeze the affected leaves between the finger and thumb. As a preventive the plants may be dusted with soot, or, what is better, syringe a solution, made from quassia chips, over the plants occasionally during early May and once or twice afterwards. Another pest, known to growers as the "jumper," often causes havoc among the tender growths just before bud formation. It is very active and difficult to catch, but by constant disturbance of its quarters and lightly passing the hands over the shoots each time the plants are visited its depredations are stopped. Green-fly and black-fly may be easily eradicated by dusting with tobacco powder, no matter when they make their appearance. Dust the under side of mildewed leaves with flowers of sulphur.

Buds and their Development.—Each plant first develops what is known generally as a "break" bud, which is the first change in the plant's life, and so called because the plant breaks out into fresh growth from this point. The bud appears in the apex of the single shoot, which is grown on from the cutting stage, and is surrounded by several new growths. It is usual to pinch out the bud, selecting afterwards to be grown on three or four, more or less, of the strongest shoots just referred to. These fresh shoots soon go ahead, and in the course of two or three months in most cases a bud is developed in the point of each of the shoots grown on from the "break." These buds are known as first "crown" buds, and growers of exhibition flowers frequently retain or secure this bud by pinching off the young shoots surrounding it, leaving the bud quite alone at the apex of the shoot. As many Chrysanthemums, however, fail to give the best flowers from a first "crown" bud selection, this kind of bud is pinched out and one or more of the young shoots surrounding it are grown on vigorously. These in about a month or six weeks each develop what is called a second "crown" bud; and as this is the more popular kind it is more often retained. As in the case of the first "crown" buds, a bud is retained by pinching out the shoots surrounding it, leaving each bud quite alone at the top of the shoot. Second "crown" buds invariably develop handsome flowers, and are highly valued for their decorative value in the conservatory as well as for exhibition. The majority of Chrysanthemums develop first the "break" bud, then the first "crown" bud, which is succeeded by the second "crown" bud, and finally by a "terminal" bud. A terminal bud marks the termination of the plant's growth, and instead of only one bud being developed on each stem or shoot, the buds are produced in clusters. The whole of these terminal buds are seldom allowed to develop, they are more often thinned out slightly, in which case they make a charming

flower display when most of the big flowers are over. When terminal buds are preferred to all others, the second "crown" buds must not be retained but be pinched out, and the shoots succeeding them grown on. In a short time the terminal buds will develop and must be thinned out as described. A few Japanese varieties persistently develop "crown"

buds, but ultimately even these produce their crop of terminal buds.

FIG. 20.—Terminal Buds.

So called because they terminate the plant's growth. If only one large bloom be desired, remove all but the largest bud in the centre. For a free display of blossoms remove a few of the more crowded buds, leaving the others to develop in the ordinary way.

Period for Buds to be Retained.—Chrysanthemums vary so much in time of flowering that it is difficult to determine buds of new kinds to secure. However, as a general rule, retain buds of Japanese varieties any time after the first week in August, deferring the selection of buds of the Incurved and Anemones until the end of the same month, and the first week of September. The Pompons, and small decorative sorts on terminal buds, if retained during the middle of September, develop their flowers the second week in November. The buds should be kept in an upright position when once they have been retained, these remarks applying more particularly to buds grown to produce flowers of high quality. The advantage of observing this somewhat simple rule is that the buds develop evenly, and the long graceful florets unfold in the correct way. Small hazel stakes should be tied on the stouter ones inserted in pots earlier

in the season, and so arranged that they are brought up immediately under the bud.

Terminal Buds.—The illustration depicts the development of terminal buds. If a free display of blossoms be the aim of the cultivator, the whole of the buds should be allowed to produce flowers. If three or four blooms only are wanted, disbud to this number. In all cases, where large handsome flowers are desired, every bud but the largest bud in the centre should be removed. Before this is determined, however, the bud it is proposed to retain should be carefully examined, to see if it is of good and even shape. Should this fail to attain the standard required, retain one of the smaller buds surrounding it, removing all others at the time.

Bush Plants.—These find much favour with those who prefer an abundance of flowers. When they are propagated as early as December or January, there should be no difficulty in obtaining very large plants. The method of culture to be followed in this case is very simple. When the young plant is from six inches to eight inches high, pinch out the tip or point of the shoot, thus inducing the plant to break out into fresh, new growths at the axils of the leaves immediately below. From this time, as succeeding shoots attain a length of six inches, pinch out the points. If a November display be the aim of the cultivator, the last "pinching" should take place during the third week of June, while for a December display continue pinching the shoots until the third week of July. The plants by this treatment flower on terminal buds, and with the exception of thinning out if necessary they may be left to develop. For the greenhouse and conservatory these plants are unequalled, and as cut flowers for indoor decorations these freely-flowered plants are specially suitable.

Early-Flowering Chrysanthemums.—Those who have never grown the early-flowering Chrysanthemums miss many charming varieties. There are now many English raisers, and their varieties are fast displacing sorts of Continental origin. Beautiful varieties are in store in the near future, and there is a real prospect of English gardens in autumn reflecting the glory of drowsy summer days. They are essentially plants for the outdoor garden, where their flowers make patches of colour when Dahlias and other tender subjects are cut down by frost; the early-flowering Chrysanthemums continue blossoming freely until severe frosts occur. The best plants are dwarf and branching, and develop their growths without any interference whatever. Cuttings may be inserted between January and the end of March, while many of the Pompons may be propagated as late even as May. The advantage of early propagation is that larger plants by these means are developed, January cuttings often resulting in plants which will carry one hundred and fifty flowers. They should be potted up into pots of various sizes as advised for the mid-season sorts, the last shift for plants intended for the outdoor border being into those five inches in diameter. Before planting out, carefully harden off the plants in cold frames, and stand them together in batches in a sheltered position out of doors. The third week in May is the best time for planting, all danger of serious frosts then being over. The ground should have been deeply dug previously, but not too much enriched with manures. Plant firmly, allowing a distance between each plant of three feet for the Japanese sorts, and the same distance between each row. The Pompons require less space, two and a half feet between the plants and the rows answering the purpose well. An occasional hoeing between the plants during the summer months will keep weeds in check, and sweeten the soil. In very dry weather water copiously, and give a liberal supply of liquid manure once or twice after the buds are formed. In wet weather dust the soil around the plants with one of the concentrated manures. It will be necessary, before the summer has advanced much, to insert a stout stake

or bamboo cane, for the support of the taller plants. The main stem should be tied fairly tightly to the stake, and the branching growths lightly looped to it also. Do not disbud the plants except in the case of the more crowded sorts, and then only partially, or the flowers will expand quite out of character. The early-flowering varieties succeed well in pots, those eight inches in diameter, in almost every instance, answering their requirements.

Housing the Plants.—With regard to the ordinary mid-season or November-flowering plants, they must be placed under glass towards the end of September or the first week in October. The work entirely depends upon the condition of the plants and the kind of weather at this period. Plants should be housed in September as soon as any of the buds begin to show colour, otherwise the heavy dews will result in "damping," in which case the buds often become worthless. About the third week in September sharp frosts often occur, and it is wise to place as many plants as possible under glass without delay, as the grower must run no risks at this time. When the weather remains genial and open, proceed with the housing of the plants leisurely, making a careful arrangement to obtain a good effect. Thoroughly cleanse the glass, limewash the walls, and make the roof waterproof. Drip must be prevented at all costs. On no account crowd the plants, as this is a fruitful source of failure.

Treatment of Plants under Glass.—When once the plants are housed in the autumn, and their arrangement determined so as to obtain the best effect, give abundant ventilation. To keep the plants healthy, doors and ventilators should be kept wide open when the weather is favourable. When they are not crowded, and air is permitted to circulate freely in the house, the leaves are less apt to fall. It is well to water in the early morning, so that superfluous moisture is dried up before the evening, and give liquid manure until the flowers are two-thirds expanded, after which gradually cease supplying stimulants until only clear water is applied. Dead leaves should be picked off, and the soil in the pots kept free from weeds. The trapping of earwigs should also be continued, and caterpillars watched for after dark, a good lantern being invaluable for this purpose; keep hot-water pipes well warmed on frosty nights and days. Also, when the weather is damp and foggy, maintain a temperature of about 50 degrees; this will prevent damping, and assist the buds to open. Sheets of blotting paper, fixed about six inches above fine blooms during the night, or in foggy weather, will prevent loss through damping. This is particularly advantageous in low-lying districts.

Thirty Japanese Varieties.—The following are varieties of recent introduction, of high merit and reliable, such that amateurs must possess if they wish to succeed in the exhibition room. They are, moreover, mostly of dwarf habit and easy to grow: His Majesty, rich crimson; King George, mulberry red; G. J. Bier, pure white; Bob Pulling, a rich yellow; Duchess of Westminster, rosy mauve; Japan, rich, clear yellow; Miss A. E. Roope, golden yellow; Gertrude Peers, chestnut

crimson ; Pockett's White Australia, white ; Thomas Lunt, crimson, very strong grower ; Lady Francis Ryder, pearly white ; Mrs. Gilbert Drabble, marble white ; Marie Loomes, chestnut terra-cotta ; H. E. Couverse, reddish bronze ; William Turner, pure white ; George Hemming, purple amaranth ; Francis Jolliffe, creamy yellow, edged light rose ; Evangeline, white ; Rose Pockett, old gold, shaded salmon ; Mrs. R. H. B. Marsham, pure white ; Mrs. R. Luxford, Indian red ; Mrs. L. Thorn, yellow ; Mrs. A. T. Miller, white ; White Queen ; Master James, chestnut red ; W. Mease, old rosy cerise ; Mrs. W. Knox, yellow and bronze ; Master David, deep crimson ; Lady E. Letchworth, yellow ; and Harry Wood, crimson, shaded scarlet.

Twenty Incurved Varieties.—Heston Gladstone, pure white ; Mrs. P. E. Wiseman, primrose ; Durbar, rich plum ; Ethel Thorpe, silvery pink ; Mrs. G. Denyer, silvery pink ; Mrs. Robert Hall, rich orange ; Miss Nellie Hall, canary yellow ; Frank Irestion, amber and orange ; Edwin Thorpe, white ; Clara Wells, rich cream ; J. Wynne, white, suffused pink ; Marvel, primrose, suffused pink ; Buttercup, yellow ; Charles H. Curtis, yellow ; Mrs. F. Judson, pure white ; W. Biddle, golden bronze ; Romance, yellow ; Mrs. J. P. Bryce, white, tinted rose ; G. F. Evans, chrome yellow ; and Lady Isabel, blush white.

Twelve Single-Flowered Varieties.—Mrs. Tresham Gilbey, deep yellow ; Mrs. W. G. Patching, bronzy chestnut ; Ceddie Mason, terra-cotta ; Mensa, pure white ; Metta, deep magenta ; Mrs. R. C. Pulling, clear pink ; Mary Richardson, reddish salmon ; Edith Pagram, rich pink ; Roupel Beauty, wine red ; Sandown Radiance, chestnut crimson ; Reginald Godfrey, yellow ; and Sylvia Slade, garnet red.

Twelve Varieties for Decoration and Cut Blooms.—Mrs. J. W. Scott, pure white ; Mrs. J. Thompson, pure white ; Embleme Poitevine, golden yellow ; David Ingamells, golden yellow ; Dr. Enguelard, rosy pink ; Caprice de Printemps, rosy pink ; A. J. Balfour, pink ; Winter Cheer, deep pink ; Western King, pure white ; Mme. R. Oberthur, pure white ; Tuxedo, orange ; and Source d'Or, orange and gold.

CACTI FOR AMATEURS

THIRTY or forty years ago, Cacti were far better known than at the present time, though during the last few years a decided change has taken place in their favour. It is hard to understand why in so many places their cultivation should be ignored, for although they may not be "decorative," in no other class of plants do we get such curious, weird, and fantastic stems, such wonderful arrangements of spines, or, in numerous instances, such lovely flowers. The flowers of the night-flowering *Cereus* are powerfully fragrant, a foot or more across, rich in colour and exquisitely formed, springing apparently from dried-up branches. In *Phyllocactus* we get large, rich-coloured flowers springing from the sides of small flat branches, and in *Epiphyllum* long, waxy, bright-coloured flowers in such profusion as to hide the branches. Cactus culture is a good hobby for beginners.

Cultivation.—In the first instance, though a large house is advisable for anything like a complete collection, from the slow growth of many little room is required, and large numbers may be grown in a small house; or if a house is not to be had, a considerable number may be grown in a cold frame, in a glass-case in a room as ordinary winter plants, or, if a warm sunny position can be found, a few may even be grown out of doors. Again, as they are natives of hot, dry, desert regions, they are not so susceptible to injury as many other things if watering cannot be attended to regularly, and they occasionally become dry; in fact, with a few exceptions, no water at all is required for at least six months of the year. Then again, being of slow growth, repotting is necessary only at rare intervals. Except in one or two cases which will be mentioned later, the following method of cultivation will be found satisfactory: The majority require a minimum winter temperature of from 50 degrees to 55 degrees, rising on sunny days to 60 degrees. During summer no shading should be given, and the temperature, without fire heat, allowed to rise as high as possible, giving a free circulation of air. Throughout the growing season, from the end of April to the end of July, plenty of water will be required at the roots, with medium syringings overhead twice daily. After the later date, water must be gradually withheld, none at all being given after the middle of September throughout the winter. Repotting should only be done when the pots are thoroughly filled with roots, or when the soil seems to be in bad condition. In the latter case, all old soil should be washed from the roots. April is the best time to repot. The compost should have as its principal part good fibrous loam, adding to every five parts

one part of sandstone or broken bricks, crushed to the size of a walnut, and from that size downwards to dust. As small pots as possible must be used, filling them nearly half-full of crocks. Any plants that have well filled the pots with roots should be assisted with occasional applications of weak liquid manure.

When it can be managed, better results can be obtained by forming a rockery in the house, and planting everything out, and too much cannot be said in praise of this method. In this way they grow much quicker, are more at home, and infinitely more pleasing to the eye than when placed in rows of pots. Many are particularly well adapted for planting in crevices between stones, and grow much better in this way than in pots.

Propagation may be effected by means of seeds, cuttings, or grafting. Seeds should be sown as soon as received, and when the tiny plants are large enough to handle, prick them off in a bed of sandy soil in a sunny position near the glass. Cuttings should be allowed to dry for several days before insertion in sandy soil. Very little water must be given until they are rooted. Cuttings from an inch long to several feet may be used. Grafting is resorted to in a few instances only, principally with *Epiphyllums* (see p. 368).

Insect pests are best kept under by means of fumigating, and by the use of insecticides. A useful insecticide is made by mixing a quarter of a pint of paraffin in four gallons of strong soft-soap water. Mealy bug and thrips are the two worst insects.

Cacti that have been injured during importation, or from other causes, and are beginning to rot should have all decayed matter cut away, and be painted with carbolic acid or Condyl's fluid several times, and left in a sunny position until thoroughly dry. Afterwards an occasional dusting with charcoal will keep them right.

Turning to the

Selection of Suitable Plants, the most worthy are found in the following genera:—*Cereus*, *Echinocactus*, *Epiphyllum*, *Mamillaria*, *Melocactus*, *Opuntia*, *Pereskia*, *Phyllocactus*, and *Rhipsalis*. With few exceptions they are confined to South America and the West Indies, the headquarters being California, Mexico, and Texas. Of

Cereus alone—in which the three genera, *Echinocereus*, *Echinopsis*, and *Pilocereus*, have been merged—nearly two hundred species are in cultivation. The different species vary greatly in habit, some being but a few inches high, and forming dense tufts of spiny growths, others, as in the case of the Giant Cactus of California, making tall, massive, sometimes single, sometimes branched, columnar stems several tons in weight. Another section—well represented by the Old Man Cactus (*Cereus senilis*)—makes tall stems, terminated with a large mass of long white hairs; while yet another is well marked by having long, thin, climbing, or scandent stems. In some instances the stems are nearly round, and slightly angled; in others they are very deeply ribbed or angled, and in most cases they are very spiny. The flowers are borne from the sides of the stems in summer, and in many cases are very

showy. Particularly is this the case with a number of climbing species which are known as "night-flowering Cacti." Of the many species the following are all worth growing :

Climbing, or scandent kinds, which usually flower in the night, suitable for training on a roof : *C. grandiflorus*, *Lemairii*, *Macdonaldiae*, *Napoleonis*, *rostratus*, and *triangularis*. All these produce flowers from ten to thirteen inches across, ranging in colour from yellow and white in the two last named to the same colours tinged with red in the others. In addition, the Rat's-tail Cactus, *C. flagelliformis*, which flowers in the day-time, makes long, thin stems, which produce pretty, small pink flowers freely ; it is an excellent basket plant. Of tall, strong-growing species : *C. giganteus*, *glaucescens*, *Jamacarri*, and *Peruvianus* are useful ; the former, and the two latter, have white flowers which open during the day. In addition, *C. senilis*, The Old Man Cactus, is remarkable for its long white hair ; although usually seen a foot or so high, it will grow to a height of ten feet or more.

Echinocactus is characterised by short, thick, globular, deeply ribbed stems, usually unbranched and covered with tufts of stiff bristles and stout-hooked spines. A few of the most conspicuous of a large number of species are : *E. Lecontei*, with a thick, globular, angled stem, covered with tufts of grey bristles and strong rosy-red spines, two to four and a half inches long ; *E. Wislizeni*, a large round plant, with long wide, dull brown spines ; *E. Grusonii*, a large, round plant, thickly covered with bright yellow spines ; *E. ingens*, distinct by reason of its almost round spines ; and *E. cornigerous*, *electracanthus*, *Emoryi*, *Haselbergii*, *horizontalis*, and *Pfeifferi*.

Epiphyllum is a family characterised by much branched, flat, short-jointed stems, the flowers being produced abundantly from the ends of the branches in November and December. It requires a closer and moister atmosphere than most Cacti, and should never be kept without water. As the several species are found growing naturally on branches and in forks of trees, a lighter soil is necessary for them. They are sometimes grafted on tall stems of *Pereskia*, or they may be grown in baskets or on rafts. When on their own roots a mixture of peat, charcoal, and sand is suitable. In a moist warm house, grafted plants can be grown six feet high, several feet through, and thoroughly clothed with branches from the pot upwards. The flowers are bright coloured, thick and fleshy, and somewhat resemble in shape those of a *Salvia*. *E. Gartneri*, with scarlet flowers, *E. russellianus*, with rose flowers, and *E. truncatum*, with red blossoms, are showy species. Of the latter, a large number of garden forms are in cultivation, varying in colour from purple, rose, and salmon, to white.

Mamillaria.—This genus is characterised by having intensely spiny stems, and by having the whole stem covered with small bulb-like tubercles. Between the different species there is a wide variation in habit. Almost all are of small stature, some making a cluster of small

CEREUS TRIANGULARIS ON THE ROOF OF AN ALMOST COLD HOUSE.

PRICKLY PEARS OR OPUNTIAS GROWING OUTDOORS AT CAMBRIDGE.

stems an inch or two high, others making stems a foot or more high which rarely branch, while another set form round thick stems, three or four inches high, and of the same diameter. Of the taller ones, *M. sulphurea*, covered with soft yellow spines; *spinosissima*, var. *brunea*, with similar white spines; *pyramidalis* and *flavispina* with yellow; and *M. fuscata*, with grey spines, are the best. Of the short globular set, *M. dolichocentra*, *Nicholsonii*, *mutabilis*, *bicolor*, and *rutila* are useful, while of dwarf much branched plants, *M. stellaris*, *elongata*, *stellata*, var. *aurata*, *pulchella*, *densa*, *tenuis*, and *elongata* make pretty plants. The flowers of this genus are borne from near the apex of the stem, and are often bright coloured. Melocactus is characterised by a thick, short, Echinocactus-like stem, but the flowers are produced in a large cup-like head, which continues to increase in size for many years. The Turk's Cap Cactus (*Melocactus communis*), a West Indian plant, makes a large head of red flowers, shaped like a Turk's cap, hence its name. It is the best representative of the few cultivated species.

Opuntia is known by its many-jointed stems, the portions between the joints being flat and wide, or in a few instances cylindrical. The flowers are produced from the edges of the stems. The fruit is pear-shaped, and in some species edible, known as Indian figs and prickly pears. A very large number of species are grown, some of the most distinct being *O. arborescens*, *aurantiaca*, *candelabriformis*, *cylindrica*, *decumana*, *ferox*, *Ficus-indica*, *glaucophylla*, *grandis*, *leucotricha*, *nigricans*, and *Dillenii*.

Pereskia is a climbing genus, very distinct by reason of its leafy stems and terminal panicles of flowers. *P. aculeata* and *P. Bleo* are the best known. They are often used as stocks for Epiphyllums, either as standards or trained on a roof with tufts of Epiphyllum inserted here and there. For a small house they are not serviceable plants, being very strong growers.

Phyllocactus.—A group of showy-flowered plants, having flattened jointed stems, from the edges of which the flowers are borne. The flowers are usually brilliantly coloured, six to eight inches across, with long, thin tubes. A mixture of loam, peat, and rotten manure, with plenty of sand, makes a suitable compost, and during the growing season a warm moist house is to be recommended. The plants should be kept on the dry side in winter, but not thoroughly dried off. A number of species are in cultivation, among the best being *P. biformis*, *crenatus*, *grandis*, *latifrons*, and *phyllanthoides*. A large number of garden hybrids are in cultivation, exhibiting a very wide range of colour.

Rhipsalis.—This family has round thin stems, or flattened Phyllocactus-like stems, small inconspicuous flowers, and mistletoe-like fruit, which is the chief attraction. *R. Cassytha*, with numerous white berries, is one of the best. It makes a handsome basket plant, and should be grown like an Epiphyllum.

HARDY CACTI

The strange and picturesque hardy Cacti are arousing interest, and in many English gardens they have a little garden to themselves, a "Cacti" garden, interesting at all times and a blaze of colour when the flowers of the various Cacti are in full beauty. Since the high regions of the Western and Southern States of North America have been more thoroughly explored quite a number of true Alpine Cacti have been discovered, some of them being already in English gardens. The only difficulty in the way of successful culture here is the extremely damp climate in winter. Early spring is the best time for planting, choosing either a sunny, well-drained border, rock-garden, bank, or wall, in a mixture of soil consisting principally of bits of porous stone, sand, gravel, or broken bricks and loam. The Mamillarias, Cereus, and Echinocactus should be protected with pieces of glass during the winter to keep them dry; this prevents rot through damp. The

Opuntias are the commonest and best known of hardy Cacti, and the following are the most familiar of the family: *O. vulgaris* is a prostrate plant with jointed stems, and minute leaves with bristly axils and sometimes spines. The flowers are imbricated and rose-coloured, whilst the fruit consists of an edible berry. This *Opuntia* is common over the extreme south of Europe, save the sea coast, and grows in rocky or sandy soil. This and other allied species of *Opuntia* are favourite plants for groups in the southern parts of France and over the greater part of Italy and Spain, especially as they need little more than planting and keeping in order; they flower in early summer. *O. Rafinesquii* is larger and taller. This is a well-known *Opuntia*, and is probably the most popular of all. It has large joints and larger flowers than those of *O. vulgaris*, whilst the centre is reddish coloured. This also flowers in summer, and is a native of Italy. *O. missouriensis* has broad obovate joints and small leaves, with tufts of spines and bristles upon the axils. The pale green flowers appear during early summer, and, like the former, a dry and sandy soil and sunshine are essential. *O. Engelmanni* is more bushy, and has branched stems with obovate joints from six inches to eighteen inches in length furnished with bundles of spines. The pretty bright yellow flowers are about four inches across. This comes from the Western States of North America, and flowers during early summer. *O. pulchella* is quite dwarf, with slender joints,

numerous spines, and bright purple handsome flowers. It is one of the most distinct and desirable of the Alpine *Opuntias*, and thrives best in poor sandy soil. *O. echinocarpa*, although without showy flowers, which are of a quiet greenish yellow, is sufficiently attractive for the Cacti garden through its silky white centred spines. It is about a foot high, and comes from the plains and mountains of Colorado and Arizona. None of the *Opuntias* suffer from drought, but succumb in winter to the damp unless covered with glass.

Cereus.—This family is quite distinct from the *Opuntia*, the succulent plants being usually columnar, short or tall, often ribbed or angled, with bundles of spines or bristles on the ribs. The flowers usually open in sunlight, but close when the weather is dull. *O. Engelmanni* is one of the best known. It has white spines and large, handsome, deep purple flowers in June, whilst it is found in the Western States of North America. *C. Emoryi* is cylindrical, with straight yellow spines and clusters of flowers on one side of the tip of the stems.

Mamillaria.—This group is distinguished by succulent globose stems and small flowers. *M. arizonica* has large and showy deep rose-coloured flowers. It has long and straight spines, the exterior ones white and the few inner ones deep brown. *M. setispina* has white spines and rose-coloured flowers.

Echinocactus cylindraceus is a handsome Cactus with reddish spines and small greenish-coloured flowers. This group is quite as easily managed as any of the others, but dislikes winter damp.

Echinocereus group greatly resembles the *Cereus* and the *Echinocactus*; in fact, there is only a thin line between the two families. One of the best known is *E. Fendleri*, which has large magenta-red flowers.

COILS AND THEIR TREATMENT

PART III

SOILS AND THEIR TREATMENT

It is by no means essential that a gardener should possess scientific or chemical knowledge of the constituents or composition of the soil of his garden. Many good cultivators never have possessed such knowledge, yet have obtained splendid crops. It is not our purpose in this chapter on soils to enter into any scientific disquisition on their composition, as it is outside the scope of a beginner's book. Would-be cultivators of the soil—in other words, gardeners—soon find that, whilst scientific knowledge of soil composts may be of some value to them, greater value is derived from sound information relating to cultivation and cropping, and this it is our intention to furnish.

Soils are of very light, porous, sandy material; of a combination of stone-brash or gravel with loam—which is, by the by, a term applied to soils that have clay and sand in about equal proportions; of chalk, which is abundant in various localities, and if for a time thin and poor becomes eventually, with good tilling, very fertile; and finally clay, a description of soil in which sand is materially absent, is very close, almost impervious to moisture or air, and, if retentive of moisture when wetted, yet has the reverse demerit of drying intensely hard and becoming difficult to work or crop in hot dry seasons. Whatever description of soil it may be the cultivator's lot to till, it is obvious that his aim must be to endeavour to associate retentive matter in the form of clay with soils that are very light, sandy, gravelly, or porous, and that quickly part with moisture and become unduly dry under the influence of sun or wind. The application of sand or of any light porous mineral or vegetable matter to clay soils tends to the same ends. But every gardener finds that in time deep working, such as trenching ground presents, allied to the introduction of vegetable or animal matter in a state of semi-decay, does great good to all descriptions of soils. Deep culture is often effective as drainage, allowing surplus moisture to escape and enabling the air to permeate the soil, purifying and sweetening it and causing it to become fertile.

It cannot be too clearly understood, that soil which is at all waterlogged or retains water unduly never can be sweet or fertile. It may produce coarse weeds freely, but never good garden crops. Wherever water is retained air is excluded, and mineral or other plant foods or crop manures are washed

FIG. 21.—Deep or Pipe Drain.

away and destroyed. Thus whilst the majority of soils may need no special drainage, porous pipe drains, laid in from 2 feet to 3 feet deep into the ground at from 25 feet to 30 feet apart, leading to some ditch or stream for out-fall, serve a valuable purpose. When these pipe drains are laid down in narrow excavations, some woody material—heather, gorse, or hedge trimmings—should be laid over them before the soil is filled in. This will prevent the drains from becoming clogged. Where pipes are not used, rough rubble of any description will suffice if some 6 inches to 8 inches thick. Still this is work that is needed only when water gives much trouble in gardens. When soil suffers only from exceptional floodings through being near to streams or from very heavy storms, it is well to keep open, on the surface, drains 12 inches wide and 10 inches deep, as these greatly facilitate the removal of the water. But all experience goes to prove that

Trenching ground from 20 inches to 30 inches deep, according to conditions, is productive of immense good, even in relation to drainage. It frequently happens that just beneath the top twelve inches of soil there is a hard pan of some almost impervious material, which has never been broken up.

This, if of stone or rock, is best removed absolutely, but if it be of any softer material, such as can be broken well, it is best in the process of trenching to break it up thoroughly, some 10 inches to 12 inches deep, and leave it lying where found before the upper porous soil is replaced. Such impervious subsoils in time become loose,

FIG. 22.—Shallow Rubble Drain.

porous, and fertile. Air sweetens and crumbles them. Applications of manure render them capable of supplying plant food. They serve also to assist crops in dry weather in finding root room and moisture; they enable heavy surface rains to pass away freely; and as air always follows the retreating moisture, these once useless, worthless subsoils in time become of the most valuable description. There seems to be absolutely no description of subsoil that cannot in this way be made fertile. A most important product of deep working or trenching ground is that, not only does it tend in winter to keep the soil in which crops may be growing drier than shallow soils do, but is also much warmer. In the summer, when drought so commonly prevails, the deep

FIG. 23.

Shows a deep or vertical section of deep trenching after the ground has been previously well worked. Both top and bottom spits of 12 inches of soil, A and B, are thrown out, and the hard bottom soil, C, is forked and broken up 12 inches deep. The entire body of 2 feet of soil from the next trench, D, is thrown out, and so on throughout the plot.

working enables the roots of crops to go so much deeper, where the soil is at once cooler and moister, and thus continue productive much longer. Remarkable illustrations of the differences found in crops grown on deeply-worked and shallow-dry soils are often seen on groups of allotments, where the soil is quite of the same nature or texture. In the first case the crops are robust and luxuriant; in the latter they are poor, soon ceasing to be productive.

Operations.—The process of trenching is simple enough, but should be invariably performed during the winter months, on plots that are for the time uncropped, and have not been deeply worked previously or for several years. In good class gardens the work is done about every third year, but if done in gardens where labour is less abundant it is carried out once in from four to five years. The first effort of the cultivator in trenching where soils have not been so

previously treated, is to do so in such a way that the lower or subsoil is not brought to the surface. This is described as half or bastard trenching. Were the lower sour soils brought to the surface at once crops would fail or growth be very poor in consequence. For that reason the cultivator not only leaves these subsoils where found for some time, but as they become sweet and fertile gradually mixes or incorporates them with the upper good soil, so that in time the entire worked depth is sweet and productive. After several years of such treatment trenching may take a complete form, the lower soil being

FIG. 24.

A surface example of how to trench a plot of ground. Open a trench 2 feet wide at the left-hand end of one-half, as shown at A, placing the soil at B. Then trench the whole strip as marked, returning on the other half, D. Finish where soil, B, from the first trench has been placed for the purpose of filling.

brought to the surface and the top soil buried low down, but being in its turn brought up again some three years later.

In Half Trenching a plot of ground, if broad, the operator must start by dividing it into two equal portions, running a mark down the centre to form a division, then throwing out at one end of one of the halves as shown at A the whole of the top soil down to a depth of twelve inches and width of twenty-four inches on to the adjoining soil B. With a strong fork thoroughly break up the bottom soil at A fully twelve inches deep, and leave it there. It is an admirable plan when manure is at hand to cast in on to this broken bottom a liberal dressing and rework that into the soil. Then from the next width of two feet C throw on to the first trench A the whole top soil, twelve inches deep, and the first trench is

filled and complete. Keep on repeating this trenching process until the entire half of the plot is done. Then open a trench of the same width and depth at that end of the other half D, using the soil taken out to fill up the end trench of the first half, and that portion is completed. Then the process has to be repeated with the second half until that also is done.

Trenching is laborious work, but always pays well for its performance, therefore great care should always be taken that the whole of the soil be worked deep and equally. If the surface soil after trenching needs a manure dressing get it on with a barrow, putting down planks on which to wheel. Then spread the manure and well fork it in, and the plot will then be in first-rate condition for cropping in the spring. In

Complete trenching it is needful to throw out from the first trench the entire depth of two feet of soil and of that width. The bottom should then be deeply forked up and the whole of the soil from the next trench of same width and depth cast into it. That process naturally brings the lower soil to the surface, but it may be practised with the best results when the whole body of soil has become thoroughly sweetened.

Digging ground, whether with spade or fork, is a simpler process, and is practised on all plots of soil not trenched and between each kind of crop. Light steel spades or forks enable this work to be done without rendering the labour exhausting. But to move the soil as deep as possible, say twelve inches, the tool blade or tines should be new and long. Digging necessitates opening at one end of a piece of ground a trench twelve inches wide and deep, and casting it out ready to fill the trench left when the second half of the plot is done, if the plot be so divided as suggested for trenching. If the whole piece of ground be dug from one end to the other, then the whole of the soil from the trench must be wheeled in a barrow to the end where the digging is concluded for filling the trench. The tools should be kept upright, and with the foot sent down into the soil to their full length so that the movement of the ground may be as deep as possible. In digging, also, the soil should be kept quite even and level, as that shows good work.

Forking is moving the soil a few inches in depth as amidst growing crops, where it has become too hard or is weedy, or the weeds need burying, or amongst flower beds or borders. This work, if done with care, so that crop roots be not disturbed, does much good as well as renders the soil porous, loose, and neat.

Hoeing produces similar results, and is admirable spring and summer work. It is chiefly performed to destroy summer weeds, but in every case as soon as seeds, crops, or plants generally have made visible growth, the hoe should be freely used about and amongst them, as it is of great importance to keep a loose, light, and, of course, clean surface of soil, as in such case the soil beneath dries far less rapidly than is the case when left unhoed. Hoeing is most valuable summer soil culture, and should be constantly performed.

MANURING

This term simply means that plants, like animals, have to be fed. But whilst animals partake of food through their mouths, plants do so through their roots. The soil is their dining-room, and it is a good one when it contains plenty of plant food. All plants have more or less similar methods of taking up food. They have on their roots, and generally on their smaller or fibrous roots, minute hairs, and these have throats or hollow trunks through which they absorb in liquid form the foods or manures put into the soil for plants to exist on. We know, too, by experience and observation, how beneficial manure is to crops. Who walking over a meadow has not noticed that where animal excrement has fallen there the grass becomes strong and vigorous. The same may be seen in a field of corn, or where manure shot down from a cart has remained a few weeks before being spread, as that particular spot always produces the strongest corn. In the garden we have found, by adding to the soil manure from stables, cow-sheds, pig-styes, or fowl-houses, or any decayed vegetable matter, such as leaves, or of soot or salt, that vegetation is always more robust than where no such dressing is given. Observation has shown that to have good crops we must supply plants with manures, or, to use the proper term, plant foods. Then all these manures, no matter whether they be of animal, or vegetable such as rotten leaves or guano, or mineral such as nitrate of soda, kainit, salt, &c., must be easy to dissolve when brought into contact with the moisture of the air and earth. Thus there are what are termed soluble manures—that is, those which soon or in a few months become dissolved. Insoluble manures are such as bones in an unbroken state, yet bones broken up fine or steamed soft become first-rate plant food.

Plants cannot eat or use the soil as food, as that is purely

mineral and insoluble, but they do live on the soluble elements found in soils, and as a rule, especially in gardens, these must be put there by the gardener. Scientifically we know that all plants are formed, more or less according to their nature, of three primary elements—phosphate, potash, and nitrogen, with a few others. And these things in manuring we seek to supply to the soil in some form or another: thus all vegetable matter when changed into manure, through animal consumption or when in a state of decay, gives back to the soil what originally came from it; also all leafage abstracts from the air certain gases which are utilised by the plant, and become plant food also. So that, were a crop of something green dug into the ground as a manure dressing, it always gives back to the soil in that way more than came from it. Thus green crops of Tares, Peas, Barley, Oats, or similar green plants, dug in, always greatly fertilise the soil. Primarily our manure supply is found in what animals furnish with the aid, too, of straw or moss-litter. As this is collected from stables, cow-sheds, and pig-sties it should be put into a neat heap, and be turned twice at intervals of two weeks before putting it on the soil. When applied quite fresh it is apt to be too crude, and when allowed to remain lying about and to ferment, or be washed by rain, runs to waste. Care in this matter is always well repaid.

Animal Manures may be applied to soil at any convenient time, but should always be in a half-decayed moist condition. Dry straw manures are of little good, as plants find nothing to utilise in them. Generally the best time to dress land is in the autumn and winter, and on wet soil; it is a good plan to take advantage of hard frost for wheeling manure over paths and soil. As to quantity of such manure, a couple of wheelbarrow loads commonly suffice for a rod of ground. Still, much depends on the nature of the manure and soil.

Artificial, or Chemical Manures, so called, being chiefly of a dry or powdery form and having their food properties highly concentrated, are, relative to animal manures, much more costly. But if good, that is, if they contain a high percentage of one or more of the elements phosphate, potash, or nitrogen, they are not expensive, because used in comparatively small quantities. Thus, if two barrowfuls of animal manure are needful for a rod of ground, a dressing of about 6 lb. of any good chemical manure is ample for the same area. Chemical manures comprise phosphate, made from softened bones, or the powder known as basic slag. This phosphate makes hard woody material in plants, just as it makes bone

in animals. Then potash comes from kainit and other salts dug from the earth. That again helps to make tissue, fruits, and seeds. Nitrogen comes from nitrate of soda, or a salt found in the veins of the earth, sulphate of ammonia, obtained in the making of coal gas, and from soot and other things. This nitrogen specially creates leaves and soft stems. The best way to obtain these manures is to purchase each one in a raw state from the merchants, and mix them to form what is called a complete manure, in this proportion: Phosphate, 4 lb.; kainit, 2 lb.; and nitrate, 2 lb. Generally the rule is to mix the two first only, and apply them when soil is dug or forked over in the winter, adding the nitrate after the crop has made some growth, and hoeing it in immediately.

Liming Soil.—During recent years a great deal of attention has been given to applying lime to the soil. It is undoubtedly one of the most important substances for rendering soil fertile. Although it contains but little actual plant food it exerts a chemical action on the soil and vegetable matter contained therein, and releases, or renders soluble, much plant food that would otherwise be lost. If ground is heavily manured with animal manures year after year it becomes what is known as "sick," a condition that is quickly remedied by the application of lime. Generally speaking, lime is best dug into the soil when the latter is free of crops, using freshly slacked lime at the rate of $\frac{1}{2}$ bushel to each square rod of ground. Where permanent crops exist the lime should be dug in whilst the plants, trees, or shrubs are at rest. A word of warning is necessary at this juncture. Lime must *not* be applied to soil in which it is intended to grow Heaths, Rhododendrons, and similar plants that like peaty soil.

Soot may be beneficially applied to land or crops at almost any time, sufficient to make the surface fairly black being a suitable dressing.

Liquid Manures.—Plants can always utilise liquid manures the moment applied, because the foods are soluble. They are especially valuable for plants in pots or other restricted areas where food is limited. But they are all the same of the greatest benefit when applied to trees, shrubs, roses, fruits, vegetables, and flowers of nearly every description. A pound of guano, soaked in six gallons of water, or a peck of good horse droppings, or fowls' manure, put into a bag, or half a peck of soot, all similarly treated, make good liquid manure. A useful zinc pail with perforated sides is now on the market for holding the manure, which is placed in the tub, and is much cleaner to use than a sack. House

sewage is good applied to coarse vegetables or trees. The drainings of farmyards, stables, &c., with three times the quantity of water added, make good liquid manure also. Still these liquids should not be applied too freely; a watering with them once a week suffices for most growing plants.

In gardens it is an excellent plan to have a large tub that can be used for the making of liquid manure of any description standing in some out-of-the-way corner. When the liquid is used daily, though not to the same crop or plant, no unpleasant smell is emitted. When not in use an old sack or mat may be thrown over the tub.

THE STERILISATION OF SOIL

DURING recent years a good deal of attention has been given to the sterilisation of soil, particularly that used for borders in greenhouses, where the removal of the old soil and replacing it with new is necessarily a lengthy and expensive operation.

Partial sterilisation of the soil is an efficient means of dealing with several pests that live in it, eelworms in particular, and it has the further curious effect of first delaying growth for a very short time, then hastening it, so that plants put into such soil quickly overtake those put into similar but untreated soil. The cause of this appears to be as follows: Most of the bacteria are killed, but not all. The minute animals that prey upon the bacteria are also killed, as well as eelworms and so on. The bacteria that remain are able to grow at a rate far exceeding that of those in soil where their animal enemies abound, and in growing they produce from the decaying matter which forms their food a correspondingly greater amount of ammonia. Plants, therefore, in this partially sterilised soil have greater stores of ammonia at their disposal than those in untreated soil, and are consequently able to grow more rapidly. Other advantages are the prevention of the growth of moss on seed-pans and the destruction of weed seeds. By far the most efficient method of effecting partial sterilisation is by heat. Other methods not so efficient, but able to be applied under certain circumstances, are flooding, drying out, and the use of chemicals.

Heating by Steam.—The most effective way of heating is by the application of steam. Dry heat apparently occasionally causes undesirable changes, which check growth to a very great extent; but probably this is most marked when a high temperature is reached. As a rule, if a soil mass can be heated to 180° Fahr., that is sufficient to ensure most of the benefits of partial sterilisation. It is obvious that heat such as is required cannot be applied on a large scale outdoors, but on a small scale it may be easily managed. Taking steam first, we may have a box or tank made with pipes perforated

at intervals running along the bottom, and after putting the soil to be treated into it and covering over with a canvas cloth, we may drive steam from a boiler through it. If this method be adopted (as is done in several commercial growers' places now), pressure of 60 lb. to 80 lb. to the square inch is required. A modification of this method is in use in green-houses, where a movable frame of perforated pipes is laid so as to cover half a bed, and soil from the other half is thrown over it and covered with canvas. The steam is then driven through and the temperature raised to the required degree. The frame can then be moved on, and so the whole house may be treated a piece at a time.

Baking the Soil.—Where steam-heat cannot be obtained, baking the soil may be resorted to; but this should not be done to such an extent that the soil becomes charred. Several methods besides the use of the kitchen oven are in vogue. Heating the soil on a shovel over a fire, thrusting red-hot iron plates or even hot bricks into the soil heap, may be practised.

Treatment by Chemicals.—Carbolic acid, formalin, naphthalene, carbon bisulphide and so on are used at times; but their use is not unattended by danger to the crops to follow, and is not always satisfactory. The only method which at present seems to offer some degree of success outside is the use of powdered quicklime, dug in while still in a thoroughly caustic state. Potash salts also apparently have a slightly sterilising effect, especially kainit. No doubt in time some substance injurious to animals such as the eelworms and minute creatures which prey on bacteria, will be found sufficiently cheap to act as a soil steriliser, and with it will begin a new era for those whose business it is to gather the riches of the soil.

HOW TO MAKE AND CROP A KITCHEN GARDEN

IT is proposed to explain, as concisely as possible, how a kitchen garden should be formed, and also how it may be cropped to the best advantage. To refer first to the formation, one can but describe the details of an ideal kitchen garden, and each reader must, as far as his particular circumstances will allow, endeavour to approach the conditions set out. The kitchen garden should be considerably longer one way than it is the other, say in the proportion of two to three, and the greatest length should be from east to west, *not* from north to south. The greater portion of the garden will then face the south, thus giving a more extensive surface of southern borders, and these are a most important item in the kitchen garden. Shelter from the north and east is essential. The cold, cutting winds that prevail in the spring, even if they do nothing worse, considerably check early vegetables. Although shelter is so necessary, one must remember that shade is not, and whilst better shelter than that afforded by fairly tall trees could not be wished for, these must not be too close, or they would shade some portion of the garden also. The greater part of the kitchen garden should be as nearly as possible on the level, although it is wise to have a south border upon a gentle slope. It is here that the early vegetables will be grown. Should the whole kitchen garden be sloping ground, it is probable that, during the summer, the vegetables would suffer from want of moisture at the roots—the water would be apt to drain to the base of the slope, and there disappear.

Walls are of the greatest value in a kitchen garden. They are expensive to build, but if properly and effectually covered with fruit trees, the cost will eventually be more than repaid. One must also take into account the great help that vegetable crops derive from the shelter of walls. The kitchen garden must, of course, be enclosed either by walls or hedges, and if the former are erected they will, in the end, prove more satisfactory. We will suppose that the kitchen garden is

enclosed by walls ; it will be necessary to have a hedge outside them as a protection for the trees growing against the outer side of the former. This valuable space would be wasted were it not protected by another enclosure.

One word must be said against the practice of having the kitchen garden in some out-of-the-way corner. During the months of April and May, what part of the garden can equal in beauty the kitchen garden ? Then it is that the Apple, Pear, Plum, and Cherry Trees are in full blossom (for it is presumed that the fruit and kitchen garden are one). Not even the most beautiful hardy flowering shrubs are more charming, or so burdened with blossom. It is not suggested that the kitchen garden should be formed in front of the dwelling-house, but it might with advantage be within easy access. It is wise to make it beautiful throughout the summer by planting suitable flowering-plants by the principal walks.

The Soil.—The best soil in which to grow vegetables is a rich loam as a surface, with a subsoil that allows the moisture gently to escape. Soils that consist chiefly of either clay or gravel require much cultivation before they will produce good crops, and should therefore be avoided. Chalk, providing that it is not too near the surface, is preferable as an ingredient to either clay or gravel, for the former is apt to become waterlogged, and therefore cold and unwholesome during the winter, and the latter has little of what for want of a better name may be termed "body," so that during the summer it practically dries up unless much labour be expended in mulching and watering. It is rarely, however, that one can find a soil that is all it should be, and one has therefore to improve it. The great value of a refuse heap as a soil improver is not generally known ; at any rate it does not appear to be largely taken advantage of. By collecting road scrapings, vegetable refuse, dead leaves, old soil turned out of flower-pots, &c., into a heap, and mixing with this, from time to time, wood ashes, lime, soapsuds, &c., a quantity of most valuable garden food will be provided. For digging into light land such material does more good than rank farmyard manure, and is easily and cheaply obtained. It is wise to allow farmyard manure to ferment before using, by making heaps and turning these frequently. Heavy soil can be ameliorated by the mixing in of wood ashes, road scrapings, lime, and brick rubble, river sand, lumps of burnt clay, &c. An excellent method of disposing of old cabbage stumps, or the remains of a winter crop that

may be on ground required for spring planting, is to bury them in the soil when trenching. They will in time form valuable manure ; by this method is the ground cleared and prepared for another crop, and enriched for the benefit of future vegetables. To ensure the production of first-class vegetables, the soil must be trenched. A thorough trenching of the soil in the kitchen garden is of the utmost benefit to crops cultivated upon it. It is obvious that if plants are grown in the same soil year after year, this must, although it may be regularly manured, to a certain extent depreciate. The great value of trenching lies in the fact that it brings fresh soil to the surface to be acted upon and improved by the frost, rain, wind, sun, &c., and gives the soil previously on the top a rest.

Trenching.—Neglecting to trench land will result in impoverishment, for soil that is never exposed to the ameliorating influences of the elements must deteriorate. By trenching, the subsoil is broken up and rendered friable, and therefore is a far more suitable medium for roots to enter than a more or less hard and unbroken mass of material, as it would otherwise be. The work of trenching is best done in the autumn, so that the soil may be left bare throughout the winter. Details of the work will be found on page 378.

Digging also materially helps to improve the soil ; it is obviously not so good as trenching, for in the latter operation the soil is moved to the depth of quite three feet, and in the former to about fifteen inches. By rough digging in the autumn the soil is turned over and not broken up, but left in large lumps, thus allowing the winter elements to sweeten and render it friable ; in the spring the soil may easily be broken and prepared for either planting or sowing. Trenching is work that needs much time, labour, and expenditure for its proper performance ; it usually happens, therefore, that much of it cannot be undertaken at once. The kitchen gardener should make it a rule to trench a certain portion of his land every year, and the amount to be thus treated will be best determined by himself. This is the only practical and satisfactory plan of carrying out this most important work. One can easily know by the disposition of the crops which portion can be most conveniently trenched. As the various winter crops are grown first in one part of the garden, then in another, so must the trenching gradually make the tour, and each vacant portion of the ground be treated in turn. The simpler

The Design of the kitchen garden, the better it will be.

Make convenient plots of ground, and convenient means of access to them. This should be the aim in view in the formation of a kitchen garden. It is most important that one should be able to get on the land easily with wheelbarrows, and carts also, if the garden is of sufficient extent to warrant this. Fruit trees should be planted by the side of the walks, say at a distance of about five or six feet away, so that the branches may not in time unduly hang over the roads. Fruit trees so planted add considerably to the appearance of the kitchen garden, and leave the plots altogether free for the planting of vegetables. The ground between and around the trees must not be wasted, for Strawberries and Parsley, to mention but two useful plants, will cover it profitably. The excellent little Apple trees called Dwarf Horizontal Espaliers are just the thing for planting by the sides of some of the smaller garden paths, where there would not conveniently be space for the larger Bushes or Pyramids.

Cropping the Land.—The kitchen garden must be cropped systematically. The various plots should, during the winter, have allotted to them on paper the vegetables it is intended to plant in the coming season. The maintenance of a proper rotation of crops is one of the most important details in the successful management of the kitchen garden. By rotation of crops one understands, strictly speaking, a succession of different crops over a period of several years. Although this theory is excellent, it is not always possible to put it into practice exactly. Neither is it absolutely necessary providing the land is well manured, although it is advisable not to grow the same crops, particularly Potatoes and Brassicas, upon the same land year after year. The accompanying tables will, it is hoped, be of help as showing what really should be done; it probably, however, will not be convenient to follow strictly the rules there laid down. They may be accepted more in the nature of a guide. Potatoes continually grown upon the same land will make the latter what has been termed "Potato sick"; in other words, it will be considerably impoverished. It is inadvisable also to cultivate plants of the Cabbage family (*Brassicæ*, which includes Cauliflower, Cabbage, Broccoli, Savoy, Brussels Sprouts, Kale, &c.) on the same ground for several years in succession. Endeavour to change the crops as frequently as possible, for the old adage that a change is as good as a rest is particularly applicable to the kitchen garden land. In a description of the rotation of crops, such as that accompanying the present notes, it is, of course, impossible to include many of the minor vegetables, technically

PLAN OF A KITCHEN GARDEN

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KEY TO PLAN

PLOT A			
1st Year	Asparagus, Rhubarb	Horseradish	{ Jerusalem and Globe Arti- chokes
2nd "	" "	"	" "
3rd "	" "	"	" "
PLOT B			
1st Year	Strawberries	Onions	{ Carrots, Parsnips, Beet- root, Salsify
2nd "	"	Autumn Sown Cabbage	Autumn Cauliflower
3rd "	"	Potatoes	Seakale
PLOT C			
	Gooseberries	Currants	Raspberries
PLOT D			
1st Year	Peas in Succession	Scarlet Runners	Potatoes, Early and Late
2nd "	Potatoes	A Root Crop	Peas
3rd "	{ Broccoli and Winter Greens }	Onions	Cauliflower
PLOT E			
1st Year	Celery	Cauliflower	Brussels Sprouts, Leeks
2nd "	Onions	Leeks	Potatoes, Cauliflower
3rd "	Cabbage	Celery	Peas, Winter Salad
PLOT F			
1st Year	Seakale	Early Savoys	Early Brussels Sprouts
2nd "	Peas	Potatoes	Seakale
3rd "	Potatoes	Peas	Strawberries

REFERENCES TO PLAN ON OPPOSITE PAGE

Plot A and Plot C are of course permanent. The reader will not need to be told that Gooseberries, Currants, and Raspberries may remain where they are planted for many years, and those vegetables, with the exception of Jerusalem Artichokes, mentioned in Plot A will also thrive best if left undisturbed for several years. To enable one to produce a supply of first-rate Strawberries, a plantation should be made every year. Good results are had, however, from planting afresh every other year, as mentioned on page 456. As has been before mentioned, the minor quick-growing vegetables not here included will be worked in between as circumstances allow. It will be seen that each plot is in three divisions; this plan has been adopted, because it is unlikely in a garden of the size of that under consideration one plot would be exclusively devoted to the cultivation of any one vegetable.

The dotted lines in the plan near the walks represent fruit trees, bushes, and pyramids by the principal paths, and dwarf horizontally trained trees by the smaller ones.

termed "catch crops," which being interpreted means, that instead of the ground being allowed to remain idle during the interval that may elapse between the gathering of one crop and the sowing or planting of another, it is made use of for the purpose of raising some such quick-growing vegetables as Spinach, Lettuce, Dwarf Beans, Turnips, &c. All these must be interleaved, as it were, between the standard products of the kitchen garden; they cannot be included in the regular rotation of crops. And it will not be found at all difficult to introduce them.

Do not permit weeds in the kitchen garden. Not only do they rob the rightful dwellers in the soil of much food, but they are altogether an eyesore, and a painful indication of neglect. Always sow and plant systematically in drills, so that the hoe may be easily worked between the plants. He who sows broadcast will also reap weeds broadcast, for it is then impossible to keep them down, and for the simple reason that one is not able to reach them without damaging the cultivated plants in so doing.

THE MAKING OF GARDEN ROADS AND PATHS

THE construction of roads and paths is a very important item in the laying out of a garden, for it depends largely on whether they are made well or badly as to whether they can be used or not in wet weather. Of the many points to consider in connection with the work, one of the most important is drainage. When the ground is naturally well drained, the work is simplified, for there is little necessity for the construction of an elaborate drainage system. Surface water can be easily carried away by catchpits made here and there along the margins, the size and depth being regulated according to requirements. But when the ground is naturally heavy and badly drained, it is highly important that a good service of agricultural drains should be laid to prevent the path from becoming waterlogged. In such a case the ground should be excavated to the required depth and be left 2 inches or 3 inches higher in the middle than at the sides. A drain can then be formed along each side, with branches 20 feet or 25 feet apart falling each way from the middle. Connections must also be made between the surface and the side drains for the purpose of carrying surface water away. This is really more important when the road or path is to be used for vehicular traffic than when it is to be wholly for the use of pedestrians, for if such a road is not well drained, it is impossible to keep it in good condition.

The contour of the ground is another item which has an important bearing upon the construction of roads and paths. When the natural ground is moderately level, or has a slight general slope, the work is more simple than when undulating ground or land with a rapid fall has to be dealt with, for in the one case it may be necessary to reduce hillocks and fill up depressions both for appearance and to ease the road for traffic, while in the latter case steps must be taken to make the road as easy as possible to climb, and also to provide against its being badly washed by heavy storms. When

removing hillocks and filling little depressions, care must be taken to arrange the sides of the road in such a manner that they look perfectly natural; thus it may be necessary to regulate the ground for 20 feet or 30 feet back in order to make it approach the road more or less in the form of the sides of a valley. Should it be impossible to alter all hard lines, then banks of shrubs, judiciously placed, may be made to mask the defects. The gradient of a steep road or path may be eased considerably by using good bold curves; but when the road is for vehicular traffic, the curves must have really good sweeps, for sharp turns are both awkward and dangerous. Then, to stop the wash of water flowing rapidly down and carrying gravel with it, it is a good plan to have large boulders placed in the gutters every 20 yards or 25 yards immediately below a drain, while in some cases it may even be advisable to pave the gulleys with setts or to lay glazed earthenware pipes, cut in longitudinal section, along the sides.

The depth to which it is necessary to excavate a path or road depends entirely on the purpose for which it is to be used. A path which is simply for use by pedestrians may be from 6 inches to 8 inches in depth, while one for light vehicular traffic should be from 9 inches to 12 inches, and if heavy traffic is anticipated, from 12 inches to 18 inches; but such roads are, as a rule, best paved, that is, when they are destined for service roads for gardens and back premises, rather than for carriage drives.

A path which has been excavated 6 inches or 8 inches deep should be drained if necessary, and have 3 inches of hard core, stone or brick rubble placed over the bottom. On this place from 1 inch to 2 inches of coarse clinkers, and ram them down until a level surface is formed. Then proceed to fill up with whatever material has been selected for the surface. As a rule, nothing beats a good binding yellow gravel which has not been screened too finely. This must be spread and well rolled while moist, otherwise it will not set. There are two periods when gravel is objectionable. One is the early days of a thaw after a frosty period, and the other is a light rain after a dry period. At both these times the surface is wet and soft and the lower part dry and hard, consequently the upper part is lifted by the feet or by wheels. There is no help for it, and nothing can be done to remedy it except keeping off the path while it is in either of these conditions. For this reason it is often desirable to lay asphalt paths in small gardens where the paths are in

everyday use, but when this material can be avoided, avoid it by all means. Loose gravel or granite chips are sometimes used in preference to a binding gravel, but these are not very satisfactory, especially when the path is destined for heavy use, for the loose chips soon become filled with soil and other dirt. By rolling on every possible occasion, a well-made gravel path keeps in good condition, and there is nothing to beat it for appearance. Carriage drives and roads

FIG. 25.—Diagrams to show the Construction of Garden Paths.

A.—Plan of drains in bed of path: 1, bed of path; 2, side drains; 3, branch drains. B.—Section of path showing drains: 4, catchpits at sides of path; 5, section of side drains showing connections with surface and branch drains; 6, branch drains in bed of path; 7, rough material; 8, the finished rounded surface of the path. No. 9 shows a paved channel, and No. 10 section of pipe channel.

must be given from 6 inches to 12 inches of hard core, according to depth, and over this, flints or broken granite should be placed to bring the road within 2 inches of the surface. Make it as firm and level as possible, then cover with gravel and roll well. Such a road will stand a considerable amount of wear, providing wheel-marks are regularly raked over and the surface frequently rolled. A fertile source of injury to roads is the heavy shade of trees, which does not allow the surface to dry, and by their leaves falling and not being regularly cleaned up. Foreign matter of any descrip-

tion must be removed from the surface at once if the road is to remain good. Since the advent of motors, some people have taken to tar spraying the surface of carriage drives. Roads so treated wear well, but are less pleasant to the eye than those surfaced with gravel.

For temporary roads there is no need to go to the same trouble or expense as is necessary for permanent ones, and excellent roads, capable of carrying a lot of heavy traffic, may be constructed of old railway sleepers, which may often be obtained for 9d. or 1s. each from the railway companies. The life of these old sleepers may be anything from five to twelve years, therefore a good deal may be said in favour of their use.

VEGETABLE GROWING

VEGETABLES should form no small part of the garden, and the cottager fills his plot chiefly with the things he knows will bring comfort to the family. This phase of gardening, therefore, is dealt with fully, knowing that individual tastes differ greatly, one preferring the succulent Cabbage, another a more dainty vegetable, the Asparagus or the Seakale; and to meet the desires of all, the principal kinds are described, with accompanying cultural notes.

Artichokes, Globe.—Plants of these can be raised from seed sown in a shallow pan or box stood in a frame early in May, or be sown in a shallow drill outdoors, being thinned out to 12 inches apart. Those raised under glass must be planted outdoors when strong enough. Only a few plants are needed in any garden. In November they should be lifted from where sown and be planted in deep soil, 4 feet apart, in a row, as growth is very strong. Their edible product is found in the green-pointed scales which form the flower-heads in a bud state. They must be cut whilst closed. Their value as food depends on the fleshiness of these scales. New growths break out early each winter, and these need some protection in winter by having straw wrapped round them. Plants can be increased by lifting some of these growths or suckers, with soil attached, and planting them out into fresh soil. This is preferable to raising from seeds, as seedlings vary considerably.

Artichokes, Tuberous.—There are two distinct forms of these roots, which are called Artichokes without any reason—the tall or Jerusalem Artichoke, of the sunflower family, that produces large irregular-shaped roots and is of somewhat close watery texture, and the Chinese Artichoke so called, having quite small, white knotted roots, and is best known as *Stachys tuberifera*. The former is grown by planting medium-sized tubers in March in good but not necessarily rich soil, in rows 2 feet apart, the sets being buried 6 inches. A small plot usually suffices for all ordinary purposes, as the tubers are chiefly used in the making of soups or stews. The stems are single, and grow to a great height, often to 8 feet. A row or two, therefore, makes a useful break for unsightly objects in the summer. The plants, however, very seldom produce flowers. The stems die down in November, when they may be removed, and roots, which frost does not harm when in the ground, may be lifted and used as needed. Some should be planted in fresh ground every year.

The *Chinese Artichoke* tubers should be planted in February in rows 20 inches apart, and 12 inches apart in the rows. These like deep, good ground. The tubers may be dibbled into a depth of 4 inches. Growth begins in April, and is bushy and dwarf, the leaves being much like those of Sage. During the summer the bed becomes densely covered with growth, which dies down in the autumn. The roots, or tubers, may be forked out as wanted during the winter, being washed and cooked at once, partially boiled, then finished by frying them to brown the tubers, when they are delicious eating. A fresh bed should be planted every winter to keep up a supply of good tubers.

Asparagus.—Beginners may possibly be unable to cultivate Asparagus until they have had some experience of other vegetables. But asparagus is a native plant, and is easily grown. It is propagated by sowing seed, for that is abundantly produced, and is cheap. For the reception of the seed the ground should be dug deeply, and well manured in the winter. If it runs together, then it should be lightly forked over early in April, but if it remains light and loose, drills may be drawn and seed sown thinly along them about the middle of that month. Drills should be 14 inches apart, and about an

inch deep. When growth is good, and the shoots are 4 inches in height, the seedling plants should be thinned out to 6 inches apart, the soil about them being kept well hoed and clean all the season. In the autumn the stems die down, leaving strong, fleshy roots, having a cluster of crowns in the centre. To make a permanent bed, trench during the winter a piece of ground of sufficient size quite 2 feet in depth, mixing into the bottom soil a good dressing of half-decayed manure. Do the same with the top spit of soil, so that, the sides being deep, the ground is well enriched by early April, which is the time to plant. With the aid of a garden line, throw out trenches 4 inches deep and 7 inches wide, and $2\frac{1}{2}$ feet apart. Into these put the best of the seedling Asparagus roots, lifted for the purpose, at 2 feet apart, and cover them up and level the soil. Growth the first year should be strong, and can be materially helped by strewing over and hoeing into the soil, after the stems are 12 inches in height, a light dressing of coarse salt or of nitrate of soda. Weeds must be kept down all summer. In the autumn the growths will again die down. During the winter a top dressing of manure may be laid along between the rows. The treatment the second year must be as for the first year, and the same in the winter. Then the following spring, or third season, some of the stems as they appear above the ground may be cut for eating up to the middle of June, and the following year cutting may go on till the end of that month, and the same for many years after. Dressings of salt or nitrate of soda may be given each summer, and of manure each winter, and so treated, a bed as advised, not raised, but kept level with the ground, will prove the most profitable, and give good Asparagus in abundance. But it is useless to put out plants without first preparing the ground.

Beans.—Of these pod-bearing vegetables there are three distinctive forms: Broad or Longpods, Climbers, and Dwarf Kidney. The first named are fairly hardy, the last mentioned are quite tender.

Beans, Broad.—These beans may be sown as early in the year as January, other sowings being made in the two following months. Because the plants are very susceptible to attacks of a black insect called aphid, or dolphin, it is not advisable to make sowings later than the end of March in the south or the end of April in the north, except where the air is moist and the soil deep and holding. The plants make very erect growths, carrying two or three stems from each seed. In good ground they will reach a height of 3 feet, but when some 15 inches of bloom is expanded on the stems it is wise to pinch out the top of the plants, as that checks growth, and causes the pods to form and lengthen. The usual rule is to sow in drills, 4 inches deep, drawn at 2 feet apart, the seed beans being placed 4 inches apart in the drills. Sometimes double drills are drawn 6 inches apart, the seeds being placed into each as already advised. In such cases the rows should be fully $2\frac{1}{2}$ feet apart. As Broad Beans seldom find favour after Peas become plentiful, that again is another reason for not making more than about three early sowings, except where these Beans are specially desired.

The Broad form of Beans is known as Windsor, and there are ordinary brown-seeded and green-seeded, or Green Windsor. All the pods are very broad and rather short, seldom producing more than two Beans in each pod. Those who like large Beans when cooked, or if allowed to get rather old, then boiled and skinned before being served to table, think these Broad Beans best. The Longpod form includes several varieties, all of which are good. Sometimes the pods are 12 inches in length. There is a very dwarf form known as Dwarf Fan Cluster or Green Gem, but this is seldom grown.

These hardy Beans do best on stiff holding, deeply-worked, well-manured soil. When the black-fly which so commonly infests these Beans appears, it is always on the young tops. These may be picked off carefully, and be carried away and scalded, as, if thrown on the ground where gathered, the insects soon return to the plants. When the soil is good and moist, not much trouble is given. A pint of seeds will plant some 60 to 70 feet run of rows. In no case should there be crowding in the hope of securing a fine crop. That would only result in failure.

Beans, Climbing.—These are all tender. Their season ranges from May till October, but cold soon injures them. Because they are of climbing habit, it is needful to furnish them with sticks, either straight or branching, or string, or a similar support, to which they readily attach themselves, and then in good ground they will grow to a great height. The best form is found in the rough-podded Runner, commonly called the Scarlet or Dutch Runner. This has red-speckled and pure white seeds, the former producing scarlet flowers, the latter white ones. There is an old variety, Painted Lady, the flowers red and white. All have the same character in leaf, pod, and productiveness. The most favoured, however, are the Scarlet Runners. A capital feature in a good row of these Beans is that when well staked a good blind or break in a garden is formed for some three months of the year, or they may be so planted and trained as to make an admirable creeper-covered arbour.

Culture.—Because tender, essentially summer croppers, and long-enduring, it is need-

*ASPARAGUS CROWN WITH ROOTS SPREAD OUT
FOR PLANTING.*

*AN ASPARAGUS BED 5 FT. WIDE SHOULD
ACCOMMODATE THREE ROWS.*

A SEAKALE CROWN WITH SIDE
ROOTS SUITABLE FOR CUTTINGS.

ROOT CUTTINGS OF SEAKALE
PREPARED READY FOR PLANTING.

ful to give them good, deep holding, retentive soil. In all cases where possible the ground should be deeply trenched and heavily manured in the preceding winter. Where that is not practicable, there should be opened for each row a trench 20 inches wide and deep, the bottom then broken up with a fork, layers of soil and manure being added until the trench is filled. After settling down for a few days, the Beans should be sown in drills drawn with a hoe, 3 inches deep and 6 inches apart, down the centre of the trench, the seeds being placed in these drills at not less than 6 inches apart so as to give the plants ample room. The drills should then be carefully filled with fine soil. So far the culture is simple, so much depending upon the preparation of the ground, thin sowing, and good seed. That can always be had good by careful saving from the previous season's stock, or purchasing from a good seedsman.

The time of sowing should not be too early, except where it is possible to give the plants good shelter. Thus a sowing may be made as early as the middle of April at the bottom of a warm sunny wall or wood-fence. This sowing should be made, however, only to secure a few early pickings, as it is too hot later on. Generally the first sowing may be made quite early in May, as then the plants are usually through the ground in two weeks. A second sowing, to give a good succession, may be made a month later.

Supports should be furnished before the plants begin to throw up tendrils or climbing stems. In whatever form, they should be fixed about 3 inches from the plants along each side of the rows, and range from 5 to 7 feet in height. We have seen, where soil was deep and good and stakes tall, Runner Beans reach a height of 9 feet, cropping abundantly all the way up. Preference should be given to long rods, and each plant should have its own stake. These the climbing tops soon attach themselves to, or, if need be, can be helped to find their own proper supports.

Manuring.—There is great need for liberal manuring of the ground for these pod-bearing crops. Abundant produce can only be had when growth is strong, indeed, almost luxuriant. To create that, plenty of good nitrogenous manure, such as animals give, is needful. Further, all these plants like occasional good soakings of liquid manure in the form of house sewage, or slops, or the drainage of stables, cow-sheds, pig-styes, &c., in dry weather. Also they benefit by being syringed in the evenings with clear water in hot weather, such dampings especially helping flowers to set seeds rather than to fall prematurely from the plants. Artificial manures are best given in liquid form, after being soaked in a tub. Four pounds of any good artificial manure will make 40 gallons of liquid manure.

Gathering the pods should not be neglected, as allowing many to remain on the plants and become old greatly hinders production. If some be needed to produce seed, select and leave one of the longest and straightest here and there, but not more than will give the required quantity of seed. Of all others gather as fast as they attain the proper table size, having them rather young than old.

Varieties.—The best of the scarlet-flowered Runners are Scarlet Giant, Hackwood Park Success, Exhibition, and Prizewinner. There are also climbing forms of the so-called French Beans, and these need the same treatment as Scarlet Runners.

Beans, Kidney Dwarf.—These are commonly known also as French Beans, but the term is not a correct one. The seeds of these are generally smaller than those of the large Scarlet Runner, and are very varied in colour, there being many varieties. They are essentially summer croppers, and have about the same season as the Runners have, but do not need such rich soil, as they are less productive or enduring. They do well in any good garden soil, in rows from 24 inches to 30 inches apart, according to strength or variety. Drills should be 3 inches deep and single, and the seeds set into them from 3 inches to 6 inches apart, as plenty of room is needful. The times of sowing may range from the middle of April on a warm border and every fortnight on to more open ground up to the end of July, and even in August on to a warm border again where protected from cold winds, or large wood frames can be placed over the plants to enable them to crop well into the autumn. In all cases the pods should be gathered so soon as fit for cooking, or otherwise the plants soon cease to crop. In very hot weather place a dressing of manure between the rows and give liberal supplies of water.

Varieties.—For outdoor culture one of the very best earliest is Ne Plus Ultra. That can be succeeded by Magnum Bonum and Canadian Wonder. The latter two are rather strong growers. There are many other new varieties, including those with golden, stringless pods, all of which are good.

Beet.—These are usually called Beetroots, but the term "roots" is needless. These useful products, all of a highly nutritious nature, and constituting most valuable food, are in two diverse forms. The earliest are round or turnip-rooted, the later ones are all long or taper-rooted. For early purposes the very best is the Blood-Red, a selection of great value from the original Egyptian round-rooted, and much superior. Its great usefulness lies in the quickness with which the bulbs are formed, and therefore early use

in the summer and autumn before the long or tapering-rooted varieties are ready for pulling. Beets like a deep holding soil of good quality that has been rendered fine and loose by well turning it up with a fork in the spring. If a previous crop has been well manured, and the ground before the winter thrown up roughly, and later forked down level for sowing, it is better so to leave it than to add fresh manure, as such application in a fresh state tends to the production of side roots, which are, on all these products, very objectionable. But when it is essential to add manure to the ground it should be dug in, or better still, trenched in early in the preceding winter, burying it well down. All these tapering roots obtain their sap food chiefly through the aid of the fine point root which strikes vertically into the soil; hence where manure is low down it is more readily utilised.

Sowing the earliest crop may take place in the south quite early in April and in the north at the end of the month. A fairly sheltered position is best. The drills, which may be an inch in depth, should be 12 inches apart, the seed being sown thinly in them, then covered with fine soil, roughly raked over, and left neat on the surface. As the plants give somewhat sweet leafage birds are apt to prey upon it, hence some protection, either in the form of nets or dusting with lime or soot, may be needful for a few weeks after growth begins, to protect the plants from harm. To have these round-rooted early Beets in good condition the plants in the rows should be thinned to 6 inches apart, and throughout the summer the surface soil be freely stirred with a hoe both to kill weeds and to retain moisture. When the roots are but half grown they may be pulled for use; and when fully grown, which they will be by the beginning of August, they are of a dark crimson colour, flesh fine and firm, of good flavour, and delicious when cooked and eaten while cold, or sliced and eaten as salading. The blood-red, globe-shaped variety, with its tops of dark hue and moderate growth, should be asked for.

Beets, Tapering.—As these forms make good growth well into the autumn, early sowing is undesirable. It is therefore soon enough to make sowings during the month of May. The ground should be prepared as before mentioned, the drills being drawn 14 inches apart, and grow them as advised for the round-rooted forms. In using a hoe between the rows great care should be taken not to injure the roots. Large roots are undesirable, for these invariably have inferior and less well-coloured flesh than those of medium size.

Varieties.—Some that show handsome dark-hued leafage and also have roots of rich deep colour and good refined flesh are Dell's Crimson, Pragnell's Exhibition, Nutting's Red, and Blood-Red; Cheltenham Greentop is also a good variety. These, when moderately well grown, give roots of the highest excellence in flavouring and deep-coloured flesh.

Wintering.—Being somewhat tender, it is needful to lift Beets from the ground and store them in dry sand or ashes in any cool shed or outhouse from which frosts are excluded. The cooler the roots can be kept the better. The lifting should be done not later than the middle of November, the soil being carefully rubbed from each root, and the leaves not cut but twisted off, before placing the roots in the sand. Store them so that the crowns project. An occasional looking over them is needful during the winter. Carefully preserved roots should be good till the end of May at least, but much depends on place of storage and attention given during the winter. When properly cooked and served to table, a really good, rich-coloured Beet is delicious. It would be well were Beets far more largely consumed.

Broccoli.—These are fairly hardy, and biennial, that is to say, they are raised from seed one year and produce their frothy heads for eating, and later their flowers proper in the following year. Their time of heading-in ranges from January to June. Seed of the earliest varieties, those to head in early in the year, should be sown in March or April, to enable strong plants to be dibbled out into rows, 2 feet apart, in June, or early in July. Later varieties may be sown in May, and be planted out in August and early in September. It is undesirable to have the plants too gross or leafy, as these are more liable to injury by frost; again, large heads are undesirable, as those that are from 6 to 8 inches across, when cut, are quite large enough for cooking. When the ground is rich enough with manure dressings, it is well to tread it quite hard about the plants, as that induces them to become less leafy and much harder in the stems. It is a good plan to put out Broccoli plants on to ground that has just been cleared of Peas or other crops, and has not been dug again. The purple-sprouting Broccoli is a most useful as well as a hardy variety, the sprouts being gathered as needed, and thus the plants continue to produce them for several weeks. Seeds of that variety should be sown in April or May, the sprouts being ready for use in the following February and March. Seed in all cases should be sown thinly, in drills, 12 inches apart. The best white Broccoli are—Early; Christmas White, Winter White, and Early White; and for later cutting: Self-protecting, Late Queen, and Model.

Brussels Sprouts.—These distinct forms of Cabbage do not produce hearts, but each

stem gives a comparatively small head, and a very large number of sprouts which, if of proper form, are about the size of walnuts, quite hard, round, and green. The plants when put out into the open ground from the seed-bed as early as June become strong and tall, and commence to produce sprouts of this nature at the bottom of the stems in November; and as these are cut off and used, others higher up will swell, and in due course are large enough for use. Thus stems that are from 20 to 24 inches in height will, in this way, give a supply of good hard sprouts for fully five months. The sprouts come out from the upper side of every leaf-stem, and as they mature, the leaves ripen and fall, or may be pulled off, but in no case should they be removed until the sprouts are to be cut. Cutting takes more time than pulling, but as, in the spring, other long, tender shoots break out from the stems and furnish delicious greens, it is best to cut the sprouts, as then their more dormant buds are left to break into shoots. The tips or heads should not be cut until late in the winter, for as long as these remain stem growth goes on, and sprouts are produced, even though they are only small ones. Seed should be sown about the middle of March in shallow drills, and protected by nets or litter from birds. It is well to put out plants when 6 inches in height, as then they make strong growth and begin to sprout early in the winter. The usual rule, if planted in a bed, is to have the rows 2 feet apart, but in rich ground they should be wider than that. The soil, after planting, may with advantage be made very firm, as that tends to make the stems harder. Good varieties are Exhibition and Pride of the Market.

Cabbage.—Although all the various members of Brassica are of the Cabbage tribe, having all emanated from the wild Cabbage, yet there is great differences in them, as may be found in Cabbages proper, White, Red, Savoy, and Colewort, Curled Kales, Brussels Sprouts, Cauliflowers, and Broccoli. Under the term Cabbage, therefore, we treat of those properly so named. What are called White Cabbages are all hearting, and whilst leaves exposed to the light are green, the hearts, being firm and blanched, are white. These constitute one of the most valuable of vegetables, being very hardy, and available for use nearly all the year round. Sowings of seed may be made frequently, the earliest in the year being in a frame in February; or failing a frame, then outdoors on a warm border early in March, the object being to secure a quick succession to the Cabbages obtained from an autumn planting. The seed-bed, which may be a small one, should be either covered up thinly with dry, clean straw litter or ferns to keep off birds, or be netted over for the same reason. A second sowing may be made in May to give plants to furnish heads in the autumn, after Peas are over and the hot weather has passed away. Yet, a further sowing may be made about the middle of August in the open ground. This sowing, as it is well to have plenty of plants, should be in shallow drills, 10 inches apart, the seed being thinly sown, as then the plants can develop well for planting out. It is a good plan indeed to sow all these Cabbage seeds in drills in this way. The plants obtained from an autumn sowing should be ready to plant out on good grounds in rows, 20 inches apart, early in October, putting them in with an ordinary hand dibble, and in all cases well fixing the plants in the soil. From such a sowing there should be good hearts to cut from during May and June—much depends on the variety; but it is a good plan to have two, one small and quite early, such as Harbinger or April, and one later, like Flower of Spring. It is a common rule to allow the weaker plants from an autumn sowing to remain in the bed all the winter, and then plant them out in March to make hearts for succession. All of the ordinary type of Cabbage, after hearts have been cut, will produce sprouts that are valuable also. But it is best to leave only the autumn planted stock for that purpose, as the cut stems break strong, and give good sprouts for some ten months longer. The chief times to have Cabbage good are from April till midsummer, and from the end of August until the end of the year, when Coleworts and Savoy succeed. To have them good during hot, dry weather, it is needful to water liberally, and place a liberal mulch of manure about the plants. When caterpillars appear, a sprinkling of fine salt on the heads at night, and washed off in the morning with water, does great good in destroying the pests and helping to manure the plants. Generally it is well to have plants to put out in the open ground in March, May, July, and October to have a long succession. Good varieties for autumn sowing are Harbinger, April, Ellam's Early, and Flower of Spring. Heartwell is the best Cabbage that we know for sowing in spring and early summer. Harbinger and April are small, but very early, and may be planted rather closer than advised above.

Cabbages, Red.—These are grown exclusively for conversion into pickles, being of somewhat harder texture than cooking Cabbages. The seed is sown usually in the early spring, generally in April, outdoors with other varieties, and the seedlings transplanted when strong enough into a row, as few heads are, as a rule, sufficient for ordinary use. The culture required is simple enough; the plants need only to be planted in good garden soil, 15 inches apart, and kept clean by frequent use of the hoe. Very large heads are undesirable; indeed, to enable large ones to be produced it is needful to plant out much

further apart. The old Red Cabbage produces very large and useful leafage with great heads. The Dwarf Blood-Red variety is preferable, as if the heads are smaller than the others they are firmer, of deeper colour, and much sooner come to maturity. Seed may also be sown in the autumn for spring planting.

Cabbages, Colewort.—These hardy greens bear a close resemblance to Cabbages, but are usually sown early in June, and again in July, in small beds, to give successional plants to put out in the autumn. As the heads are not large, and they turn in quickly, it suffices to plant from 12 to 14 inches apart each way, both in August and September, on ground that has been forked over after a crop of Potatoes, Peas, autumn-sown Onions, or similar products has been removed. They then turn in for pulling or cutting during mid and late winter. The flesh of these Coleworts when cooked is softer and more succulent than is that of Cabbages, and being planted so close, become very profitable. Like all Cabbage tribe seeds, it is best to sow in shallow drills, and also to protect from birds. The two common varieties grown are the Hardy Green and the Rosette, the latter being broad-headed.

Cabbages, Savoy.—Possibly these hardy winter Cabbages originated in Savoy. They are, besides being hardy, peculiar for producing partially-curved and much-puffed or corrugated leafage, which is usually of a dark green colour. The heads are roundish, and during the season become very firm. They are best for cooking from December till the end of March, severe weather helping to make the leafage tender for eating. The times of sowing seed varies from April to June, according to variety and habit. Too often, if seed be sown early, these Cabbages heart in during the autumn, when they are not wanted. Plants from later sowings, especially of dwarf varieties, heart in late in the winter. The Drumhead is the largest, but is least fitted for gardens. The best varieties are Dwarf Green Curled, Tom Thumb, and Early Ulm. Plant the first 18 inches apart, and the latter two at 15 inches each way. After cutting, the stems give nice greens to gather in the spring.

Cabbages, Kale.—These, also called Borecole, are, like Savoy Cabbages, essentially late winter and early spring greens, and very hardy. Sowings made in April usually suffice for all ordinary purposes, and are best made in drills. There are numerous varieties, the best being Dwarf Curled, Scotch, Cottager's (tall), Drumhead Kale, which forms moderately hard hearts, and Chou de Russie or Russian Kale. The last named has highly fimbriated leaves, and is a splendid vegetable for winter and spring use. The Scotch and Cottager's need to be planted in rows 2 feet apart and 18 inches apart in the rows, whilst the others may go rather closer together. The Asparagus Kale is much liked by some also. These greens can often be profitably planted for succession between dwarf Potatoes or Peas, and always planted to follow after any of these or other early crops have been taken up, even till the end of September, as their produce is always useful.

Cardoons.—These are raised from seed sown in shallow boxes under glass, the seedlings being transplanted into rows outdoors when strong, or seed may be sown in drills on rich deep soil outdoors at the end of April, the plants being, when strong enough, thinned out to 12 inches apart; the rows should be 4 feet apart to enable the plants to be moulded up, as Celery is, to blanch the leaf stems. These should be gathered up together before soil is placed to them, as the leafage is very large and spreading. When stems are strong and well blanched, they are from 20 to 24 inches in height, but for ordinary use smaller ones are best and not so coarse to eat. When stems are cleaned they should be cut into lengths of 6 inches, tied into bundles, and then gently but well boiled before they are served to table.

Carrots.—The earliest of all Carrots are the Early French Horn varieties, such as are commonly forced on hot-beds or sown very early on warm garden borders. Where there are spare wood, movable frames, and plenty of manure and tree leaves to make up a hot-bed, one may be built up in January in a sheltered and warm place, on to which, when settled down, the wood frame may be placed. Into that should be put good soil 6 inches in depth, well levelled, and on which, in shallow drills 4 inches apart, seeds of the Early Horn, Forcing, or Gem may be thinly sown, then covered up with fine sandy soil, also thinly, well watered, and left after the light has been shut down close. A hot-bed made up 2 feet in depth, and very firm, of one-half stable manure and the rest of tree leaves, gives a gentle warmth for some time, and answers admirably to help the seed to make growth. There will be nice Carrots usually from an inch to an inch and a half long, and about the size round of a man's small finger, to pull in a few weeks, and most delicious they are. Thinning the plants is not required. A similar sowing may be made in February on a piece of ground the size of a frame, on a warm border, without any hot-bed. Round the bed may be fixed, on edge, stout boards 12 inches deep, and on these be laid the glass-light of a frame of that size. Failing a frame, strips of wood may be laid across, and on these a thin covering of canvas or calico, until growth begins, then the covering should be given only at night. Early in April sow-

ings of the Early Nantes, Champion, or Model, short, blunt-rooted Carrots, from 5 to 6 inches long and of delicious quality, should be made in light, well-pulverised, and deep-worked soil. Drills for these should be 10 inches apart, the seeds being thinly sown to save labour in thinning the plants later. It is a good plan to dress the ground, and well point it in with a fork before drawing the drills, with a mixture of wood ashes, soot, and guano, the latter in the proportion of one-tenth to the others. The bed should be trodden moderately firmly after the seed is sown.

Carrots, Main Crop, are of longer form, and should not be sown until the end of April or early in May. The best variety for this purpose is that known as St. Valery, New Intermediate, or Matchless. This is a broad-shouldered Carrot, tapering handsomely to a root-point, and is usually from 10 inches to 12 inches long. It is the heaviest cropper of all Carrots grown. The soil for the crop should be deeply trenched, and, if manured, the dressing should be added in the early winter when the trenching is done. In the spring the surface should be lightly forked over, and a dressing added as previously mentioned. Drills, as drawn with a broad hoe beside a garden line, should be 12 inches apart and comparatively shallow, as it is only needful to bury the seed about half an inch in depth. Sow seed thinly, and cover up quite evenly with fine soil, raking over the entire surface of the bed, treading and leaving it until good growth has followed. The first labour should be directed to thoroughly hoeing the soil between the rows; then when the young plants are well up, these should be thinned in the rows to some 6 inches apart. A free use of a hoe between the plants during the summer is the chief attention requisite. Very large Carrots, especially if the seed be sown early, are apt to split. Without doubt, the best flavoured roots for cooking are those of medium size and of clean growth. Main crop Carrots have to be lifted from the ground and stored, when cleaned of dirt and side roots, in dry sand or ashes in any cool, airy cellar or outhouse, the crowns being in all cases outwards. So cared for the roots keep well for many months. It may be needful now and then to run each of the roots through the hand to remove root or other growths, replacing them in the sand or ashes as before. Where there is a summer sowing the main crop or large roots may be used for soups and stews, whilst the younger ones are best for table. Carrots are very nutritious food, and when well grown as advised are fit for any table.

Summer Sowing.—Although it is sometimes difficult to get Carrot seed to germinate when sown in July, yet it should be the aim of all who like these roots young and tender during the winter, to make a good sowing of seed in that month. Just then early Peas, Potatoes, and other crops being removed leaves ground available for a sowing of Carrot seed, not necessarily a large one. The best varieties are the blunt-rooted Model or the New Intermediate, because, whilst of good size under ordinary conditions, the roots from a July sowing are not so and need little thinning, as the chief object is to have plenty of comparatively small roots to pull that are soft, succulent, and of delicious quality all the winter. One excellent result of such a summer sowing, made in drills 10 inches apart, is that the tops keep green all the winter. It is needful when severe weather sets in to cover up a portion of the bed with long straw-litter or ferns so as to exclude frost and enable pullings to take place.

Cauliflowers.—These are more tender in constitution and texture than Broccoli. They are also properly annuals, as the plants can be readily induced, by early sowing of seed under glass, to produce heads, and from these flowers the same season. Cauliflowers also are so far tender that they will not endure exposure to ordinary winters in this country. There are dwarf and tall, early and late varieties, the earliest being Snowball or, as sometimes called, Matchless, and Sutton's First Crop. These, when mature, produce close, compact, very white heads, some 6 inches clear and almost close to the ground. To have these forms giving heads early it is well to sow seed in shallow boxes or pans in gentle warmth either in a frame or greenhouse during February. Growth is then quick, and the plants should be, when 4 inches in height, dibbled out into other boxes 2 inches apart, and be grown on in a cool house or frame, kept near the glass so as to induce them to become stout and sturdy. From the boxes each plant, being lifted with a trowel and balls of soil and roots attached, should be planted out on a warm border about the middle of April in rows 18 inches apart. For this purpose the soil should be well manured and deeply dug. From such a planting generally heads may be cut early in June. It is possible where a frame is at disposal to plant some into it 12 inches apart and thus secure white heads some two weeks earlier. Some gardeners even put plants singly into 6-inch pots, and stand them in a vinery or peach house where they head in very quickly, though small. Still Cauliflowers are not generally much forced. If a further sowing of this early strain be made in March or April plants give heads outdoors in due succession. Sowings may be made of later and larger varieties, both in frames and in beds, or in drills outdoors in April, as these need a much longer season to mature. A good summer variety is Early Giant, and others equally good are Kinver Monarch and

Late Guardian. These from an April sowing, then planted out at the middle of June, give fine heads during August and September, especially if well watered when planted and the soil has been well manured. Cauliflowers, because they have to make their chief growth during hot weather, need more liberal treatment in soil and watering than Broccoli. A later and rather harder variety also to be sown in April is Veitch's Autumn Giant. This is a superb variety to head in during September and two or three following months. Plants should be put out into rows fully $2\frac{1}{2}$ feet apart, and in good, deep holding soil. If one planting be made in June and a second a month later then a long succession of heads is produced. Late heads may be partially protected from early winter frosts by drawing the large leaves together and tying them into a cone. That should be done as soon as white heads show. Even a few large leaves broken down, so that they lay two or three thick over the centres, protect in the same way. Cauliflower and Broccoli stems, after the heads have been cut, do not sprout, hence they may be pulled or forked up and removed at once.

Celery.—This is the chief of winter salads, and, when well prepared, is in universal favour. But its excellence depends so much upon culture and proper blanching that Celery may well be classed amongst the best vegetables of a garden. It is a hardy, cold weather plant also, yet sometimes suffers severely from hard frosts, because the blanching of the stems serves to make them somewhat tender. Seed is cheap, and a very small quantity suffices to make a sowing for a small garden. Two sowings also are ample. The first should be made rather thinly in a broad, shallow pan filled with light, sandy soil. In a pan, 10 inches broad, some 200 seedlings can easily be raised, enough to make quite a big planting for a small garden. Make that sowing about the end of February, standing the pan in a frame or greenhouse, and shading when the sun shines out warmly. The seed of Celery germinates slowly, but comes all in good time. When the seedlings are 2 inches in height they should be lifted carefully from the pan and be put out 3 inches apart on to shallow boxes of soil or into a frame or under a hand-light where they can remain until 6 inches in height and quite strong, ready to plant out into trenches. The second sowing, to give later plants, may be made in the same way, or, if preferred, in a shallow box, towards the end of April. The plants of this sowing, when strong enough to lift, should be dibbled out on a well-prepared patch of ground, slightly shaded, in the open garden. For such purpose throw off an inch thick of the top soil on a space 4 feet by 6 feet, then lay on the space short manure, an inch thick, well patting down, and on to that recast the soil previously thrown off and neatly levelled. Then dibble out the seedling plants on to that, 4 inches apart each way, taking sixteen plants in a row, and if the whole patch be thus filled it will hold upwards of 350 plants. When planted water freely, and as it will then be June shade from strong sunshine for some ten days until the plants are well rooted. Water freely each day if needed. In six weeks very strong well-rooted plants will result.

Trenches for the reception of Celery plants are desirable, not only because they facilitate moulding up to blanch the stems later, but also enable liberal waterings to be given, and where made side by side trenches should be fully 5 feet apart. Also they should be thrown out 18 inches wide and 12 inches deep. If the bottom soil be good add a dressing of well-decayed manure 3 inches thick, and well fork it into the bottom. If the subsoil be poor, or gravelly, or clay, throw out 8 inches depth of it upon one side, throw in so much of the top soil, then add to that and mix the needful manure dressing, and on that fork in a couple of inches more of soil. In a few days the trenches will be ready to plant. Do that with a trowel, lifting a dozen or so plants from the bed at once with good ball of soil and roots, taking them in a flat basket to the trench, and then with the trowel planting them well in a single row up the centre of the trench at 10 inches apart, fixing them securely by treading with the feet as the planting proceeds. If at once a liberal soaking of water be given the plants will not suffer much from the transplanting. No set time can be fixed for this work, as much depends on when ground for trenches is available. Usually for late Celery the end of July is soon enough to get it out, and by that time some early Potatoes, Peas, or other crops have been cleared off and space is available. In the case of an earlier planting it is desirable if possible to reserve a space specially for a trench or two, but that must depend on garden room, otherwise the first ground cleared from some other crop must be used.

Celery plants are gross feeders, and during dry weather need frequent liberal waterings; and if once a week the plants can have a good soaking of liquid manure, made in a large tub from horse, sheep, or fowl's manure, with some soot added, or failing these things, then with some dissolved guano or other artificial manures, at the rate of 1 lb. to 10 gallons of water, great good will result. Fairly quick growth is always best. Earthing should not commence until the plants have made strong growth, as after it has begun watering cannot go on. This work should always be done in dry weather; any very short leaves or suckers about the bottoms of the plants should be first pulled off.

Moulding up is facilitated if the tall stems of each plant be tied up loosely together, as then with a fork or spade the soil can be placed about the plants evenly, being gently pressed in about them with the hand. The first moulding should not exceed 6 inches in depth, other mouldings, of some 3 or 4 inches in depth, being added as the plants make growth, until finally they are well banked up with soil on both sides, and patted down to throw off rain. Late Celery may be in very severe weather saved from harm by shaking over the tops of the plants some fern or long straw-litter. The chief insect-pest is the maggot, caused by the celery-fly, which deposits its eggs in the leaves. These soon hatch and produce maggots, which subsist on the green colouring matter in the leaves, and make brown blotches in them. As soon as these blotches are seen they should be pressed firmly between finger and thumb, thus killing the insect. Good White Celeries are Pearl White and Solid White; and of reds none are better than Aldenham Prize Pink and Mammoth Red. These latter are best for late winter use, being usually hardier than white varieties.

Celeriac.—This is a turnip rooted form of Celery, and is useful when well grown to give bulbous roots for stewing or for slicing, to make salading, or may be used equally for flavouring soups, &c. Seed, of which one sowing is ample, may be sown in April. The plants are harder than Celery, and one great point is that, if grown from seed as Celery is, then when the plants are strong, put out, 9 inches apart, in rows 2 feet apart, on level but good ground, the bulbs form on the surface like those of turnips, and in the winter they can be covered up with soil, the tips of the leaves only being exposed, and in that way kept from harm by frost. Celeriac should always be grown where flavouring for soups is in great demand.

Chicory or Witloof.—This is a deep growing, fleshy-rooted plant similar to the Parsnip. The leaves closely resemble those of the Dandelion. Seeds sown in shallow drills, 12 inches apart, in the month of May on good garden soil will give properly thinned, strong roots the following winter. Seeds should be sown thinly in the drills, as the plants have to be thinned out 4 inches to 5 inches apart in the rows. The hoe should be freely used between them during the summer. In the winter the roots may be lifted as needed, or in bulk, and stored in dry sand in a cool shed; then, if some be placed in a cellar or in a big box with soil about them, and covered up quite close to exclude light, the crowns send up strong growth like Seakale; when blanched it is tender and mild, making capital salading, or may be cooked like Seakale and eaten. It is a useful winter vegetable.

Cucumbers.—Because these tender members of the Gourd family can rarely be grown successfully except under glass, they tax the capacity of beginners in gardening materially. The simplest culture is only required to produce Ridge Cucumbers, and small ones of the same nature called Gherkins. These are grown outdoors in warm positions, and if wind prevails in the garden much shelter can be provided by growing on the windward side a tall row of Runner Beans. Even a bed of Asparagus will also furnish a break from wind. The best way to grow these is to make holes 18 inches across and 12 inches deep. Fill these holes with short fresh stable manure, treading it down and heaping soil over it 4 inches thick, thus forming a mound. In the centre of each of these mounds sow, 4 inches apart and 1 inch in depth, six seeds. Place a large flower-pot over each mound until growth is seen. Then lift it off, covering up only at night, or at least until the plants become too strong to be thus protected. But when second or third leaves have been formed, three of the weaker plants should be pulled out, leaving the three strongest only. The mounds should be 3 feet apart. The sowing should take place about the third week in May, but later if the weather be cold. The manure buried into the holes generates a little warmth which helps the seeds to germinate. For that purpose it is well to prepare the mounds about a week before the ordinary date of sowing seed. The best varieties for this form of outdoor culture are King of the Ridge, Long Green, and The Gherkin, the latter being used for pickling.

Cucumbers, Frame-House.—All the long handsome cucumbers seen in shops and in markets are grown in warmth, under glass. But beginners in gardening, who have probably only a frame or small greenhouse at their disposal, can grow them only in a small way. To have the fruits early, the most useful way in this case is to obtain stable manure early in the spring, and to make up a proper hot-bed for the purpose. To do this well the manure should be obtained all at once, and in sufficient quantity. If a frame be of the ordinary one-light size, 6 feet by 4 feet, a good cartload of manure will be needed, and for a double-light frame quite two cartloads are needful. When obtained, the whole of it should be well turned into a neat heap, and shaken or mixed, removing the bulk of the long straw. That, of course, reduces the quantity, but it is needful. When the heap has been thus made, a long, pointed stick should be thrust deep into it. After four or five days that can be pulled out and felt to test heat, and if found hot the heap should be at once re-turned and well shaken together; also the manure during the process should receive several good sprinklings of water, not to deluge it, but to damp it

equally. After remaining for some six days, and being again tested, the heap may be taken and built up into a hot-bed, on which the frame is to rest. That bed must be 12 inches longer and broader than the frame, that it may securely stand on it. The bed should be firmly trodden when made, and be rather higher behind than in front, being in a sheltered place, and facing the south. So soon as made the frame can be placed on it, with a mound 6 inches deep in the middle of good turfy loam, with which is mixed a very little well-decayed manure. An inch thick of the soil may be spread over the rest of the bed. The glass light may then be put on. Any spare litter or straw can be packed round the bed to exclude wind and air, and over the frame mats may be laid. When the frame is found to be filled with steam, tilt the light a couple of inches at the back to allow it to escape. When that steam declines the Cucumber plants may be put out into the mound, the roots being well buried, but very little of the stems. For a single-light frame two plants are ample. After planting give a good watering with tepid water and shut down the light. It may be well to shade a little in hot sunshine, but the glass should be covered with mats at night. In a couple of weeks tiny white roots will be seen coming out from the mound of soil. Then another inch or so may be added all over the bed, and that will suffice for the season. A gentle watering should be given each other day, and the leafage syringed each afternoon just as the sun is going off.

After Culture consists chiefly in keeping shoots fairly thin, admitting a little air, frequent dampings or syringings, and should green-fly appear on the leaves, giving an occasional smoking with tobacco, filling the frame with smoke, and covering it up close for a few hours, when no doubt the insects will be found dead. A hot-bed of this description should not be made up until the middle of April, as by the time the heat is gone the sun will be warm enough to satisfy the plants' needs. Attacks of red spider or thrips on the leaves, causing them to turn brown and wither up, are the result chiefly of keeping the soil and plants too dry.

House Culture.—For forcing Cucumbers early the best description of house is one that is low and narrow, having beds on either side of soil on which the plants may be grown, and plenty of hot-water piping to keep up a good heat. But where there is only a small house with little heat the beginner should, as for a frame, purchase strong plants in pots from a florist rather than attempt to raise them, as that involves so much trouble and loss of time. In such a house a very large flower-pot or a box 12 inches wide and broad, and 10 inches deep, will do for the soil, or that may be with some turf at the bottom and sides built up in the form of a mound, 2 feet across and 12 inches deep in the middle, the plants being put out in or on these things singly. If pits or boxes be used they should have large holes in them to allow water to percolate through. The best drainage consists of rough pieces of old broken turf, the soil as advised for frames being placed upon it. If there be no artificial heat in the house it will be best to wait before planting until the middle of May, when strong plants may be put out safely. Such plants after they make a strong leading shoot, which at 12 inches long has to be pinched back, soon produce several shoots. These must be trained to wires or laths secured just about 10 inches under or below the glass roof, and in time these shoots will cover a large area in this way. It will be needful occasionally to cut or pinch out some of the non-fruitful shoots, or otherwise the plants will become far too crowded. Male flowers, which are not fruit producers, come first and numerous. Female flowers appear on the points of the fruit, and usually open after the fruits are from 1 to 2 inches in length. It is needful to fertilise these by using pollen from the male flowers only when seed fruits are needed, but to get proper fruits for table, fertilising the flower is wrong, as the fruits are less fitted for eating.

House Cucumbers need frequent syringings, indeed quite twice daily, except when the weather is dull and cold. The door of the house where the plants are may be partially open during the day, but must be shut close up at night. Damp down the paths and staging then to generate a moist atmosphere which the plants like, whilst plants thus grown will need a liberal watering every other day. Later, when several fruits have been out, it is well to make some weak liquid manure and give them a good watering with that at least once a week. It is wise, however, in all cases not to allow water to come into close contact with the main stems.

Varieties of Cucumber for glass culture are numerous, amongst the best being Lockie's Perfection, Telegraph, Rochford's Market, Peerless, Matchless, and Sutton's A 1, the latter three being specially good for exhibition. For ordinary frame culture Sutton's A 1 and Telegraph are the best.

Endive.—This is a leaf salad, harder than Lettuce, and suited only for winter use. When properly grown and blanched white, the leaf hearts of the plants make excellent food. One sowing of seed usually suffices for ordinary needs. That sowing may be made about the third week in July, thinly, in a bed in the open ground. When the plants are strong they should be lifted carefully and dibbled out in rows 12 inches apart, on

borders or beds made to slope somewhere to the south. There, needing only an occasional hoeing, they remain and become quite strong. There are two forms, the Curled and the Broad-leaved or Batavian. Both are hardy. When fully grown the former is best blanched by covering the plants close on a dry day with boards or slates, tiles, or similar materials, as by thus excluding light and air the hearts become white and tender. When such is the case they can be cut and eaten. The Batavian Endive, being of more erect habit, can be blanched by tying up the leaves closely. A second planting rather later can usually be made from the one sowing, and thus a succession is obtained. In some cases, plants when of full size are lifted with balls of soil attached to the roots, and blocked in close together in a dark frame, or cellar, or outhouse, but kept absolutely dark, and in that way are easily blanched. Some, failing other conveniences, may be put, a dozen at a time, into large boxes, which can be covered up close with lids or newspapers.

Horse-Radish.—A little of this in a garden is very useful. Short sets or crowns should be planted in deeply cultivated soil in February.

Kohl Rabi.—During recent years the small or garden forms of this vegetable have become popular. It somewhat resembles a green turnip, and seeds should be sown in April in shallow drills 15 inches apart. Thin as advised for Turnips, which see. Good varieties are Earliest White and Short-top Green.

Leeks.—These edible stem plants deserve far wider culture than they usually get. Possibly some prejudice against them exists because they belong to the Onion family, but their perfume and taste are not strong, and they are really excellent as a cooked vegetable when properly blanched, as the process of blanching the stems takes away all strong flavours. Leeks can be easily raised from seed, and a gardener in a small way may raise sufficient plants for his first crop by sowing seed in a 10-inch shallow pan filled with fine soil, standing it in a frame to promote germination. That may be done early in April. The young plants, when 4 inches in height, may be lifted from this seed-pan, and be dibbled up thinly into shallow boxes, or under a hand-light, or in a frame, where they become strong and well-rooted in about a couple of weeks. From thence lifted carefully with balls of soil and roots, and transplanted into a trench as prepared for Celery, growth soon goes on, and in a little time some soil may be put around the stems, this going on all the summer, and by the end of August, or soon after, the plants will have stout stems, blanched as white as snow, to a height of from 10 inches to 12 inches. These may be lifted and trimmed, and cooked as required. A second sowing may be made outdoors about the middle of May. From this plants can be put out, as before described, late in the summer, and they will be hardy enough when well earthed up to stand the winter, and give stems over a long season and at a time when vegetables are scarce. Stems such as are usually furnished at exhibitions are very large, quite as big round as broom handles. These are far too big for ordinary table use. Those about the dimensions of an ordinary walking stick are better. Many persons are content to dibble their plants out into rows 18 inches apart, letting the stems down in dibbling them quite 4 inches, and then later, as the plants grow, adding a little soil to them. But it is much better to prepare trenches with manure buried into them, as is done for Celery, as growth is quicker, and the blanched stems are, when cooked, more tender. There are a few slightly diverse varieties of Leeks, but under ordinary cultivation one is about as good as another. For exhibition, the Champion, Exhibition, and Lyon are esteemed the best, and they are equally so for ordinary garden culture.

Lettuce.—The most popular and widely-consumed of all leaf or heart salads is Lettuce, and it can be had good for a long season. There are two diverse forms, one being tall, and erect, called Cos, the other of dwarf form, somewhat squat, and hearting, and called Cabbage. There are white, green, and reddish lines in both sections, and some of the latter are much curled. Both are good, although some consumers prefer the latter form for eating. Seed is cheap and plentiful. Sowings may be made at frequent intervals, beginning in March under glass, sowing thinly in a shallow box or plan, and standing it in a frame or greenhouse; then having the young plants, when a few inches high, lifted out and dibbled 2 inches apart into other boxes, or else into a frame, or under hand-lights, for a few weeks, when they are strong enough to plant outdoors on to a warm border to give a supply for early cuttings. Both Cos and Cabbage forms may be so sown. A further sowing may be made on a warm border, and rather more largely, early in April, and others, always quite small ones, in succeeding months, as in that way a supply of plants for cutting is kept up. The latest sowing should be made about the middle of September, in a frame filled with soil to within a few inches of the top. Such a sowing should be of Hick's Hardy Green Cos, and Black Seeded Brown Cos. These are amongst the hardiest, and can be kept as strong seedling plants through the winter, ready to plant out in March in a sheltered position. The latest sowing for outdoors in the summer should be made about the middle of August of the above-named varieties and of Hardy Cabbage varieties. These can be planted out at the end of September beneath walls, or on warm, sloping banks or borders, to stand the winter. Summer Lettuces are most valu-

able, because the leafage is so cool and pleasant to eat in hot weather. A good variety to stand heat is Mammoth White Cos, but when planted from June onwards the position should be partially shaded, the soil deeply worked, and where ample water can be given. When the position is hot and dry the plants do not heart in, but bolt off to flower. Whilst in the summer, beds planted with Lettuce may be made to slope to the north, in the winter they should slope to the south. Very thick sowing results in the production usually of far more plants than are needed, and so many that are weak and drawn. Thin sowing and early planting out thinly from seed-pans or beds prevent weakness and a drawn growth. Lettuces, being in the young stage tender and succulent, are much relished by slugs and snails. It is therefore, in planting out, needful to dust about the plants freely, especially at night, with fresh-slacked lime or good soot. This needs to be followed up for a couple of weeks after each planting until the plants become hard. Cabbage Lettuces need no tying, as naturally they heart in firmly, neither should any good stock of tall or Cos Lettuce; the practice of tying them with bast or raffia is carried out chiefly to assist the hearts to form and become blanched earlier.

Varieties.—Of Cos or tall varieties the finest is the Mammoth White Cos for summer, and Black Seeded Brown Cos for winter. Of Cabbage varieties, Hardy Hammersmith and Grand Admiral are good for winter, and Holborn Standard, All the Year Round, Matchless, and Heartwell for summer use.

Maize or Sweetcorn.—This is a very popular vegetable in America, and during recent years has been cultivated on a small scale in this country. Seed should be sown in March or early April in pans or boxes filled with rich light soil, and when large enough the seedlings should be potted singly into 5-inch pots. Grow as near the glass of warm frame or greenhouse as possible, and from mid-April onwards give as free ventilation as possible, the idea being to get sturdy, hard plants. When the pots are filled with roots give weak liquid manure once or twice a week. The plants must not be put in their permanent quarters until the first or second week in June. Select a warm place in the garden, trench the soil thoroughly, and heavily manure it a few weeks previous to planting. The rows must be 2 feet or 2 feet 6 inches apart, and the plants 2 feet apart in the rows. Plentiful supplies of water must be afforded during dry weather, as quick growth is essential. The seed spikes or cobs are the part used as a vegetable, these being picked whilst green, and gently boiled with the outer coat intact. Good varieties are Early Yellow, Quarantain, and White Sugar Cane. Variegated forms are often used in the flower garden. Their cultivation is as advised above.

Mushroom.—This acceptable fungus is artificially grown both outdoors and indoors. The common method for outdoor culture is to make up beds in ridge form of stable manure and spawning them. The manure must be that of horses, and of those that are healthy only. This should be one-half of droppings, the rest of rather short straw. When there is much long straw the greater portion should be shaken out. The manure should be kept in an open shed, or, if otherwise, when in a heap, covered up with mats. As soon as collected it should be well shaken up, mixed, and put into a neat heap. If it seems dry, then it should have, as the turning takes place, a liberal sprinkling of water. The turning should be repeated in some five or six days, or when the heap is found to have become hot again. If found dry, more water should be given. A third turning may be needful to get the manure into good condition, and after that it can be built up into a bed, having a base $2\frac{1}{2}$ feet wide and the same height in the centre, trodden firm as put together. The heat of the bed should be tested with a stick forced into it, and as soon as found to be hot pieces of mushroom spawn, such as are purchased in dry, square cakes from seedsmen, should be well forced into the surface of the bed at some 8 inches apart all over it. The cakes may be cut each into some eight pieces. Next coat the bed over with 2 inches rather close loam from a pasture, give a good watering, using tepid water, then cover it up well with a thick coat of straw litter, and if it be winter then cover with mats also. Beds of this description produce mushrooms in about two months. They can be made from September until April. If beds be made slantwise or sloping under a wall or in a shed or cellar they must be from properly prepared manure as described, be solid, spawned, and covered up.

Onions.—Sowing seed of these somewhat odorous bulbs was formerly limited to two seasons—the spring and late summer. Now it is a common practice to sow seed under glass in January, putting the plants outdoors in April to grow into extra large bulbs. Being somewhat deep rooters and gross feeders, Onions need both a deeply worked and well-manured soil. Many growers adopt the rule of putting Onions on the same ground every year; others alternate the crops, Onions one year, Cabbages or Peas the next. But whether the ground be so cropped or whether several crops follow the Onions, it is indispensable that the ground be always trenched fully 2 feet in depth during the winter to secure a good crop of bulbs and have a heavy dressing of well-decayed manure worked into it, especially putting some down deep to attract roots to it, and thus furnish them

with a liberal supply of food and moisture during dry weather. A method of getting ground into fine condition for Onions is, after trenching and burying a dressing of manure deep into it, to give to the surface a further dressing of well-decayed short manure, forking that in several inches deep, then leaving the soil to settle down for several weeks before sowing the seed. It is the nature of Onion plants to send roots down deep and direct, but they like the soil fairly firm on the surface, as that tends to force the plants into bulb formation all the sooner.

Times of Sowing Seed.—What is commonly called the spring sowing of the main crop is usually made in the month of March or early in April. The condition of the soil and nature of the weather must determine the exact time, but it is always well to remember that the tops of very early raised plants often suffer from sharp spring frosts. The usual practice is to strain a garden line across the plot of ground to be sown, and by its aid then with a hoe to draw shallow drills 12 inches apart, sowing the seed thinly along these, and covering it up with soil. If the soil be naturally light, loose, or porous, it is wise before drawing the drills to either tread it over evenly or to run a light roller over it, as that makes it firmer. After filling in the drills the whole plot should be neatly raked over and trodden when dry. The customary autumn sowing is made from the 20th to the 30th of August under similar conditions, but in this case the ground need not be specially prepared if it has carried a crop of early Potatoes, Peas, or some other vegetable, and for these has been previously trenched or deeply dug and manured. It may be but needful to lightly fork over the surface to level it and enable the seed to be sown. As the plants have to stand outdoors all the winter it is unwise to have the soil too rich, as if the plants be coarse or unduly gross they may be killed by severe frosts. The seed sowings may be moderately thin in both cases, as where the plants are thicker in the rows much labour is necessary later in thinning them, and there is also much waste of seed. Even though many plants be used for salading in a young state it is not well to allow them to remain to become large enough for that purpose in the rows that are to be thinned for the main crops. It is so much better to sow one or two extra rows more thickly with seed expressly for pulling when large enough, and clearing the plants entirely as wanted. From the autumn sown breadths it is good practice in March to lift some plants carefully so as to preserve the roots, and to dibble them out into rows 12 inches apart, the plants being 6 inches from each other in the rows. If the planting be carefully done so that the roots go down well into the holes and be firmly fixed, the bases of the plants just being covered, and the ground has been well prepared, much finer bulbs usually result than in the rows of the plants left where sown. As a rule the thinning of the autumn-sown plants is not done until March or thereabouts.

General Culture after thinning consists of a free use of the hoe between the rows through the growing season, and an occasional dressing of soot or of some artificial manure or guano in showery weather, having it well hoed in. That washes down and greatly assists the formation of fine bulbs. Still it is best to give these dressings after bulbs have begun to form. It is also good practice to go over the plants when strong and well advanced, and to gently press the stems just above where bulbs are being formed, to cause the tops or leaves to rest on the ground and all one way. That practice not only gives the bed a neat appearance, but it assists the plants to form bulbs, which is the primary object in Onion culture. But very stiff-necked plants should be dealt with carefully lest they break off. The bulbs from a spring sowing are usually ripe to pull ready for storing for the winter about the end of August or early in September. They should remain on the ground to dry thoroughly for a couple of days, if it does not rain. If rain prevails then the crop should be pulled and put under cover before cleaning off decayed stems and final storing in a cool shed or store on shelves for the winter. Where the thinning has been properly done, the plants being about 4 inches apart, usually a very firm, even sample of bulb is produced. Autumn sown bulbs are usually thinned down to 9 inches apart. These are ripe for pulling towards the end of July or thereabouts.

Winter-Sowing.—To raise bulbs of great size and weight, the practice is to sow seed in shallow pans or boxes filled with light soil about the first week in January. The seed is sown moderately thick, then the pan or box is stood in a frame or greenhouse where there is a little warmth, and kept near the light; growth follows in a couple of weeks. When the plants are 3 inches in height they must be lifted from the seed-boxes and be dibbled, 2 inches apart each way, into other shallow boxes, or singly into 3-inch pots, filled as before with light soil, well watered; then stood on shelves or near the grass. There they must remain until the plants have become 6 inches in height. Then put the boxes into a cold frame, where the plants get plenty of light and air. Every care must be taken to keep the plants erect, which they will be when well exposed to the light. Planting outdoors is done from the middle to the end of April, the ground for these plants having been previously trenched and manured as advised for the spring sown crop. The rows, marked out with a line, should be 16 inches apart, very shallow drills

being first drawn. Into these put the plants at 12 inches apart, lifting them from the boxes with a garden trowel, so as to retain to each a nice ball of soil and roots. Only these balls but no portion of the stems should be buried in the soil, well fixing them, and, if needful, watering in. Because thus early raised, and having so much space between them, the plants make very strong growth, and later in the summer produce exceptionally large bulbs. Good growers commonly obtain bulbs weighing from 2 lb. to 3½ lb., perfect samples, hard and well ripened. Usually these bulbs are ready to pull from the middle of July to the end of August, as may be wanted for exhibition or storing. Such bulbs are excellent when baked or stewed, being mild and succulent.

Varieties.—The common pickling form is the Silver-Skinned, but almost any ordinary variety sown thick and left to form bulbs unthinned will produce picklers. The ordinary time for sowing these is in April.

Winter-Sowing.—To obtain exhibition bulbs the finest stocks are Ailsa Craig, Cranston's Excelsior, and Sutton Globe, oval-shaped; and Lord Keeper, A 1, and Main Crop, round.

Spring-Sowing.—Fine oval varieties are those above-named and Southport Red Globe, James' Keeping, and Champion; of rounds, Improved Banbury, Improved Reading, and Rousham Park Hero.

Autumn-Sowing.—Any of the above varieties, or of softer onions, Giant Rocca, White Leviathan, Globe Tripoli, and Carter's Record.

Parsnips.—Hardier than are most of the summer grown roots, a sowing may be made so soon as early in March, or at any time during that month, if the soil be in good condition for sowing seed. Generally but one sowing of this root crop is made, as the roots are not required for consumption until the winter, and are not acceptable then until matured by a long season's growth. To secure clean, well-shaped, though not necessarily long roots, the ground should invariably be trenched during the winter, and have added a moderate dressing of manure well buried down to encourage the main or tap root to go deep rather than favouring the formation of side roots, which fresh manure near the surface promotes. Drills for the seed should be 12 inches apart, and be about 2 inches in depth. In sowing the seed, place it thinly equally along the drills, as otherwise much is wasted, and great labour in thinning the plants later is entailed. This thinning should be done when the plants are 3 inches in height. Prior to that the soil between the rows will be all the better for a free deep hoeing, as that facilitates thinning the plants afterwards. The thinning should be to fully 8 inches apart, but if extra large roots are desired, 10 inches apart is not too much. During the summer and autumn the only culture needed is by the frequent use of the hoe between the plants to keep the soil loose and clean. As Parsnips are quite hardy, the roots may be left in the ground all the winter, provided that either some litter or soil be placed over the crowns of the roots in hard weather to exclude frost. It is a good plan, however, to lift every alternate row from a bed, and store the roots in dry sand, ashes, or soil in any cold place under cover, merely cutting off the leaf stems an inch from the crowns. Then there is ample space between the other rows to mould soil over them, but it is quite soon enough to do that early in the new year, as until then frost is seldom hard enough to do Parsnips harm. All experience, however, goes to prove that roots left in the ground keep so much fresher and sweeter than are those earlier lifted and stored. Roots of medium size, clean, and just scraped over and left white, then boiled slowly in sufficient water to cover them in the pot, the water gradually boiling away until the roots are soft, are, when served to table, far more acceptable as food than are roots peeled, cut to pieces, and boiled in water all the time. It is probably largely due to lack of knowledge how best to cook Parsnips that these most nutritious roots are less eaten than they should be. There are few varieties. The most commonly grown is the Hollow Crown, and the whitest selection from that variety is Tender and True, which is so far the best in commerce. A good stock of The Student is very good also. It is better in all cases to secure clean roots of medium size, as they are less watery than are large ones, and furnish the best food.

Peas.—These pod-bearing plants, because productive only during the summer season, have special need for deeply worked soil, to enable roots to go down in search of moisture and food. Where Peas are sown on a light soil that is only dug 12 inches deep, they invariably fail to produce a satisfactory crop in warm weather. When the soil is trenched 2 feet deep, and a good dressing of decayed manure buried into it, then the plants invariably keep vigorous and healthy, and carry a fine crop of pods. These are elementary facts that every beginner in gardening should understand. Then a too common fault in Pea culture is sowing seed far too thickly in the drills. Now a proper Pea drill should be fully 4 inches deep, drawn with a large hoe quite straight beside a line of cord, and be fairly broad at bottom. But in the case of large-seeded, wrinkled marrow Peas, especially if the plants reach from 5 feet to 6 feet in height, a pint should be made to sow 100 feet length of rows. That means thin sowing certainly. If the plants range

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PEA MAYFLOWER, A GOOD FIRST EARLY VARIETY.

POTATO ROYALTY, A WHITE MID-SEASON VARIETY (See Page 413).

to a height of 3 feet, then make a pint of seed sow from 80 feet to 90 feet run, and if quite dwarf, that is, from 18 inches to 20 inches in height, then the sowing may be a little thicker. These instructions should be carefully borne in mind, as it is a common fault to sow a pint of peas in a row from 40 feet to 50 feet in length. When plants are thick, naturally they fail to find root room, or plant room later, and suffer accordingly. Then, when rows of Peas are sown side by side, the drills for tall Peas should be 6 feet apart, 3 feet to 4 feet Peas 4 feet apart, and the dwarf ones from 2 feet to 2½ feet apart. Tall Peas should be sown only where the soil is deep, holding, and rich, and when it is intended to support them with branching stakes. Peas of medium height pay well for such staking, but if sown to remain on the ground, as field Peas do, the rows need not be more than 3 feet apart.

Times of Sowing.—Little is gained by very early sowing, except on a warm, sunny border, close under a wall. But even then if one be made early in February, it is soon enough. A second may follow at the end of the month also on a warm border, and from that time two sowings per month may be made in the open ground up to the end of May. That course should give a long succession, especially if the latest sowings be of naturally late varieties such as do best in the autumn.

Varieties.—There are literally hundreds of so-called varieties of Peas in trade, but many of them differ almost only in name. One great feature of present day Peas is that all the best now are of the wrinkled marrow form, and these are much better than are the old round-seeded varieties. All the class known as wrinkled produce seeds when ripe that are much shrivelled in appearance, but when sown soon absorb moisture, then swell up and become double the previous size. These Peas have higher flavour and more sugar in them than the round varieties. Still further they produce much finer and better filled pods, and generally heavier crops. There is little need now to sow any of the old hard-seeded varieties in gardens, indeed they are chiefly sown in the fields for early market gatherings. Of good early varieties the best are Chelsea Gem, Carter's Eight Weeks, Early Morn, Little Marvel, Dwarf Gem, Pilot, Mayflower, Sutton's First of All, Gradus, Laxtonian, and Thomas Laxton. Second earlies: Webb's Paragon, Defiance, New Model, Carter's Daisy, Buttercup, Sutton's Centenary, Prizewinner, and Dwarf Defiance. Main crop: Peerless, Quite Content, Eureka, Senator, Ne Plus Ultra, King George, Universal, Gladstone, Glory of Devon, Omega, Autocrat, Telephone, and Carter's Michaelmas. For latest crops choose Ne Plus Ultra, Gladstone, and Carter's Michaelmas.

Pea Diseases.—One material trouble to which Pea plants are subject arises from attacks of those exceedingly minute insects called thrips. These suck the sap from the leaves, and cause them to turn pale and become thin. When that is so the crop suffers. An occasional syringing very gently with some insecticide helps to destroy these pests. Great heat and drought generate them. In the same way mildew is often generated. That is best destroyed by gently syringing or spraying the plants with the Bordeaux mixture, a solution of equal quantities of sulphate of copper and lime with water. A couple of dressings usually kills the mildew, but does the Pea plants no harm.

*The Potato (*Solanum tuberosum*).*—Were a teacher about to examine a class as to the knowledge of the members respecting the Potato, no doubt the first question would be, "From what part of the world did it come, and when?" Taking the last point first it is sufficient to say that the Potato was introduced into Europe rather more than 300 years ago, and that Sir Walter Raleigh (the famous navigator of the Elizabethan era) is credited with its introduction into England. But whilst exact data on this matter may be of small moment, it is of importance that we should know accurately as to its native habitat, and the pupil's reply would be that it came from South America, chiefly from Peru, Chili, and Brazil, where it grows as a wild plant, having somewhat coarse stem and leaf growth, and creates in the ground numerous small tubers that were found to be edible. The importance of knowing of its habitat, a very warm part of the world, is that we in cold Europe have to grow it under conditions such as most assimilate to those of South America. Hence we find it still to be a very tender plant, exceedingly susceptible to harm from frosts, or other climatic troubles, the tubers also being too tender to be exposed to frost during the winter. Down to the beginning of the nineteenth century the Potato seems to have made comparatively little progress. But since that time it has been greatly changed under the influence of intercrossing, of selection and of culture, so that now we have the finest varieties in the whole world, and grow the tubers as articles of vegetable food of importance to the human family second only to wheat.

Propagation.—All growers of the Potato find it is easy enough to make stocks to increase by means of the root tubers so abundantly produced by the plants. Commonly the lesser ones are utilised as seed tubers for planting, the larger ones being eaten. But it is of the first importance that the tubers be for these diverse purposes differently

treated. All tubers to be eaten as food when cooked must be kept secluded from light in soil pits or clamps made outdoors, but well covered with straw and soil to exclude rain or frost, or they must be kept in cellars or dry sheds well covered up. The object in excluding light is to prevent the tubers from becoming green, as they will be if thus exposed to light, and when so greened be quite unfit for eating. The seed tubers, on the other hand, need to be so kept that, whilst dry and free from frost, yet they have ample light and air, so that the skins by such exposure become hard, and when later in the winter the eyes or buds begin to shoot or burst into growth, such shoots as may be formed will then be stout, strong, and green, and can be retained on the tubers for planting. Were the tubers kept in darkness, the shoot made from the eye would be long, weak, and blanched, and in that way worthless, while their production would rob the tubers of much nutriment, and check the production of strong shoots when planted.

Preserving Seed Tubers.—The best and simplest method of doing this satisfactorily is to have shallow trays or boxes made from thin boards. These may be but 4 inches deep

FIG. 26.

Produce from Sets with only one strong
Shoot when planted.

Several Stems and small Tubers
due to bad storage.

inside, and be of such sizes as may be preferred. Those of 14 inches by 18 inches hold quite a large number of seed tubers, which should be stood in the boxes with their shoot or bud ends upwards, and close together. If a strip of stout wood be fastened to each end of the box to form a handle, great convenience for moving and planting are furnished. These boxes may be stood in quite a cool, airy place during open weather, and be stacked close together and covered up, or removed into a less cold position when frosts threaten. It is difficult to overestimate the value of such treatment meted out to seed tubers, as the crops from such cared-for sets are usually double in bulk to those that result from badly wintered tubers, especially as bad storing always tends to weaken the stock. Only one or two of the strongest shoots should be left in each tuber at planting time, rubbing the weakest out. If all are left a lot of small tubers will result.

Raising from Seed.—The Potato as grown now, with the object of securing the greatest possible crop of tubers or root produce, seldom produces seed naturally, although the plants will in the summer bloom profusely. The plants seem incapable of carrying at once abundant root tubers and seed balls or apples which contain seed. Those who wish to raise Potatoes from seed must obtain pollen or fine fertile dust from the flowers of one variety, and employ it to fertilise the pistil points of one or two flowers on some other variety, and thus induce the bloom to set, to carry seed, balls or apples. These when ripe can be saved, kept in a box in a dry place for the winter, when only seed and skins will be left. The seeds may then be cleaned, and about the middle of April sown in pans on fine soil, and be stood in a greenhouse or frame to germinate. Later the young plants have to be dibbled thinly into shallow boxes, and from these at the end of May be transplanted into the open ground in rows, 2 feet apart, for the summer.

Planting the Sets.—A fairly light, deep soil suits the Potato well. It need not necessarily be rich with fresh manure; generally it is best to manure well for some previous vegetable crop, and then follow with Potatoes. But the soil should always be deeply worked, and broken quite loose. Very early varieties may be planted on a warm border during March, but some protection from frost must be furnished to the plants. For all ordinary purposes and main crops, it is early enough to plant from the second to the fourth weeks in April. Moderate growing varieties may be put into rows at 2 feet apart, and strong late growers should be in rows 30 inches apart. A good depth to plant is from 4 to 5 inches. In the rows the sets should be from 12 to 15 inches apart. There is no gain in planting closer, and often much loss in doing so. As to methods of planting, the tubers must be properly buried in the soil from 4 to 5 inches deep without injuring the shoots on them. On light, loose soils a large dibble, shod with iron, answers very well, but generally it is best to plant as the ground is being dug, or, if previously dug, to throw out furrows of the above depth, setting the tubers into them carefully. If any artificial manure be employed, it is a good plan to strew it into the furrows with the tubers.

Moulding the Plants.—This treatment is given to Potatoes for some two or three reasons, but chiefly because were soil not heaped over the tubers many would be exposed to the air, and they would thus become green and unfit for food. A good ridge of soil drawn about the plants also helps to keep the stems erect and protected from harm by strong winds. Prior, however, to the moulding up, the soil should be very freely hoed so as to destroy weeds, and render the surface loose and pulverised. The moulding up is ordinarily done with the long-handled hoe, but the greatest care should be taken not to bury leaves, rather to draw up the soil under them. A good moulding up to a sharp ridge also helps to throw off heavy rains from the tubers, and also those fungus spores which produce the disease. It is often, when the soil is rather poor, good practice to sprinkle from 3 lb. to 4 lb. per rod of nitrate of soda or sulphate of ammonia between the rows of plants before the moulding up is performed. When lifting the crop, the medium-sized tubers should be gathered up separately, and be exposed to the light and air to harden them, whilst the larger ones intended for eating should be put into a dry place, and secluded from light and air.

The Potato Disease.—This is a trouble our Potato crops are never free from. But they suffer less in warm, dry seasons, and more in wet ones. The disease is a fungus propagated by minute spores that become living and active germs during the summer, and, lodging on the plants, are by moisture induced to root or grow into the leafage and stems, as also in the newly-forming tubers in the soil, and thus produce those black spots with which we have long been made familiar. Only one form of dressing seems so far to have been capable of checking the growth of these spores on the plants, and that is found in what is called the Bordeaux mixture, which consists of equal portions of sulphate of copper, or bluestone, and of fresh lime, dissolved in water. If 5 lb. of bluestone be put into a bag and suspended in a wooden tub containing 5 gallons of boiling water, it will dissolve in 24 hours; and 5 lb. of lime should be dissolved in a large pail holding 5 gallons of water until quite clear. The latter liquid should be mixed with the copper solution, and to the whole add 40 gallons of water. It will be wise to add 5 lb. of soft soap, well dissolved, to the mixture, to render it more adhesive. This mixture is then sprayed by the aid of a knapsack-distributor over the Potato plants, giving one dressing early in July and a second towards the end of the month. Such dressings usually suffice to keep the breadths quite free from harm by the Potato fungus.

Varieties.—These are very numerous, and, because new ones are annually introduced, are constantly varying in popularity.

First Earlies for frame, pot, or border culture: Ashleaf, Sir J. Llewelyn, May Queen, kidneys; Harbinger, and Laxton's First Crop, rounds. Earlies for open ground: Puritan, Midlothian Early, Snowdrop, kidneys; Early Regent, Snowball, and Ninetyfold, rounds. Main Crop Varieties: Up-to-Date, Royalty, and Reading Giant, kidneys; Emperor, Windsor Castle, Balmoral Castle, and The Factor, rounds. These are all whites. King Edward VII is a good Main Crop Potato with red blotches on the skin.

Radishes.—These are very varied in character, as they include long tapering, oval, and round roots, in diverse colours; also for winter use, round and tapering large roots, black, white, and red. Radishes are eaten raw as salading, the most favoured being those oval or round rooted forms that come in early in the spring. Seed of those should be sown evenly on ground that has been heavily manured, the dressing being just buried with soil. The first sowing may be made in February, the rest, following at fortnightly intervals, being small ones. When the seed is sown it should be very lightly covered with fine soil, then patted down, watered, and covered with long litter or netting to keep off birds. As growth follows, the covering may be removed. It is simply needful to

repeat this form of culture all the summer. It is of little use to sow Radish seed in poor ground, as growth is too slow, the roots become hot or hard, and the plants soon bolt off to flower. Water should be given freely in dry weather when sowings are made regularly and often a mere patch of a few yards in area is ample for single sowings. The earliest of all is the Red Globe Short-Top, but there are few better ones than the round and globe-shaped French Breakfast, with their white tips, and these may be followed by the red and white turnip-rooted. Those who like long Radishes may prefer the Long Salmon and Wood's Early Frame, but for these the soil should be deeply worked; the roots are also a few days longer in coming to maturity. In all cases roots soon become woolly or hollow, hence it is important to sow often. To have winter Radishes of fair size it is well to sow seeds on good ground in June and July, having the plants in drills 12 inches apart, where they can be moderately thinned. The best of these, all excellent when peeled and sliced for winter salads, are the long black, white, and carmine varieties.

Rhubarb.—A very useful and popular edible stem plant. Rhubarb is easily grown, yet it needs to be grown well. Plants can be raised by sowing seed outdoors in May thinly, in a drill, thinning out the seedlings to 20 inches apart, but especially saving those which seem to be the earliest and strongest as well as that show most colour in the stems. After the leafage has died down in the winter, these roots should be lifted and planted out on deep, well-manured ground, in rows 4 feet apart, and 3 feet apart in the rows. So treated, they soon become strong, and give plenty of stems.

But seedling Rhubarbs are of several varieties, whilst plants obtained by division are true to name. If, therefore, no roots be at hand, a few can be purchased cheaply from the nursery or seedsman. These will be stout and fleshy, and have one or two crowns. They should be planted as advised for the seedlings, during November or December, and some long litter manure laid about them as a protection from frost, because newly planted. Growth will commence in March, but no stems should be pulled from these plants that year. The following spring they will break up very strong, and many stems may be pulled then up to the middle of May. Then the plants will again make strong growth for the rest of the season, and should be left alone. Winter culture consists in spreading over the ground between the plants a dressing of manure, which may be lightly forked in, and just over the crowns may be put some light litter, as that helps to promote quicker growth in the spring. It is a good plan to put out a few new or small roots each year, as after the third year the roots, then large, may be lifted as wanted, some two or three at a time, beginning in January, and be stood in any warm, dark place, with soil about them and watered, when stems will soon be produced, and thus give very early Rhubarb; or, if preferred, some roots may be simply covered up outdoors with tubs, boxes, or big pots, and these with long manure or leaves, and thus induced to make early growth for pulling. Once a good stock of roots is obtained, a few should be lifted and divided every year for planting as advised. Roots should never remain more than four years, if they do well, without being divided. The best varieties are Hawke's Champagne, early; Hobday's Giant and Victoria for later use.

Small Salads.—Of these the best and most commonly grown are Mustard and Cress. Market growers use Rape instead of Mustard, as it is less hot and far cheaper. In a small way the best method of growing these salads is to have several boxes, each about 12 inches by 20 inches, and 3 inches deep. They should be filled with good loam and well-decayed manure, and have on the surface a thin top of fine sandy soil well pressed down, and within a third of an inch of the top of the box. On to that the seeds of Mustard and of Cress, in separate boxes, may be thickly sown, pressed down, and well watered, then covered up with newspapers and stood in a frame or greenhouse. The Cress being of slower growth should be sown 24 hours before the Mustard. It is important that the boxes be covered, the plant-growth lifting up the paper bodily, as that causes rapid development, and the salading is more tender. A couple of fresh boxes should be sown, and similarly treated each week, all through the spring and summer. If sown outdoors it should be under hand-lights, as otherwise growth is slow and hard. Another valuable small salad is Watercress, which is, of course, best grown in small streams, but may be had very good all the same in any small garden if a bed be made near a pump-tap or well, where watering twice a day can be given. The bed should be prepared in March by forking into quite a small space, say 3 feet by 4 feet, a good dressing of short manure. Strew over the surface some sharp sand and a little shingle or well-washed small gravel, then dibble in, 4 inches apart, Cress tops partially rooted, water them, and shade with paper or other thin material for a few days. Rooting soon follows, then growth, and if the bed be watered in dry weather twice a day, considerable gatherings may be had over a long season. A ridge of soil a few inches in height may be placed round the bed. Watercress can also be raised by sowing seed in a pan under glass, then dibbling the plants out as advised into a bed when strong enough.

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FORCING RHUBARB WITH HELP OF OLD BARREL.

FORCING RHUBARB WITH A SIMPLE COVERING OF STRAWY MANURE.

Salsafy and Scorzonera.—These are long tapering-rooted plants that do not obtain the wide cultivation they deserve. The Salsafy has long, narrow leafage, and long, narrow, white roots. Scorzonera has broader leaves and dark-skinned roots. The former enjoys on the Continent the designation of vegetable oyster, so nice are the roots when properly cooked. Seed of both plants should be sown about the middle of April in shallow drills, 12 inches apart, and on soil that has been deeply dug. When the weather is dry it is well to thoroughly water the drills an hour before sowing the seeds. The plants when 4 inches in height need to be thinned out to from 3 to 4 inches apart in the rows. The hoe should be freely used between them during the summer. Roots of both kinds are cooked and sent to table. They can be used from October onwards during the winter, but the roots should have some protection in hard weather.

Seakale.—This is a hardy British plant. Seakale, as its name implies, is partial to the sea coast. But it thrives well in any ordinary garden soil, provided that be well prepared for it. To obtain a supply or stock of roots, it is needful to sow seed. That can be purchased cheaply. For its reception, ground should be trenched 2 feet deep and well manured. Then, early in April, drills, 2 inches in depth, should be drawn with hoe and line at 20 inches apart. Along these the seeds should be sown thinly, and then covered up. It is not desirable, as the seed leaves are rather tender, that the plants should be above ground until the middle of May. When all are up they should be rigidly thinned out in the rows to 10 inches apart, as later on they need ample room. The ground needs to be kept well hoed as long as the strong leafage which will presently form will allow, but later that will quite cover the ground. In the late autumn, being mature, it will die away. In November the whole of the roots may be carefully lifted so as to preserve them intact, then each one must be hard trimmed of all branching or side roots cut off close to the main or tap root, which, when thus trimmed, should be about 8 inches long, and have a dormant crown at the tip. When trimming off all side roots the pieces should be carefully laid one way, so that the upper ends be known. But the first thing next to do is to chop down in the open ground with a spade a trench or furrow, 8 inches deep, and nearly upright. Into this the crowns should be placed on end upwards, quite close together, and some soil put up to them and gently trodden, as well as a little over the crowns. All these roots may be, a few at a time, through the winter put into boxes or tubs, or on the floor of a close, dark cellar, or in any warm but quite dark place, in several inches of soil, and well watered, and from each crown will come stems, that being in the dark will be blanched white and tender, and when 7 inches long may be cut with a part of the crowns and cooked. It is then a most delicious vegetable, and lasts, if there be plenty of roots, for some three or four months. All the side roots trimmed off should then be made into proper root cuttings. These should be from 4 to 5 inches long. The top part should be quite level, and the lower part slanting. Then all these root cuttings should be stood into trenches just deep enough to bury the tops when being placed thickly; soil is put against them and a little over them. Let that be done in November. Planting may be done at the end of March or early in April. For the reception of these cuttings the ground should be well trenched and manured, as is so constantly advised. The cuttings should be dibbled into it in rows 20 inches apart, and 12 inches apart in the rows, to give ample room. The tops of the cuttings should be buried half an inch in the ground. When, in a few weeks, leaves appear, each root should be gone over, and all but one crown removed. The ground must be well hoed, and one dressing of salt or nitrate, at the rate of 5 lb. per rod, well hoed in, will do great good. The roots will have to be lifted and treated each winter just as advised for the seedlings, and trimmed, root cuttings being preserved and again planted in fresh soil. In that way it is easy to have hundreds of roots to blanch during the winter, and no vegetable is more profitable. To have some late blanched growths, some of the rows, if only one or two, may be left in the ground, and early in March have some light, loose soil placed over them in a ridge, and 9 inches deep. When the ground shows signs of cracking, rows should be cut from at one end until all are consumed. These roots may remain to produce crowns if desired for the following winter.

Shallots are small, fairly hardy bulbs, members of the Onion tribe, that are grown yearly by the aid of small bulbs or offsets, planted in beds or in rows, 12 inches apart, in February. The ground for these bulbs should be deeply dug, and moderately manured. Planting may be done in the autumn, but early in February is the safest time to do so. If planted in a bed, let the rows be 12 inches apart, putting in the bulbs at 6 inches apart. These should not be of the largest or smallest, but those of medium size and good form. It is but needful to press each bulb down firmly into the soil, so that its top is just covered. Growth soon begins. Several stems usually grow, and each one forms a bulb at the base, so that when the tops die down and the bulbs are ripe, ready to lift in July, they are in the form of clusters of some seven to nine in number. If, after planting, sharp

frosts come, it may be wise after they have disappeared to make the soil about the roots somewhat firm. Not large, but nice, clean, even-sized bulbs are best. They are appreciated for pickling, and for soups and stews. The best variety is the Old Shallot, which has a brown, silky skin; and the largest is the Red Jersey or Russian, which is double the size and very productive, but is of stronger flavour.

Spinach.—This is a very useful, hardy, green-leaved vegetable that is easily raised from seed, and can be had over a long season. Its nature when gathered and cooked is somewhat bitter or astringent, but when properly prepared and sent to table with condiments that bitterness is toned down and becomes rather pleasant. Spinach is a very healthy product, and should be more largely consumed than is usually the case. Seed is both smooth and prickly, but all varieties have those characteristics. It is customary to recommend sowing round or smooth seed in the summer and prickly seed in the autumn for a winter stock, but that is a mere seed fancy. Without doubt the best varieties are for summer the Long Stander, which has large, thick, green leaves, and if well thinned out to 9 inches apart in the rows, stands much longer before running off to flower than any other. That and the Victoria or Viroflay, very large leaved, are the best for winter cropping. The drills should be fully 12 inches apart, drawn shallow, and the seed be sown thinly. Spinach needs good liberally manured and deeply dug soil. The earliest sowing may be made on a warm border about the middle of March, and others for succession every three or four weeks, not large ones, but to give a good succession. The final sowing should be made about the third week in August, as that will begin giving leaves in November and form the supply all the winter till quite the end of March. In all cases leaves only should be gathered, but not until the plants have become strong. Besides thinning the plants, the hoe should be freely used between the rows in all seasons, not only to destroy weeds, but also to keep the soil open and loose. New Zealand Spinach is a very useful vegetable in late summer and autumn. As the plants spread about a lot seed should be sown thinly in May in drills 6 feet apart. The young tops are picked for use, and the more these are gathered the more the plants spread. New Zealand Spinach does not run to seed, and is available for use until killed by frosts.

Tomatoes.—These plants are, like Potatoes, very tender, and so closely allied to them that it has been found possible to graft Tomatoes on to Potato stems, and thus exhibit the strange phenomenon of Potato tubers in the ground on the roots and Tomatoes above the ground on the stems. But the Tomato is a *Lycopersicum* and not a *Solanum*. They are, however, tender, and can be grown outdoors only during the summer months, but may be grown at any time in glasshouses when sufficient warmth is produced. Still it is never wise to attempt to fruit the plants in glasshouses during midwinter, for, because of the lack of sunshine, the fruits are few and quite flavourless. All the plants are easily raised from seed, as each fruit produces seeds in abundance. These, where any are saved specially for one's own growing, may easily be taken from the fruits by cutting them clean through crosswise, removing the seeds from the cells with a knife, washing and drying them, then saving in a paper bag until wanted to sow. In saving fruits for seed always select one of the finest and handsomest from a plant that fruits well, as in that way a good stock is obtained. Where it is desired to keep any stock true, only that one variety should be grown in one house.

Sowing Seed.—Generally it is best to make sowings in pots of from 5 to 6 inches across the tops, putting an inch depth of broken crocks or rubble into the bottoms, on to that some of the coarser soil used, then filling up with a compost of loam, leaf soil, and sharp sand. Press the soil into the pots fairly firmly, and leave it the third of an inch below the tops of the rims. Sow the seeds evenly and singly over the soil, putting about fifteen seeds into a 5-inch pot and twenty-four into a 6-inch pot. Then place over them fine soil the thickness of a penny piece, water gently, and stand in a frame or greenhouse. Until the seeds make growth it is well to place a sheet of thin paper over the pots to shade them if the sunshine be strong. But whilst seed sown thus in April or May will germinate—that is, grow very well without the aid of artificial warmth—if sowings be made earlier some such warmth is needful, as growth will be slow and very weak. But it is seldom necessary to sow seeds before the middle of April, and then the sun usually warms a frame or greenhouse sufficiently. Even then if the pots be stood in a box large enough to hold four of them and a sheet of glass laid over the box, great help is given to the seeds. Where there is no glasshouse plants may be raised in such a box thus covered with glass, if stood in a sunny place in a garden. Of course, some covering should be given to it at night.

General Treatment.—When seedling plants are some 2 inches in height and show what are called rough or second leaves, it will be needful to lift them carefully with the aid of a pointed stick from the seed pots, and put them singly into quite small or 3-inch pots, still using sharp sandy soil, and giving each pot some drainage. In thus potting the seedlings place them down so as to bury one-half of their stems. When all are done,

water gently, then stand them, whether in a frame, or greenhouse, or in a glass-covered box, as close to the glass as possible. Water should be given sparingly, as the little plants are apt to damp off if over watered. In three weeks it should be needful to shift the plants into 5-inch pots, still keeping the stems down a little into the fresh soil as roots break from them. After being in these pots for a fortnight, and under glass, the plants should be ready to plant out in a greenhouse, or to be put into large pots or boxes for similar growth, or be planted outdoors into a warm position.

House or Frame Culture.—The common method of growing Tomatoes under glass by amateurs is in large pots. The method is one of the best generally, as the roots are kept under control. Pots for this purpose should be 10 inches across the top. A few rough pieces of potsherd should be placed in the bottom, on that some coarse pieces of turfy loam, and then filled with a compost of turfy loam, old hot-bed, mushroom-bed, or well-decayed stable droppings, in the proportion of one-fourth to three parts of loam. A little wood ash may be added, as also a pint of bone-meal to a bushel of the whole compost, and well mixed. As the pots are filled the soil should be pressed into them firmly, then the plants from the 5-inch pots set into the centres, and keep the stems still somewhat down. Then the pots should be placed close together in a row where the plants are to be grown, the stems then being about 12 inches apart. Generally it is best to raise the pots on a stout shelf or plank to within 20 inches of the roof, if to be so trained, then tying the stems loosely but securely as they grow to wires, fixed some 10 inches from the roof. As growth ensues all side shoots which break out from the base of every leaf must be hard pinched off. Flower trusses break out from the main stem, and so long as the plants are kept watered and have occasional soakings of liquid manure, after fruits are well set, and also warmth is kept up, the plants will go on fruiting if kept for that purpose until nearly the end of November. Where pots are not to be had boxes 20 inches long and 9 inches wide and deep will carry two plants very well. In the case of market growers, Tomatoes are generally planted out on the house floors, and trained up erect; but that is not a method to advise for beginners or those who have but small houses, as for them nothing excels pot or box culture. Where a house or frame is not provided with fixed wires it is easy to fix strips of wood, or thin stakes, or bamboo rods in a slanting direction, and running just under the glass roof. The plants always fruit more freely when trained in this way than when trained upright. Besides keeping the side shoots pinched off, it is only needful to secure the stems (not too tightly), as they will swell later, to the supports with raffia, grass, or some other soft material, and pinch out the points or leaders of the plants when they reach the full length of their supports.

Setting the Flowers.—Very often amateur growers find it difficult to induce the flowers to set fruit at the first. Sometimes giving the stems of the bunches a gentle tapping two or three times a day helps to that end. Other growers hold a piece of white paper under the flowers, on to which by a vigorous shaking some of the pollen will fall, then take it up on a camel's-hair brush and touch the points of the pistils or the little points which project from out of the centre of the flowers. Tomatoes in houses or frames like plenty of light and air, which is better rather dry than wet. There is no need to use the syringe, and in watering it is not well to leave puddles or slops about, as such over-damping does harm. Even in watering it is better to keep the soil a little too dry than too wet. Too liberal waterings, especially when the fruits are ripening, greatly tend to cracking of the skins, and that is an evil, as mildew soon settles in the cracks and injures the fruits.

Outdoor Culture.—Plants should not be put into any position outdoors earlier than the end of May, and even then should have some protection from rough winds and night frosts until the end of the month. When planted against a warm, sunny wall or fence it is easy to furnish the desired protection by hanging sacks, mats, or some other material over them at night. When plants are put on to a border, or in the open garden, the first or second week in June is soon enough. If planted against a wall or fence, the ordinary garden soil is sufficiently good as a rule, but if poor a little well-decayed manure may be first dug in, the soil being made fairly firm. Then the plants turned out of their pots may be planted 12 inches apart close to the wall. If they be rather tall it is well to secure them by putting a cloth shred round each stem, which can be secured to the wall with a nail. But plants properly grown should not be tall or drawn, but be stout, sturdy, and well leaved. Of course, nailing becomes essential as the plants grow in height. In the case of those put into the open ground the rows should be 2½ feet apart, and the plants 15 inches apart in the rows. It is a very good plan to drive in a stout stake that will stand 3½ feet out of the ground, just where each plant is to be put. Thus a proper support is ready when needed. It is not desirable to allow open-air Tomatoes to grow higher than some 3½ feet, as beyond that height fruits will not ripen. Keep the side shoots of outdoor Tomatoes pinched as in the case of those under glass. In very hot, dry weather water occasionally, and place about over the soil a good mulch of long manure, as that serves to retain moisture and checks drying.

Varieties of Tomatoes.—There is an endless number of varieties. There are smooth, round and egg-shaped, both red and yellow. There are large and quite small fruited, as well as some of medium size. Some carry great clusters, some are nice to eat raw as table fruits, some to eat as salad, and some when cooked. The most popular ones are those which produce good-sized, round, handsome red fruits, and in great profusion. Good ones are: Perfection, Carter's Sunrise (splendid), and Duke of York. Good egg or plum-shaped fruits are: Ar, Regina, Challenger, and Peerless. There are some of a reddish, terra-cotta colour, but these are not in favour. The best yellow varieties bearing good showy fruits are: Golden Jubilee, Blenheim Orange, and Sunbeam. The best small-fruited or dessert yellow is Golden Nugget, one of great excellence, the fruit the size of damsons, rich colour and excellent flavour. The best reds are: Red Dessert and Cluster, both wonderfully productive, the fruit being about the size of pigeons' eggs.

Early Winter Crops.—When plants are raised from seed about the middle of June, and are grown on into large pots, as previously described, they are kept outdoors till the end of August. These are put into a greenhouse, near the glass and without heat, till the end of September. Good quantities of fruit will be produced, and if then warmth of from 60 to 70 degrees be furnished, all these plants will ripen fruits well up to the end of the year, and at a season when Tomatoes are scarce.

Turnips.—These root vegetables can be had in gardens for a long season. A common fault is to sow seed too thickly and largely at once during the spring and summer. Frequent but quite small sowings of but a few yards in extent are usually ample, if made once in three weeks from March till the middle of August, when others of more extensive breadth should be made, as those will have to furnish a supply for the winter months. It is a common rule in good gardens to make up a bed of manure and leaves to furnish warmth; on that to place a wood frame, to half fill it with soil, then to sow seed in drills 9 inches apart, to water, and place a glass light over, covering up with mats to preserve the heat. The seeds germinate in a few days. Light must then be given, except at night, when covering up is needful. The plants need to be thinned to about 2 inches apart. The best varieties for this purpose are the Long Forcing, or tap-rooted, much like a long, white radish, but a capital table variety and keeping fresh a long time; and the round-rooted Early Milan. The former is, however, the best. Then successive sowings of either of these varieties should be made in April and succeeding months, in drills 12 inches apart and thinly. Large roots are not required, but the soil should be rich and kept well watered in dry weather, as quick growth is needful to secure crisp, fresh, sweet roots. Very moderate thinning of the plants whilst small suffices. In August two sowings, one early, one in the third week, may be made of that excellent variety Snowball, a very white, round form. The sowings are best made in drills 12 inches apart, the plants being thinned down to 4 inches apart. Sowing in drills facilitates thinning and hoeing, and also saves waste in sowing seed. A free use of the hoe between the plants whilst quite young keeps down weeds, and helps the plants to make good growth. From these August sowings of the Snowball, roots may be pulled of the best table quality up to the end of the year, and if the weather be not severe much later. For late winter pulling it is wise to make, about the 20th of August, where ground is available, a sowing of Red Globe, as that is hardier than the Snowball, and takes longer to produce roots. These will need to be thinned out to 6 inches apart, as the leafage must have ample space. If some of the larger roots be pulled, trimmed, and stored in sand in a cool shed in January they will be safe from hard frost and give a supply for several weeks. A capital Turnip, very popular in Scotland, and of marrowy texture, is Golden Ball, the flesh quite yellow. This needs similar treatment to the Snowball.

Swedish Turnips.—These are of a distinct race, and are consumed generally by cattle, but small roots, such as may easily be grown in gardens, make very nice food in the winter if properly cooked. Seed should be sown in drills 12 inches apart at the end of May or early in June. The seedling plants require to be thinned out to 12 inches apart, and kept free from weeds, and well hoed through the summer. The roots are fairly hardy, and may be left in the ground until January, then be pulled, trimmed, and stored in sand for use as needed. The flesh is soft and pleasant eating. Unused roots of these, or white Turnips, planted outdoors during March, will soon make growth, and furnish tender sprouts or tops that make a pleasant green dish. Swede Turnips will repay growing for this purpose only.

Vegetable Marrows.—Although the Gourd family is a large one, and contains many members that produce handsome ornamental fruits, yet relatively few are worth growing for edible purposes, the forms known as Vegetable Marrows being the best. Vegetable Marrows include fruits long, narrow, and white, or green in colour; others of medium length, of short or almost round form, and of the custard type, those of quaint shape like a little round pie turned out from a basin. All however have, when cooked, flesh of somewhat similar character, soft, succulent, watery, but yet very pleasant eating. Plants

differ in habit of growth slightly, or so far that whilst the majority trail in growth, sending out long shoots, a few are of compact or bushy form, and are known as Bush Marrows. These may be planted more closely than others, indeed each may be but 3 feet apart. The trailing forms are, however, the best, being more varied and productive. They need ample room to run, and seem to be most at home when trained over stiff hedges, sticks, sheds, wood piles, or anything that keeps them from the ground. Of course the plants must be rooted in the soil, and the ground should in all cases be deeply worked, well manured, and be somewhat raised, as the plants like to be on small mounds. Still they thrive well in hot, dry weather when liberally watered, provided they be not deluged too near the stems. Those plants which make long, strong growths need occasional pinching to cause the formation of other shoots which are more productive. Fruits of medium size are best for cooking; those left to produce seed should be very few and be of July blooming. As Vegetable Marrows are very tender, it is unwise to expose them outdoors until danger from late frosts is over. For that reason early in April is soon enough to sow the seed in broad pots or pans, under glass. The seeds should be an inch apart at least, and be buried half an inch. If a little artificial heat can be given in a greenhouse or frame, growth is quicker. Still at that time of the spring sun warmth is usually strong enough to produce very good growth, if more slowly. When the seedling plants show one or two rough or new leaves, they should be carefully taken from the seed pans, and be put singly into small pots or in pairs, one on each side, into 5-inch pots, using some light good soil. After watering the plants should be placed in ample light, where for a couple of weeks they will become strong. After that they may be placed in a cool frame to harden, and then be stood outdoors in a sheltered place to more fully harden before planting out. That may be done during the last week of May, except where the position is very warm and night protection can be given, when they may go out a week earlier.

Sites for the plants should always be sheltered from strong east or north winds. Holes to receive pairs of plants should be opened 4 to 5 feet apart each way, 2 feet across, and 1 foot in depth. Into the bottom soil some manure should be forked, then other well-decayed manure added to the thrown out soil as filled in, and thus a fair-sized mound is formed, into the centre of which the plants should be put. If it be needful to furnish some protection at night because of danger from frosts, hand-lights are best. Failing these, boxes or large pots, or even baskets, over which a mat or sack or piece of canvas is thrown, are good protectors. These may be put on late in the evening and be removed next morning. But danger at that time of the year is shortlived. A few pairs of plants, thus put out, will produce a great crop of fruits during the year.

Good Varieties are: Long White, Long Green, Pen-y-Byd, Moore's Cream, and Hibbard Prolific, short and roundish, and the quaint-shaped Custard Marrow, but which is not the most profitable. For exhibition Long White is best.

Autumn Protection.—A common danger to Vegetable Marrows arises from unduly early frosts in the autumn. Not infrequently it happens that a sharp frost in September kills the plants, or otherwise they might go on fruiting for some three or four weeks longer. It is good practice with the approach of the 20th of September to draw the plants more closely together, and to lay mats or other light covering over them at night, but removing it early in the morning. With so much care taken plants will often give far more fruit late than is needed to pay for the small trouble involved.

Herbs.—These are indispensable in a vegetable garden. Parsley, always much used for garnishing, will give an ample supply if a row in a shallow drill be sown each year in May, the plants being thinned out to 6 inches apart. Mint may be propagated by putting tops in as cuttings under hand-lights, or in pots in a frame, in May; also by lifting the long, string-like roots in winter and planting some afresh in other soil. Sage is easily increased by cutting branches from old plants and setting them deep in the ground in May. Both Lemon and Common Thymes can be raised from seed, or be lifted, pulled to pieces, and replanted, and thus increase stock. Both Marjoram and Savory can be increased by seed sowing and division of old plants. Fennel is easily raised from seed. These are the most useful Herbs.

CULTIVATION OF FRUIT

WHOLESOME fruit is as pleasant to see in the garden as the flowers scattered in the border. An Apple tree is a thing of beauty in itself, its growth is picturesque, its flowers as exquisite as those of the most treasured foreign Crab, grown for beauty alone, and its leaves turn to crimsons, yellows, and browns when the ruddy fruit still hangs on the bough. Of course in the large garden the fruit department is the most important, but when a small space is under consideration the owner must fit in things in his own way. He may prefer more strawberries than Apples, or Plums rather than Pears. It is wise to have plenty of bush fruit, Currants, black, red, and white, and Gooseberries, with Apple trees on the Paradise stock. These rarely fail to give each year an abundance of produce, and the man who has a small garden feels a bad season more keenly than the one with broad acres, in which if one variety fails another bears abundantly, and gain and loss are in a measure equalised.

Minute details have been given to assist the novice, and it is surprising how little is known of fruit culture even by those who have possessed good gardens half their life. Rudimentary matters are as a sealed book, pruning is accomplished in such a way that the fruit promise of another year is hacked off, and then the tree is condemned as worthless. In the case of quite small gardens, where perhaps half a dozen fruits alone can find a place, a small selection has been given, and any variety from that selection will not prove a failure. So much depends upon individual tastes—one wants a late Apple, another an early one, and thus selections are given to meet as far as possible various inclinations.

The Apple.—Probably the most generally cultivated, and certainly the most useful, of hardy fruits is the Apple. The climate of the British Isles agrees thoroughly with this splendid fruit, as proved by the specimens annually seen at the Royal Horticultural Society's and other leading Exhibitions. There is, however, one drawback to be

noted, and that is late frosts when the trees are in flower. All hardy fruit trees are, of course, liable to suffer from the same cause, though the flowers of the Apple tree, opening later than those of the Pear or Cherry, are less likely to suffer through the frost. The effects of frost may be lessened by selecting as sheltered a position as possible, such as is afforded by trees, a hedge, or wall. Not only are such shelters of service in preventing the flowers being killed by frost, but they are also useful in protecting the trees from rough winds. The cold east winds of spring injure the blossoms almost as much as frost, and the rough west winds in autumn sometimes bring down bushels of fruit. It is well to bear in mind also that the flowers of trees upon high ground, where the air is dry, are not so liable to be caught by frost as those of trees planted in damp and low positions. If the garden, therefore, affords any variety in elevation, rather choose the higher than the lower ground.

Soil.—Land that is capable of growing ordinary garden vegetables will also agree with Apple trees. If upon reaching a depth of 2 feet water is found, drainage is necessary. In soil rendered cold and damp by the almost continual presence of water Apple trees will not grow satisfactorily. The best and simplest method to get rid of stagnant water is to lay down drain-pipes 5 or 6 yards apart and about 3 feet below the surface of the soil, taking care to so place them as to give a slight fall towards, and connect them with, an outlet.

Purchasing Trees.—Always deal with a well-known firm, for strong, healthy trees, true to name, may then be relied upon. It is wise to pay a few more pence for a good article. Order in good time in the summer, so that you may rely upon having the trees in early autumn—the best season for planting. If, when they arrive, it is not possible to plant them at once, never leave the roots exposed to the air or they will soon become dry and shrivelled; take out a small trench in the border, lay in the roots of the Apple trees, and cover them over with soil until planting time. Only reliable varieties should be purchased, unless, as is sometimes the case, an exceptionally good local kind is cultivated in the neighbourhood.

Planting.—The work of planting fruit trees is important, and requires to be carefully performed. The best time to do this is in the month of November, before all the leaves have fallen, for then the trees are able to become somewhat established before the winter months, and in spring will be quite ready to make a good start. When planting is deferred until winter the ground has by then become cold and probably wet—conditions that are most unfavourable to root action. It is wiser to wait until the month of March than plant in midwinter, if it is not possible to do so in November. Naturally, trees planted in spring do not make such good growth the first season as those planted the previous autumn. Having finally decided upon the position, the next thing is to make a hole sufficiently large to comfortably hold all the roots when they are spread out. Nothing

is more harmful to the well-being of any plant than to cramp its roots into a small hole. The latter should be square and not less than 4 feet in diameter, and the soil taken out to a depth of 2 feet. The soil in the bottom of the hole must also be well turned over, but not removed. A reliable guide as to the depth at which fruit trees ought to be planted is to note how deep they have been before; this can invariably be seen by examining the bases of the stems. When the work is finished the roots nearest to the surface of the ground should be at least 4 or 5 inches deep. Many cultivators prepare the holes several *weeks* before planting time, an excellent plan. The soil is taken out as above mentioned, a few barrow-loads of new soil are added, the subsoil (that at the bottom) well broken up, and the hole is refilled. Thus, by the time the trees are ready for planting the soil has returned to its normal level, and the trees are in no danger of sinking too low after planting. If, however, the trees are made firm in ground that has only been recently prepared there is little danger of their sinking low enough to affect their welfare. If the hole be 2 feet deep, with the subsoil well turned over, the former must be filled in such a way that the tree when placed therein is at its proper depth, as shown by the soil-mark on the stem, indicating how deep it had been previously. Say, for instance, that it was necessary to fill the hole 12 inches for this purpose, one or two barrow-loads of fresh soil should be mixed with the natural soil taken out, and a sufficient quantity of both returned together. Make this quite firm by treading it well down, and place upon the top a thin covering of new soil. Remove all bruised and broken ends of roots with a sharp knife by making an upward slanting cut. The root fibres that push from the upper portion of the cut end will then remain near the surface and not tend to grow downwards, as when the cut is made in the opposite direction. When the hole is ready to receive the tree the soil therein should be raised a little in the centre, so that when the tree is planted the roots slope slightly towards the sides of the hole.

In planting, be careful to place a few of the roots in at a time. When the lowest of all have been spread out carefully, cover them over with fresh soil. Throw the soil to the base of the stem, and with the hand draw it gently towards the extremities of the roots, which are then kept in position, and the soil is well worked in amongst them. Make this quite firm, and follow the same practice precisely with the next layer of roots, and so on until all are covered. Then fill the hole with the remaining soil, making it firm as it is thrown in, so that when the work is finished the tree may be thoroughly safe. It is a good plan to work the soil after covering each layer of roots, and at the same time to gently shake the tree. This materially helps to settle the soil around the roots; it is then unnecessary to tread the former so hard. If the trees planted are trained as tall standards, each will need the support of a stout stake driven into the ground a few inches away from its base. Tared string is good material with which to tie the tree to the stake, or thick wire may be used. A piece of leather

*A YOUNG PYRAMID APPLE TREE.
The white band indicates the depth to plant.*

A TEN-YEAR-OLD STANDARD APPLE TREE.

or rubber tubing, however, must be first fastened to the stem to prevent injury from the string. Firmly fix the stake driven into the ground, so that the tree will not be shaken about by rough winds. It is an excellent practice to mulch (that is, to cover with manure) the surface of the ground around newly planted fruit trees, for the roots are then kept warm during winter, moist in summer, and also at the same time derive benefit from the stimulating effects of the manure. When fruit trees are planted on grass land, never allow the grass to grow within 3 feet all around the base of the stem. A surprising difference is noticeable in the vigour of trees so treated and those uncared for in this respect.

Forms of Apple Trees.—Apple trees are to be obtained in several different forms, the best of which are those known as standards, half-standards, bush, pyramid, cordon, and espaliers.

Standard Trees have a clear stem of several feet from the ground before branches are formed. This form is particularly suitable for planting in grass land upon which cattle are turned, for there is then plenty of room for the latter to graze underneath the branches. Another advantage is, that the smaller fruit bushes, such as Currants, Gooseberries, &c., may be cultivated amongst them. The best stock upon which to graft Standard Apple trees is the Crab. The roots of this travel a long distance, are not very fastidious as to soil, and are therefore well fitted for comparatively untilled ground. Standards may be planted at a distance of 24 feet apart, except some of the stronger growing varieties which require a larger amount of space. If possible, plant them twice as thickly as they ultimately will be allowed to remain, that is, at 12 feet apart, and in the course of fifteen or twenty years, when they have become crowded, remove every alternate one. Half-standards are similar, except that the main stem is shorter.

Bush Trees.—The Bush, or open Dwarf, is a popular method of training the Apple tree, and the most suitable one for small gardens. The branches originate within a few inches of the ground, and after the base of the tree is formed, grow perpendicularly. Many trees may, therefore, be grown in a small space. The stock upon which these are grafted is the Paradise; the roots of this remain near the surface, and Apple trees grafted upon it are, as a rule, very productive when quite young.

Pyramid Trees.—Pyramid trees are also grafted upon the Paradise stock. When symmetrically trained they are very beautiful, though perhaps hardly so productive as Bush trees, and they occupy more space. From the central upright stem, branches proceed in a horizontal direction.

Cordon Trees.—There are several forms of Cordon trees. Those restricted to one stem are known as Single Cordons, others may have two or even more. Cordons may either be trained in an upright or oblique direction. They are usually planted against walls, are easily managed, bear large crops of fruit, and occupy little room.

Espaliers.—These trained horizontally with two branches only are very useful for small gardens. They are suitable for planting by the side of garden walks, and should be trained on wires about 18 inches above the ground. Considering their small size they bear fruit freely.

Pruning.—The technical term pruning is applied to the annual removal of certain shoots or branches, and is practised in the cultivation of all fruit trees. The objects of pruning are to regulate the form and size of the tree, to equalise growth by restricting unduly vigorous shoots and encouraging weaker ones, to form flower-buds for the production of fruit, to admit a proper amount of light and air between the branches, and remove all dead, diseased, or otherwise useless wood.

In order to thoroughly understand the pruning and training necessary to form a properly shaped Standard Apple tree, we will follow the progress of one of these from the commencement. We will suppose that a clear stem of rather more than 6 feet has already developed since the tree was grafted; the next operation is to form the foundation branches. In winter, cut the top off the shoot, for that portion of the wood is usually soft. The following spring allow three good shoots to grow from the buds immediately below the cut portion. These are to form the primary branches of the tree. During the summer months attend to them carefully in order to regulate and equalise their progress as much as possible. The shoot proceeding from the uppermost bud is almost sure to be the strongest, and will probably grow perpendicularly. This must be prevented, however, by bending the shoot downwards, so as to check the flow of sap and divert it to the other two branches, both of which are usually weaker. If one is particularly weak it should be brought upright, as this results in more vigorous growth. Towards the end of the summer 12 or 15 inches of each young branch should have been brought down almost straight. This is easily accomplished when the shoots are young. The following winter, cut or prune back the growths made during the summer to within 9 or 10 inches of the base of each.

An inch or two more or less does not matter, but what is of more importance is the necessity of cutting them back to two buds that point away from the centre of the tree. The two best shoots that push in an outward direction from the upper parts of each of the three branches should be encouraged to grow the following summer. There are now six branches, and they need the same careful attention during the warm months, in order to have them evenly balanced and at an equal distance from each other, as in the case of the three primary shoots of the previous year.

The primary branches of a Bush Apple tree may be formed in a similar manner, though they will, of course, in this case, originate a few inches above the surface of the ground. Numerous side shoots will develop from these branches, and when they have grown about 5 inches long pinch them. If they were allowed to grow until the autumn, and were then cut back to within a short distance of their bases more shoots would push the following summer from the buds

BUSH APPLE NEWTON WONDER.

THE
RIBSTON
PIPPIN
APPLE TREE

OLD RIBSTON PIPPIN APPLE TREE IN RIBSTON PARK.

below the cut portion and the tree quickly become a mass of shoots. If, however, the side shoots are pinched when a few inches long, and those that eventually push from the side shoots themselves (called sub-laterals) are pinched back to one leaf, the former will develop into fruit spurs—that is to say, blossom buds will form upon them. Once the tree is well established, keep the top well open so that sun and air may be freely admitted. To attain this object, all shoots that have a tendency to grow inwards or across others should be pinched, as above advised. Unduly vigorous shoots also need stopping, otherwise they destroy the symmetry of the tree and render the weak shoots woefully unproductive. Trees with branches crowded closely together and allowed to grow in all directions cannot be expected to bear a good crop of fruit.

Summer Pruning.—This is certainly one of the most important operations connected with the cultivation of the Apple. As before mentioned, if the growing shoots are allowed to fully develop during the summer, and then are pruned back to two or three eyes in winter, these dormant buds or “eyes” will again most probably produce shoots the following year, and the result will eventually be a tree crowded with unproductive wood. If, however, these growths in the month of July are pinched beyond five or six leaves flower-buds will eventually form and the arrested shoot develop into a fruit spur. The object of the cultivator should be to train the branches thinly, so that sun and air may have free access to all parts, for this is the secret of success.

Winter Pruning.—This is not a troublesome task if the shoots were pinched, as advised, during the summer. Cut these back to within three or four buds of their base. All dead wood should be removed. Wounds caused by canker disease should be pared out clean, right down to live tissue, and then painted with white lead or tar. The leading branches of Apple trees, and any shoots intended to form new branches, where there is room, should be left about 15 inches long. When exceptionally strong leave them rather longer, and prune a little harder when weakly. When shortening the leading outside branches, cut back to a good bud, on the outside, otherwise next year's shoot might push towards the centre of the tree.

Root Pruning.—Some varieties of Apple trees are naturally of very strong growth, and sometimes, especially if the soil in which they are planted is fairly rich, they make a large quantity of shoots which produce no flowers. The reason for this is, that the roots of the tree have gone down into the subsoil, and instead of producing numerous small fibres, are simply “tap roots”—that is, they are destitute of fibres,

FIG. 27.—Root Pruning: Way to cut back a Root.

and can take comparatively little part in supplying nourishment to keep the tree in position. To check undue luxuriance, and to promote the

FIG. 28.—Root Pruning : How not to cut back a Root.

formation of healthy fibrous roots, the long, bare, tap roots must be pruned. To do this, make a trench about 2 feet deep around the tree, at a distance from it of not less than 4 feet. Then with a fork carefully draw away the soil from the tree, more particularly from underneath, so as to find the thick and gross growing roots. Shorten these back with an upward cut (as explained before), from which fibrous roots will be emitted, place

horizontally, again cover over, and make firm.

Grafting.—The most general method of propagating the Apple is by grafting. This operation consists in joining together, so as to form one plant, the cut surfaces of two different shoots. The shoot to be grafted is technically known as the scion, and the plant upon which it is placed is the stock. The latter is growing in the ground, and the former is a part of a shoot cut in winter from the previous year's growth. Stocks for grafting upon are raised from seeds sown early in the year out of doors. They are grown on, and transplanted several times until they have become sufficiently vigorous. Stocks should not be grafted until they are about the thickness of one's finger. In grafting, the habit and constitution of the variety require attention. It would obviously be useless in forming a Standard tree to graft a weakly variety low down, and allow it to form the stem, for the latter would never be strong enough to support the branches. The right course to pursue would be to allow the stock to form the stem and to graft higher up. If the variety to be grafted, or "worked," as it is called, is vigorous, it may either be united near to the ground or higher up, for it would be capable of forming a stem equally as good as the stock itself. Early in the year the stock should be cut back to where the scion is to be affixed; the latter also is cut at the same season, or even earlier. If one end is inserted in the soil in a cool border outside, the scion will keep perfectly well until required for grafting. The month of March is a favourable time to perform this work, for then the sap is flowing gently. Always make sure that the inner bark of the scion fits exactly over the inner bark of the stock, for it is here that union takes place. This is the principle that underlies all grafting; no matter what method may be employed, the union of the inner barks must be effectual. One of the commonest ways is that known as—

Whip or Tongue Grafting.—The stock is prepared by first making a slanting cut as shown, so that it may terminate just above a bud. Then cut away a corresponding portion from the scion. Be careful to make the end of the latter quite thin, or it will not fit

exactly upon the stock. Afterwards make an incision on the cut portion of the scion, and also a similar one on the stock. Place the two together, so that the two small tongues fit exactly, and be sure that on one side the outer edges of the barks correspond (if the scion is smaller than the stock, the barks cannot coincide on both sides), for then the inner barks will also be together. Endeavour to have the scion and stock as nearly as possible of the same size. Then tie tightly round with matting, and cover over with clay to prevent the air reaching the cut portions.

Saddle Grafting is another method, but cannot well be practised unless stock and scion are of equal thickness. Great care is necessary in cutting the scion or it will probably split in the centre.

Rind (Crown) Grafting is generally employed when the stock is comparatively large. The latter is cut straight across, and the scion cut obliquely, exactly as in tongue grafting, except that, instead of the tongue, a notch is made, which fits upon the cut surface of the stem. Insert the thin end of a budding knife or paper-knife between the bark and wood (these easily separate in spring), and place in the scion in the opening thus made. The thin end of the scion will thus be between the wood and bark, and the notch fits upon the cut surface. Several scions, three or four, according to the size of the stock, are usually inserted; tie round with matting, and cover with clay or grafting wax, as before advised.

Varieties.—The number of Apples in cultivation is legion. Many of them are worthless, especially to a small grower, and others indifferent. It is essential to make a careful selection, for unless one has good varieties in the first place, after care and attention are lost. It is advisable to grow several trees of each of the best varieties rather than possess one or two of many varieties. A suitable list is given in the chart on page 605.

Cherries.—From the days when Henry VIII scoured the Continent for new fruits and the resulting finds were planted at Teynham, Kent has been famed for its Cherries. But even in this country their culture is localised to a large extent, and the reason for this will be found to be—chalk. Where there is an abundance of this mineral, there are Cherries flourishing. On the granite soils, such as are found, for example, in the West of England, it steadfastly refuses to grow. The lesson is obvious. This fruit is somewhat impatient of the knife, and therefore restricted forms such as espaliers are not advisable. Even the more natural fan-trained forms on walls should not be too strictly dealt with in regard to pruning. The best wall fruits I have seen were grown on trees the tortuous branches of which would shock those whose eye for symmetry is well developed, but at the same time please those who consider that the first duty of a fruit tree is to fruit. Where pruning is necessary it is best done in summer, in the same way as advised for the Pear on p. 431. The pyramid form is suitable, if not pruned too hard, and especially for varieties of the Duke race, whose neat, upright habit takes them halfway to this form. Cordons

also do well on walls if not too much encouraged with nitrogenous manure, and this advice, indeed, applies to all forms. In the early stages of growth stable manure should be strictly avoided, and potash and phosphatic manure should only be given, with, of course, lime, if this is not present in the soil, in fair quantity. The culture of this fruit under glass is not undertaken so often as it should be. To defeat spring frosts and, incidentally, the feathered tribes, this method is very desirable, and for those who have not eaten "under glass" fruit a revelation awaits them. As the cooking Plum is to the Green Gage, so are outdoor Cherries to the indoor ones.

The soft-fleshed Bigarreus, so unfit for the untender mercies of Covent Garden, only require to be better known to those whose idea of a Cherry is the indigestible, if profitable, Napoleon; and the black varieties, such as the Tartarian or Circassian, are found in the highest perfection under orchard-house culture. The varieties that can be recommended for quality are, in the yellow, Bigarreus, Frogmore, Elton, and Governor Wood; in black varieties of this race, the Tartarian above mentioned, Early Rivers, and Waterloo; and the old St. Margaret's or Tradescant's Black Heart, a name which takes us back to the Duke race, whose refreshing acid flavour is acceptable to many palates, and are best represented by May Duke, Royal Duke, and Archduke.

The Morello Cherry needs no recommendation. Its preference for a cool wall and its never-failing cropping qualities have won it a place in all gardeners' hearts. It fruits on young wood of the previous year's growth, and as much of this should be retained as possible. Of similar flavour is the Kentish Red, a very distinct variety, which for cooking is quite unequalled. Cherry jam made of this variety will be the first sort to disappear from the pantry. Use half a pound of sugar to 1 lb. of fruit, and you have a preserve fit for the proverbial king. To sum up, the secret of Cherry-growing is to forget the knife and the manure-barrow, and remember the lime.

Plums.—While the exact identification of the "forbidden fruit" remains a matter of speculation, I have no hesitation in designating the Plum the "unappreciated fruit." The extended culture of the commoner varieties for "market" purposes has perhaps to answer for the lack of appreciation of this most delicious fruit; but I also venture to think that a lack of care in gathering at the right season and storing for a short interval are likewise partly responsible for its neglect.

The Plum has long been reproached with unfruitfulness; but we are now able, thanks to recent research at the John Innes Horticultural Institution, to remedy one frequent cause of this first of deadly sins. I allude to the fact that Plums are generally self-sterile; that is, pollen must be brought from another variety to ensure the perfect setting of their fruit. This is a valuable piece of information to gardeners—and nurserymen.

Another cause of infertility is the destruction of blossoms by spring

THE
GARDEN
OF
THE
MUSEUM
OF
THE
CITY
OF
NEW
YORK

MORELLO CHERRY ON NORTH WALL.

WHITE HEART CHERRIES.

frosts. Considering the ease with which this may be combated, by throwing over the tree a piece of netting, I wonder it is not more practised on dwarf trees. Most gardeners, however, allow a certain wall space to the choicest varieties, where protection is easier still. It is a common complaint that the Plum in its earlier stages makes too much growth. This should be remedied by the culture of pyramids and bushes, when occasional transplanting for the first ten years will ensure an abundance of fruiting spurs. It must also be remembered that this fruit is a lime-loving plant, and needs a good supply always at hand, or should I say at the root?

Plum orchards may be seen thriving on the Southern chalk downs with the thinnest of surface soils. Of varieties there is a wide choice, and I will mention but a few of the best. First of all comes Oullin's Golden Gage, a large yellow fruit, excellent for dessert, and for bottling one of the very best. August brings the Early Transparent Gage, small, but certainly highly flavoured. September is the Plum month, and many are at the disposal of the gardener. The Green Gage, Transparent Gage, and Jefferson are all sorts that no self-respecting gardener can dispense with, while for the kitchen, and also for the boys home from school, Victoria, the ever-cropping, and Belle de Louvain are desirable. Late varieties are found in Golden Transparent and Coe's Golden Drop. It is not generally known that the latter can be kept for a long period in a cool room. For late cooking purposes Monarch and the newer President are most valuable.

Those whose gardens are in sheltered spots, and where spring frosts are not troublesome, should grow a tree or two of the Myrobalan, of which there are two varieties—yellow and red. The tree flowers very early and is decorative, so that even if it fails to crop, it justifies to some extent its existence. The fruits when bottled are excellent, but must not be gathered too ripe, or they will be mealy. This must not be confused with the Mirabelle of the Continent, which is of the Gage tribe and noted for its excellent jam-making properties.

The Pear.—Although not so useful as the Apple, the Pear is more luscious and refreshing. It is not more difficult to grow than the Apple, although more fastidious as to climate, for in the warm southern and western counties of England, the Pear thrives better than in the more northern and colder districts. When once well established, it will live and bear fruit for many years. In soil suitable for the Apple, the Pear will also succeed. In one of the best hardy fruit gardens in the south of England, on one side of an extensive drive, Apple trees are planted, while the border on the opposite side contains splendid specimens of Pear trees throughout its full length. Providing that there is a sufficient depth of well-drained loamy soil, the Pear may be successfully grown, but land that is of a gravelly nature through which water passes away quickly is not suitable. If in possession of such land, the cultivator should always well mulch the trees early in spring by covering the surface of the soil several feet away from the stem of the tree with short litter. This is of the greatest assistance to fruit

trees planted upon light land ; it keeps the soil cool and moist by preventing evaporation. If the rays of the sun are allowed to strike with full force upon the ground immediately above the roots of the tree, the former becomes hard, dry, and generally cracks—a condition that is injurious to the roots. It is obvious also that mulching lessens the necessity of such frequent applications of water, and with every fall of rain the tree is benefited by the stimulating effects of the manure.

The remarks in the notes upon the Apple with reference to the best aspect and position for planting, apply equally well to the Pear. In most gardens where the space is available, a few Pear trees are generally planted against walls, and, as a rule, produce finer fruit than when planted in the open. A better crop is also usually obtained, for the flowers are to a certain extent protected from the frost and rough winds to which Pear trees in the open are exposed in spring time. It is not, however, everywhere that wall space is available. We will, therefore, first endeavour to make clear the culture of a Pear tree not against a wall. A Pear tree in the open may either be in the form of a standard, pyramid, bush, or espalier. The description of each of these will be found under the heading of The Apple. The cultural details to be followed in the operations of preparing the soil, planting, &c., are also there explained, and apply to the Pear.

Stocks.—As in Apple culture the two stocks for grafting principally made use of are the “Crab” and the “Paradise,” so the “Pear” and the “Quince” are the stocks upon which Pear trees are invariably grafted. Those upon the Pear stock live the longest, and are the most vigorous ; the roots of this, however, are, like the Crab, far-reaching, and liable to enter the subsoil. If there is a good depth of suitable soil, trees upon the Pear stock will succeed well. Also in poor, gravelly soil, the roots of this stock are able to find moisture and nourishment at a distance never reached by roots of the Quince. The Quince stock tends to dwarf trees grafted upon it, and to bring them into bearing earlier ; the roots are small and fibrous—those of the Pear are long and comparatively destitute of fibres—and remain near the surface of the ground. It will be therefore understood that in a shallow soil, or one of which the subsoil is unfavourable, such a stock would be decidedly preferable. If, however, the cultivator purchases his trees from a reliable nurseryman, which is far more profitable and satisfactory than propagating oneself, they will, of course, be grafted and properly established upon their respective stocks.

Standard Trees, usually planted on grass land, or land that is not tilled with the spade, are invariably grafted upon the Pear stock. Pyramids, bushes, espaliers, &c., for planting in cultivated garden soil, are grafted on the Quince. They do not grow so large as Standard trees, and are therefore suitable for small gardens.

Pyramid.—The Pyramid Pear tree should have an upright central stem, and horizontal branches emanating from it, and gradually diminishing in size and length towards the apex of the tree. It is necessary that this should be so, for the sap naturally rushes in the first place to the

top, and if this were not restricted in some way the base of the tree would be left uncared for, and probably die away. The tree also would be unfruitful; at the upper part, because of an excess of vigour, resulting in gross shoots, and lower down because of weakness and want of nourishment. The equalisation of the flow of sap to all parts is an important consideration in the training of fruit trees, and should constantly be kept in mind as an aid to fruitfulness. If Pyramid Pear trees are grafted on the Quince stock, they may be planted about 6 feet apart, but if on the Pear stock, they should not be closer together than 9 feet or 10 feet.

Bush.—The Bush form, a somewhat similar kind of tree, has no strictly upright central stem; its primary branches originate within a few inches of the ground to where the central stem was cut back during the formation of the young tree. These branches, from which others are also developed, after spreading horizontally so as to form, as it were, a cup-shaped base, grow perpendicularly. A large number of Bush trees may be cultivated in a small space, as they need not be planted more than 5 feet or 6 feet apart.

Standards.—Standard Pear trees are almost invariably grafted upon the Pear stock, and, as has been mentioned, are usually planted on grass land. As in the case of Standard Apple trees, bush fruits, such as Gooseberries and Currants, may be grown underneath. The clear stem of Standard trees, before branches are formed, is, as a rule, about 6 feet from the ground. The primary branches originate in the same way as with the Bush tree, but they are allowed to grow more freely, no particular shape or form being aimed at. The branches, of course, are not permitted to grow in all directions, or to crowd each other, but the head of a Standard tree has no distinct design as in the case of Bush and Pyramid.

Espalier.—This is a desirable method of training the Pear, for it possesses several good points. Trees so trained do not take up so much space in the garden; they are easily accessible, not difficult to manage, are partially protected, and also succeed well. The espalier, or trellis-work, upon which to train them can be quickly constructed. It is necessary to obtain several stout poles or iron rods, 6 feet above ground, and some stout wire. The poles or rods are erected at intervals, and wires, placed about 12 inches apart, are connected with each one. Several forms of Pear trees, horizontal, fan-shaped, and cordons, are grown against such espaliers, to which reference will be made when treating of wall-trees.

Summer Treatment.—The chief points to bear in mind in the management of Pear trees, after they have been properly planted in suitable ground, are as follows: Each branch and shoot must have ample room to develop and ripen, and sun and air should penetrate freely to all parts of them. All exceptionally vigorous shoots must be checked, and it will be found that those towards the top of the tree are liable to grow most strongly. If allowed to go on unchecked the lower branches would correspondingly become weak. Never allow a branch

to form unless there is sufficient room for it to grow without overcrowding the tree; either cut away the shoot completely, or prune it back to form a fruit spur. The fruit of the Pear is borne upon short branches, known as fruit spurs. These naturally formed fruit spurs—that on the wild Pear are thorny branches—are produced more or less by all Pear trees. By the judicious pinching and pruning of other shoots, artificial fruit spurs may also be formed. We will endeavour to show how this may be done.

Take, for instance, the ends of one of the branches, *i.e.* the previous year's growth. Some fruit spurs will probably form, and some shoots will also develop. If the latter were allowed to grow throughout the summer, and the following winter were pruned back to within a few buds of their bases, next summer shoots would again push from these buds, and the result would be a mass of growth. This evidently is not the right method to adopt in order to obtain a good crop of fruit. Instead of permitting the above shoots to grow until the autumn, pinch them to within five or six leaves of their bases early in July. Laterals, or side shoots, will develop which must also be stopped when 2 or 3 inches long. By following such a system, those shoots which, if left to grow unchecked during summer would eventually produce simply a thicket of leaves, may be induced to form flower-buds. The fruit spurs, however, should not be closer together than 6 or 8 inches, or they, too, would probably become unfruitful. Leaf, as well as flower-buds, develop upon the spurs, so that if the latter were less than the above distance apart, those important factors in the well-being of a Pear tree, *viz.* sun and air, would be excluded by the mass of foliage. In pinching the summer shoots, those on the uppermost branches should first be stopped, gradually descending until the whole tree has been passed over. Do not pinch them all at one time, but allow several days to elapse between the checking of those at the top, middle, and bottom of the tree. The leading shoots of the Pear tree need not be stopped, as is necessary with the laterals. Allow them to remain at full length until the autumn.

Winter Pruning.—At the annual winter pruning, which may be carried out in November or December, the end shoots of the various leading branches should be left about 9 inches or 12 inches long, according to their vigour. Always cut back to a bud that points away from the centre of the tree, so that there may be no danger of the resulting shoot growing inwards. At the winter pruning the branches may be regulated, and the true shape of the tree preserved. If any branches have grown inwards, or across others, cut them away; also remove all dead or cankered shoots, and those that are very weak.

During the hot summer months do not allow the ground immediately around the Pear trees to become hard and dry. Either cover it with manure, or run the hoe over it frequently, so as to keep the surface soil loose to maintain moisture by reducing evaporation. In a dry season water hardy fruit trees in the open sometimes, especially when the fruits

AN ESPALIER PEAR TREE BESIDE A PATHWAY (See Page 431).

*PEAR DOYENNE DU COMICE, TRAINED HORIZON-
TALLY ON A WALL.*

are developing, as this is beneficial. By mulching and maintaining a loose surface much may be done to lessen the labour of watering.

Pear Trees on Walls.—The usual forms of Pear trees trained against walls are the horizontal, the fan-shaped, and the upright or oblique single, double, or triple cordons. If the wall is high, a fan-trained tree would cover it more quickly than a horizontally-trained one. This method is not, however, so extensively practised as formerly. Horizontal-trained trees are preferred, and, during development, so that the space between them shall not be wasted, the wall is planted with cordons. Horizontal-trained trees, grafted on the Quince stock, should be planted about 15 feet apart, and the stem kept at least 8 inches from the wall so as to allow plenty of room for future growth. The formation of a tree of this description, which is not at all difficult, is carried out in the following way: Suppose that after having been grafted, one season's growth has taken place. In the winter cut down the shoot to three buds; two of the latter should be about 12 inches above ground, for the shoots from them will eventually form the primary horizontal branches. The shoot from the third bud is trained upwards to form the leader. Allow the shoots from the two side-buds to grow in an oblique direction until well on in summer, and bring them down to a horizontal position later. They naturally grow more vigorously in the former position. Next winter the upright leader is pruned to three buds, exactly as the maiden shoot the previous season. The two side-buds should again be about 12 inches above the primary horizontal branches. Thus from these buds two more horizontal shoots will again develop, and from the third one, an upright shoot for the leader will be formed. This practice is repeated until the tree has attained the desired height. In order to strengthen the horizontal branches, the growth made every summer should be slightly shortened the following winter. Laterals will develop from them, and until the tree has become established, say for two seasons, they may be allowed to grow freely during the summer, so as to render the branches as vigorous as possible. Allow each branch to grow in a slanting direction during summer, and bring them down at right angles to the stem in the autumn. When the tree is well established, instead of allowing the laterals to fully develop, pinch them back to five or six leaves in summer, and in winter prune them to three buds, so as to induce the formation of artificial fruit spurs, if there is room for them; if not, cut out the shoots altogether.

Fan-trained Trees.—The formation of a fan-trained tree is equally simple: Cut the maiden shoot down to three buds, exactly as advised for a horizontally-trained tree. The resulting growths from the two side-buds may be treated as in the last-mentioned form, for they will constitute the two lowest branches. The leading shoot, however, must be cut back to three good buds somewhere near to its base. After shoots have grown from these the following summer, in winter each one is also pruned back in the same manner. Thus, at the end of the third season there would be nine branches in all. In the winter, after their

season of growth, the various branches should be brought down and secured several inches above the branch immediately beneath. Thus it will be seen that the tree in time assumes somewhat the shape of a fan; hence the name of this particular method of training. The branches as they extend will, of course, leave a larger space between them, necessitating the production of more of the former to properly cover the wall. These may be easily produced by shortening back one

FIG. 29.—Pear. First branches of fan-trained tree. (See text.)

or more branches to buds situated where it is desired that new branches shall originate.

Cordons.—Cordon Pear trees are strongly recommended for a small grower. They cover a wall very quickly, usually bear a good crop of fruit, and are easily managed. Cordons are known as single, double, treble, &c., according to the number of stems; they may either be trained in an upright or slanting direction. If the wall to be covered is a low one, the latter method is to be recommended, for then the Pear tree would be able to grow to a greater length than if trained perpendicularly. When it becomes necessary to restrict them considerably by severe pruning, canker is liable to set in, and some of the branches probably die away. Double or treble-stemmed Cordons are preferable for a low wall, as the trees are able then to extend farther and grow more freely. The various stems should be not less than 12 inches apart; in planting Cordons with several stems this, therefore, must be taken into consideration. As the stems extend, natural fruit spurs will doubtless form. Lateral shoots must be stopped exactly as advised before,

i.e. in summer five or six leaves, and pruned in winter to three buds. When this practice is followed and care is taken that the spurs do not crowd each other so as to exclude the sun and air, a fruitful tree will invariably result.

Pruning the Spurs.—It is sometimes necessary to prune the spurs, so as to keep them near the wall. In time they get so far away as to derive no benefit from its warmth and shelter, and must therefore be shortened. Upon fruit spurs there are two kinds of buds—plump, oval-shaped ones, the blossom-buds; and thin, elongated ones known as

FIG. 30.—Pear. Fan-shaped, second year.

“spur-buds.” These produce leaves only, and if, as sometimes happens, the spurs of a Pear tree have numerous spur-buds and comparatively few flower-buds, the best practice is to thin out at the winter pruning or severely shorten back those spurs on the upper part of the tree, and to treat those in the middle and lower branches more leniently. The object of so doing is to equalise the distribution of the sap—for the lower portion of the tree is invariably the weaker—a condition that tends to decrease the number of barren and useless spurs by promoting the formation of flower-buds.

Root-pruning.—This sometimes necessary and beneficial operation is fully explained in the chapter on the Apple (p. 425); it is usually upon trees worked on the Pear stock that root-pruning is required. Instead of simply making a trench around the Pear tree to arrive at the offending roots, if the former be not very large it may be lifted altogether; and its roots, that will probably have found their way into the subsoil, cut back and placed in a proper position nearer to the surface of the ground.

Good Varieties.—A list of these will be found in the tables on page 606.

Thinning the Fruit.—If the spring is a favourable one, free from late frosts, more fruits "set" upon a Pear tree than the latter can properly bring to maturity. It is, therefore, necessary to remove some of them so that the remaining ones may reach a satisfactory size and develop a good flavour. The flowers of the Pear are borne in small bunches of six or eight, known as corymbs. All except one or two of these, when set, must be pinched off in thinning; it may be even necessary to remove some of the bunches altogether. Upon a healthy

FIG. 31.—Pear. Fan-shaped, third year.

tree in a favourable season the flowers are extremely numerous; the branches are one mass of white from apex to base, so that to leave even one or two fruits in each corymb would be a mistake. Sharp frosts, when the flowers are open, mean that probably none, or very little, thinning will be required. It is a great mistake to allow a fruit tree to mature a very heavy crop of fruit, for the following year at least it will be almost barren. A far better practice is to leave a moderate quantity of fruit each year, so that the tree may not have to expend the whole of its energy in developing and maturing the former at the expense of forming wood and nourishing its buds for another season.

Gathering the Fruit.—The simplest way to learn when a Pear is in condition for gathering is to raise it gently until the fruit is almost

on a level with the stalk. If ready to be removed it will part easily at the point where it leaves the spur. If the fruit, however, does not appear to separate at that point it should be left longer. Several Pears, notably Williams' Bon Chrétien, must be gathered before the above stage or they will be found quite soft inside and unfit for use. Flemish Beauty and Doyenné Bussoch are also of this class. The early Pears—Citron des Carmes, Doyenné d'Été, Clapp's Favourite, Jargonelle, &c., will not keep, and must be consumed almost as soon as gathered. Do not leave any fruits upon the trees after the first week in November, or they will be liable to sustain considerable damage from high winds. It is advisable, however, to let all the Pears remain out of doors as long as possible. Avoid squeezing the former when gathering them, for every bruise will become visible in the course of a few days, and lead to decay. If it is desired to have late Pears throughout the winter months a cool, regular temperature is essential, and the atmosphere of the fruit room also must be dry.

Specially-constructed rooms for storing fruit are usually fitted with shelves about 2 inches wide, and 1 inch apart. The fruit resting between these always has a free circulation of air around it. Examine the fruits from time to time, in order that all showing signs of decay may be at once removed.

The Grape Vine.—It is surprising that a fruit so delicious and wholesome as the Grape should not be grown more by amateurs. In many a small greenhouse throughout the country excellent Grapes might be annually produced.

The house in which the Vines are grown may either be span-roofed or lean-to. The span-roofed structure is, however, decidedly preferable, for in a house of this design less space is wasted. It should be built with the ends facing north and south, as it then receives an equal amount of sunlight practically all over.

In early morning the eastern side would have the benefit of the sun, and the western side in the afternoon and evening; while with the sun high in the heavens, both would benefit equally. If the house were built to face east and west, the southern side would receive the sun's rays almost the whole day, whereas the northern side would be scarcely touched by the sun at all.

Equally good Grapes can be grown in a lean-to vinery as in a span-roofed house, and if one desires to have Grapes early in the season, the former structure is suitable.

The Border.—Prepare a well-drained and suitable border, for, if the material from which the roots derive nourishment for the support of the plant does not meet their requirements, the Vine cannot thrive. Whether the border be made inside or outside the vinery must largely depend upon circumstances. When the interior of the house is required for the accommodation of other plants the border must be outside. For the cultivation of mid-season and late Vines no other need be wished for; if, however, it is desired to have forced Grapes in early spring, an inside border is preferable, because the temperature of

the soil would be higher and more even than would that of an outside border, and so conduce to early root action and growth.

The depth of the border should be 3 feet, and for the first year need not be more than 4 feet wide. It is a far better practice to make a small border when planting, and add a little fresh soil every year, than to at once construct a large border, that by the time it is full of roots will probably have become sour. If the subsoil is known

FIG. 32.—Vines in span-roofed house : all space utilised.

to be heavy and close, small drain-pipes must be placed in the bottom, 2 or 3 feet apart, sloping towards the front of the vinery, if the border be inside, and away from it if outside, and in each case be connected with a main drain. If, however, the subsoil is dry and gravelly, and therefore porous, drain-pipes are not required. Supposing these to have been placed in, if necessary, and carefully covered with large stones to prevent breakage; sufficient brick rubble should be placed over the bottom of the border to make a covering 9 inches deep. This makes a splendid foundation for a Vine border, and affords excellent drainage.

To prevent the soil from choking the drainage up, fill the remaining

space chiefly with turfy loam—the coarser the better. If broken up into very small particles, it does not remain sweet and wholesome so long as when turves chopped into about four pieces are used, neither does it afford so attractive a rooting medium as coarse fibrous loam.

To ensure annual crops of Grapes, mix other ingredients with the

FIG. 33.—Vines in lean-to house : back wall practically useless.

loam. Two of the most easily obtainable, and at the same time the most valuable, are wood ashes, and lime and brick rubble. The latter allows the water to pass freely through the border, thus preventing the soil becoming sour through the presence of stagnant water. In a heavy, clayey soil, naturally more of this would be required than in a sandy one. Wood ashes are excellent for mixing

in the soil of a Vine border; they contain a large amount of potash, proved by analysis to be one of the chief constituents of the Vine.

After a good sprinkling of some trustworthy artificial manure, the whole of the above ingredients must be well turned over, and thoroughly mixed together. Then place sufficient of the prepared compost over

FIG. 34.—Section of half span-roofed house. Way to make Vine border, gradually adding new soil yearly.

the turves to make the border of the required height, making it quite firm as it is put in by well treading it down. Finally, give a good soaking of water, and allow a day or two to elapse before planting.

Planting.—Vines are best planted sometime during the summer, when they are growing freely. If possible, do not delay planting young Vines after June or July; they are then making roots freely, and will quickly take hold of the new soil. Until required for permanent planting, young Vines are usually cultivated in pots. Care is necessary when taking them out of the latter not to break or damage the roots. Take care that the hole made to receive the Vine is so large that there is a clear space of 12 inches around the roots. Remove the surface soil, disengage some of the roots that will have probably become matted

together in the pot, remove the crocks, and spread out the former as well as possible. If the mass of soil and roots be left intact, as taken from the pot, it is likely to become dry, and the roots also cannot push into the new soil when they are matted and twisted together. Arrange the roots, as far as possible, in different layers, placing them out carefully in a horizontal direction. After covering over one layer with soil, make this firm before placing on the next. The uppermost

FIG. 35.—Section of Vine border.

A, prepared soil; B, turves; C, drainage; D, subsoil.

roots may easily be kept back until required by turning them upwards to the stem; keep them down by means of pieces of turf.

Do not plant the Vines (supposing the border to be inside) within 18 inches of the hot-water pipes, and, if planted outside, place them as near to the wall of the vinery as possible. It is a mistake to have much of the stem exposed.

During cold weather, straw, or some other material, should be put over the base of the stem outside, or the Vine, if growing or carrying a crop of fruit, would suffer severely. The distance apart at which Vines should be planted depends largely upon the variety (for some are much stronger in growth than the others), and also whether it is intended to force them early in the season or allow them to start naturally. For the more vigorous ones, such as Alicante, Gros Guillaume, and Syrian, a space of 3 feet 6 inches or 4 feet be-

tween each is necessary, while Foster's Seedling, Black Hamburgh, and Lady Downe's Seedling do not require more than 3 feet. When hard forcing is practised for a supply of early Grapes, the Vines will be wide enough apart at 2 feet 6 inches.

Always make sure that the Vines are thoroughly well watered before being taken out of the pots. If dry when planted, it is difficult to water them properly afterwards. Instead of running through the hard mass of soil and roots, the water makes its way into the more

FIG. 36.—Pot Vine as it appears when removed from the pot.

FIG. 37.—Pot Vine. As it should be prepared for planting.

porous border, leaving the former quite dry, although this perhaps may not be found out until the plant begins to suffer.

Treatment after Planting.—Encourage the Vines to grow vigorously, as that means they quickly become established. On sunny days the ventilators may be opened fairly wide—several inches both on the top and also at the front of the house. About three o'clock, however, they should be altogether closed. The temperature of the vinery will then naturally increase, and if, at the same time, the Vines are syringed and the walls and floors moistened, a genial atmosphere most favourable to growth will result. Towards the end of summer the wood of the Vine begins to turn a yellowish-white. This is a sign that growth has practically ceased, and that the ripening or maturation of the wood has begun. It is clear, therefore, that to still

maintain a warm, moist atmosphere—so conducive to growth—would be useless. More air and less heat and moisture should now be given gradually, until in a few weeks' time the vinery is kept completely cool, the ventilators being left open night and day. By the month of December the wood will have thoroughly ripened, the leaves have fallen, and the buds in the axils of them have fully developed.

At this period it is necessary, strange though it may seem, to cut down the Vine cane—that probably has reached half-way up

the roof of the house—to within two good buds of its base,

i.e. usually about 2 or 3 inches above ground. The object of this operation is to establish the Vine well before allowing it to bear fruit, and also to enable it to form a good, strong stem. It is evident that if the first year's cane were left half or the whole of its length, and the following year side shoots were allowed to develop, both the former and the latter would be very weak. Keep the vinery quite cool until the first week in April, when it may be closed. No fire heat is necessary, except in very cold weather.

A night temperature of 50 degrees is sufficient for the first few weeks. When the thermometer registers 65 degrees during the day the top ventilators should be opened 2 or 3 inches, and if the sun continues to shine more air, both at the top and front of the vinery, must be given in the course of an hour or so. Syringe the pathways and walks of the house occasionally, especially when the ventilators are closed in the afternoon. The thermometer then may register as high as 80 degrees without any danger. Taking advantage

of the heat of the sun in this way lessens the need of so much fire heat, and is far better for the Vines. A house that is thus thoroughly warmed

FIG. 38.—Vine. Showing method of planting.

FIG. 39.—Vine. One year old. Prune to dotted lines.

by the sun will not fall below 50 degrees during the night unless it is exceptionally cold outside. In a month's time from closing the vinery increase the night temperature to 55 degrees, and a few weeks afterwards to 60 degrees, at which it may remain throughout the growing season. Cut back to one leaf all side shoots that make their appearance during summer, so that every opportunity of making good growth may be given to the main rod. When in early autumn

signs of ripening are noticeable in the wood, more air must be given and less moisture, as before advised. It will thus be seen that during the first two seasons after planting the Vine is not at all difficult to manage. It may thus be summarised:

During the growing season, from April to August, provide a warm, moist atmosphere, and be careful to see that the border is well watered

whenever the soil appears dry. When the wood begins to ripen gradually decrease the moisture and heat, and increase the amount of air, until finally the ventilators are kept open night and day. The border must not be allowed to become dry during winter, for the roots of the Vine are alive and require nourishment. Naturally they will not absorb so much water as when the Vines were in full leaf, but to let the soil of the border get quite dry is fatal. In the winter following, if the Vine has grown vigorously and become, say, as thick as one's thumb, the cane may be left

FIG. 40.—Young Vine after second year's growth.
Way to prune back.

about 4 feet long. If, however, it is somewhat weak, shorten it again. Presuming, however, that the Vine has succeeded well enough to be left 4 feet long at the second winter pruning the cultivator may expect to have two or three bunches of Grapes the following summer. The apex of the young cane will now reach some little distance along the wire trellis suspended about 18 inches away from the roof. Rub off all the buds upon the stem of the young Vine, beginning with the lowest, to within the two below the trellis, for if shoots were allowed to grow from them

they would never be of use on account of the nearness of the hot-water pipes and the absence of light. Give exactly the same conditions and

FIG. 41.—First stage in tying down Vine shoot.

FIG. 42.—Second stage in tying down Vine shoot.

temperatures as were afforded the two previous seasons, and the remaining buds will soon push forth. The one near to the apex of the

Vine must be trained towards the top of the vinery to form the leader, and those that push from the other buds are trained horizontally. These horizontal shoots must not be closer than about 15 inches, so that it will probably be necessary to remove some of them. In doing this endeavour to leave the shoots, so that those on the one side alternate with those on the other.

When the tender young shoots have almost reached the roof tie them down to the trellis so as to keep them from being scorched or injured by cold, and also train them in the required direction. This work requires care, for the young growths break off easily at the base. Place a piece of matting (raffia) over the shoot, about 3 inches

FIG. 43.—Last stage in tying down Vine shoot.

away from its apex, and draw it gently away from the roof. Tie the other end of the matting to the trellis. Do not make a double knot, for in the course of a few days the matting can be drawn considerably tighter, sufficiently so perhaps to bring the shoot half-way down between the trellis and roof. After several days have elapsed it will bend easily to the trellis, and may then be finally tied. Soon afterwards laterals will develop from the shoot cut back, or these also must be stopped when they have made two or three leaves. Some of the side shoots are almost certain to bear bunches; but all the latter, except two or three, should be removed, as to allow the Vine to carry a heavy crop of fruit at so early a stage of its existence would be unwise. Encourage the Vine to grow freely by keeping the house warm and moist, and giving the same temperatures as previously mentioned.

When, however, the Vines come into flower a drier atmosphere is required, so that the pollen from the stamens of the flowers may be easily dispersed. If the pollen becomes damp through too much moisture in the vinery, it is naturally not so easily dispersed as when perfectly dry, and in this case imperfect fertilisation would ensue, or, as it is popularly expressed, the Grapes fail to "set" well. The necessity for a drier atmosphere and more air is therefore easily apparent. It is an excellent plan to gently shake the Vines every day when they are in flower. In the course of a few days if fertilisation be effected (and most varieties of Grapes set easily if the above conditions are afforded) the berries begin to increase in size quickly. When this is noticeable keep the house warm and moist again to assist the Grapes to swell as rapidly as possible.

When the berries have become almost as large as peas remove a great many of them ("thinning" is the technical term for this work) so as to allow the remaining ones sufficient space for development. A pair of Grape scissors, with long tapering points, and a small forked stick, about 9 inches long, are required. In thinning, hold the stem of the bunch by means of the forked stick with the left hand, and cut away the superfluous berries with the scissors in the right hand. Commence at the bottom of the bunch, and remove

FIG. 44.—An unthinned bunch of Grapes.

first the small seedless berries, then most of those inside, and finally the necessary number of the remaining ones. It is impossible to say how many berries should be removed, but taking, for example, the well-known variety, Black Hamburgh, in a properly thinned bunch about half the berries will have been cut away. These, when finally thinned, should be about half an inch apart. Keep in view the shape of the bunch, and endeavour to equally regulate the distance between the berries. Always leave a good number upon the uppermost shoulders,

which must be looped to the trellis above with a piece of matting if they droop down. It is necessary to look over the bunches in the course of two or three weeks, for some of the berries may have been left too thickly when first thinned. When four leaves have developed beyond the bunch of Grapes, pinch back the shoot to within two or three leaves of the bunch, according to the amount of space at disposal.

FIG. 45.—Bunch of Grapes properly thinned.

Sometimes the bunch originates nearer the base of the shoot than at other times, thus allowing space for leaves beyond.

As the berries are swelling freely, a night temperature of 65 degrees should be maintained, and little fire heat is necessary in early summer. In a few weeks' time, it will be noticed that the berries have apparently ceased to swell. What is known as the stoning period has arrived, and for about a fortnight, or rather more, no material difference is visible in the size of the berries. The reason is that the energies of the Vine are then directed towards the development of the seeds. On no account allow a high temperature to prevail at this period, for the berries

cannot then be forced to swell, and injury might easily result. It is not difficult to discern when the stoning period is over, for the berries again quickly increase in size, and continue to do so for several weeks. Still close the house early in the afternoon, and moisten the walls, &c., to create a warm, genial atmosphere. A considerable quantity of water is now required. The border must not become dry, or a check to the plant and its fruit results. Liquid manure water is beneficial at this period. Before many weeks have passed, some of the bunches will

begin to change colour. At first they are tinged with light red, become reddish-black, and finally black. As soon as signs of colouring are noticed, sprinkle a little water about the house, and give more air. After several days when the change in colour becomes general, increase the amount of air, and also leave the ventilators slightly open at night. Discontinue to moisten the walls, paths, &c. In a few weeks' time the vinery may be thrown quite open during the day, and partially so at night, until the fruit is cut. Then keep it quite cool. Do not diminish the fire heat at all until the Grapes are well coloured, and even when they are ripe, a little heat should still be maintained so as to avoid damp upon the bunches.

Pruning.—This is an important operation in the culture of the Vine. The system in almost universal practice in this country, and undoubtedly the best and most convenient, is that known as spur pruning. Let us take as an illustration a young Vine that has made three seasons' growth, the one we have hitherto considered. At the end of the first season after being planted, it will be remembered that

FIG. 46.—Vine. Winter pruning.

Dotted lines = where to cut back to.

FIG. 47.—Showing where to stop primary shoot of Vine.

Two or three leaves beyond the bunch. Dotted lines denote where to cut.

the Vine rod was cut back to two eyes, the next year left 4 feet long, and the following spring horizontal shoots were allowed to develop from the higher portion of this, and the leader was trained up the

trellis towards the roof of the vinery. At the third winter pruning leave this leading shoot 2 or 3 feet longer than it was at the beginning of the year; it will now therefore be about 7 feet in length. The horizontal shoots are to form permanent fruit spurs. Shorten them back to within one or two buds of the base; to one, if the basal bud is well developed and hard, and to two if the lowest is not a good one. The same principle applies here as when the young Vine was cut down at the end of the first year after planting. If the shoot under consideration were left at full length it would be weak and useless. By pruning the shoots that have grown from the spurs during summer to the one or two lowest buds every winter the Vine is kept within proper bounds, and may be cultivated for many years in a

FIG. 48.—Development of laterals. Stop at dotted lines.

comparatively small space. Do not leave more than two buds at the annual December pruning, and two only when the last one is not well developed. If the shoot is left an inch or more in length every winter, the spur soon becomes long, unsightly, and weak. Until the leading shoot reaches the top of the vinery, it may be cut back at the end of each season to within about 3 feet of where it commenced to grow the previous spring.

Watering.—Watering must not be overlooked. From the time the berries commence to swell until the Grapes are ripe, an abundance of water is necessary. The border should never be allowed to become dry. After the first mentioned period give stimulants occasionally, either in the form of artificial manure, sprinkled in the border, and slightly forked in before watering, or of liquid farmyard manure. It is important not to allow the Vines to suffer from want of water after the fruit is cut, for then the buds are being matured for another season's

growth. Water is hardly needed from after pruning until the Vines have been started several weeks.

Varieties.—Undoubtedly the best of all Grapes for the amateur is—

Black Hamburg, unless very late Grapes are required. This variety may be ripened by the month of May, and also throughout the summer until October and November. It has an excellent constitution, bears well, sets freely, and the fruit ripens quickly.

Foster's Seedling—a white Grape—is almost, if not equally as good. It also may be had in perfection in May, and, like *Black Hamburg*, has a good constitution. The berries are yellowish-white, and very sweet. It makes an excellent companion for *Black Hamburg*. These two Grapes are certainly the most satisfactory for an amateur grower.

Black Alicante may be next recommended. This is a late Grape of good flavour, and may be had from October to March.

Gros Colman is a large, black, late Grape, of a peculiar and distinct flavour, largely grown for the London market. It requires more heat than the above varieties to properly ripen.

Madresfield Court and *Muscat of Alexandria* are two splendid Grapes, but require rather a higher temperature to ensure success than the two varieties first named.

Lady Downe's Seedling is a delicious late Grape, that keeps until late in spring; it has not, however, a vigorous constitution.

Propagation.—The usual way of increasing the Vine is by means of "eyes," taken in winter. The term "eye" denotes a cut portion of the previous summer's ripened wood, containing a bud. It is about an inch long, being cut close to the bud on both sides. Each of these "eyes" is capable under proper treatment of developing into a fruit-bearing Vine. After each bud or "eye" has been cut as shown in the month of January they are placed singly in small pots, $2\frac{1}{2}$ inches in diameter. These are previously firmly filled with a mixture of loam and leaf-soil, and the "eye" is then pressed into this, until only the bud is visible. Plunge all the pots in fibre or sand over hot-water pipes in the warmest house at disposal, or a small hot-bed of manure might be made. Syringe them several times a day, and shade when the weather is bright. The buds in a week or two will commence to burst. The soil hardly needs water for two or three weeks after the bud has burst into growth, for comparatively few roots are formed; until then keep the tiny plants in a position near the glass so that they may have plenty of light and sun, and they will soon increase in size and vigour.

Herbaceous Grafting, that is, the uniting of two growing shoots, and Inarching, are two useful operations, well worth knowing how to perform. If, for instance, two Vines are growing side by side, one of which is worthless, a shoot from the one that is of value may be grafted upon the worthless one, and the branches of the latter eventually cut down. The operation is very simple: Choose two shoots that can easily be brought together. With a sharp knife cut a small piece from the side of each, and fasten the cut portions together,

so that on one side at least the outer edges of both correspond. Bind them together firmly with matting, and then cover this thinly with clay to prevent the access of air to the parts to be united. In a month or two the union will probably be effected. The shoot of the worthless one should then be cut back just above the graft, and when the grafted shoot has become thoroughly established, it may be severed from its

FIG. 49.—Two growing shoots to be grafted. Dotted lines show where to cut.

FIG. 50.—The shoots joined together.

parent, and the worthless Vine completely cut away, except, of course, that portion below the graft.

Inarching, or Grafting by approach, consists in uniting two Vines together by treating them exactly as in herbaceous grafting. The operation, however, is performed just as the Vines commence to grow, and the matured wood of each, instead of the green, is joined together. A pot Vine may easily be inarched upon a permanent Vine planted out, if brought close to the stem of the latter, and attached to it as above explained.

Bottle Grafting is also a simple and convenient method of propagation. The shoot to be grafted is cut from the Vine the previous autumn, and kept half buried in soil in a cold-house, until the Vine upon which it is to be placed has just commenced to grow. Then bring the graft into the vinery for a few days before grafting, so that it may be brought into practically the same condition as the stock, *i.e.* the

permanent Vine. Place one end of the graft into a bottle of water, and attach the other end to the stock by the method previously described, finally covering over with matting and clay. Sufficient nourishment is contained in the rain water of the bottle to sustain the graft until it has become united with the stock. Do not remove the bottle and covering until the grafted shoot has grown several feet long.

Vines are largely grown in pots by nurserymen to provide a supply for early forcing, and for replacing old Vines and planting new vineries.

A small grower cannot do better than buy good, strong pot Vines for planting out; it is far more satisfactory than attempting to raise them oneself. Great heat is necessary, both above and below, to have them of sufficient size and vigour in one season.

Insect Pests.—

There are several troublesome pests that attack the Vine, and a season seldom passes without one or more making their appearance. Mildew, a white fungus that attacks the leaves and also the young bunches, is one of the most common, and, if not checked, quickly disfigures a whole house of Vines. The spores

of this fungus cannot germinate in a warm, dry atmosphere; moisture is necessary for this. It is, therefore, evident that the latter condition must be avoided, and the vinery kept warm and dry for a few days. Flowers of sulphur dusted on the berries and all affected parts is an excellent remedy.

The red spider is a minute insect that often attacks the foliage, and, if left alone, would soon destroy it. It always appears to attack the lower surface of the leaves, which then have a yellow, unhealthy appearance. A hot and dry air favours this pest; it is often more prevalent near the hot-water pipes. Endeavour, therefore, to maintain a moist atmosphere until it is checked. Syringe the Vines well with clear water daily, and occasionally with a solution of soft soap and warm water.

FIG. 51.—Bottle-grafting Vine shoot.

Mealy bug when once established in a vinery is difficult to eradicate. The most effective remedy is to throw a good handful of sulphur upon a few pieces of hot coke placed in a flower-pot, and allow the fumes to fill the vinery. This must only be done in midwinter, when the Vines are perfectly dormant, and no plant in a green state must, of course, be left in the house, or even in an adjoining one, for sulphur fumes are deadly to vegetation. When the Vines are started in the spring, a lookout must be kept for this insect, and a short time spent each day in going over the Vines with a small brush and a little paraffin. This will kill mealy bug instantly, but the buds of the Vine must not be touched, otherwise they will be injured.

Vine Culture in the Open Air.—Excellent Grapes may be grown out of doors, but their growth must not be neglected. East Anglia is one of the parts of England that has always been noted for its open-air Vines, and cottagers sometimes make good sums of money by the sale of Grapes from their walls. The Vines generally cover the roof, as well as the front of the cottage, being supported by a wooden framework, about 15 inches from the roof. Vines delight in abundance of sunshine, and should be planted against a wall facing south. A border must be prepared, but this is quite easy, as it need not be more than $2\frac{1}{2}$ feet deep and 3 feet in width. A border of these dimensions, if composed of good holding heavy soil, with a little bone meal and a liberal quantity of old mortar rubble added, will support Vines for many years, provided the roots are well mulched with short manure, and assisted with liquid or artificial manure when the berries are swelling.

Rich borders encourage a strong sappy growth, which does not ripen properly, and invariably gets crippled in winter. With regard to drainage, if the ground is naturally porous, nothing more than spreading 6 or 8 inches of broken bricks or clinkers in the bottom will be necessary, but if the subsoil is at all retentive, a drain-pipe, 3 inches in diameter, must be put down in a slanting direction to carry away superfluous water. Cover the drainage with turf, grass side downwards, to prevent the soil from blocking it, and this must be made firm by treading or ramming. Obtain moderately strong well-ripened Vines in small pots from a good firm in January. Prune them back to within 15 inches of their base, and keep them dry and cool until the end of March, when they may be planted. Turn the Vines out of the pots, remove the crocks from the base of the balls, loosen the roots a little with a pointed stick, and plant, covering the roots with 3 inches of soil, and ram it firmly. When planting against a bare wall, place the Vine in the centre, and train a rod horizontally to the left, and another to the right, some 2 feet or so from the ground—these to furnish the main bearing rods—to be trained in an upright direction, 3 feet apart, the second and following years, until the wall is furnished. When planting against a dwelling-house, place the Vine in the most convenient position, and train the main rods over all available spaces, 3 feet apart. The Vine must either be nailed to the wall or tied to wires.

General Remarks.—As a rule, February is the best month for pruning open-air Vines, and the main growths should be pruned back into the well-ripened wood. When the Vines commence to grow, the young fruit-bearing shoots on each side of the rods must be thinned out, and evenly disposed 18 inches apart. If left thicker, sun and air will be excluded, and both foliage and fruit will be small and inferior. The fruiting laterals must be pinched at two leaves from the bunch, repinched when another leaf is made, and not allowed to make a further growth.

When the berries are set, and are as large as No. 3 shot, they should be thinned with Grape scissors. Remove most of the inside berries, as they seldom colour properly, and thin out the rest, so that when the ripe bunch is cut and laid on a dish it will not lose its shape. When the Grapes are swelling, well water the roots once a week with liquid manure, the colour of pale ale, or sprinkle a little artificial manure on the surface and water it in. The foliage should also be freely syringed occasionally on fine evenings to ward off red spider. Mulch the border in June with short manure to keep it moist. Wasps and flies often attack open-air Grapes when ripening, and the best way to protect them is to envelop the bunches in muslin bags. Wasps may also be trapped by half filling soda-water bottles with sugar and beer, and hanging them on the Vines. Each year when the Vines are pruned, a little of the old soil should be removed from the border, and replaced with fresh sweet compost.

The best Grapes for open-air culture are—Reine Olga, Cambridge Botanic Gardens, a very sweet purple Grape; Miller's Burgundy, Old White Sweet Water, Royal Muscadine, and Chasselas Vibert, a delicious Grape. The Vine, apart from its fruits, is valuable for its picturesque growth. Many a sunny corner may be well clothed with its beautiful foliage and in the autumn sweet fruit clusters, and Vines are as appropriate as any wall plant for the old-world English homes now built in many parts. A cottage or English home of the past was seldom without its clustering Vine.

The Strawberry.—This is one of the most delicious of hardy fruits, and gives its precious harvest in June and July. The Strawberry should be cultivated by those with merely a small plot of ground; it needs neither pruning nor training and quickly fruits. This cannot be written of Apple, Pear, Plum, &c., that never reach full fruit-bearing condition until several years have elapsed.

Soil and Situation.—In ordinary garden soil the Strawberry succeeds; it delights, however, in a deep loam, well enriched with manure. As in the case of most other fruit-bearing plants, it does not thrive so well upon light, gravelly land. The ground upon which it is intended to make a plantation of Strawberries should, towards the end of July, be dug over deeply, at the same time placing a layer of manure in the bottom of each trench as the work proceeds. This will prove especially valuable to the roots if the soil be of a light nature. Strawberries grow well in almost any position in the garden; they may be

planted upon open ground fully exposed, or upon borders facing north, south, or west. Planted on a north border late varieties are very useful, for they provide a supply of fruit for a considerable time after the general crop has been gathered. Upon a south border, especially with a wall behind, ripe fruit may be gathered from the early varieties by the first week in June, or even before, much depending upon the weather.

Planting.—August is the best month to plant the Strawberry; early planting is one of the chief points in its culture. The plants are then able to get well established in their new quarters before the winter, and so pass safely through the cold, inclement weather; whereas if planting is deferred, say, until late in September, winter is at hand before the roots have penetrated into the fresh soil. When brighter

FIG. 52.—Showing how to plant a Strawberry.
Crown just above surface of soil.

and longer days appear they are not in a fit condition to take advantage of the change. Consequently they are late in commencing to grow, and when the flower spikes do appear they are so weak and small that one can safely predict that the first season's crop will be useless. Such is the effect of planting too late.

After a Strawberry plant has borne fruit for three, or, upon good land, for four seasons, a fresh plan-

tation must be made, as from this time deterioration sets in. In large gardens Strawberries are frequently not kept more than two years. Place the Strawberries 12 inches from each other, in rows 2 feet apart. Choose, if possible, a dull day for planting, and when the ground is moist; the plants then get a good root-hold more quickly than when the soil is hard and dry. If the summer has been very hot, and no rain has fallen for some time, well water the ground before and after planting, and also for a few weeks until the plants have made fresh roots. Of course, if rain falls, this will be unnecessary. Make sure that the Strawberry plants are watered before being placed in the ground. When water is given after planting in a dry soil it will run down by the side of the hard dry ball, and enter the more easily penetrated ground immediately around, thus leaving the plant as dry as before. Much of the after success of the Strawberry depends upon the way in which it is placed in the soil. The roots should be just covered and quite firm; the crown (*i.e.* the

PROTECTING STRAWBERRIES WITH FISH NETTING.

BASKETS OF ROYAL SOVEREIGN STRAWBERRY.

point from where the young leaves arise) must, however, be quite free and exposed. If this were covered with soil, and the latter became wet, the leaves would probably decay and death result. If, on the other hand, the crown were too far out of the ground, the plant would become so loose, by being shaken by the wind, that it would never obtain a proper hold of the soil. First make a hole with a trowel, at the spot already marked out, sufficiently large to comfortably receive the roots when spread out as they should be; then insert the plant, cover with soil, and with the foot tread firmly all round, taking care not to touch the plant itself.

After Treatment.—After planting place a mulch of well-decayed manure around the Strawberry plants. If the autumn is hot and dry the manure will keep the ground moist and cool, and the formation of new roots will be greatly assisted. The manurial properties will also be washed down into the soil by rain. On the first appearance of weeds in spring at once run the hoe between the plants. In the month of May a covering of clean straw should be placed between and around the plants to keep the fruit clean and uninjured. Strawberry fruits that are allowed to remain in contact with the surface of the ground become splashed with soil during rain, and are then almost worthless. The straw also serves to protect the flowers from slight frost; it is a simple matter to shake it out a little with a fork at night so as to cover them over. If there are signs of sharp frost when the flowers are open improvise some covering without delay, otherwise the crop of fruit will be partially destroyed. Straw, old mats, or canvas are excellent. Unless it be desired to increase the stock of Strawberries, the side shoots, or runners as they are termed, should be cut off as soon as they appear. The swelling fruits will be greatly helped by the mulch that was spread over the ground the previous autumn, providing sufficient rain falls to wash its manurial properties to the roots. If not, water must be applied by hand. Do not gather the fruit when wet, especially when it is to travel some distance. After all the fruits have been gathered remove all decayed leaves from around the plants, cut away any runners that remain, and lightly fork the soil in between the rows, after having first removed the straw.

Propagation.—The way to increase the Strawberry is by runners. A "runner" is easily recognised. Examine a vigorous plant during the summer; it will be noticed that several long, thin, stalks we may call them, proceed from it at various points, and that at the end of each of these there is a tiny plant. This is a runner, and propagation is effected by these ("layering" the operation is called). One must so treat these small plants as to induce them to form roots. They are then severed from the parent plant. There are several ways of accomplishing this; the one most strongly recommended is that of layering the runners into small pots which should be about 2 inches in diameter, having a small piece of turf at their base for drainage, fill up with soil, from which the coarser particles have been sifted, then plunge them into the ground quite close to the parent

plant. The object of placing the small pots in the ground is to prevent the soil from becoming dry, as would quickly occur were the sun able to reach them. The runner (the tiny plant at the end of the long stalk) is then fixed into the soil of the small pot. This is sometimes effected by means of a piece of wire bent $\cap$ shaped, or a hairpin, but more generally by wooden pegs or a stone laid on the stalk. Give them water whenever required—this may be even twice a day in bright weather—and in a week or so roots will be emitted, and quickly take possession of the soil in the pot. The long stalk may then be cut, thus severing all connection with the parent plant; for the runners are now established on their own roots, and well able to take care of themselves. They are now ready, either for planting out in the garden, as already described, or they may be again placed in larger

FIG. 53.—Strawberry plant with runners, suitable for layering.

pots and grown for forcing. The latter half of June is the best time to insert the layers in the small pots.

Cultivation in Pots.—Strawberries are cultivated in pots, so that they may be taken into a glasshouse in spring, for the purpose of compelling them to produce fruit earlier than those grown in the open garden. Such a method is known as forcing, and the fruits thus produced, as forced Strawberries. Strawberry-forcing is most interesting work, and should be attempted by all who wish to prolong the season of this delicious fruit. It is not necessary to have a large number of plants, and much fire heat is unnecessary, unless it is desired to have fruits very early; it is not, however, advisable for the small grower to attempt to force Strawberries very early, for a certain proportion of the plants become blind (*i.e.* they bear small, useless flowers, or perhaps none at all), and the flavour of the fruits in the dull weather of early spring is by no means first-rate. Delicious fruits may, however, be had in the month of April by gentle forcing. We will now go back to where the runner was left. It will be remembered that this was fixed into a small pot of soil and carefully watered. About ten days

after having severed the rooted runners from the parent plants, in order to have plants that can be forced to bear fruit by the following April, transfer the former to larger pots—those 6 inches in diameter are the most suitable. If the runners were layered towards the end of June, by the first week of August they will be sufficiently well rooted to remove. The nature of the soil in which they are now potted is of great importance, for it has to support them for about nine months. Nothing is better than rough, turfy soil, with which a little guano, or manure from an old-mushroom bed, and some small pieces of lime or brick rubble are well mixed. The latter help to keep the soil sweet and wholesome, while the guano stimulates and supports the plants. Place

FIG. 54.—Showing the runners when layered into small pots.

several crocks over the base of each 6-inch pot for drainage, so that the water given to the plant may pass away freely. Unless proper drainage is provided, satisfactory results cannot be obtained. Over the crocks place a few rough pieces of turf to prevent the smaller particles of soil from falling into them, and thus stopping free drainage. Then fill in as much of the prepared soil as will raise the uppermost roots of the runner within about an inch and a half of the rim of the 6-inch pot and place the runner upon it. Holding the small plant firmly with the left hand, with the right hand fill the surrounding space between it and the side of the pot with the prepared compost. Make this quite firm with a wooden rammer. The latter should be 9 or 10 inches long, an inch or so in diameter, and made round; the base, however, is quite flat. As soon as the space around the small plant has been filled in, add sufficient soil, made firm, to fill the

pot to within about three-quarters of an inch of its rim. This margin is necessary to receive and hold water when this is applied. On removing the runners from the small pots, take care that the roots are not broken or bruised. When all the plants have been thus placed in 6-inch pots, stand them for a few days in partial shade, syringing them several times daily, and give water whenever required. In a week's time place them upon an open piece of hard ground—the garden walk is an excellent position—so that they may have all the sun possible. Allow each plant plenty of room, by placing them in rows, 9 or 10 inches apart, and let each one be 3 or 4 inches from its neighbour. An abundance of water is required during the hot weather, when the plants are well rooted, and they must not be allowed to suffer

FIG. 55.—Way to place the runners, when rooted, into a larger pot.

from dryness, or bad results will follow. It is preferable to water them early in the morning or evening, as then the water thoroughly moistens the soil. It is probable, however, that water will be again required before the day is over. Syringe the plants every evening, so as to encourage growth. Cut off all runners that appear, and remove weeds when seen. When cold weather arrives, some protection must be afforded, or the roots might suffer, and the pots be broken. A simple method of preventing this is as follows: First place the plants closely together in a straight line. Then spread a layer of bracken or ashes (the former is preferable, if it can be obtained) by the pots; place another row of plants next to the bracken, so that the latter is pressed quite closely between the

two rows of plants. Continue this—a layer of bracken, and a row of plants alternately—until all are protected. The first row that was put down will also need covering on the outside until about the middle of February, when no further attention is required. If ripe Strawberries are desired in April, the number of plants required must be placed under cover early in February.

Forcing.—A cold frame is the best position for three or four weeks. If a mild hot-bed of leaves can be prepared in which to plunge the plants, so much the better, for this promotes root action. Under this treatment, the flower spikes also appear more quickly. In about eight weeks from placing the plants in the cold frame ripe fruit may be expected, if a little fire heat be afterwards available. At the close

of three weeks or so, when the flower spikes commence to push forth, the plants must be placed near to the roof (that is to say, within 12 or 18 inches) of whatever structure is at hand. If none other than a cold frame is available, this will answer the purpose well, although the fruits will naturally not be ripe as soon as in a heated glasshouse. When the plants are first placed in the cold pit, if it is intended to remove them in a few weeks' time, they may be plunged close together. If, however, they are to remain there to fruit, a distance of several inches between each plant must be allowed. A mild hot-bed is of immense advantage for starting early Strawberries, for by first gently exciting the roots into action the plant is made to produce better foliage and stronger flower spikes. Syringe the plants daily once or more, according to the weather, giving a little air in the morning; close the pit early in the afternoon, and syringe the plants at the same time. When the flowers begin to open, keep the atmosphere of the house dry, and admit plenty of air; such conditions facilitate the formation of the embryo fruits, and must be maintained until these are properly formed. When six or seven fruits "set" upon each plant, the pit or house should again be kept warm and moist, to encourage the former to grow as quickly as possible. Close the house quite early in the afternoon, to raise the temperature, syringing the plants at the same time to create a moist, genial atmosphere. After developing for a week or more, the fruits gradually become white, and soon afterwards change to the normal red colour. Discontinue syringing when the red colour is noticeable, for the fruits then are softening, and if wetted, will probably decay. Always endeavour to assist the fruits after they are "set," by giving stimulants to the plants in some form or other. A little guano may be sprinkled upon the surface of the soil and the latter disturbed with a small pointed stick (this allows the guano to enter the soil more easily), or weak liquid manure may be given about twice a week. To ensure well-flavoured fruits, more air and a dry atmosphere are essential when the ripening stage approaches, foretold by the change in colour. These various changes in the conditions of the house where Strawberries are grown must not, of course, be effected suddenly. The air must be gradually increased daily, as the flowers open, until by the time all have expanded, the house is quite cool. The same method should be adopted when the fruits commence to change colour.

Varieties for Outdoor Culture.—Many varieties are in cultivation; some good, others indifferent.

The following are six of the best for a small garden :

Royal Sovereign : a large, handsome, bright scarlet fruit, of good flavour. The plant bears well and ripens early.

La Grosse Sucrée : this is large, dark red, of fine flavour, good constitution, and early. This variety and *Royal Sovereign* are the kinds for small growers.

The Bedford : a mid-season variety of robust habit, very free bearing, and roundish fruits of good flavour.

Laxton's Latest: a fine late Strawberry of large size and good flavour.

Countess: a handsome, conical-shaped, deep crimson fruit, of first-rate flavour, and good constitution.

Waterloo: this is a valuable variety, and is almost the last to ripen. The fruits are large, very dark red in colour (some are almost black, when fully ripe), and of a fine flavour.

Other Good Varieties.—

Latest of All: a very late Strawberry of exquisite flavour.

Aromatic: a fine large fruit with an aromatic flavour. The plant bears abundantly, and is well worth growing.

Bicton Pine is a white-fruited variety of distinct flavour, and bears well.

James Veitch: large, handsome fruit, red, of good flavour.

President: handsome, bright red fruit, well flavoured, good bearer.

Varieties for Pot Culture.—The best for forcing are undoubtedly Royal Sovereign and La Grosse Sucrée. The former is the one for a very early supply. James Veitch and Sir Charles Napier (a pale scarlet fruit of sharp flavour) also force well, and may be tried in addition to the first two named.

The Gooseberry.—The Gooseberry is one of the most serviceable of our hardy fruits, especially to the amateur, for the bushes occupy little space, and the fruit has the advantage of being ready for use in a green state as well as when ripe.

Soil and Situation.—If very large Gooseberries, regardless of flavour, are desired, a rich, moist soil and partial shade from the sun are necessary.

Unless required for exhibition, however, it is better to obtain medium-sized, well-favoured fruits; a soil that is drier and not so rich, and a situation exposed to the sun, are then desirable. The bushes themselves will afford sufficient shade to each other. It is more convenient when planting Gooseberry bushes to group them together upon one piece of ground, for when the fruits are ripe black-birds, &c., are troublesome, making it necessary to cover the bushes with netting. Such protection is obviously more easily given when the bushes are together than when dotted about here and there. The roots are then also in less danger of suffering from the spade or fork, as might easily happen were the ground immediately around them cropped with vegetables. Where, however, land cannot be devoted solely to a plantation of Gooseberries they may be planted by the side of the garden walk or between Apples and Pears. It should be remembered that their roots are close to the surface of the ground, and if this were dug over with a spade some of the former would be destroyed. Although usually planted upon open ground, Gooseberry bushes may, in order to prolong their season, be trained against a north wall or upon an espalier in a cool position. Unless a few are required very early it is unwise to plant them against a wall facing

south. This position is too hot. This refers more especially to the southern part of England. In the northern and midland counties wall protection would be beneficial.

Planting should be performed during October and November. Several weeks before planting prepare the ground by digging, and mix with it some manure at the same time. Be sure that the hole to receive the Gooseberry bush is sufficiently large for the roots when spread out, and that it is slightly higher in the centre than at the sides. After the roots have been fully extended and carefully covered over, make the soil quite firm by treading. Bush plants, in the open, are planted in rows 6 feet apart, with a distance of about 5 feet between each plant in the row. The character of each variety should be considered when making a plantation; for instance, early and late sorts must not be placed side by side, nor strong growing varieties close to

FIG. 56.—Distance to plant Gooseberry bushes.

weak ones. In the former case the work of netting is facilitated (the same nets will do for both if these are kept separate); and in the latter the vigorous bushes do not overcrowd the others, as would occur were both planted indiscriminately.

Propagation.—The Gooseberry is easily increased; the best method being that of taking cuttings, which are formed of a portion of the growth made during the previous summer. They are taken from the bush in the autumn, just as the leaves fall, and are cut to about 12 or 15 inches in length. Endeavour to select straight, firm, and short-jointed wood. All the buds except those within about 5 inches of the top of the cutting must be removed. Shoots will eventually develop from these buds to form the primary branches of the bush. The opposite end of the cutting—*i.e.* where the buds were cut out—is inserted in the ground, 5 inches or 6 inches deep. First, take the shoot from the bush, and prepare it afterwards. It is not always possible to obtain the cuttings of one particular length, but whether the latter are rather longer or shorter than the above dimensions does not signify. The object in view is to have a firm shoot—the buds of which have been removed to within about 5 inches of its apex—sufficiently long to be placed 6 inches

in the soil, and then leave a stem 8 inches or 10 inches above ground. Thoroughly eradicate the buds from the lower portion of the stem, or growths will eventually push from them and prove annoying.

FIG. 57.—Young Gooseberry bush, showing first branches.

Cross lines indicate where to cut back to at winter pruning.

Such growths are known as suckers, and, if allowed to grow, soon crowd into and interfere with the development of the branches proper, besides having an untidy appearance and preventing a free use of the hoe and the application of manure. The more one cuts them back the stronger they reappear. The only way to destroy them is to get down to the buds, whence they originate, and cut them completely out. This, however, cannot be done without injury to the roots; it is therefore wise to make sure that the bud is properly removed in the first place. After

having prepared the cuttings plant them out in rows on a shady border. Make the rows 12 inches apart, and let the cuttings be about 6 inches from each other in the rows. This work should be done as soon as the cuttings are ready — October or early November. The following autumn transplant them into rows 18 inches apart, with a distance of 12 inches between each. After another year has passed they may be placed in their permanent quarters in the garden.

Forming and Training the Bush.—Suppose that the prepared cutting has passed safely through the winter, and that the buds have pushed into growth. Four or five buds may have been left at the apex of the cutting; it is therefore safe to assume that three of them

FIG. 58.—Gooseberry bush, showing six branches at end of second year's growth.

have commenced to grow. If such be not the case the cutting is not worth keeping. The object of removing the lower buds in preparing the cutting, besides guarding against suckers, was to obtain a clear stem of

several inches between the ground and the lowest branches of the bush. Allow the shoots that will develop from three of the buds upon the upper end of the cutting to grow freely throughout the summer, and also laterals that make their appearance. In early winter prune the three principal shoots back to about 6 inches in length, and cut all the laterals to within half an inch of the base. The following spring two shoots should be allowed to develop from the three primary branches that were shortened in winter. At the close of the second summer there will thus be six branches. Next winter shorten these also to within about 10 inches of their bases. In spring encourage two more shoots from each of the six branches, thus making twelve in all. The Gooseberry bush will then have a good foundation. When afterwards other branches are allowed, if there is room for them, be careful that they do not originate from buds pointing downwards or inwards, or they will defeat the object of the cultivator, which should be to keep the branches thinly disposed so as to admit all sun and air possible.

Summer Treatment.—During the summer months, lateral growths will push from the branches, in addition to the natural fruit spurs

FIG. 59.—Gooseberry shoot in fruit (previous summer's wood, showing advantage of young growth).

that form upon them. The strongest of these should be pinched back to five or six leaves. The object of thus pinching the shoots in summer time is to prevent overcrowding and to encourage the formation of fruit buds at the base of the shoots so pruned. This is better than allowing the latter to go unchecked until the winter, and then to shorten them down. The Gooseberry bears fruit remarkably well upon wood of the previous year's growth, as well as upon spurs that form on the older wood. This fact should not be forgotten, and wherever there is room to introduce a shoot, instead of pinching as above described, allow it to develop, and simply shorten it slightly in winter. The following year it may be expected to bear fruit.

Keep the surface of the ground well hoed throughout the summer

months; it will then be kept free from weeds and the soil will not lose so much of its moisture as if the ground were allowed to become hard. When the fruits are swelling, they are greatly assisted by well watering the ground, and especially so if a covering of manure is first put down.

Winter Treatment.—At the annual early winter pruning the leading branches should be left about eight or nine inches long, until the bush has reached the desired height and size. Then cut them back every year to two buds. When a branch becomes old, and bears little fruit, cut it away, so that a younger one may grow up to take its place; a far better crop of fruit will thus be obtained. In fact, the cultivator should endeavour to introduce as much young wood as possible, never hesitating to remove an old or weakly branch. In the south of England, more branches are usually allowed to form in the centre of the bush than is the case farther north, for if they were kept too thin the fruits would suffer from the effects of the sun, naturally more powerful in the former than in the latter districts.

Espaliers.—Espalier-trained Gooseberries are excellent, and usually bear well. As is the case with all fruit trees thus trained, they occupy

FIG. 60.—Cordon Gooseberries.

little space, and are therefore useful in small gardens. A trellis-work to train them against can easily be constructed; a few upright wooden or iron posts, placed at intervals in the ground, and wires, 12 inches apart, fixed between them, will suffice. Cordon Gooseberries may either be trained with single, double, or treble stems; each of the latter

should be 6 inches or 8 inches apart, so that if the plants have two or three stems, they naturally must be placed wider apart. The management of espalier Gooseberries is simple: allow the leading shoots to grow throughout the summer, and shorten them back slightly every winter, until the top of the trellis is reached. In the month of June, pinch all unduly vigorous side shoots back to six leaves, and in winter shorten them to within about half an inch of the older wood.

Fan-trained Gooseberry trees are also used for planting against espaliers. By this method a quantity of young wood may be laid in every year upon which fruit is freely produced. The older shoots must, of course, be cut away to make room for this. In pruning fan-trained trees all that is necessary is to regulate the branches every autumn to several inches apart, retaining the young shoots in preference to older ones. In summer endeavour to encourage a shoot from the base of the previous year's wood, so that it may take the place of the latter. Pinch hard back all the other shoots upon the same branch, so that the one at the base may grow freely. For suitable varieties see table on p. 611.

Currants.—There are three kinds of Currants under cultivation for their fruits, viz.: the Black, Red, and White. The Black and the Red both grow wild in this country, and the White is a variety of the Red one.

Red and White Currants.—As in the case of the Gooseberry, Currants may be propagated from seed if there is a special reason for doing so, such as the raising of a new variety, but the most satisfactory, convenient, and generally practised method is by cuttings, which are made in exactly the same way as advised for the Gooseberry. Firm, short-jointed shoots, from 12 to 15 inches long, are taken off, and all the buds removed, except four or five near to the apex, so that no suckers can appear afterwards. In preparing the shoot, cut it straight across, under a joint, for it is only here that roots are formed. If the cut were made, say, midway between the two joints, the end would die back to the first joint above, and probably would not form roots at all. Insert the cuttings on a shady border several inches from each other, in rows 12 inches apart. The principal branches of the Currant bush may be obtained in the same way as described for the Gooseberry, *i.e.* by shortening each of the primary shoots, so as to obtain two from them, making six in all. Currant bushes are less spreading in growth, consequently there will not be space for so many branches, from six to nine being sufficient. Red and White Currants succeed in any well-tilled land. A deep, loamy soil is the best for them, and a light, gravelly one the worst. Many cultivators plant them against walls to insure a succession. Those trained on walls facing west or south-west provide the first supply, while those on north walls are the latest. As with Gooseberries, it is preferable, if possible, to have all the plants together, either upon a plot of land or in a row by the side of a walk. They should be planted at a distance of from 5 feet to 6 feet apart. Plant in

the autumn, just before the leaves fall, so that the bushes may become partially established before winter. Do not plant White Currants between Red ones, for the former grow less vigorously than the latter, thus requiring a smaller amount of space for development.

General Treatment.—During summer, to prevent overcrowding, remove those shoots that are weak, and pinch the strongest ones back to six leaves. The cultivator should always bear in mind that to provide the requisite nourishment for the development and ripening of a crop of fruit, a certain quantity of healthy young roots is essential, and the way to encourage their formation is to allow moderately free growth. Always avoid removing a lot of foliage at once. Rather go over the plants daily, and stop a few of the strongest shoots each time, or remove a few of the weak and useless ones. Every winter, until the bush has reached the desired height, the leading shoots must be shortened back to about 6 inches, more or less, according to whether they are exceptionally vigorous or otherwise. Unless this is done the fruit spurs that eventually form will be very weak. Always cut to a bud pointing outwards, so as to preserve the symmetry of the bush. The side shoots must be cut closely back to within an inch of the old wood. The White Currant does not require to be pruned so hard as the Red, for it is of more slender growth, and less vigorous in every way. During summer spread manure round the bushes, for this keeps the soil cool and moist, and Currants quickly suffer from drought. Do not gather the fruit when wet, especially if intended for preserving. The bushes should be covered with netting when the fruit is ripening, or the birds will prove destructive. Currants are often grown as standards, and are then very useful, especially in small gardens; moreover, they are quite easy to manage. Insert the cuttings as previously advised. In spring only allow the shoot from the top bud to grow, and pinch back the others to one or two leaves as they develop. Do not interfere with the leading shoot until it has reached a height of rather more than 3 feet from the ground. Fasten it to a stout stake, so that it may be held firmly. In the autumn slightly shorten the shoot, and next spring train four growths from just below the apex, to form the primary branches of the tree. These will thus be 3 feet above ground. The advantage of standard trees is that other bushes can be grown underneath them, for there is, of course, plenty of room for the stem of a standard between these.

Black Currants.—The Black Currant delights in a deep moist soil, and prefers a somewhat shaded position. It does not thrive so well on poor, light land, although much may be done to improve this by well mulching and manuring. The Black Currant must have altogether different treatment to that required for the Red and White kinds. In the first place, the lowest buds must not be removed from the cuttings, when these are prepared, for the fruit is borne largely upon wood of the previous season's growth. The object then should be to annually introduce as many young shoots as possible, for these

the following year will bear fruit. Suckers produce fruit equally as well as shoots that originate from the branches, and therefore must not be destroyed. At the annual winter pruning remove the old wood to make room for the new, and by thus cutting the older shoots back to a point where a younger one originates the bush is kept full of good bearing wood.

Pests.—Some of our small birds, bullfinches especially, delight in picking out the buds from Gooseberry and Currant bushes in spring, and if not destroyed or driven away soon inflict serious damage. Caterpillars appear during early summer, and feed upon the leaves. Undoubtedly the most effective plan, although it occupies considerable time, is to pick off the pests by hand. It is an excellent plan to scatter lime amongst the branches of the bushes after rain, so that it adheres closely, and also spread some over the ground. When this is carried out occasionally throughout spring and summer caterpillars are seldom troublesome. Some caterpillars injure the interior of a shoot of a currant bush, and decay results. If such happens the shoot should be cut off and destroyed. Black-fly also attacks the ends of the young growths; to kill this dip the latter in a strong solution of soft soap and warm water. For treatment of Black Currant mite see p. 493.

Figs.—Amateurs do not pay sufficient attention to this wholesome fruit, for when forced it will give two splendid crops.

Pot Figs.—This is a most interesting way of growing Figs, as they fruit very freely and need little forcing. Propagation is not advisable for amateurs to practise. Those who have no trees or convenience for raising them should purchase from a good source small trees in 6-inch or 7-inch pots; they are not costly, and ready for forcing at once. With regard to forcing, so much depends upon when the fruits are required. For May the plants should be started in January or early in February, and they like a mild temperature. When a little warmth at the roots in the way of bottom heat can be given so much the better, 50 degrees at night and 5 degrees to 10 degrees higher by day being sufficient. This in two months may be increased, the fruits thinned, and feeding commence. All shoots should be stopped at the fourth or fifth leaf from the base, as that is the bearing wood for the next crop. Unless they are stopped the shoots rob the fruits of sustenance, with the result that they turn yellow and drop; this is one of the most important points in Fig culture. After stopping the new wood commences to form embryo fruits in the axils of the leaves, and these begin to swell at the same time as the plants are finishing their first crop. All kinds do not bear two crops, one of the best in this respect being the Brown Turkey, but the earliest variety is the St. John—a white Fig, and the best for pot culture; it rarely casts its fruit. St. John's has a white flesh and green skin, and crops heavily. There are other good kinds, such as Pingo de Niel, a white fruit; Violette Sepor, a reddish fruit of good quality; the White Marseilles; and Osborn's Prolific. Most of these give two crops, but

for slow forcing or late use select Negro Largo. Nubian is excellent, but only gives one fine crop, and must not be forced hard. For July, August, and later supplies little forcing is needed, if given house-room, as the sun heat with early closing will suffice.

Pot trees when first started need little moisture until in active growth; also only slight damping overhead in dull weather or early in the season. More moisture is required later, and constant feeding is needful when the pots are small. After forcing, they succeed in the open, plunged to prevent dryness at the root, and any repotting should be carried out when the leaf begins to turn colour. As Fig trees grow very freely it is not well to overpot at any time. As the plants increase in size it may be necessary to rely solely on surface feeding.

The trees are subject to white scale, which should be removed by washing with tepid water and soft soap, scrubbing the old wood with a soft brush. With pot trees fruit may be obtained eight months in the year, and trees not forced hard never fail to crop splendidly. On the other hand, when in active growth, never allow them to become dry at the roots, as then the fruits drop.

Figs Planted Out.—Much the same treatment is necessary for trees planted out in houses. The same varieties are suitable, but none are so reliable as Brown Turkey for general culture. Most of the kinds are inclined to run to wood unless the root-space is confined; indeed, such kinds as the Negro Largo, Nubian, and others fail to fruit at all if given ample root-space or an over rich soil. Of course with trees on walls or trellises a certain amount of young wood must be laid in for leaders or extension, but keep others closely stopped. Only a few leaders are needed, and thus old wood may be removed every winter and new shoots trained in, but give ample space, as crowded trees bear poor fruits.

The temperature given for pot trees will suffice, and avoid at any time a high night temperature; when started in the spring 50 degrees are ample, but a liberal use of sun heat is advantageous.

Soils for both pot and planted-out trees should consist of good loam, to which add a fourth part of old fine mortar rubble or burnt refuse. Wood ashes are especially good, as these and the mortar rubble build up short-jointed fruiting wood. In potting or planting ample drainage and firm potting are essential; indeed, the rammer should be used freely, and give no manure other than as a mulch during the fruiting season. Plunge small pot trees when fruiting to prevent dryness. After the crop is removed the trees should be freely exposed and syringed in fine weather to keep the foliage clean, and any small spray growth pruned away to admit light to the branches. In taking a second crop thin freely. As the trees bear such heavy crops the early one next season suffers when thinning is forgotten.

Figs for Open Walls.—In many parts of the British Isles it is necessary to plant the Fig under a glass coping, or it fails to ripen. On the other hand, in Sussex, the Fig does splendidly as a

bush near the coast. The Brunswick, a pear-shaped fruit, develops exceptionally well; also other kinds, but this is unusually good. With regard to the position the trees should occupy, choose a west or south wall, and when planting make the soil, or add to it, so that the roots obtain a good percentage of chalk or lime, as this results in a firmer growth; the trees are hardier and more fruitful. March or April is the best time to plant, and the trees may be selected with a single leg or stem, as, unless this is done, sucker growth is troublesome. On the other hand, they may, with advantage, have three leaders. Train these in, and a wall is more quickly filled, as from each of these main shoots others will converge. They should be at a distance of 18 inches apart; this will allow for spur-growths from the side shoots, all foreright shoots being rubbed off as they appear—that is, the shoots that push out at right angles to the wall. All shoots should come from the sides, and, as far as possible, at about equal distances apart.

There are fewer varieties to choose from for open walls. The Brunswick is one of the best, and Brown Turkey is very fine in a warm soil or upon a south wall. In the north of England and in Scotland Castle Kennedy is a favourite, but it does not bear freely and makes rather gross wood. Brunswick is far more trustworthy and profitable if given room to expand on a warm wall, the old wood cut out, and new growths laid in each year. Another very good open-wall variety is White Marseilles, and, like the Brown Turkey, is excellent when forced—indeed, these two last named and the Brunswick are undoubtedly the most suitable for walls. Even in the south it is necessary at times to protect the trees in winter. Unnail the branches, cut out useless wood in November, tie the branches in bundles, and wrap straw, hay, or, what is better, dry bracken well round the wood, and then encircle with mats. Make the trees firmly secure to the wall after the mat has been placed round the protecting materials. In April remove the covering, and a little later nail the trees in their places, and stop side growths, as advised for forced trees.

Melons.—Many amateurs are afraid to grow the Melon; its culture is regarded as mysterious; but once a few important details are mastered, the work is quite easy. Usually the beginner kills the plant with kindness at the start. Little food is required at first, as a rich root run means gross growth and poor fruits or none at all. Setting is a difficult matter, as the plants run to leaf, the little fruits turn yellow and refuse to swell.

Melons in Houses.—Where Melons are forced for early fruits at least three crops may be taken in the same house by having strong plants ready to put out as fruit is taken from the old ones. Many good growers can take two crops from one set of plants, but great attention is necessary. Beginners could not be expected to do this. If Melon seed is sown in January the fruits should be ripe at the end of May or early in June. Another set of strong plants should be ready, and these will ripen in the middle of August, as from June to August

is the most favourable season. Strong plants being put out at that date will finish their fruits in October, but, of course, with frame culture only one crop can be attempted. Sow the seed early in April, plant as soon as four leaves have been made, and grow on, care being taken to ventilate carefully, as with frame culture every bit of warmth from sun heat is beneficial.

Grown thus bottom heat is beneficial, as the plants receive a distinct start early in the year; it is less important later on, but in the autumn it is again useful in finishing up a late crop. A small pit, or a span or lean-to house, is preferable to a larger structure, as atmospheric moisture is better maintained. Excellent crops may be secured in a pit with 8 feet to 11 feet run of rafter, or even less, as the plants may be fruited at 3 feet from the bed. The best method of culture is unquestionably to run the growth at the start in a single cordon, then stop at, say, $2\frac{1}{2}$ to 3 feet from the base. The plants will then throw out side or lateral growths, and show both male and female flowers. Both are needed, as, unlike Cucumbers, Melons do not set unless fertilised, and the grower cannot depend on insect agency to perform the work. Pinch out the points of the side shoots when they are from 15 inches to 21 inches in length. By this stopping the vigour of the plant is thrown into the fruit. The flowers will now open and require setting, as it is well to secure the first fruits that show; delay means several weeks, as another set must be secured from later growth. In the case of Melons, set the flowers at one time, or within a few days, otherwise the first fruits will monopolise the sap and the later ones refuse to swell. Three or four flowers should at least be set if that number of fruits be required, and that is a fair quantity for plants with limited top growth. The way to set is as follows:—The male flowers are soon distinguished from the female, which have small Melon-like formations at base with the flowers attached, whereas the male is a simple open flower with merely a stalk. The male flower must be taken from the plant with, say, half an inch of the stalk, and gently divested of the corolla or the yellow part quite close to the green portion. The remaining portion will be found covered with pollen, or a fine powder, and this part is gently pressed inside the female flower. It remains there, the latter closes, and in two or three days begins to swell freely. Of course the plants must not be syringed overhead when in flower, and a little more ventilation will be beneficial. From this day feeding may commence, either with liquid manure or with fertilisers. Top dressing with loam to which bone-meal or fertilisers have been added will assist growth. Go over the plants every week, cutting out useless side growths to prevent crowding, and in all cases allow growth to proceed from beyond the fruits. Many crops have been lost by close stopping, practised to prevent growth beyond the fruit, but this interferes with its proper development.

Syringing and watering are important details from the start until flowering time; it is well to syringe early in the day and when closing the house. Damp the house down freely at other times when the

weather is bright. Little water is needed at first until the fruits have set, then give more and syringe freely until ripening commences. More air and less moisture will be needful to secure full flavour. In a house a liberal

Temperature must be maintained. At planting, say, in January, 65 degrees at night or 60 degrees in any cold weather will suffice, with a rise of 10 degrees during the day; it is better to promote free growth during daylight than risk over-heating during cold nights. To save hard firing cover the glass with mats or canvas, and stronger growth results. When the fruits have set a few degrees higher temperature will be beneficial, but careful ventilation is more important. On some cold days it will be impossible to ventilate freely, but by damping down the house and care in firing the temperature can be maintained.

Melons, unless when first planted, need no shade of any kind. Inure them to the full sun as soon as the roots obtain hold of the soil. On the other hand, if there is free exposure, too much fire heat, and insufficient atmospheric moisture, the plants will suffer from insect pests, such as red-spider and black-fly. For the former syringe freely with tepid water, to which add soft soap to make it like milk and a lump of sulphur the size of an egg, and well mix. Shade the glass for a few days and keep both house and plants moist and the spider will soon disappear, as it cannot exist in a moist house. Black-fly is as troublesome and needs even stronger measures. Dip the affected points of the shoots in tobacco water. Syringe the plants with a weaker solution and fumigate twice a week when the soil is dry, but in the intervals maintain a moister atmosphere, as the pest delights in dry heat. In very bad cases it may be necessary to sponge the leaves, but, if possible, the pest should be destroyed in its early stages.

Another disease, more difficult to eradicate, is canker of the stem, and if not arrested the whole plant sometimes collapses. When first seen put finely-powdered fresh lime over the cankered portion, and always keep the soil dry near the stem when watering. Canker is also caused by allowing a too free growth, severe stopping, too sudden fall of temperature, and excess of moisture.

Soil.—A good stiff loamy soil should be chosen for Melons, and this with a small portion of bone-meal or fine old mortar rubble makes a good compost. Manures are unnecessary; it is wiser to rely on surface foods given when required. The soil also should not be sifted, but left in a rough state, using a little fine material round the roots at planting. Some growers do not make a bed, but place a ridge or heap of soil at the start, say half a bushel to a plant. This is increased by another when the fruits are set, and of a little richer material. Make the soil quite firm, and stake firmly and carefully. Use tepid water for watering and syringing, and put the plants out on the beds at 3 feet apart in the house. They may be a little nearer if the variety is a compact grower, and 4 feet may be given if two growths are taken from one plant. To do this stop the plants at from 12

inches to 18 inches from the soil. The two strong shoots at the upper portion are then trained over the trellis and all those below rubbed out, the main shoots being again stopped at 3 feet to 4 feet as advised above for the single shoots. Grown thus plants, soil, and labour are saved at the start, but more attention is needed to secure a full set of fruit. The single growth system at the start is preferable for beginners, and by doing so an earlier set is obtained.

Frame Culture is very similar. The temperatures given above cannot in this method of culture be kept up, but much may be done by careful ventilation, early closing, covering at night, and giving a thin shade in the day to avoid scorching. Manure will be the heating agency, and place this in sufficient quantity to start the plants freely. If put out in May the plants should bear fruit at the end of August. When planting keep the frame close for a few days, and with frame culture less water is needed, but the soil should be moist all over. A bushel of soil to each plant or light at the start will suffice. Peg the growths down when large enough to the soil, stop at 18 inches, and train two or three shoots over the surface. Stop these growths when plenty of fruit shows, and then set the fruit as advised for house cultivation, keeping the plants drier and admitting more air. When large enough place the fruits on slates or tiles to keep them from the soil, and useless growths must be removed, as with frame culture ample light is important. Excellent Melons may also be grown in cold frames; but grown thus greater care is needed in watering and ventilating.

Nectarines and Peaches.—The Nectarine is a popular hardy fruit; it is very pretty and of rich vinous flavour. Moreover, the trees are easily grown, and will succeed on open walls as well as in borders and pots under glass. Nectarines may be grown in either a span-roofed or lean-to structure, which must be light and well-ventilated, and supplied with sufficient hot-water piping. The border, which may be either inside or outside the house, should be about $2\frac{1}{2}$ feet deep, and where the subsoil is clayey, cover it with concrete, and have a good fall and a 4-inch drain pipe to carry off superfluous water. Several inches of broken bricks should be laid in the bottom of the border, and these must be covered with turf, grass side downwards, to prevent the soil from blocking the drainage. Where, however, the subsoil is naturally porous, no concrete will be necessary. Nectarines succeed best in good loamy soil, rather strong than otherwise, with a good quantity of mortar or plaster refuse added. Animal manure should not be used, as it encourages a too strong growth. The firmer the border is made the better. Choose healthy, evenly-balanced trees free from canker, and plant them in November or December. Remove all unripe wood and coarse or damaged roots with a sharp knife, and spread out the rest evenly, covering them with about 4 inches of soil, making it very firm. Give a gentle watering, and cover the surface lightly with leaf-mould or short manure to keep it moist. Keep the house very cool and airy during winter, and allow the trees

MELON FRUITS SUPPORTED BY MEANS OF NETS.

THE CARDINAL NECTARINE IN OPEN.

to start naturally into growth in spring. When the young shoots are half an inch long commence to disbud, removing all those shoots growing out from the front of the branches, and leaving as many on each side of the previous year's branches as can be laid in without crowding. Should any extra strong shoots start from the centre of the tree, cut them clean away, as if allowed to remain they will rob the rest of the trees of sap. Tie the growths to the trellis, keeping them as straight and even as possible, and freely syringing them every fine afternoon, to keep red-spider at bay. Admit plenty of air, keep the border moist, and when the foliage commences to change colour in autumn keep the ventilators open continually. When the wood is ripe prune the trees, cutting the shoots back into the firm wood, and training them carefully to the trellis, finally washing the woodwork and glass with warm soapy water, the walls with lime-wash, and picking the border over with a fork. Early in the following February close the house, well water the border, and syringe the trees with tepid water morning and afternoon in fine weather. Admit air liberally but cautiously, and when the trees are in bloom maintain a temperature of 50 degrees with a rise of 10 or 15 degrees from sun heat, together with a rather dry atmosphere, and give the trellis a sharp rap at midday to disperse the pollen, and assist in setting the fruits. Syringing must be discontinued while the trees are in flower, but again resorted to directly the fruit is set. The border and pathways of the house must also be sprinkled several times daily. Disbud piecemeal, commencing at the top of the tree and removing a few shoots daily. A shoot should be left at the base of each fruit-bearing lateral, and one at the extremity, all the intermediate shoots being removed. If the fruits set thickly, a few of them must be removed at a time, and the rest left about 6 inches apart. Keep the border moist, admit air freely in fine weather, and if green-fly or thrip makes its appearance, fumigate the house mildly several times with tobacco paper. As soon as the fruit is stoned, the final thinning must be made, leaving them 9 inches or 10 inches apart. Close the house early on sunny afternoons, to shut in all the sun heat possible, and induce the fruit to swell. Water trees carrying heavy crops with weak liquid manure, or sprinkle a little native guano on the surface, and water it in. When the fruit commences to colour cease syringing, and mulch the border with short manure or dry bracken to prevent rapid evaporation. A somewhat dry atmosphere and a liberal supply of air night and day are necessary for the production of large, richly-flavoured fruit. After the fruit is gathered, all shoots which have borne fruit must be cut out, in order to admit all the light and air possible to the current year's wood. Very little pruning will then be necessary in winter. From this time until the leaves fall off, plenty of water at the roots and a continual supply of air will be the chief requirements.

The Peach requires much the same treatment as the Nectarine. Good varieties will be found in the table on p. 609.

Nuts.—The amateur gardener in the country could often grow

Nuts in the garden or orchard and enjoy a profitable pastime, but careful attention must be given to the trees in the early stages of growth. Nuts, like other fruit trees, succeed well in good soil. In Kent the Cob and Filbert trees are first favourites, and excellent prices are obtained for the Kent Cobs; indeed the Kentish trees, owing to the attention received, frequently bear when others fail. The beginner may grow quite as good Nuts as dwellers in Kent, and at no great cost. It is useless to plant hedges and allow them to grow in their own way. The pruned trees are not so pleasing in appearance in winter as a pyramid bush Apple or Pear tree, but they are quite as profitable. Once the trees have assumed their correct shape they do not give much trouble.

The trees are raised mostly from layers, and this is the best system to obtain a true stock, as though at times seedlings come true they are not trustworthy. In the Kent Nut-fields the trees do not always occupy the whole space; the trees or bushes are trained low, and there are rows of standard Plums or Apples at distances of 30 feet to 40 feet apart, and these trees, in addition to being valuable for their crop, act as a protection to the Nuts when in flower in spring. No one who can grow good Plums or stone fruits need hesitate about planting Nuts, and though they like a deep and well-drained soil, in some parts of Kent there are excellent trees on banks in rough, poor soil, which, however, in many cases, is top-dressed with quick acting fertilisers. Excellent crops are produced.

The beginner should purchase stock from a good source, and select the best kinds. As these trees begin to grow early in the season autumn planting is advised. When planting leave the trees 10 feet apart. Fifteen feet is sometimes allowed, and then there is none too much room; but almost everything depends upon the soil and variety. Some kinds require greater space, and when 20 feet is given between the rows dwarf bush fruits may be planted. The smaller space is preferable between the trees in the row, and give, say, 31 feet to 40 feet clear space for standard fruit trees. On the other hand, when 15 feet is allowed, and bush Currants, Gooseberries, or even rows of Strawberries are grown between the trees, when the Nut bushes need more space it is an easy matter to destroy the bush fruits. It may appear strange to the beginner to be told that trained and regularly formed Nut trees are far more profitable than the rougher type seen so frequently in gardens. Those who intend to make Nuts profitable would do well to study the two systems. Trees in a garden are often merely a thicket or hedge of growth and a few Nuts appear at times. Then there is a fair crop on that portion of the trees exposed to the light. The Nut, on the other hand, is not at all fastidious as to soils, and rarely fails when hard pruned year after year, so that the restricted branches are like an old Apple tree cut hard back yearly and only spur-growth allowed to develop.

The trees are in many cases kept quite open in the centre, or what may be called cup-shaped. Some, however, are more spreading and

resemble saucers or shallow bowls. When the form of the trees has been decided upon cut away strong side shoots at pruning time, but leave the small twiggy wood, as this produces the fruit and catkin, to assist in setting a crop. Cut back also the main or leading shoots when no extension of the trees is necessary, and these will then form spurs or buds for next season's supply.

The Cosford bears catkins abundantly, and on this account alone is valuable to plant among other varieties. It is also a first-rate variety with a roundish nut, thin shell, and very sweet flavour. This will come quite true from seed, which makes it a valuable garden variety. No matter what variety is grown, sucker growth should not be allowed, and if the trees are a fair size when obtained they will have a clear stem of at least 1 foot to 2 feet from the soil. The aim of the cultivator should be to keep the trees open. Secure six to eight or more leaders, and then prune close in every season, allowing the main shoot to extend as far as desired.

In a few words, the main or strong lateral growths are cut close, the short, small spray wood is left, and no suckers are allowed from the stems or from the soil. Many years must elapse before large trees can be formed, but once formed they remain fruitful for a lifetime, and, given food in the way of surface dressing in the winter months, they are most profitable. Night soil, mixed with long litter that has been in heaps for some months, may be made good use of for old Nut trees. Young trees that produce gross wood should not be fed.

Varieties.—The following are a few of the leading kinds. One of the best is the Cosford, which has been already described. The Kentish Cob is one of the most prolific, a good market variety and free, and the newer Webb's Prize Crop promises well. This is an improved Kent variety, and a larger cob than the older one. In the Filbert none can beat the true Kent variety for flavour, but this should be planted where a little protection can be afforded. It is not so prolific as the old Red Filbert, which has a red skin and is very free. The Filbert Prolific is distinct, produces fine clusters, having a cut or frizzled husk, and is much liked in its green state before being kept.

The Raspberry.—The Raspberry grows wild in moist and shady places in many parts of England. Its home life reveals its requirements as to soil and situation. It succeeds best in a deep and moist soil. In poor shallow soil its surface roots suffer from insufficient moisture and nourishment. If the ground upon which it is intended to cultivate Raspberries is light and rather poor, improve it by digging in decayed leaves, or other refuse from the vegetable garden, and also manure if available. A good mulch early in spring for a short distance around the canes is of great benefit. The numerous fibrous surface roots are kept cool and protected from the drying effects of the hot sun, while they are benefited by the mulch.

Planting.—The best time for this is when the leaves are falling in autumn, viz. in the month of October. Raspberries are usually trained

to horizontal wires fixed between upright poles. These espaliers (for such are formed by the poles and wires) should be 5 feet apart, and each plant about 2 feet from its neighbour. If autumn planting is impossible postpone the work until the month of March. This is preferable to planting in midwinter, when the soil is cold and wet, although such good progress cannot be expected from spring-planted canes as from those put in during October. The latter have an opportunity of becoming established before winter, and are then ready to start well in spring. Raspberry canes may also be trained to single stakes, placed in rows 5 feet apart, with a distance of 3 feet between each stake in the row.

The shoots, or "canes" as they are generally called, of the Raspberry are produced every year either from a perennial (*i.e.* living for several years) root-stock, or from the roots. In the latter case they are termed suckers. It is not advisable to keep the root-stocks of Raspberries more than six or eight years; but replant with younger canes, as from these finer fruit is obtained in greater abundance. The canes that develop one season produce fruit the next; thus while the canes of the past year are bearing fruits, others are developing to provide the following summer's crop. It will thus be apparent that the cultivator should endeavour to produce as many firm healthy canes every year as can be comfortably found room for. When the fruit is gathered the canes upon which it was borne should be removed, for they are of no further value. Cut them off at their base and draw them downwards to avoid injuring the remaining ones. If the Raspberries are grown against stakes not more than six or eight new canes must be allowed to remain annually. When trained against horizontal wires leave a space of several inches between each cane. Those shoots not required for fruiting the following year should be removed early in the season, soon after they make their appearance. The whole vigour of the plant may then be concentrated in developing only the necessary growths.

Summer Treatment.—This consists in destroying weeds by means of hoeing the ground, covering the surface of the latter with manure, and allowing no more than the necessary number of canes to remain. When the fruits are swelling, if the weather is at all dry, a good watering will prove helpful. As above mentioned, after the fruits are gathered, cut away the old canes so that the younger wood may not be interfered with. In the autumn shorten back the strongest canes of those that are to bear next year's crop of fruit to about 5 feet, less vigorous ones to, say, 4 feet, and the remainder to about 3 feet. Such a method prevents overcrowding.

Propagation.—The most convenient method of increasing the Raspberry is by means of suckers, which, as already mentioned, are produced from the roots. The strongest of these should be carefully detached, and planted in good soil in the autumn, and eventually trained either to stakes or wires. When planting cut down the shoot to within 10 or 12 inches of the soil. This will bring about the

production of stronger canes the following year than would be the case if the primary shoot were left unpruned. Offsets from the root-stock may also be used for propagating. These must be carefully removed from the established plants so as to disturb them as little as possible. Root suckers are often produced at some distance away from the parent plant, and so can be detached without fear of injuring the latter.

Autumn-Fruiting Raspberries.—Raspberry bushes may also be had in fruit in the autumn. The plants, however, require different treatment to the summer-fruiting kinds. The fruit is borne upon the current year's growth and not upon canes made during the previous year. The proper way is to cut down the canes in the month of February to within a few inches of the ground, and shoots will then push from them vigorously. These must have a liberal amount of sun and air so as to become well developed before the end of summer. The canes should therefore not be quite so close together as the summer-fruiting ones. Water liberally if the weather is dry, and also give manure water to assist fruit development. The following varieties are suitable for autumn fruiting: Belle de Fontenay, large, red; Noire d'Automne, large, very dark; October Red, bright red; October Yellow, medium sized, yellow.

Summer-Fruiting Raspberries.—Superlative, large, red, producing heavy crops of fruit; Hornet, a fine large red variety; Baumforth's Seedling, an excellent variety, red.

FRUIT TREES AS GARDEN ORNAMENTS

The best use of many fruit-bearing trees is not restricted to the kitchen garden only, for many of them are beautiful things in the most dressed ground. Few small trees are more graceful in growth than the old English Quince that bears the smooth roundish fruits. It is not only a pleasant object in leaf and flower in early summer and in autumn glory of golden fruit, but even when bare of leaves in winter, a fully matured tree is strikingly beautiful; and in boggy ground, where no other fruit tree would thrive, it is just at its happiest, and is most fruitful. Then many Apples are extremely ornamental; and there is a whole range of Crabs—Siberian, Chinese, John Downie, Dartmouth, and other home-raised hybrids—that are delightful things both in flower and fruit. *Pyrus Malus*, vieing in beauty of bloom with its near relatives the Japanese Quinces, is particularly beautiful, especially during the autumn months.

There are no better garden ornaments for foliage than Figs and Vines, and though the needful pruning of a Vine

for fruit takes off somewhat from its pictorial value, which depends in some measure on the wide-flung luscious summer growth and groping tendril, yet in any shape the Grape Vine is a thing of beauty. Some of its garden kinds also show how, in distinct departures in colour and shape of leaf, it is always beautiful, for the parsley-leaved Vine, with its dainty and deeply-cut foliage, is a suitable accompaniment to the most refined architecture; while the red purple leaf of the Claret Vine and its close clusters of blue fruit are richly ornamental in autumn.

A Medlar tree, with its large white bloom, and handsome leaves, is desirable, and several of the Service trees are ornamental small trees.

Every one knows the lovely pink bloom of the Almond in April; but few may have tried something that is not an experiment but a certainty, viz. the successful culture of the hardier Peaches, near relatives to the Almond, as standards in the south of England. A Peach of American origin, the Early Alexander, bears full or fair crops every year. The only danger is from leaf blisters from sudden cold in May; but if its place is sheltered, or if it can be afforded the protection of a net, it will suffer but little, and perfectly ripened Peaches, red all round, may be had at the end of July.

The beauty of Cherry blossom is so well known that it needs no extolling; and any great and high wall looks the better at all seasons for a well-trained Pear.

A free planting of the cut-leaved Bramble is pleasant to see on the outskirts of the garden, and is beautiful in leaf, in flower, and in fruit.

A SMALL ORCHARD

The usefulness of a small orchard when judiciously planted and well managed can scarcely be overestimated, and every country house should possess one. To those who have families a small orchard is indeed a boon, and if planted with early, mid-season, and late varieties of Apples and Pears, the happy owner is enabled to supply his children with delicious apple puddings and pies for eight months in the year. Moreover, in plentiful seasons, there are always more Apples, Pears, and Plums than can be used at home, and these, if carefully picked and packed, can be profitably disposed of at the nearest town. Then a small orchard can be tilled with the spade at small cost, and vegetables and choice small fruits,

such as Strawberries, Gooseberries, and Black Currants, may be grown between the rows of fruit trees for several years, and thus the usefulness of the orchard is increased. In small gardens, even, space can generally be found for a small orchard, whereas a large one is quite out of the question. Of course, its utility will largely depend upon the varieties of fruits grown in it, and the kind of stocks they are worked on. Apple trees should be in bush form and be grafted on the Paradise stock, and Pears on the Quince, as then they commence bearing fruit the first year after planting, which is a great advantage. When Apples are grafted on the Crab many years often elapse before they commence to fruit. It is also necessary, in order to realise the full usefulness of a small orchard, that only a small number of early Apples be planted, as these will not keep long. A fair number of mid-season sorts may be allowed, but at least one-half the number of Apple trees should consist of late keeping sorts, as they are the most useful in every way. Of Pears a fair number of trees of Swan's Egg, Louise Bonne of Jersey, and Doyenné du Comice may be planted; but stewing Pears are the most useful, and they will keep until May. Few fruit preparations are more delicious than a dish of Catillac, Vicar of Winkfield, or Suffolk Orange, and children enjoy the wholesome meal. The best way to stew them is to peel and put them into an earthen jar in a syrup, seal the jar, and place them in a steady oven until soft and brown.

As already stated, small fruits and small vegetables may be grown between the fruit trees for several years, and what is more useful in the household than Strawberries, Gooseberries, and Currants, or a good supply of wholesome vegetables. The best trees to plant round an orchard for shelter are Damsons, Bullaces, and Nuts. Plant a Filbert or Cobnut between every Damson and Bullace, and in two years there will be a perfect hedge. Bullaces and Damsons being very hardy invariably bear good crops of fruit, and they make delicious puddings and pies; and Wine Nuts are quite as useful too.

FRUIT TREE CULTURE IN POTS

General.—It cannot be said that fruit tree culture in pots is a new system by any means, nevertheless it has not become general. It has oftentimes been demonstrated in a most practical manner by Messrs. Rivers & Son, and may at any time be seen in full operation at their nurseries. Other

trade growers have also taken up this mode of culture, so that now plenty of pot-grown trees may be had. Continental growers also adopt this system, and that with equally marked success. Possibly this departure from the usual methods was not so well understood a few years back as it is at the present time; hence failures were more common no doubt. Failures will occur if ordinary precautions be not taken; thus, for instance, it is unreasonable to suppose that trees in pots can be successfully grown under the shade of other trees, *i.e.* trained ones, or in houses that are not supplied with a reasonable amount of ventilation. The system is applicable either for forcing or for cultivation in absolutely cold houses. The idea has existed that the trees in pots are not long lived; this is quite a mistake, and in proof of which one has but to inspect the large specimens at Sawbridgeworth, some of which are a quarter of a century or more in point of age. Canker, which in some instances is so destructive, does not disturb pot trees. As regards insect pests, the balance again is in favour of this system. Where early forcing is practised, it is possible to take two crops at least from the same houses, with, in some cases, a partial crop of something else in addition. Thus, after early forced Peaches and Nectarines, Melons can follow, and pot Figs after the Melons. After pot Cherries Plums and other fruits not forced make a succession, these being cleared off in time to house Chrysanthemums. These are only a few instances; other crops will suggest themselves, such, for instance, as pot Strawberries upon shelves.

Houses.—The best plan of house for pot fruits is the span roof beyond any doubt, abundant means of ventilation being provided. Houses of elaborate or expensive construction are totally unnecessary, in fact, they are a waste of money. The heating should be sufficiently provided for where forcing is carried out, so that no undue degree of heat has to be maintained in the pipes. Rather than have houses of large dimensions, give preference to those of moderate size. All the light possible should be secured by using large panes of glass—say 20 inches by 15 inches, which is an easily procured stock size. No staging whatever is required beyond shelves for such as Strawberries in pots. For the floor either gravel or coal ashes form a good bottom, one object being to exclude worms.

The Trees.—Autumn is the best season of the year for making a start, by forming, or adding to, a collection of pot trees. The best trees to choose are those of two, three, or four years' growth; these should have been grown one

year at least in pots, such being more amenable to treatment the following season. Peaches and Nectarines are much better if cultivated in pots from the bud stage onwards than when allowed to make one season's growth, and that often a too luxuriant one, in the open quarters of nursery grounds. All pot trees should be bristling with flower buds when purchased in the autumn season of the year, if they are not so the management is at fault rather than any peculiarity of the trees themselves. As a rule the pots of newly-purchased trees should not exceed 10 inches in diameter, unless trees of extra size are desired.

Potting.—The question is often asked—Is it necessary or expedient to pot the trees annually? The answer is Yes, by all means do it in every instance. It is a popular delusion, as well as a decided source of failure, to omit this work every autumn. The annual repotting is productive of fine fibrous roots which are the essence of fertility. If not so treated the soil before the second year has expired will become utterly exhausted, whilst the requirements in the way of watering are increased. It must not be inferred from this that larger pots are recommended every autumn. A larger size of pot once in three years is ample, as a rule, for the trees. On no account should the trees be put into larger pots without first having reduced the balls, in a more moderate degree, however, than when similar sizes of pots are again to be used. In the latter instances a sufficient reduction must be made to ensure a good amount of fresh soil—such, for instance, as will allow of the fingers being passed freely around and between the balls and the pots. Firm potting is absolutely essential both in order to prevent the water percolating through the new soil rather than the old balls, and in order to foster fibrous root action. In order to do this work well pot rammers must be used. In reducing the balls take away the lower portion as well as the upper, and in repotting allow sufficient room for watering and top-dressing. The best tool with which to reduce the balls is a small claw-like instrument about the length of a wall hammer. This is easily made. If any roots show signs of over-luxuriance, it is advisable to cut them off clean with a knife rather than break them away. Should there be the slightest tendency towards being dry at the roots the ball should be well soaked in a tub of water. After potting, those trees that are intended for forcing can either be stood again in an open, sunny position if the weather be fine, or taken under glass if there be room to spare. It is certainly advisable to place the earliest forced

trees under glass early in October, or, at any rate, before any heavy rainfall takes place. When taken under glass they may be stood almost pot to pot. One thorough soaking of water after potting will last for a long time, but syringing is recommended once or twice a day when it is sunny and warm weather. It is better to get the potting under hand before all the leaves have fallen. Guard as much as possible at all times against worms getting into the pots. For the potting the best loam obtainable should be used; that having a tendency to be calcareous is the most suitable. A tough fibrous loam that will not become close and adhesive should have the preference. In addition some lime rubble, such as that from old buildings, should be added in the proportion of about one barrowful to a cartload of loam and twice that amount of manure, such, for instance, as that taken from an old Melon bed; the manure from the stable direct will also answer after repeated turnings. It is hardly desirable to use any artificial manure at this juncture; if any be used let it be bone-meal, which will supply all that is needed until stoning takes place.

Pruning, &c.—A slight amount of pruning may be done at the time of potting, but it should only be superfluous lateral growth. A better time on the whole is at the starting period, but even then it is not advisable to prune as in the case of trained trees. It is a safer plan to prune after the fruit is set and when one can see what the crop is likely to be, say when the fruits are about the size of nuts. No disbudding whatever is advised for pot trees, the spring pruning at various periods during growth supplying all that is needful. Pinching the leading shoots where such are seen to monopolise too much sap is quite necessary, and this may have to be done repeatedly. Only sufficient wood need be retained to provide for the following season; to grow superfluous shoots and then have to cut them away is misdirected energy. Thinning of the fruits follows as in the case of trained trees, for young, newly purchased trees in the pots named ought not to carry more than eight to ten fruits, or a dozen if the trees be extra strong. When the fruit is swelling freely liquid manure, made from stable manure with a small amount of soot, forms a good stimulant alternately with a small pinch of an artificial manure in which there is a good percentage of phosphates, to aid in the proper development of the stone. Top-dressing or mulching with decomposed manure and loam is a great aid when the fruit is growing freely. Temperatures are the same as in the case of trained trees, so also the treatment for

insect pests, bearing in mind that a thorough fumigation at the time of starting is most valuable. When the trees are hardened off after fruiting they should be plunged to the rims in an open position until the time of potting comes round again, and not overcrowded.

Varieties recommended for pot culture (the best six of each): *Peaches*—Alexander and Hale's Early for early forcing (both are rather given to drop their buds), Early Grosse Mignonne, Dr. Hogg, Sea Eagle, and the Nectarine Peach. *Nectarines*—Cardinal, Early Rivers, Lord Napier, Pine Apple, Victoria, and Albert Victor. *Plums*—Early Prolific, Jefferson, Early Transparent, Golden Transparent, Coe's Golden Drop, and Reine Claude de Bavay. *Cherries*—Bigarreau de Schrecken, Early Rivers, Frogmore Early Bigarreau, Governor Wood, and Belle d'Orleans (include a May Duke for pollen purposes). *Pears*—Fondante d'Automne, Conference, Doyenné du Comice, Pitmaston Duchess, Marie Louise, and Durondeau. *Apples*—Ribston Pippin, Cox's Orange Pippin, Washington, King of Tompkin's County, Mabbot's Pearmain, and Allington Pippin.

THE LOGANBERRY

The Loganberry is important from a commercial point of view, as it is doubtless one of the most useful fruits we have for preserves and compotes, and, in addition, is remarkably prolific. The fruits are produced in clusters, and closely resemble a large Raspberry as regards size, but are firmer. The Loganberry is said to be the result of a cross between the Blackberry and the Raspberry, and the growths more resemble the last named. The fruits when ripe are firmer than those of a Blackberry, and have a more acid flavour. The latter point is a great gain, as it is so much better for preserves. We are not all sure that everyone would call it a good dessert fruit owing to its brisk flavour. It is of rampant growth, and all the old wood, and the weakest of the new, should be cut out as advised for Raspberries. It is an American introduction, and was named the Logan after the raiser, Judge Logan.

Besides the Loganberry there are several Blackberries that deserve a note. Mr. Bunyard in the *Fruit Garden* writes as follows about the Blackberries and allied fruits: "These useful fruits give variety to the year's supply, and are valuable in the making of jam, jelly, and tarts. They require but little care in cultivation and grow freely in any ordinary soil. The best results are obtained from plants in rows 6 feet apart,

the shoots being trained right and left, espalier style. The fruiting shoots can then be removed every season, and fresh sturdy growths laid in as they are produced for the following year's crop; some peg them down and cut off the ends after August to strengthen the lower buds, which next year produce strong flowering branches. All the pruning necessary is to cut away the old fruiting wood yearly, as with Raspberries. When established, all grow strongly, and the plants can be placed from 6 to 10 feet apart. The American sorts, as a rule, flower satisfactorily, but only fruit freely in a few positions, or in very favourable positions." The Parsley-leaved Blackberry (*Rubus laciniatus*) is well spoken of; it is the most beautiful of the Brambles for its leafage and fruit. It is described as the best of the Blackberries for general culture. The fruit is very large, freely produced, and the foliage is handsome, the stems being of a rich colour also, but the flavour of the fruit is not equal to that of the wild Blackberry. Wilson Junior is considered one of the best large American black sorts, and grows very freely. The Lowberry is a large black-fruited Bramble which crops well in sheltered positions. It needs the same treatment and pruning as the Loganberry. The Newberry is a fine new fruit of red colour and sweet flavour; and the Laxtonberry is also a useful new kind. The treatment advised for Loganberries applies to both.

THE APRICOT

This fruit is largely planted against walls with a southern or western aspect, and is also grown under glass, often in pots. It needs the same soil and much the same treatment as Peaches and Nectarines, but instead of disbudding the shoots, pinching back of laterals during the summer should be adopted. As the Apricot flowers very early, usually in February, it is necessary to protect outdoor trees at that time with a double thickness of fish netting or some tiffany. When fruit is ripening under glass keep a rather drier atmosphere than is recommended for Peaches and Nectarines.

THE MULBERRY

This fruit is not planted anything like so extensively as it was years ago. The tree likes a deep, well-drained and rather moist soil, and beyond an occasional thinning of growths does not subsequently call for any special attention. It ought not to be planted in very small gardens, as it eventually forms a large and handsome tree.

INSECT PESTS AND WAYS TO DESTROY THEM

HOWEVER carefully and judiciously we may cultivate our gardens by growing the plants most suitable for the soil, and placing them in the most favourable situation for their growth, we still have to reckon with a host of insect pests that are almost certain to infest them. In spite of all our care, there is no doubt but that plants grown in favourable circumstances and in robust health are less liable to the attacks of insects and fungi than those which are unhealthy and not in a vigorous condition, but still they are liable to be attacked. It is impossible on the present occasion to describe all the various insects that injure plants; but that is not really necessary, as the great thing from the gardener's point of view is to know how to destroy them, and many may be dealt with by the same means. It is important to realise that an insect may be found in four different states or conditions, namely, as an egg, a grub or caterpillar, a chrysalis, and as a perfect insect capable of propagating its species. It is true that some insects are never grubs or caterpillars, or become chrysalides, for at similar periods of their life-history they more or less resemble their parents; still the change from one state to another is well marked, and the four different conditions are assumed (of course, there is no rule without an exception). It is important to bear this in mind, for sometimes, though an insect is quite harmless in one state, it is very destructive in another, and it may be that it is easier to destroy it in its harmless condition than in the one in which it is injurious. Insects, as far as their powers of injuring plants are concerned, may be roughly divided into two classes: those that injure the plants underground, and those that attack the parts of the plant which are above the surface of the soil. The former are, on the whole, perhaps the most injurious, for they attack a plant at a very vital part, namely, the root, and for obvious reasons the first intimation of their presence is given by the plant beginning to flag or droop, or show some signs of distress, so that the plant has already sustained considerable injury before we know that it is attacked; then when we realise that a certain plant is infested at its roots by some pest we cannot in most cases destroy it by means of an insecticide, as a large quantity would have to be used, and of more than ordinary strength (for the soil acts as a filter to a great extent), which would be very hurtful to the plant already weakened by the injuries to its roots. So that, in the case of plants grown in the flower

garden, probably the best thing to do is to bury baits near the plants to attract the pests, or to take up the plants and carefully pick out the insects from the roots, and destroy those that are in the soil. Nearly all the insects that feed on the roots of plants are in the grub or caterpillar state. There are a few exceptions, one or two species of aphides feeding on the roots of plants. It is often stated that ants injure the roots of plants. In one sense this is quite true, as they make their nests among them at times, but not with any intent of feeding on them, or injuring them in any way; but when they find a plant infested by one of these underground aphides, they make their nest so that they can easily obtain the sweet matter which these, like all other aphides, secrete, and the presence of the ants laying bare some of the roots, and the interference with their supply of moisture consequent on the nest surrounding them, is naturally very harmful to the plant. The ants in this respect are of a certain amount of use, as, when one of their nests is found at the roots of the plant, it is an almost sure sign that the latter are attacked by one of these aphides, which would seriously injure the plant if means were not taken to destroy them. Under these circumstances the plant should be lifted out of the ground, and its roots carefully washed so as to free them from the aphides, and the hole from which it was taken filled with boiling water so as to kill any of the pests which might be in the soil. This will also kill the ants if plenty of water be used so that it thoroughly fills the nest; boiling water is a most useful agent in killing all kinds of insects, it is absolutely sudden death to them. There are a great number of different kinds of

Grubs and Caterpillars that Feed on the Roots of Plants.—The former may be divided into two kinds, those with legs and those without. Those that have legs are the grubs of beetles, but they have only three pairs of legs, which are placed near the head; the caterpillars that may be found at the roots of plants have eight pairs, so they may easily be distinguished from grubs. Among the grubs of beetles, perhaps the best known are the

Wireworms, whose parents are the long, narrow, dull-coloured insects, belonging to the family Elateridæ, and commonly known as "skip-jack" or "click" beetles, which live among grass and weeds, and may often be seen on the flowers of "cow parsley" and other plants of that nature. The grubs have received the name of wireworms, on account of their resemblance to a short piece of copper wire; they vary in size according to the species, but the largest is seldom more than $\frac{3}{4}$ -inch long; they are of a yellowish colour, except the heads, which are dark brown, and the three pairs of legs, which are just behind the head, are of the same colour. If these characteristics are borne in mind, it is impossible to mistake any other insect for a wireworm. These pests may be trapped by burying small slices of turnips, mangolds, carrots, or potatoes in the ground just below the surface; if a small wooden skewer be thrust into each they will be more easily handled, and their position in the soil more easily seen. Small pieces of oilcake are also very useful as traps, even if only placed on the ground. These traps should be examined every morning. When ground is being dug that is infested with this insect, a sharp look-out should be kept for them; though small, their colour soon betrays their presence. The grubs of the "common cockchafer" (*Melolontha vulgaris*) are also very injurious to the roots of various plants, and as they are three years old before they attain their full size, each grub has the opportunity of doing an immense amount of damage. The grubs, when full-grown, are about 2 inches long and almost $\frac{1}{2}$ inch in diameter. They are nearly white, but their tails, which are generally curled under their bodies and are the thickest part of the grub, are bluish. Practically there is no way of destroying them except turning them up out of the ground, and the easiest way of keeping this insect in check is by killing the cockchafers. The grubs of several kinds of weevils feed on the roots

of plants, but unfortunately they cannot be caught in traps as the wireworms can, and the best way when a plant is attacked is to take it up and pick out the grubs from among

FIG. 61.—Common Cockchafer.

1. Cockchafer. 2. Grub. 3. Chrysalis.

the roots. The caterpillars of the "ghost" and "swift moths" (*Hepialus humuli* and *H. lupulinus*) attack the roots of various plants, and those of the "dart moth" (*Agrostis*

FIG. 62.—Daddy-long-legs or Crane fly.

1. Male Daddy-long-legs. 2. Female Daddy-long-legs. 3. Eggs.
4. Grub. 5. Chrysalis.

segetum), and some others, on the roots and also on the collars of the plants. They hide under stones, clods, &c., or in cracks of the ground during the day. The other division,

Grubs with no Legs, are all the grubs of flies. Many only feed on decaying vegetable matter, but a large number feed on the roots of various plants. Those of the common daddy-long-legs (*Tipula oleracea*), often known as "Leather Jacket," are particularly injurious. When full grown they are about $1\frac{1}{4}$ inch in length, and as thick as a small quill. They are of a dull slaty brown colour, and though without legs are able to move about with considerable rapidity. They may be caught by the same kind of traps as the wireworms (but oilcake is of no use in their case), and also by laying pieces of board, slates, tiles, bricks, or pieces of turf on the ground, as they will creep under such things for shelter during the day. The traps should be examined every morning. The grubs of the cabbage-fly attack the roots of Cabbages and other plants of that nature. They are small grubs and are not more than one-third of an inch in length. They cannot be trapped. The plants that are attacked should be taken up with a spud so as to take away the soil just round the roots, and burnt. The holes made by their removal should be filled with lime or soot so as to kill any grubs that may be left in the soil. Plants that are only slightly injured may sometimes be saved by watering them two or three times with one part of ammoniacal liquor from the gasworks to two of water. Onions and Carrots are also attacked by the grubs of flies (*Anthomyia ceparum* and *Psila rosæ*). The best method of destroying these pests is by pulling up and burning the infested roots. To turn now to the

Insects that Attack Plants Above Ground.—Probably the different kinds of aphides or plant lice, of which the common green-fly perhaps is the best known species, are the most troublesome, for they infest so many different kinds of plants and increase and multiply at times with such remarkable rapidity that it seems almost impossible to keep them in check. There are a large number of species, but they all injure plants in the same way, by drawing off the juices through their long probosces, and by covering the leaves with a sweet sticky secretion commonly known as honey-dew, which drops on and clogs the pores of the leaves, &c., that may be beneath them. One of the chief things to be remembered in their destruction is to take some steps in that way as soon as any are noticed, and not to think that a few cannot do much harm and so let them be. In suitable weather they will increase, so that in a few days the plant will be smothered with them. The best remedies for plants grown in the open air are spraying with paraffin emulsion or quassia extract (see Insecticides), or some other insecticide containing soft soap, such as "Paranaph" or "Abol," dusting the plants with powdered tobacco, or snuff, or in some cases dipping the end of the shoots into tobacco water or some other liquid insecticide. Under glass plants should be fumigated with tobacco smoke, or strong tobacco water should be vaporised over a small stove.

"American Blight" (*Schizoneura lanigera*), if only existing in small patches on a tree, may be killed by dipping a camel's-hair brush in methylated spirit and thoroughly wetting them with it; but if the attack is extensive the infested parts should be well scrubbed with a stiff brush and one of the soapy solutions just mentioned and the mixture thoroughly worked into all the cracks, &c., in the bark. Or the tree should be sprayed with a caustic wash in the course of the winter (see Insecticides). The caterpillars of butterflies and moths and the grubs of certain saw-flies that injure plants in the same manner are best picked off by hand unless they are in such numbers that it is worth while to syringe the plant with some insecticide. The grubs of the Currant saw-fly (*Nematus ribesii*) and the Pear saw-fly (*Eriocampa adumbrata*), when full grown, drop to the ground and become chrysalides in the soil, about 3 inches below the surface. If the ground below the trees to that depth is removed and burnt, or buried not less than a foot deep, the insects will be destroyed. When leaves are rolled up by caterpillars, as rose leaves often are, a close made basket or a box should be held under them while they are cut off, or the leaves may be pinched so as to kill the occupant, if care be taken that it does not drop out before the finger and thumb meet, as is often the case.

Certain small—

Caterpillars and Grubs live inside the leaves between the skins, such as the grub of the Marguerite daisy fly (*Phytomyza affinis*), which infest the leaves of that plant and others of a similar nature, and those of Cinerarias. The grubs of the Celery fly (*Tephritis oenopordinis*), the Carnation fly (*Hylemyia nigrescens*), and Holly fly (*Phytomyza aquifolia*), all live within the leaves of the plant that they are named after. The only way of destroying them is to pinch the leaf at the part where the grub is, or to pierce the leaf with a pin or needle so as to stab the grub. If a leaf is very badly attacked, it should be cut off and burnt. The leaves of Lilacs and Laburnums are sometimes very much injured by the caterpillars of small moths (*Gracillaria syringella* and *Cemistoma laburniella*) that feed inside the leaves. The caterpillars of the goat moth (*Cossus ligniperda*) and the wood leopard moth (*Zeuzera asculi*) sometimes attack our fruit trees, and cause much injury to them by boring long galleries in their stems. They are best destroyed by pushing a sharp-pointed wire into the hole until the insect is reached, or by injecting

paraffin oil or tobacco water into the gallery by means of a small syringe with a fine nozzle, and immediately closing the hole with a plug of well-kneaded clay; or a piece of tow soaked in tar or paraffin oil may be pushed as far as possible into the tunnel, and the opening closed with clay so as to keep the smell in as much as possible. Currant bushes are sometimes attacked by the caterpillars of the Currant clear-wing moth (*Sesia tipuliformis*), which bore into the branches and shoots of Currant bushes, causing the death of the branch. The best way to deal with this insect is to cut off the shoot below where the caterpillar is and burn it, as the branch would die in any case. Among the insects that are injurious in their perfect state perhaps the various kinds of weevils are the most troublesome. The Pea and Bean weevils (*Sitones lineatus*) are often very destructive to our Pea and Bean crops; they injure the young plants by eating the leaves, gnawing large notches in them. They are difficult pests to deal with, for they only feed

FIG. 63.—American Blight in various stages. —|— signifies natural size.

1. The fly. 2. The insect. 3. Showing its effect upon a fruit-tree shoot.

at night, and are so much the colour of the soil that it is almost impossible to find them when they drop off the plants, which they do at the least alarm. Dusting the leaves when they are wet with powdered lime, or soot, or gas-lime and soot mixed together, or spraying with paraffin emulsion is useful in preventing the weevils from attacking the leaves. Sand soaked in paraffin oil strewed on each side of the rows is also useful; the young plants should be pushed into rapid growth as quickly as possible. The well-known grubs in Nuts are the progeny of the Nut weevil (*Balaninus nucum*); the Black Vine weevil (*Otioryncus sulcatus*), and its brother, the clay-coloured weevil (*O. picipes*), are both very injurious to the foliage of plants in greenhouses, particularly to Vines, Peaches, Roses, Ferns, and many plants grown for their foliage, and their grubs feed on the roots of these plants. Out of doors they injure Raspberry bushes by feeding on the leaves, and by eating right through the young shoots. These beetles only feed at night, and, like the Pea weevils, fall to the ground on being in any way disturbed; they may be caught in houses by laying white sheets under the plants before it is dark, and afterwards throwing a bright light on them and shaking or tapping them. Out of doors an open

umbrella or a piece of board freshly tarred or painted, so as to be sticky, should be held so that the weevils can be shaken on to them. The Black Vine weevil is about $\frac{3}{8}$ inch in length, and is of a dark brown colour or black colour; the other species is somewhat smaller, and is of a pale brown colour. The Apple blossom weevil (*Anthonomus pomorum*) is a much smaller species; it lays its eggs in the opening flower-buds of the Apple, which soon hatch, and the grubs feed on the flowers, at times completely ruining the crop. When the weevils are seen on the trees they may be shaken down on to cloths or something sticky. Thrips (*Thrips adonidum*, and other species) is an insect that is very annoying in greenhouses, where it may be killed by the same means as recommended in the case of green-fly or aphides. Out of doors it seldom does much harm, but Carnations, Dahlias, Phloxes, and some other plants are at times injured by them. To consider now some—

FIG. 64.—Thrips.

1 and 2. Immature Thrips. 3 and 4. Mature Thrips.
8 and 9. Other species of Thrips.

stand first, among them the red spider (*Tetranychus tellarius*) is the best known. As a rule, the plants that suffer most from them are too dry at the root; and in greenhouses the want of proper ventilation is generally the cause. The red spider delights in warmth, dryness, and a still atmosphere. When a plant is infested by them it should be syringed with paraffin emulsion: to every 5 gallons add 1 oz. of sulphide of potassium; or, with $\frac{1}{2}$ lb. of flowers of sulphur, 1 lb. of fresh lime, boiled in 2 gallons of water, then add $\frac{3}{4}$ lb. of soft soap, and when all is well mixed 2 gallons more water. Another very injurious mite is the Currant mite (*Phytoptus ribis*), which infests the buds of Black Currants, causing them to swell, but not to open properly, so that when many of the buds on a shoot are attacked it is rendered useless to the plant. The best remedy is to pick off these buds early in the spring, or cut off the entire shoot, and burn them. Another mite, the bulb mite (*Rhizoglyphus echinopus*), is the cause of much injury to bulbs at times.

They may usually be found at the base of the bulbs between the scales, or among the roots where they join the bulb. Various methods have been suggested for destroying them, but none of them are very satisfactory, perhaps soaking them in water at a temperature of 120 degrees or 125 degrees Fahr. for fifteen or twenty minutes will kill them; for, if placed in water at 115 degrees Fahr. (away from the bulb), they will die within five minutes. The snake millipedes (*Julida*) are often mistaken for insects, but there should be no difficulty in recognising them, as instead of having only three pairs of legs they have a very large number. These creatures are very injurious to the roots of plants, and are difficult to destroy with any insecticide, as they are tough and horny. A strong solution of salt or nitrate of soda will kill them if it can be made to reach them. They may be trapped by means of slates, tiles, &c., laid about; they move very slowly, and so may be easily distinguished from the centipedes (*Lithobius forficatus*), which they somewhat resemble.

FIG. 65.—Snake millipedes.

1. *Julus londinensis*. 2. and 3. *Blanjulus guttulator* (nat. size and mag.). 4. *Julus terrestris*. 5. *Teller*. 6 and 7. *Polydesmus complanatus* (nat. size and mag.).

These are very useful in gardens, and run with great rapidity. Woodlice, or slaters (*Oniscidae*), as they are sometimes called, are often very troublesome pests, and do much mischief in greenhouses, Melon-pits, Mushroom-beds, and among Peaches and Strawberries. It is no use trying to kill them with insecticides, but when they are found, as is often the case, in regular colonies at the base of a wall just below the surface of the soil, they may be killed wholesale by pouring boiling water over them; they may also be trapped under slates, bricks, &c., and in small bundles of dry moss. Toads are very useful in keeping woodlice and many other night-feeding pests under.

"Prevention is always said to be better than cure," and this is very true in the case of plants likely to be injured by insects, and fungi, weeds, stones, rubbish, &c., which harbour these pests, should never be allowed in gardens, even in out-of-the-way corners, and any prunings of trees or refuse of a crop that has been infested by any pest should be burned at once. Indeed, the old time-honoured rubbish heap should be turned into a bonfire far oftener than it is, for even when its contents are well rotted they are not of

FIG. 66.—Black Currant Gall Mite.

1. Black Currant Gall Mite (magnified 400 times). 2. Twig of Black Currant with healthy buds. 3. Twig of Black Currant with infested buds.

much value, and when spread over the ground often carry pests with them, and the ashes from a bonfire that has not been allowed to burn too rapidly are of considerable value. When garden ground is being dug a sharp lookout should be kept for any chrysalides that may be turned up, particularly if the last crop was attacked by caterpillars.

Leaf-Curl in Peaches and Nectarines.—Beginners are generally puzzled about this characteristic of the Peach and Nectarine. The injury it causes is generally attributed to cold winds or draughts of some sort. No doubt certain conditions of the weather are more favourable to the growth of this fungus than others, a sudden fall in the temperature after mild weather, during which the leaves have opened, being particularly liable to cause an attack. Still, if this fungus was not present in the tissues of the tree, no atmospheric conditions would cause the disease. Peach leaves are often attacked by aphides, which cause the leaves to curl more or less, and the two kinds of attack are sometimes mistaken for the same, but the difference as a rule is easily detected. The "curl" is rather of a different nature; it has not the same puckered appearance, and though in both cases the diseased part of the leaf may turn red at last if caused by aphides, it never assumes the pale sickly green colour that it does from being infested by the fungus, nor has it the almost velvety appearance. It happens not infrequently that a tree may be

infested by both pests, for insects often seem to prefer plants that are not in very robust health to those that are. The leaf-curl fungus attacks Peaches, Nectarines, and Almonds. How it gains access to the tissues of its host is not at present very certain, but it probably does so through the leaves. Having once established itself in a tree, there is no means of eradicating it except by cutting off the parts infested by it. The fungus lives throughout the year in the shoots and smaller branches, pushing its growth into the young leaves as they are opening, which causes a very abnormal growth of their tissues. The cells in the parts of the leaves between the veins growing much more rapidly than the veins, causes the leaves to become crumpled. These portions of the leaves are also much thicker than the other, and eventually the diseased parts become covered with a delicate bloom, the result of the spore-bearing part of the fungus being pushed through the surface of the leaf so that the spores can escape. The little spore-bearing cases are technically known as "asci," and cover the surface of the diseased part of the leaf. Each ascus or case contains at first only eight spores, but these increase by budding until the case is full. When ripe the spores are liberated and are carried about by the air, infecting any leaves they may meet with.

As to the best way of dealing with this pest, probably the most useful is to cut off any shoot that bears infected leaves as far back as possible, so as, if possible, to remove all the infected wood and burn it. Any leaves which are diseased that may have fallen should be gathered up and burnt. Spraying with Bordeaux mixture as the leaves are opening, and again in about three weeks' time, is useful in destroying any spores that may be carried from other trees. There is no method by which the fungus while in the shoots of the tree can be destroyed, so that when once a tree is infected, unless the diseased portions can be cut off, the fungus is almost sure in time to kill the tree. A certain amount of shelter to the trees in inclement weather as the leaves are opening, so as to prevent any checking of their growth taking place, is most useful, and should always be provided if possible. Though such precautions may appear to prevent an attack, it should always be borne in mind that they do not kill the pest, but merely prevent it from growing into the leaves and bearing fruit, just as some plants will not flower in seasons that are not congenial to them, for the pest remains in the shoot or shoots all the same. The number of

INSECTICIDES

is so great that it is impossible to even enumerate all of them, but many if not most of them are quite useless, so a few have been selected whose value is generally recognised. It should always be remembered that one application is seldom sufficient, for as a rule the eggs, if there are any, are not killed, so the process should be repeated in the course of five or six days, and care should be taken that the under sides of the leaves are properly wetted when they are infested by red spider, thrips, and other pests that live in that position. Most insecticides are best applied by a spraying machine or a syringe with a spraying nozzle. These are made so that the under sides of the leaves are easily reached, and much less of the insecticide is needed than if an ordinary syringe is used. Soft soap forms one of the ingredients in most of the mixtures. The reason of this is that the soap helps the fluid to adhere to the insects and it also chokes up their breathing pores. (Insects do not breathe through their mouths but through certain pores which are usually placed on either side of their bodies.) Insecticides should not be used when the sun is shining on the plants or in very bright weather. Apply them in the evening and wash the plant clean the next morning. Plants with very tender shoots and foliage are more likely to be injured than others, and in their case the washes should be more diluted.

Paraffin Emulsion, composed as it is of two ingredients, both very fatal to insects, is one of the best. It should be made by dissolving 1 quart of soft soap in 2 quarts of boiling water, and stirring in while the mixture is quite hot 1 pint of paraffin oil. To make the combination of the oil and soap more complete it should be worked through a syringe for some five or ten minutes until a creamy mixture is formed. If this has been properly done the oil and the soap will not separate. If they do the oil floats on the top, and it is difficult to ensure that some part of the plant does not get a stronger dose of it than it should and so be injured. To every pint of this emulsion add 10 pints of water before using it.

Tobacco Water.—Boil 1 oz. of strong tobacco in a gallon of water, add 2 oz. of soft soap, strain and use when cold. It should then be of the colour of fairly strong tea.

Quassia and Soft Soap Wash.—Soak $\frac{1}{2}$ lb. of quassia chips in a gallon of cold water for some hours, then boil gently for an hour or more; strain out the chips, add 5 oz. of soft soap, and, before using, 4 gallons of water. It should not be allowed to touch fruit.

Caustic Alkali Wash.—This mixture is very useful as a winter wash for fruit trees that are infested with American blight, scale, &c. It destroys all insect life with which it comes in contact, also all moss and lichens. It is quite harmless to the trees so long as it is used before the buds begin to open. It is very caustic, and should not be allowed to get on the skin. It will also spoil clothes, so that it should be used on a still day, to prevent it being blown on to the operator when using it. Make it as follows: Dissolve 1 lb. of ground caustic soda in a gallon of water, add $\frac{3}{4}$ lb. of pearl ash, stir until all is dissolved, and then add 9 gallons of water, and lastly 10 oz. of soft soap which has been dissolved in a little boiling water; mix thoroughly, and the solution is ready for use.

Paris Green.—This insecticide should always be used with care as it is very poisonous, but it is very useful in killing caterpillars that are injuring the foliage of fruit trees and plants. It is generally sold in a powder, but it is better to buy it as a paste, as it does not then blow about. One oz. should be used with every 12 gallons of water. The mixture must be kept well stirred as the Paris green is very heavy and soon sinks to the bottom. It should be used as a spray, and only enough should be used to wet the leaves and not to make them drip. Paris green should not be used when trees and plants are in flower, or within a month of the fruit becoming ripe.

In making up these recipes soft water should be used if possible. If hard water must be used add a little soda.

Gas Lime if applied at the rate of $\frac{1}{2}$ lb. to 1 lb. per square yard will kill wireworms and other insects that are infesting the soil, also snake millipedes, but no crop can be grown on the ground for several months after the application.

Nitrate of Soda is useful when applied as a strong solution in water to the roots of plants. It is very distasteful to insects, &c., and is a stimulant to the plants.

Soot when fresh is useful if laid thickly round the plants, and then worked in, for keeping grubs, &c., away from the roots.

Though it is impossible now to deal with the fungi which attack plants, it should be always borne in mind that if a plant is infested any leaves that fall from it should be collected and burnt, and the plants themselves, if only annuals, should be treated in the same way as soon as there is no further use for them. If only thrown on a rubbish heap or allowed to remain on the ground for some time an opportunity may be given for the winter form of spores to ripen and reproduce its species the next season. The

Bordeaux Mixture.—This is the best fungicide for general use. To make it dissolve 10 oz. of sulphate of copper in a little boiling water, and add 5 gallons of cold water, slake 6 oz. of lime in water, and pour it into the copper solution when cold; stir the mixture well so as to be sure that all is of uniform strength; then dip the blade of a bright knife into the mixture for a minute; if the colour of the steel is unchanged it is all right, but if the blade has a coppery appearance more lime should be added or the mixture will injure the foliage. Another test is to place some of the mixture into a plate, hold it up and blow gently upon it for quite half a minute, when, if a slight scum like a little oil appears on the surface, it is as it should be. For use in connection with Potato disease see page 413.

A CALENDAR OF MONTHLY WORK¹

JANUARY

Flower Garden.—There is less work in the garden at this time than at any other, as the ground should have been prepared before this; but make all arrears good at once. Those who have frames may with advantage sow a few half-hardy annuals, but it is useless to sow too early if the plants cannot be grown on under frame culture until the spring is well advanced. Plants needed for beds or grouping, such as *Ageratums*, *Musks*, *Cinerarias*, or similar subjects, specially the single *Begonias*, may now be sown. Now is a good time to rearrange new quarters, rockwork, finish planting of any kind if the weather is open, lay turf, gravel, and drain or make walks. Plants wintered in frames, such as *Pansies*, will need care to prevent damping, and free ventilation in favourable weather.

Vegetables.—Those who have land still needing digging should lose no time. Peas may be sown in pots in frames for early use to plant out in March. In open weather Broad Beans may be sown, choosing the Early Long-pod section, but only in a warm, dry soil is it wise to sow thus early. Seed Potatoes in the store should be got in readiness, specially the early kinds. These are best placed end-ways, the eyes upwards, in shallow boxes ready for planting, and placed in a cool corner near the light to encourage sturdy shoots. Frame Potatoes should be planted. Also cover Seakale to blanch; manure is not a necessity, it blanches well under pots with a simple covering of soil or leaves. The same remark applies to early Rhubarb; this will force if lifted and placed in any out-of-the-way dark spot, such as under a greenhouse stage. Seeds of all kinds should be procured; old stocks examined and tested for future work.

Fruit Garden.—Planting in mild weather should be pushed forward, and all nailing, except Peaches and Nectarines, completed. Hardy Vines may with advantage be given new surface food in the way of a rich compost, adding bone-meal freely. Pruning should be completed, and in the case of very thick old trees of standard Apples and Pears, thin out cross branches, useless or badly-placed wood, to admit light and obtain finer fruits. New trees planted in the autumn should be staked securely, also a mulch given in severe weather, using any spent manure for this purpose. Shoots may be cut for grafting and trees headed down, and the shoots laid in soil under a north wall until required.

FEBRUARY

Flower Garden.—More half-hardy seeds may be sown now than advised previously, and if means are at hand to propagate by cuttings or division, increase the stock in this way too. In mild winters the herbaceous borders may be thinned, plants that have become poor given manure, and others divided. Bulbs pushing through the soil are much benefited, if at all tender, by a mulch of light material or soil drawn up to protect the rising and tender growths. *Chrysanthemums* should be taken out of the cutting-pot if struck early. Late cuttings may be struck. *Dahlias* started into growth in frames to make cuttings; the latter are much better than old tubers planted.

Vegetables.—This month, no matter how small the garden, is a month of work, as in sheltered spots a start may be made with early Peas, Beans, and Salads, such as Lettuce and Radishes. A few Potatoes may be planted under a north wall. Onions sown in well-prepared land, the seed-beds made as firm as possible both before and after the sowing.

¹ This is a calendar of simple monthly duties in the garden, and will prove helpful to beginners and young gardeners as a reminder of the importance of sowing and planting at the right time.

Of course the work can only be done when the soil is sufficiently dry to tread upon. Parsnips, if needed of a large size, should be sown, giving these plants ample room, 18 inches between the rows being none too much; thin the plants to half that distance. Celery for early use should be sown in pans or boxes. Only a small quantity will be needed thus early. Tomatoes also should be sown thinly to grow on in pots; see varieties on pages 418 and 614. If glass is not at command, far better purchase plants than sow too early.

Fruit Garden.—Strawberry quarters, from which a crop was obtained last year, will well repay feeding at this date. If not given food in the autumn, merely hoe the surface—not dig—and spread the manure close round the plants, cutting away old leaf growth. Small runners laid in last autumn should be planted out, and new plantations made firm by treading. Raspberry canes may now be shortened to the proper length, and the canes supported. If food can be given, they may have a good top dressing. All pruning of Peaches and Nectarines should now be completed, and this is a good time to dress trees. Syringe walls to get rid of insect pests; this will save labour in the summer. It may be necessary, near towns, to net Gooseberry trees, as small birds inflict much damage this month; they are also kept at bay considerably by using black cotton between the branches. This is a good time to give these trees manure, lightly forking it in; and in gardens where Gooseberries are troubled with caterpillars in the summer, remove the surface soil, burn, and give some new material.

MARCH

Flower Garden.—The work in this garden will now begin, as though, in a late season, grass mowing will not be necessary, a certain amount of labour in rolling and making things as neat as possible must be done. Tall creepers should be trained, old and poor wood cut out, and new wood laid in; specially in the case of Roses, as the best flowers are produced on the new wood. Roses in beds should now be pruned, and the beds made neat, the surface being hoed over or lightly forked. Tea Roses that have been given protection should be gradually exposed, and growth shortened; young shoots should be encouraged from the base. Sow flower seeds, not so much however as next month; but those who have glass can sow a number of half-hardy plants, and save much time.

Vegetables.—A start must be made in the open if good Brassicas are needed. Beans, both the Long-pod and Windsor, may be sown, the former at the beginning of the month, the last-named at the end. Broad Beans succeed best in a good loamy soil, not too light. It is too early to sow Dwarf Kidney Beans and Runners, but such crops as Spinach, Lettuce, and Globe Beets may be sown; also early varieties of Turnips, such as Milan and Snowball. Carrots, Early Nantes, and the Short-horn varieties should also be sown in light warm soils. Any spare plants of autumn-sown Cabbage planted out will form a succession to those put in during the autumn. Asparagus beds should be given food in showery weather in the way of salt-fish manure, guano, or other special fertilisers; food given now that growth is just active is more beneficial than in the early winter months. Beds should be prepared for planting or sowing, and good results are obtained by deep cultivation and a liberal supply of manure. Asparagus should not be too much crowded as is often the case, a distance at least of 18 inches to 2 feet between the rows is needful. Celery sown in March will soon be ready to prick off into boxes or frames; another or mid-season lot should be sown. All vacant ground should be dug; other, that is cropped, should be hoed over the first opportunity.

Fruit Garden.—Those who have Peach or Apricot trees should give a slight protection from frost; the trees should now be nailed or tied to the walls, and where birds are troublesome look well after small fruits which they soon destroy. Much of the work advised last month may have been delayed by severe weather, and all arrears should now be cleared up.

APRIL

Flower Garden.—This is a most important month to the beginner, as seed-sowing will be more general than at any other season, and much of the future brightness of the garden, say from June to October, will depend upon the labour given during the next few weeks. A hard-and-fast line with regard to dates cannot be given to the beginner for various reasons, the chief one being that we are dependent upon climatic conditions, as even in April the soil may be too cold or too wet at the beginning of the month. This will delay sowing still later. The soil should be in what is termed a friable condition—that is, it should not clog or stick together, but break up freely; and no matter what seeds are sown, success is always greater when the soil is well prepared. Too deep sowing means failure in a cold, wet spring, so that the nature of the soil, if light or heavy, should be considered. If the latter, cover more lightly, or, better still, give a little lighter

soil if obtainable. Many beginners have no glass to raise tender seeds, and, though glass is a great gain, some of the best results are secured with a little care, but with April well advanced, there need be no misgivings as to the seed sown in sheltered borders and the open ground.

Many hardy annual flowers, such as *Antirrhinums*, *Acrocliniums* (Everlasting), China Asters, *Coreopsis* in variety, Canterbury Bells, Candytufts, Annual Chrysanthemums, Clarkias, Cornflowers in variety, Delphiniums, *Eschscholtzias*, *Gaillardias*, *Godetias*, *Gypsophila elegans*, beautiful, light feathery flowers for massing in vases; Larkspur, Lobelias, *Amaranthus* (Love Lies Bleeding), Lupines, Marigolds, Musk or *Mimulus*, *Myosotis* (Forget-me-Not), Mignonette, Pansy, Pinks, Phlox, Penstemon, *Rhodanthe*, Pyrethrum, *Rudbeckia*, Scabious, Silene, Stocks, Wallflowers, and Sweet Williams. Sweet Peas sown now will be in bloom in July. All creepers on buildings should be pruned, and new soil given where needed. Roses will now need encouragement, and pruning should be no longer delayed. From this date keep a look-out for insect pests. Lawns will need mowing, but previously should have been well rolled, and if a path wants gravel see to this at once.

Vegetables.—With regard to the vegetable supply, this and May are the worst months in the year, as the winter greens are beginning to run, and spring kinds are not in. Early Cabbage may be hastened by feeding in dry weather either with liquid manure or guano water; also early Cauliflowers. It is useless to leave old worthless stalks in the soil a day longer than can be helped. Potato planting should now be general. Give the early kinds the most sheltered positions. There is no lack of work in this department, and though what is done will make little show the return will be seen in a few months hence. All kinds of early Broccoli may be sown, also Kales, Savoy, Cauliflowers, and Cabbage for autumn supplies. Carrots, Turnips, Beet, and Parsnips may be sown in late soils, but for keeping for winter use May sowings are advisable for Beet, Carrots, and Parsnips. All ground should be dug as it becomes vacant. A small sowing of Dwarf French Beans may be made towards the end of the month. Spinach should now be sown every three weeks to maintain a regular supply. Vegetable Marrows may be sown on a hot-bed if the latter is made up at this date. Some of the best Marrow Peas should be sown for July and August supplies. Sow thinly in rich land. Lettuce and Radish should be sown as needed; the latter on a north border.

Fruit Garden.—There is less work to do in this department than in the others, as pruning will be over, but Apricot and Peach trees will need attention. All shoots upon Apricots that proceed direct from the trees should be stopped to within a couple of inches of the base; these are called foreright shoots. Those that are at the side are needed for extension, and will later on be tacked or tied in. Peach and Nectarines need disbudding. This is often totally neglected by beginners, and if all shoots are allowed to grow, the trees are a mass of spray and give few fruits. In disbudding leave a couple of good buds at the base or bottom of each shoot. These are the shoots needed for next year's fruit, and stop within two inches. One good bud or young shoot should be left above the fruits, and rub off weak ones. Let the work be done piecemeal, a little every other day, as then the trees do not suffer. To sum up the work of disbudding—leave sufficient wood for next season's fruiting, as the fruit shoots that are bearing this year will be cut out when the crop is cleared, and the shoots will be tied or nailed in as they increase in size, not over the fruit to hide them, but alongside wherever there is room. Green and black-fly are troublesome pests upon Peach trees, and must be checked as soon as seen by syringing with tepid rain water mixed with one pound of soft soap to three gallons of water. Well work the soap into the water, until it is like milk, then wet all parts of the tree. Tobacco water may be used, or quassia, but it is better to syringe several days in succession in the evening than in too strong doses. Strawberries should be planted early in the month if the plants were too small to put in during autumn. Raspberries will benefit by manurial mulching, and this also applies to old Strawberry quarters. Gooseberry trees infested with caterpillars should receive a dressing of soot and lime under the trees, even if the old soil were removed previously. All newly-planted trees will benefit by a mulch or surface covering of manure, and staked securely when necessary. The soil between fruit trees should be hoed over to stop the growth of weeds.

MAY

Flower Garden.—Much of the work advised last month may still remain unfinished owing to weather being unsuitable, so that, as regards seed sowing, the same advice holds good. The beginner should remember that the garden will be brighter if some kinds of flower seed, which are of short duration, are sown every few weeks in small quantities, thus giving much better cutting material. This applies to such flowers as Mignonette, *Gypsophila*, and other quick growing plants. Seedlings sown early and

just large enough to handle should be thinned. Many beautiful hardy flowers are ruined through sowing too thickly and leaving all to chance. Others may, with advantage, be transplanted or gaps made good, and where others have failed more may be sown. In favourable weather, half-hardy things may now be planted, and such plants as Geraniums, but only towards the end of the month. These, if purchased, should be well exposed for a little time before planting. When brought direct from a house or from under glass, they lose their leaves badly and take weeks to recover. All plants for autumn and spring beds are best sown this month; there must be no further delay. Dahlias may be planted, Carnations staked. A sharp look-out is now necessary with Roses, to keep clear of insect pests. Mow the lawn weekly, roll walks when possible, and the flower garden will be most enjoyable.

Vegetables.—This is a very busy month, as every spare bit of land should now be made the most of. Plant autumn Cauliflowers and Broccoli in fairly good soil, Savoy, Kale, and late Broccoli in land not recently manured, as plants, to stand the winter, must not be at all over-luxuriant, but as hard as possible. Lettuce should be transplanted, and more seed sown. Broad, French, and Runner Beans should now be sown, the first-named in a cool border, heavy soil if possible, the two latter in diverse soil and a warm, open position. Sow Runner Beans from the 10th to the 20th of the month, according to the locality. These like a rich root run. Celery should be secured for early supplies, and trenches made for a later lot. Some of the best Marrow Peas, such as Autocrat and Ne Plus Ultra, should be sown in well-manured land for August and later supplies. Turnips should be sown on a cool border, and kinds that will stand dry weather, such as Red Globe, as from this date this vegetable is attacked by fly. If any of the late Broccoli or Kales have failed, sowings made now will make up for losses. Give Asparagus beds occasional dressings of salt and liquid manures or nitrates well watered in. Early Potatoes should be moulded up as soon as large enough. The Dutch hoe should be kept going between growing crops, and watering done if actually needed.

Fruit Garden.—Stopping and training in shoots of Peach and Nectarine trees will need more attention this month than previously, and in cold soils the tender foliage of the Peach frequently suffers. One of the worst troubles is mildew, which may be stopped by syringing with a sulphur solution, also in very slight cases dusting over the trees when damp with flowers of sulphur. Royal George Peach quickly becomes mildewed. All fruits of Apricots, Peaches, and Nectarines should now be thinned, and with care after this date few fruits will fall. Strawberry beds that are intended to bear should now be mulched with clean litter or straw to protect the fruit. Grass is used at times, but short grass is objectionable in wet weather; but that from fields cut at this date, before the seeds are matured, and laid straight, forms a good protection and does not seed like straw litter. Newly-planted trees may need water, and it is well to thin the fruits severely as they form, leaving sufficient to test variety.

JUNE

Flower Garden.—This month will show some return for labour previously expended. This is an excellent time to sow seed of hardy perennial or biennial flowers, which make a charming display not only for one year, but yearly, as many may be propagated afterwards by division of root or cuttings. Finish all planting out, and stake or support anything needed. It is better to do this early before the plants get injured. Now is a good time to kill weeds on walks. Use weed-killers when the weather is dry. Roses may be fed with liquid manure, or use fertilisers. Roses attacked with green-fly will need syringing with soapy or tobacco water, and in wet seasons, should mildew show itself, dust over with dry sulphur. Use a small hoe freely between growing plants to keep down weeds. All creepers will need attention for a time to keep them in place, as those on buildings will grow unwieldy.

Vegetables.—In this portion of the garden the beginner will now be having a good supply of Cabbage. Cauliflower and early Peas should now be turning in; to make provision for sowing more of such kinds as were advised last month, or in poor soils the early kinds may be sown now to give late supplies. Ashleaf Potatoes will now be ready to lift for daily use, but the bulk will benefit by being left a little longer in the soil. Celery, Vegetable Marrows, and any other tender plants should be planted; also Tomatoes and Cucumbers. Tomatoes, either on walls or stakes, should be trained to one main growth, and not given a too rich root run; far better feed from the surface when fruits are formed. Lettuce should be sown for later use, and in dry soils sow very thinly in drills to save transplanting, merely thinning out the rows. Endive, a very beautiful salad plant, may be sown for early supplies, but in dry hot weather defer sowing until July. Runner Beans should be staked neatly, giving the stakes a crossbar support. Plant out all kinds of green vegetables for autumn, winter, and spring supplies. Sow Coleworts for October and

November use. These are delicious little Cabbages. Pickling Cabbage may be sown for cutting next year, if desired large. Sow Turnips as previously advised.

Fruit Garden.—This month will call forth the energies of the grower as so many things require attention; for instance, laying-in of new wood, stopping gross shoots, cleansing, and watering are all-important details. Avoid crowding healthy trees on walls; the Peach must have light to develop the growth. Many Peach trees lose shoots in severe winters because the wood is soft, but this will not be so if the advice given above is carried out. In olden days the Vine was a favourite plant (profitable also) on buildings, and this needs a little attention. Disbud freely, only leaving the strongest, best-placed shoots; these to be secured when strong enough to the wall or building. Rub off weak, useless spray growth, and stop strong shoots two joints above the bunches if such shoots are not needed for extension. All wall trees will benefit greatly by being damped over late in the day with the hose or syringe, especially Peaches, Nectarines, and Apricots; and these trees should not be dry at the roots, whilst they well repay food in the shape of liquid manure. Young Gooseberry trees will benefit by having a portion of the fruit gathered, and the same remark applies to other fruit trees. Overcropping is a mistake.

JULY

Flower Garden.—This is a variable month with regard to weather. At times it is hot and dry, at others thunderstorms are frequent. If the former, the water-pot must be used freely, and there will be a great saving of labour if a light cover or mulch can be given tender plants, such as need moisture. This placed over the surface or between the rows will prove of much benefit. Many tall-growing plants, such as Canterbury Bells and Dahlias, will need stakes, weakly growths cut away from others, and cuttings may be struck in a shady border. Now is a good time to divide Garden Pinks, as soon as the flowers are past. Polyanthuses may be sown this month for next spring flowering. These are very beautiful, if a good strain of seedlings is obtained. Roses will need the attention advised last month with regard to mildew and old bloom removed when past. Chrysanthemums should be planted out of pots from plants struck in the spring; older plants will need feeding and thinning of shoots or stopping.

Vegetables.—In case the weather is hot and dry, more attention will be required in watering and feeding, especially when the crops have been recently planted. Gather all vegetable crops as they mature, and do not allow Beans to become old. Gather regularly, also feed in dry weather. Runner Beans in a light soil frequently cast their flowers in hot, dry weather. Water liberally, and top the plants at a height of 6 feet from the soil. If Dwarf Beans are liked, make a sowing of Canadian Wonder on a cool border in rich soil, in drills 2 feet apart, and thin to 3 inches between the plants when above the soil. Cabbage seed must be sown this month. A good date is from the 10th to the 20th, according to the locality if north or south, and such kinds as Ellam's Dwarf Early or Sutton's April cannot be beaten. Coleworts may be sown for late autumn supplies, also Lettuce and Endive. Sow Carrots of the short-horn type for drawing in a young state in autumn and winter. Spray Potatoes at intervals of ten days with Bordeaux mixture to prevent disease. Parsley should be sown, other herbs dried for winter use, and the hoe used freely when possible.

Fruit Garden.—After the ripe strawberries are gathered the cultivator can either layer young runners for new beds or grow the old ones on. We advise both, as by having a new bed yearly and destroying an old one there is always a good supply of fruit. The plants like a well-cultivated soil, and if a little heavy so much the better. Give plenty of well-rotted manure, and keep runner growth cut away. Old plants retained may be cut over, the older leaves being removed to give the new crowns more light and room. This work is best done as soon as the crop is cleared, and in making new beds, if possible give a fresh root run, using the old bed for vegetables for a time. Raspberries will benefit by a mulch of rich material, also moisture in dry weather. Cherries will need attention, as black-fly is a great nuisance, and to destroy this the portion of the tree infested should be given a thorough wetting over either of quassia or tobacco water, dusting over afterwards with tobacco powder. The same advice given last month as regards stopping and laying in shoots is applicable. Feed, water, and syringe, except where fruit is ripening. A sharp lookout must be kept for the Apple moth. This is best destroyed by hand picking.

AUGUST

Flower Garden.—The Carnations will soon be past their best, and the earlier the young growth can be layered the better. This is a simple process, and is described under Carnations, p. 125. Pansies strike freely now from cuttings, also many other plants that have

made a fair growth. All old flowers should be removed, and growths regulated. Mignonette should be sown for late flowering, and the seed-pods of Sweet Peas removed as soon as possible, as if these remain the plants will stop flowering. They will repay liberal supplies of food, such as liquid manure. In hot weather watering will be needful. If lawns are watered, this must be done regularly and late in the day. Growth of Dahlias will need thinning out. Stake the plants too. This applies to other strong-growing things. Roses may be cut over to regulate gross growths, the old blooms removed, and food given in the shape of liquid manure or fertilisers.

Vegetables.—If by any mishap the seeds of Cabbage sown as advised last month have failed, make good the loss at the earliest opportunity. In dry weather cover the seed-beds with mats to assist germination, removing them as soon as the seedlings come through the soil. Colewort and Celery should be planted. Give water liberally in dry weather. Spring-sown Onions should be harvested, well drying the bulbs and storing in a cool place. A sowing of the winter kinds, such as the Tripoli, should be made in drills 18 inches apart in firm soil. Land needed for Cabbage should be prepared; those quarters just cleared of spring Onions are suitable. Hoe the soil over and draw drills rather than digging the land afresh. Spinach should be sown for autumn, and Cauliflowers for spring cutting. Turnips and Lettuce should be sown in small quantities, and the roots of the earlier Turnips lifted and stored in a cool place. Lift mid-season potatoes and clamp them, as they must not be exposed too long as they soon get discoloured. Mould up early Broccoli, Kales, and Brussels Sprouts, remove all old useless matter, stack Pea stakes as the plants are cleared, and keep the surface soil well stirred.

Fruit Garden.—To get the best results from early varieties of fruit, such as Apples and Pears, gather a few fruits daily to extend the season. Peaches are best gathered early in the day or late. The fruits bruise more easily when picked whilst warm. These trees will take a lot of moisture if under dry walls in light soils. The planting of Strawberries should not be delayed. Those layered last month will now be ready, and each plant should be made firm and planted so that the soil is just level with the crown. Water freely in dry weather after planting. The old fruiting canes may with advantage be cut out of Raspberries, allowing three to five new growths for next year, cutting away their roots. Hoe freely among the fruit trees, and protect late Cherries and other small fruits that are to be kept for some time. Lay in young wood of Cherry trees, also other stone fruits. Shorten growths of others, and destroy American blight, where present. This especially refers to young Apple trees.

SEPTEMBER

Flower Garden.—The flower garden will need more attention to keep it bright, as with shortening days leaves will fall and more tidying up be necessary. If previous advice has been followed in the way of sowing annuals, these will keep bright well into October. This is the best time to purchase bulbs for a spring supply, and at the end of the month plant Hyacinths, Tulips, Crocus, &c. Both Crocuses and Daffodils succeed well in grass, as they make a charming feature in the garden early in the spring, and reappear yearly. Now is a good time to commence new ground work and make walks, as the work can be done so much easier now than in mid-winter, when the land is not in workable condition. The grass must still be mown, as often after heat and drought it springs up quickly. Now is a good time to strike Roses from ripened shoots. Cut them about 18 inches long and trim to half the length, inserting the shoots in quite firm sandy soil.

Vegetables.—Make as much as possible of the tender vegetables at this date, as we may now expect frost at any moment, and this will cripple the crop. Towards the end of the month cover a good lot of Dwarf Beans from the July sowing, as if covered over at night and exposed in the day they may be kept good for some time. Vegetable Marrows long keep good after being cut if the stalk end is placed in water in a cool shed; the same plan may with advantage be adopted with Runner Beans and Peas, but only sufficient moisture given to cover the stalk, not the pod, and put a few lumps of charcoal in the water to keep it sweet. All kinds of Brassicas that are to stand the winter should be moulded up. Towards the end of the month the earliest cabbage should be planted, making the seedlings firm. Coleworts, also, of the late variety, the Hardy Green, will be useful from December to March if planted rather close together; they then give a good return. Turnips should be stored, others thinned. Asparagus beds should be watered if the weather is dry; it is far better to feed now than in winter, but after the early part of the month food will not be needed.

Fruit Garden.—The beginner in a way will have less work and more returns, as early

Apples and Pears will need gathering, but do not hurry this work. Many of our best Pears will not keep long, and these should be left as late as possible. Far better, in the case of late varieties to lose a few fruits by dropping than a large number when in the store by shrivelling and premature decay. Apples left as long as possible on the trees always colour better and keep longer. Many gardeners leave late kinds on the trees in a favourable season until the early part of November. As soon as Peaches and Nectarines are gathered, what is termed the old fruiting wood should be cut away; namely, the small shoots that have borne fruit, and if, as advised when disbudding, two or even one shoot were left at the base, these now will be full grown and take the place of the wood cut out. By cutting out this wood now the new growth made will have a better chance of ripening. Branches of Figs on walls should be thinned, and weak growth removed. By doing this work now, little pruning will be needed in spring.

OCTOBER

Flower Garden.—Work amongst the flowers will principally consist in clearing away old plants that have done their duty, and replacing with others of a hardier nature. Wallflowers, Forget-me-Nots, Sweet Williams, and such like plants should now be lifted from their summer quarters with a ball and planted in the beds. Now is the best time to lift evergreens if the soil is sufficiently moist. It is necessary to have a ball of earth and roots to each plant. Should the weather be dry, soak the plants previous to their removal. All tender plants should be given shelter. Bulbous rooted ones, such as Begonias, should be placed in fine soil or loose fibre, and kept dry in a greenhouse. Cannas will winter under stages or in dry cellars. This also applies to Begonias, as in many small gardens glass is not at command. Dahlias need similar treatment, also Cardinal Lobelias, which are beautiful summer plants. Calceolarias winter well in places merely protected from severe frost if not kept too moist in winter.

Vegetables.—All late Potatoes should be lifted this month and clamped—that is, they are placed in a heap on a layer of clean straw, and covered with straw, and over this soil from 9 inches to 12 inches in thickness. Make the outside smooth with the back of the spade. Seed Potatoes should be more freely exposed to harden the tubers, either on shelves or in boxes in layers. Mould up Celery without delay; finish Cabbage planting, and do not rely on a very early sowing or planting as in mild winters. These run or bolt, and the crop is lost. When planting now, select medium-sized sturdy plants, and plant in an open position in rows, 15 inches between the plants and 18 inches between the rows. Protect early Cauliflower by tying the leaves at the top. This also applies to the autumn Broccoli. Cauliflowers sown a few weeks ago should be planted on a warm border, or at the foot of a south wall; or if hand-glasses or frames are at hand, they winter well under these. Plant a good batch of late Lettuces on a warm, well-drained border, lifting the seedlings carefully to keep the roots intact.

Fruit Garden.—This is a busy month, as there is fruit to gather and store, and new trees to select and plant. The best plan is to plant as soon as the leaves fall, and the trees must be ordered some time in advance. In planting, if the soil is fairly good, dig deeply, but avoid manures. Such materials as old lime, rubble, or chalk, are most beneficial where there is an absence of lime. In the case of heavy clay ground, give drainage—such as brick rubble, and incorporate some lighter materials. Burnt refuse, road scrapings from limestone roads, and bone meal will greatly assist poor soil. Plant in suitable weather, and do not finally nail up the trees to walls until the soil has settled down. Root prune trees that grow too gross—that is, cut out a good workable trench, say from 2½ feet to 3 feet, and the same depth. Cut the roots well under the trees, and fill in with some new soil, adding such aids as advised above (not manures; add these to the soil needing improvement).

NOVEMBER

Flower Garden.—There will be little to accomplish this month. Rolling the walk or walks frequently, the grass also, and if at all poor use a coarse rake or harrow over it, and pull out weeds and moss. Place on some fresh soil to which has been added a good portion of bone meal, say one-fourth part, and such materials as old leaf-mould, marrow beds, burnt refuse, and road scrapings, are excellent. At this dull season any new work may be taken in hand, such as beds, walks, or borders. Replant shrubs, or cut out and give others support if needed. Cover Tea Roses with some light litter, or anything that will protect the stems at the part near the surface. It is a good plan to draw up soil over this portion, as then, should a severe winter cut down the old growths, new ones will spring

up at the base. Other Roses with fat shoots may be shortened a little to make them more shapely, but must not be pruned until March.

Vegetables.—This work will be one of preparation for next season and protection for later supplies. The same advice with regard to Cauliflower and Broccoli is more necessary now than last month. Frost plays sad havoc with the tender flower; it is wise to lift those plants with heads of a fair size by their roots, and lay them together rather closely in sheds or cellars, and use as desired. All vacant ground should now be dug, and even in the smallest garden trenching should not be forgotten. If the soil is very poor add manure liberally and double dig—that is, placing the manure under the first spit and digging the second, not bringing the latter to the surface; it is merely deep digging and manuring at a depth of about 7 inches to 9 inches from the surface. Artichokes should be lifted and clamped, like Potatoes, Turnips stored, and Beetroot also. Carrots, if large, are hardy, but worms and slugs injure them in wet soils. Seakale may be covered over, and leaves or warm litter used to start the crowns into growth. Rhubarb may also be covered in this way, or lifted and forced in a warm cellar.

Fruit Garden.—Though little can be done but what was advised last month, it is well to complete the planting. Early planted trees may be nailed in their right places, and others that need support in the way of stakes must be attended to without delay. Detach small twiggy shoots of Peach and Nectarine trees from the wall and by doing this the wood is hardened by exposure. At the same time there is no better period of the year to get rid of scale or other pests on wall trees. For the former a solution of Gishurst compound, an old remedy but a safe and effective one, cannot be surpassed. This syringed all over the trees, and the wall thoroughly soaked, will kill the pest. Mildew is also apt to reappear year after year, and Gishurst with sulphur in equal proportions, is an excellent dressing. Trees in the open that are infested with American blight should be painted over with Gishurst to which has been added soluble petroleum, or the latter may be used alone. If petroleum in a soluble state is not handy, use half a pound of soft soap to half a pint of petroleum, adding rain water to make it weaker, if for syringing; for use as a paint on the blight, use a paint brush and rub it in.

DECEMBER

Flower Garden.—The last month in the year is a resting month. Get rid of all decaying leaf matter, and whenever possible dig it in the open ground, as this feeds and sustains root growth. Bulbs planted early in beds may be too forward; if so, protect them with cocoanut fibre refuse or leaf-mould. All tender shrubs recently planted will benefit by some loose litter being placed over the roots. Others loose through high winds may be firmed with the heel, or the surface soil lightly rammed. Creepers on walls may be trained, and old wood cut out. This applies more especially to those kinds that bloom on the young wood. Prepare soil for future use, and select seeds needed for another season. Choose the quarters by making a rough plan for future use.

Vegetables.—Much the same advice holds good as for last month. Complete digging if possible. Make use of old heaps of manure. Examine the root-store frequently, and turn out decaying matter. Globe Artichokes do not winter well in many gardens. They may be protected by placing fine ashes over the crown. This is better than litter; the latter in wet seasons often causes decay. Keep Potatoes as cool as possible. Asparagus beds that need more surface soil may now with advantage receive any old compost, in which a liberal portion of bone meal has been added. Place this on the beds, but all weed growth should be cleared before giving new soil. In severe weather roots that are stored may need more protection in the shape of long litter.

Fruit Garden.—Pruning will be the most important work needing attention at this date. Wall trees should receive attention first, and especially Apricots, but here there will be little to prune if stopping was carried out as advised. A few main shoots may need regulating to replace losses. Remove old ties, and cut away the small spray made late in the autumn. Peaches and Nectarines should be left until last, but these and Apricots may with advantage have new soil or a surface-dressing, raking away the old soil and giving new, to which has been added a good fertiliser. December is not the best month, but there is more time for the work, which, if left later, is often overlooked. Currants and Gooseberries should be pruned, but where birds are troublesome delay the work and cover the trees with fresh lime and soot, when the shoots are damp. Old Apple and Pear trees may be thinned out, removing all cross branches, but do not shorten leading shoots. Figs on walls may need protection if the shoots are detached. Mat them up until the spring.

GARDENING TERMS EXPLAINED

Bedding Out.—This term grew out of the practice which obtained, about the middle of the nineteenth century, of filling flower-beds on lawns with plants of one description, such as Pelargoniums, Verbenas, Calceolarias, Lobelias, &c., in the early summer, although, because these things were tender, they had to be cleared from off the beds in the autumn. Thus the beds remained empty all the winter until the practice of filling them with bulbs, certain spring-flowering plants, and shrubs, became common; thus rendering the work of bedding only compulsory twice a year. This practice is almost as common now, but the “bedding” methods have been greatly improved.

Blanching.—To make some vegetables edible or tender that would not be so naturally, it is needful to blanch them. This practice is adopted with Celery, Leeks, Seakale, Asparagus, Cardoons, and to some extent, Rhubarb, and a few other things. When they are fully exposed to light and air the stems are mostly green, and perhaps hard or bitter to the taste, or generally not fit for food. Blanching is done by either putting these things into a quite dark place, or covering them up closely in the open air, so as to exclude light. Thus Celery is earthed up with soil so as to quite cover the leaf stems, and in a few weeks the green colour is expelled, and the stems are white. They are then also very tender and crisp. Cabbage hearts become blanched and tender when hard, so also Lettuce hearts, and Endive, which are so hard and bitter when green if covered up become white, tender, and sweet. Blanching is really expelling from vegetation the green colouring and hardening matter.

Budding.—The practice needs some skill, but anyone with supple fingers can soon learn to perform it. The operation means taking from one plant—such as a Rose, or an Apple, for instance—a dormant leaf bud, with a very small portion of bark or rind attached, and placing it on a shoot or stem of another Rose or Apple-stock, by opening the bark of the latter and placing the bud under it, so that only the bud germ projects, and tying it in firmly and neatly. To do this work successfully the sap in both the plant or tree from which the bud is taken, as also in the stock to be budded, must be active. Thus, any shoot of the same season's growth on the Apple or other fruit tree should be fit to have buds taken from it when in leaf, and when fairly stout and firm in the wood. Then the rind lifts freely. Before using the bud any piece of hardwood in it left in removing it from the shoot must be

carefully taken out with the point of a sharp knife, but the bud germ must remain intact in the bud. In budding the same freedom of sap flow is essential in the stock.

Bulbs.—It is a common error to assume that all roundish roots are bulbs. Thus many class Crocus, Gladiolus, and other hard round roots as bulbs. They are, however, simply corms, and they differ very much from bulbs. A Hyacinth has a true bulb root, because it consists of a series of layers or circles of flesh or scales that enclose the growing germ. Lilies have bulbs, but these are composed of masses of small or separate scales, all attached to the centre by their bases. These two are excellent examples of true bulbs. In vegetables, Turnips, though of bulbous form, are solid masses of flesh only. On the other hand, Onions are true bulbs.

Compost.—This is a gardener's term for any combination of soils and manure. Whilst generally applied to soil used for potting plants, it is equally used where Vine, Peach, or other special borders are being prepared, of which the natural soil is not sufficiently good, and a combination of soils is prepared. An ordinary soil compost usually consists of good loam, well-decayed leaf soil, old hot-bed manure, and sharp white sand, in diverse proportions, and well mixed. Gardeners and florists of old once held that such strong elements as dried blood, and other noxious matters, were good plant foods, but these views are not held now. Everything forming soil composts should be sweet, free from insect life, and thoroughly aerated. Such composts should not be allowed to become saturated with heavy rains.

Cordon.—This term is more commonly used in gardens in relation to trees, but it must not be compared with the term cordon as used in military language. In the garden sense it implies a single stem alone; and if there be more than one stem, then the trees are called double or treble cordons. Many fruit trees are now grown as cordons, especially Apples, Pears, and Cherries. Any fruit that will bear hard pinching of the side roots makes a cordon. Gooseberries also make capital cordons. The trees are grown with the one main stem or single cordons, and side shoots, as they are thrown out, are pinched or pruned in, so as to induce the formation of fruit spurs, as without these there can be no fruitfulness. Some cordons are trained to walls, some to trellises in the open ground, and some to stout wires fixed 12 inches from the ground, and called horizontal. In planting against walls or trellises, it is customary to run the stems in a slanting direction to give them greater length.

Cross Fertilisation.—This term applies in all cases in which the pollen of one plant, if a separate and distinct variety, be used to fertilise the productive organs or pistil of another variety of the same species. Thus cross fertilisation is practised by raisers of Sweet Peas, Edible Peas, Potatoes, Begonias, Chinese Primroses, and indeed many things growing in gardens, of which it may be desired to raise in that way some new and better varieties. Flowers possess generally what are commonly described as male and female organs. Thus the male element

is found in the pollen powder encased in the stamens in flowers, and the female organs are the style or pistil, which projects from the centre of the flower. When the pollen powder is placed by the hand of man on the point of the style or pistil that is cross fertilisation. If the pollen be from the same flower or plant, or is placed on the pistil by Nature, that is ordinary fertilisation.

Cuttings.—Whilst any slip or young portion of a plant may be called a "cutting," yet for the specific purpose for which cuttings are made, namely for propagation of plants, it is important to make them properly. Cuttings are required to perform certain functions, and for that purpose they are when made dibbled or set into sandy soil to a moderate depth, so that one-third of their length is buried. That is with the expectation that from the cutting-base roots will presently be emitted and a new plant formed. But Nature insists that the base of a cutting must be just beneath a leaf joint, so that in making a cutting it must always have a suitable base or bottom. Two or three of the lower leaves should also be removed. The sap stored in the cutting is attracted by the warmth of the soil to the base, and a callus is shortly formed over the cut base. Then follow roots, and the plant can sustain itself. Were the base half an inch below a leaf joint that portion would soon decay and the cutting die.

Deciduous and Evergreen.—Whilst some trees and shrubs shed every leaf or stem in the early winter, and thus seem to go absolutely to sleep or rest, others always carry their leafage, shedding old leaves in the spring, but not before new leafage has been formed. This is the distinction between what is known as deciduous and evergreen vegetation. But there are far more trees and shrubs deciduous or entire leaf shedders than there are evergreen ones. Of trees, the most familiar of the evergreens are the Fir tribe, Yew, and Evergreen Oak. Of shrubs, Holly, Laurel, Aucuba, and Rhododendron. Of deciduous trees, Oak, Elm, Lime, Chestnut, and many others; and of shrubs, Lilac, Flowering Currant, Philadelphus, or Mock Orange. The Ivy is the best known evergreen climber, and the Virginian Creeper the best known deciduous one.

Dibbling.—In the process of cropping a garden, a tool commonly called a dibber, or dibble, is often used. It is specially so when Cabbages, Cauliflowers, Broccoli, winter greens of all descriptions, Lettuces, and many other things, including some flowering plants, are put out from seed-beds or pans where they are to grow and mature. The instrument is commonly made from the upper part of the handle of a spade or fork that has been broken. Below the handle, the pointed portion which is used for dibbling, that is, for making holes in the ground for the roots of plants to be inserted, is about 12 inches in length. The lower end or point is made sharp or pointed, and should be shod with iron some 6 inches in length, as the work is more satisfactory and the tool lasts longer. Potatoes are often planted with a dibber, but in this case the implement is about 2½ feet long, has a cross handle 12 inches long, and a base that is 3 inches broad, pointed,

and iron shod. It makes a hole in the ground sufficiently large to receive potato sets, and 5 inches deep.

Division.—Many plants, especially those of a herbaceous or perennial nature, are increased by division. Thus when roots become large and have numerous crowns or shoots resting in the winter, when free from stems, if these roots be then lifted and divided into several portions with the aid of a knife or sharp spade, a considerable number of small but proper roots or plants are thus formed. Rhubarb roots propagate freely in this way, but the operation is far more in use in the hardy flower-border where Phloxes, Sunflowers, Peonies, indeed so many plants, can be thus increased. Divisions should always be made whilst the plants are at rest, but in the case of hardy flowers perform the operation early in the autumn, as the divided roots become established again before spring growth commences. Division is easily performed if common care be exercised.

Drainage.—This term in gardening has various meanings, beginning with the putting of a small quantity of well-broken potsherds or soft brick into the bottoms of pots to be used for putting plants into, or into pans or boxes in which seedling plants may be raised, or into tubs, &c., for large plants. Also in the proper draining of green-houses, pits, forcing-houses, and other garden buildings, or in the proper drainage of gardens, lawns, pleasure-grounds, roads, paths, and other garden features. All the latter work is done with the aid of proper drain-pipes, which readily carry off surplus moisture to suitable receptacles when drains are properly laid in the ground. Pot or pan drainage is easily made by the breaking up of broken pots or pans with a hammer. In doing this first make some portions known as "crops." These are pieces large enough to cover and protect the drain-holes in the pots, *i.e.* so that the smaller bits laid on them do not pass through. It is well always to place a thin layer of moss over the drainage before adding soil.

Drilling.—In sowing seeds of garden crops, especially of vegetables, there are two common methods. One is broad-casting, which means casting the seed widely though as evenly as possible all over the portion of ground to be sown. The other method is "drilling." By that shallow furrows or "drills" are formed on the ground with the aid of a garden hoe, and at equal distances apart, or it may be done with a small hand drill propelled on wheels. This makes a drill and sows seed at the same time. The value of drilling is in sowing seeds evenly all over the plot and at equal depths. Seeds are also economised as a smaller quantity is necessary. When the seeds have germinated the seedlings are easily seen in the rows, and if weeds are abundant, all those between the rows of earth can be safely hoed up, and those in the rows can be pulled out by hand. Thus the seed breadth is easily cleaned, and as there is so much room between the rows the plants can grow strongly. Gardeners generally sow most seeds in drills, as this is found the better way.

Espalier.—This implies flat training of trees to fences, wire trellises,

or stakes. The term must not be confounded with horizontal as applied to trees, Pears, chiefly, in exactly the same way on walls. Espalier is used solely in relation to similar trees grown in the open ground away from walls. This way of growing fruit trees, chiefly Apples and Pears, is very old. Trees to make espaliers are trained to have one central and erect stem. From this is made to break out branches on either side at intervals of about 10 inches, these branches being trained laterally or horizontally, the lowest being about 12 inches from the ground. As they grow they are either tied to stakes driven in at intervals, or to wires strained along the same way, one above the other, from post to post. All espaliers are quite flat, and for that reason occupy little space, except lengthwise. The branches may be trained to a great length, and if properly pruned become very fruitful.

Feeding.—The word feed has just the same application in reference to plant life as to animal life, but the food is absorbed in a different way. Plants do not masticate. They have no mouths or stomachs through which food is converted into blood. Nature does the preparation in the soil, when food, or, as commonly called, manure, is applied. This food, if ever so solid or dry, is dissolved in the soil, and converted into liquid form, and in this condition it is absorbed or taken up by the minute root hairs which coat small roots. Plant food must chiefly consist of three elements—phosphate, potash, and nitrogen. These things are found in various proportions in manures, and plants absorb those most needed by them, whilst water such as rains provide, or added to the soil artificially, assisted by the bacteria in the soil, converts solids into liquids; the most available manure or plant food is that given in the form of liquid manure.

Florists' Flowers.—That florists are essentially growers and lovers of flowers goes without saying, and equally is it true that in a certain sense all who grow flowers are florists. But the above term is used in relation to a small section of flowers, which certain gardeners, called in earlier years "florists," have in the past specially cherished and improved with a view specially to the complete development of certain points as exhibition flowers. Flowers for exhibition—Auriculas, Polyanthuses, Tulips, Roses, Carnations, Pinks, Dahlias, Asters, and many other things have been so developed. Florists have laid down from time to time rules as to points which particular flowers should possess, and it has been the aim of raisers to develop these points to their utmost limit. To myriads a flower is a flower only, but to the florists it is a thing more or less perfect, and the true florist aims at perfection.

Flower Truss and Cluster.—Flowers are presented in many forms. Some are singly on stems, some in trusses, some in spikes, some in racemes, and some in clusters. The "truss" is found in Pelargoniums, Verbenas, Phloxes, Plumbagos, and many other plants. It is produced by a neat cluster of pips or individual flowers forming a roundish clump, and all, whilst having small stems attaching to the base of the truss, are finally borne on a single stem. A truss should be of

such dimensions as to be in proportion to the size of each individual pip, as may be seen in the Zonal Pelargoniums in one case and the Verbena in the other. Whilst some may term a truss also a cluster, yet the two things have a different meaning. Roses produce clustering flowers, so also Chrysanthemums, and some others, but these are not trusses on single stems, but are several flowers on separate stems finally uniting on one main stem. Crimson Rambler Rose is a good example of clusters of flowers.

Forcing.—This term applies to placing of plants of any description in unusual heat, and thus compelling them to grow freely under artificial conditions. It is usual in vineries to force grapes by making the houses very warm early in the winter, and thus ripe fruit is produced as early as May. Other fruits, such as Peaches, Nectarines, Cherries, Pine-apples, Melons, Strawberries, and Tomatoes, are forced in the same way, and many vegetables and flowers. The term is an appropriate one, because growth is literally forced under the pressure of the artificial heat in which the products are placed. Many plants grown in this country have come to us from hot countries, and these it is needful to give artificial heat to. But that is not forcing, for, as shown, the practice is applied to plants it is desired should make growth out of their due season.

Garden Pots Measurements.—The following is taken from the *Journal of the Royal Horticultural Society*, and is of interest to the beginner, "What is a 48 pot?"

The following is a pretty correct list of the names and sizes of pots in the Midland counties, but let no one be so simple as to imagine it holds good in London or the West or North of England; and could anything be more ridiculous?

A "72"	measures 2 inches in diameter.		
A "large 72"	"	$2\frac{1}{2}$	" "
A "small 60"	"	$2\frac{3}{4}$	" "
A "60"	"	3	" "
A "large 60"	"	$3\frac{1}{2}$	" "
A "small 54"	"	4	" "
A "large 54"	"	$4\frac{1}{4}$	" "
A "small 48"	"	$4\frac{3}{4}$	" "
A "48"	"	5	" "
A "40"	"	$5\frac{1}{2}$	" "
A "32"	"	$6\frac{1}{4}$	" "
A "28"	"	7	" "
A "24"	"	$7\frac{1}{2}$	" "
A "16"	"	$8\frac{1}{2}$	" "

"Giving a Shift."—A phrase commonly used by gardeners to denote that the plants have become too large for the pots they are in, so that repotting into others a size larger is needful. In preparing to do this clean old and new pots should be ready at hand, plenty of well-

mixed compost and drainage. Armed with this, proceed to turn the plants out of their now too small pots by inverting each plant, tapping the rim of the pot on the edge of the potting-bench or table on which the work is being done; then carefully remove the drainage from the bottom of the root-ball, and a little of the top soil also. The ball in the potting process may be buried rather deeper in the new pot than it was in the old one, the new compost being well worked in round the root-ball with the aid of a stick to make it firm. New roots are quickly formed.

Grafting.—This operation is invariably performed in the spring, just as the sap is rising or becoming active. It can be done on small stems or on very large ones, such as are found on old trees. The practice consists in placing a piece of stem of one variety of fruit, that may be about six inches long, and the size round of a man's finger, or less, on to the crown of a small stem, singly, or putting several on to the severed stem of a large branch. Grafts, or, as called, scions, should be cut from their respective trees in the early winter, be tied in bundles, named, and then have one-half their lengths buried in soil under a north wall or fence. That keeps them back somewhat. Then when wanted for use in April, as that is the best month for grafting, they are taken from the soil, cleaned, and cut into lengths of a few inches. On one side of the lower or base end a slice of bark 3 inches long is cut off, leaving the base end with a point, or wedge-shaped. Then the graft is ready for insertion in the stock. The head should be clean cut off, and the stem be quite free from any side shoots below. With a sharp knife a slit has to be made down the bark of a large stem, and that being lifted at the edges, the slit point of the graft is forced firmly into the slit in the stock, then tied round tightly, and coated with either wax or clay to exclude air. If a small stock, then a slice is taken off the bark of that 3 inches long, and by an upward cut, so that when the sliced end of the graft is placed on to it, it fits evenly. But every care should be taken that the edges of the bark on both stock and scion meet on one side, otherwise there will be no union. Then the two must be secured, tied with bast, and the edges coated with warm grafting-wax, or the whole stem with clay, to exclude air from the united portions. There are other methods of grafting, but this describes the process generally.

Hybrid.—This name is one well understood by botanists, but is often misapplied by gardeners and others. True hybrids are rare in vegetable life, because they must be the product of two distinct species, although of the same family of plants. Quite different families will not intercross, and in those species that will do so there must be something similar in character. Thus if a common Primrose were crossed with a Chinese Primrose a true hybrid would result, but no such cross does occur. But the common Primrose will cross with the Cowslip, because they are closely allied species. When two varieties of the same species are crossed, such as two Dahlias, Fuchsias, Potatoes, Apples, or any other things, the product is not a hybrid but merely a variety.

True hybrids are usually infertile, *i.e.* do not produce seed. In the animal world the mule is almost the only known hybrid.

In-arching.—This is a process of propagation not commonly adopted except in the case of certain plants that have hard wood, such as Oranges, Camellias, and others. It is occasionally used in connection with Vine preparation. The process necessitates the bringing together of two branches of about equal size, or a young plant in a pot and a branch of an established plant. Just at the place in each case where the stems are to meet, a slice of some 3 inches in length is cut out with the aid of a sharp knife from the sides of each stem. The two cut surfaces are then brought close together and the two stems are neatly tied together and sometimes clayed over or coated with grafting-mat or with moss tied round them, and kept damp. In time, when the two sections have united, the top of the branch on the one plant is cut off, and the stem and root of the other, and thus a new plant on an old one is obtained.

Layers.—The propagation of plants by layers is work that should have great attraction for the novice. It is most practised on Carnations in the flower garden, but many shrubs and trees can be increased in this way. To make a layer it is generally necessary to do more than merely bury a branch partially in the ground. When only this is done, rooting seldom follows. It is necessary to “tongue” the layer with a sharp knife. By “tongued” is meant cutting a slit about an inch long on the under side, and it must pass half-way through the stem towards the leaves or point, but must not sever it from the plant. When the slit is buried in the soil it must be kept open. Sand placed round it helps to form roots later. Sap formed in the leaves becomes in its return rootwards partially diverted into the tongue slit, and roots are soon formed.

Leaf Mould.—It is naturally assumed that this material is the product of leaves. That is so, but only of tree leaves. The best leaf mould is made with the leaves of hard-wooded trees such as Beech, Oak, Elm, Lime, and Plane, and, if possible, for potting purposes, Horse-chestnut and Sycamore leaves should be avoided. The first-named trees give more woody matter than the latter. Leaves collected to form mould should be free from other matter, and be put into a heap to decay. Put them together whilst damp, or if dry then well saturate them with water. The heap must be occasionally turned and mixed to ensure decomposition, and to enable hard leaves to become thoroughly decomposed fully a year is necessary. A good dusting of soot when the heaps are being turned helps to kill insect-life. When mould is quite formed it may be stored for use in tubs or boxes.

Lean-to.—Many small greenhouses, vineries, Peach, Cucumber, and other forms, as well as ordinary plant glasshouses, are built as “lean-to’s.” Thus in good gardens it is usual to see long ranges of such houses built to a tall wall facing south, and behind facing north a long row of lean-to sheds, stores, and other such things. Lean-to houses having but one glass face, and that to the sun, are soon heated, and because they have a thick brick wall at the back which absorbs much

heat, cool slowly. For most fruit-forcing they are best. In many small gardens a greenhouse is built rather cheaply against a wall or to the side of a house, and thus lean-to's are common in that way. A frame which has but one slope is a lean-to in one acceptation of the term, but generally the description is given to houses only. Small lean-to houses can often be economically warmed.

Loam.—When advice is given about potting composts or soils, it is universally recommended that a good proportion shall consist of "turfy loam." By "turfy" is meant the combination with the loam of grassy matter such as pasture grass and roots, all of which being of a fibry nature helps to keep the loam from becoming close and hard, and as it decays also becomes plant food. But "loam" to be so described, must be neither clay, which is close, sticky, and, when dry, very hard, nor sand, which is the reverse, as it is always loose and in fine particles. It is a very happy compound of both these minerals or soils, somewhat in the proportion of two-thirds clay to one-third sand, yet no human agency seems able by combining them to produce such a remarkably well-constituted material as Nature does in good loam. It should be free from stone, and when pressed hard in the hand be so far free as to fall apart again at once. Turfy loam should be dug in the winter in spits of 9 inches deep, and be stacked in heaps, turf downwards, for six months before it is used.

Maidens.—A curious term chiefly used in nurseries where fruit trees are largely raised every year. The term is applied to fruit trees and Roses grown from bud or grafts the first year, and before they have been pruned in any way. When nurserymen offer fruit maidens for sale, and they are then usually cheap, they mean, of course, single-stem trees, quite unpruned. In the case of trees from buds, the budding is performed the previous summer. The bud remains dormant all the winter, and then starts into growth very strong in the spring. As the bud shoot extends, the top of the stock on which it is budded is cut away until nothing of it is left above where the bud shoot breaks out. Very frequently on good ground these bud shoots reach from 4 feet to 7 feet in height that season. Good standards can be made from strong budded maidens.

Marl.—This substance, though much appreciated by gardeners who have light soils, is, like clay and chalk, useless for potting purposes. But as a dressing at the rate of three barrowsful per rood, applied to light porous soils, it is excellent. It is a combination of chalk and clay, and in that respect forms what may be called a clayey compound, whilst its value lies in its tendency, when well mixed after exposure for a winter on the surface, to make loose soils more adhesive, and the chalk assists to create carbonate of lime. As an occasional dressing it is very useful. Marl is found as a subsoil in various localities, and in some districts is excavated from pits. Pure chalk dressings are good for heavy or clay soils, and clay dressings for light soils needing body or adhesiveness. All these minerals may be applied moderately with good results as winter dressings every two or three years.

Moulding up.—This term is partially described under the heading “Blanching,” but not fully. Moulding up is usually done to breadths of Potatoes, yet without any intention to blanch the stems. The primary object is to keep the newly-forming tubers excluded from light and air, as when exposed they become green and hot, and quite unfit for food. Potato rows should be planted wide enough apart for sufficient soil to be drawn from between the rows up to the stem of the plants, to a height of about 4 inches, as then the tubers are well covered. Celery is usually moulded up, but in that case to blanch the stems. Earth is sometimes drawn up to rows of Peas and Beans, and to Cabbages, to help to protect the stems. Tea Roses are often moulded up to a height of some 6 inches early in the winter to prevent injury from frost. Mould is another name for soil, and moulded up means earthed up.

Own Root.—The practice in gardening, and especially in nurseries, of propagating so many things by the artificial process of budding, grafting, &c., has made the “own root” needful to distinguish certain plants or things that may be increased by cuttings, layers, suckers, or seed, from similar things worked on other roots or stocks. Thus it is the practice to bud Roses largely, far more widely indeed than it is the rule to raise them by cuttings or layers. When therefore plants so raised are required, it is usual to refer to them as on their own roots. Some Roses when budded suffer from the free growing stocks, producing an abundance of suckers. Roses, however, on their own roots increase in beauty when they produce suckers, as these help to make strong growing bushes. Some Apples are obtained on their own roots, but not many. Fruit trees rarely root as cuttings, hence the scarcity of own root trees, but flowering shrubs should be raised more in this way.

Peat.—For potting purposes this is a form of soil indispensable to certain plants commonly called “hard-wooded” or shrubby, such as Camellias, Azaleas, Heaths, and others, but it is not at all necessary in the potting of the greater number of plants usually grown in green-houses. Peat is a vegetable product, as its texture shows, being composed so largely of vegetable fibre, root, or decayed vegetable life, and is generally associated with bogs or dried bogs. It should be dug out in sods or spits 6 inches deep, and stacked in heaps for several months to sweeten before it is used for potting. There is always associated with it a moderate quantity of sand. Rock or bog plants naturally prefer it, and in constructing rock work a good proportion of peat should be used when it is intended to grow on it such plants as prefer that soil. Generally in potting, when used with loam, it is in the proportion of one-half.

Pip.—This term has two distinct meanings, one of which applies to seeds, the other to flowers. The seeds so designated are chiefly those of Apples and Pears, which they very much resemble in form, and have from time immemorial been thus designated. But in relation to flowers the term is chiefly used to indicate the individual flowers which go to form a cluster or truss. Thus Pelargoniums, or, as generally called,

Geraniums, Verbenas, Phlox, Drummondi, Perennial Phlox, Auriculas, Polyanthus, and many other plants that thus produce their flowers, have pips. These are sometimes prized for their size, their roundness, the smoothness of their edges, as in Zonal Pelargoniums, or the fringed nature of their edgings, as in Chinese Primroses. Some again are thought much of for the substantial petal or colour. Still to each separate flower on a truss, no matter of what, the term "pip" is thus applied. Of course they vary very much in size and form, but all possess the same name.

Pointing.—Whilst digging is generally understood to mean turning the soil over the full depth of a spade or fork, "pointing" is work of less arduous nature, and adopted chiefly on ground already cropped. It often happens that ground between rows of crops gets hard or runs together. It is then good practice to point it over. That is done with a digging fork, which is forced into the ground to a depth of about 6 inches, and that portion of soil turned over and made neat. Sometimes a dressing of short manure, or of leaf soil, or decayed vegetable matter, or of artificial manure, has to be first buried, and that is done by pointing. Flower-borders or Rose-beds, which it is not safe to dig deep, can be made to look fresh by pointing over the surface with a fork, as mentioned. Again, ground dug in the winter on which it is intended to sow or plant crops in the spring is often made more fit for cropping if thus pointed over a few inches deep first.

Porous.—Soils that are porous are quite different to retentive ones. If the latter retain water too freely, porous soils seem to part with it too readily. Still porous soils, because the air can penetrate so thoroughly into them, are invariably sweet, and they can be worked, that is, trenched or dug, at almost any time. Porous soils also are warmer than wet ones, and therefore crops may be sown or planted on them earlier than on retentive soils. But if porous or loose soils part with water readily, it is possible to correct that defect in the summer, so far as atmospheric absorption or radiation is concerned, by keeping the surface frequently stirred an inch in depth with a hoe, as such loose surface soil acts as a mould or protection and helps the ground to retain what moisture it may possess in hot weather. Sandy, peaty, gravelly, and chalky soils are usually porous. They are, however, better when trenched or otherwise deeply worked.

Potting Manure.—Gardeners who make up hot-beds with stable manure prepare the manure by frequent turning and mixing, so that there is far less waste of nitrogen than when manure is allowed to ferment rapidly and excessively. The result is, that when, some time later, the bed has served its purpose, the mass of manure is so decomposed and solid that it cuts out almost like soil. Such material well chopped or broken up, especially after it has been partially dried, is excellent to mix with soils, and decomposes so slowly that it shrinks imperceptibly. Manure, no matter however short, mixed with potting soils shrinks or decomposes and leaves the soil in the pots hollow when it gets friable. Many who use potting compost in a large way, when

they have loam, build stacks of spits, with 3 inches of fresh horse or cow droppings alternately, and leave the whole to get incorporated several months before mixing and using it.

Propagation.—This is a term applied in garden phraseology to the increase of plants of all descriptions, and in many ways. Gardeners propagate or increase plants by seed, by tubers and bulbs, by cuttings, by layers, by division, by budding, grafting, and in-arching. All depends on the nature of the plants to be increased.

Pruning.—To prune is to reduce, and in pruning a tree or shrub or ordinary plant the object is to reduce it for some special reason. If large-growing forest trees are pruned it is chiefly done when young, to give proper shape and freedom to the branches. When fruit trees are pruned the object is similar, with the addition of promoting fruitfulness. If tree heads were allowed to grow untouched they would become dense thickets of wood or shapeless masses, and produce only small fruit, or none at all. Generally, pruning is done in the winter when the leaves have fallen, and in the case of fruit trees in summer, when the annual shoots being produced, these are either pinched back to one-third their length or cut back to cause fruit buds to form on the portion left. Pruning may be done with saw or knife, but properly with the latter, because the term really implies the removal of useless or barren wood from trees, and enabling fertile or cropping wood to take its place.

Pseudo Bulb.—The term bulb has been described, but the *Pseudo bulb* is something in plants totally different. *Pseudo* in this case means an imitation bulb, and is invariably found in growth above the soil, or rather in the air. These pseudo bulbs are almost exclusively found in Orchids, which, it may be explained, are generally from warm countries, and grow on tree stems, or branches, or on rocks, or in other ways practically in the air, with roots subsisting on atmosphere and moisture. Under cultivation many of these Orchids are grown in peaty and leafy soil, and in moss, but very few in soil in the way of ordinary plants. The growths they send up are invariably stout, or thick and very fleshy, and these are termed pseudo bulbs, because like terrestrial bulbs, by which we mean those which grow in the earth, they contain a store of food, on which leaves and flowers subsist, and even help to mature other growths on the plants until the bulbs die.

Pyramid.—This word is commonly used in relation to Pear trees, because the pyramidal is their natural form. In the same way we see Apples, Plums, Cherries, and some other fruits, if allowed to grow naturally, taking a broader, dwarfer, and more bushy form, and these are called bush trees. A proper pyramid has a main or central stem from which the stems or branches radiate, the lower one being the longest, thus making the tree broadest there and narrower towards the top. Fuchsias usually assume the pyramid form and make remarkably handsome plants. Many others that are not naturally of that form are trained to assume it by tying and pinching. Even with Pears pruning and pinching are needful to keep the form perfect.

Retentive.—Soils generally have either one or other of two

features. Either they are retentive or they are porous. By retentive is meant capacity to retain moisture. This feature is common to soils that are chiefly composed of clay, or, in other words, an excess of loam with little or no sand in it. Retentive soils are not all so in the summer as a rule, for the ground which holds the moisture most closely in the winter most readily parts with it and becomes hard and baked in the summer. The best correctives are draining by means of deep pipe drains, which carry off superfluous moisture, or by adding to the soil a good proportion of gritty material, such as road trimmings, street sweepings, burnt clay, called ballast; straw manure, leaf soil, or any decayed vegetable matter, as such substances greatly help to keep the soil open and thus enable the moisture contained in it to pass away. Wet soils are invariably sour and not fitted to carry crops.

Rhizome.—Many plants extend themselves by long fleshy root-like stems which run under or partially on the ground, then stop and throw up a bud or crown, from which new growth and leafage takes place. Such stems are called “rhizomes.” Some plants through such an agency become a nuisance in gardens, as shoots come up in all directions. That is the case with some of the single-flowered perennial Sunflowers, for they will send out such roots to a length of from 3 feet to 4 feet, which is inconvenient. German Irises have very thick rhizomatous stems that run partly on the surface of the ground, but these do not ramble much. Of the Primula family, *P. cortusoides* and *P. Sieboldi* have rhizome stems, also Solomon’s Seal. It is Nature’s method of increase or propagation, and as from each new crown or shoots roots are formed, separate plants can thus be obtained.

Rod and Lateral.—Whilst these terms have diverse applications they are more generally used in gardening matters in relation to Vines than to any other things. A Vine rod is the main stem which is carried up under the roof of a vinery, and may be represented singly or several together. Sometimes the rod is carried lengthwise of the houses. Practically the rod is the main stem of the Vine, and from it breaks out yearly certain side shoots which are called “laterals.” By that term is implied a horizontal shoot, or sideways, to the stem or rod. Lateral is a convenient term for gardeners to apply to these side shoots or branches. When a Vine is properly pruned these side shoots are cut back hard each winter, and from the base bud near the rod another shoot or lateral breaks out in the spring. It is these laterals which carry bunches of fruit later in the season, but practically any side shoots which break out from climbing plants in houses become laterals.

Root-Pruning.—Whilst anxious to induce trees to grow, we should yet adopt the practice of pruning, and sometimes severe root-pruning. This is something novices find difficult to understand. But the practice is limited to fruit trees, and to those only which show a tendency to produce shoots or growths freely but seldom produce fruit. But as the object in planting fruit trees is to obtain fruit, the only possible correction of this unfruitful habit consistent with keeping the trees within due bounds is found in pruning the roots, as, when

properly done, the effect is to check further wood production, and to cause the trees to create fruit spurs instead. Root-pruning is usually performed by opening trenches at moderate distances from the trees sufficiently wide and deep to enable all roots—large ones especially—that may be found, to be severed neatly. Downward roots may be found by digging beneath the ball of soil.

Runners.—Through the agency of runners several useful garden plants are propagated, but none have more value than those of the Strawberry, as runners form practically their sole means of propagation. Trailing shoots break from the plants even whilst fruit is being formed, and on the points tiny plants are formed. These soon get root-hold of the soil, and from these go out another long shoot, and a second, and sometimes a third or fourth plant is thus created. Violets can be increased in the same way by runners, although these do not root so readily in the soil as Strawberries. One of the Saxifrages called "Mother of Thousands" throws out many such runners. Ivies on the ground will increase and spread through a somewhat similar agency; so also will some troublesome weeds. In the case of such plants as the Strawberry runners are a blessing, but in others are garden pests.

Shading.—There are times when many plants that generally seem able to endure any amount of warmth require shading. Thus it is common practice where Orchids and plants that delight in heat are grown to shade the houses they are in during the heat of the day in summer. Plants in an ordinary greenhouse also need shelter from the sun during portions of the day. Cuttings, or newly-planted things of any description, often need some temporary shading, if given only with newspapers. House shading is best furnished by blinds made of some woollen material, such as Tiffany, attached to wood rollers fixed to the ridge of the house, and which can be drawn up or down when necessary. This enables the gardener to remove shading quickly when the weather is cloudy. Some shade their glasshouses in summer by coating the glass with a thin solution of milk and blue. It does very well for Ferns, but often makes the house too dark in cloudy weather.

Silver Sand.—This term is applied to white, sharp, or gritty sand containing no clay or adhesive properties. Coloured sands are usually composed of a certain proportion of clay, and after being damped, become hard or baked whilst drying. All such sands should be carefully avoided. Florists who supply potting sand invariably obtain a pure white gritty sand. Sometimes ordinary road grit may be used in potting composts or for rooting cuttings in place of sand. For such a purpose the best is that formed in gulleys or road drains after a heavy rainfall, as the residue has the clay invariably found in road sand washed out of it. Where common road sand has to be used, put some in a bucket, nearly fill it with water, and stir well to loosen the clay particles, which are lighter than the grit is; then pour off the water. Repeat the process several times, and the residue when dry will be found a clean sharp grit.

Span-roof.—There are few houses erected of wood or iron and

glass, or even frames for the housing of plants, that do not come under the designation of span-roof or lean-to. Span-roof means a roof having equal sides and sloping, so that a ridge runs through the centre. The advantage derived by plants growing in a span-roof house is that they have light all round them. The disadvantage of such houses is that, having glass nearly all over them, they soon get cool, and thus need ample fire heat. Span-roof houses may be tall and broad, such as are large conservatories or vineries, or low and narrow, such as forcing Melon or Cucumber houses. The path or alley affording access to the house is in the centre. What is known as three-quarter span is a house that has on one side a sloping roof of the usual half width of the house, and on the other only a quarter of the house width, where it meets a wall. There is no better or more common plant house than is the full span-roof.

Spawning.—Gardeners use this term chiefly in relation to mushroom culture. Mushroom spawn is purchased in the form of cakes of dry soil and manure, which, whilst in a fresh or moist condition, has been "spawned" to render them useful. Spawn is the fine thread-like roots or, as usually called, Mycelium of the Mushroom fungus, and the instrument of propagation. Small quantities of this root—mycelium—are placed in the centres of the spawn cakes whilst yet moist; they are then stood in a warm place, with the object of inducing this mycelium to spread through the cakes, after which the cakes are stored for future use when dry. Spawning is done after a bed of manure has been made up and has become warm, as then, if each of these spawn cakes be broken up into several pieces and thrust into the bed, the mycelium soon runs into the manure. Later on, after the bed has been watered and coated over with soil, Mushrooms come up thickly, as the result of the spawning. Spawn cake must be made every year. If too old it becomes useless.

Species.—All vegetable life is divided into families, or *genera*, as the botanists say, and in each family there are many members or "species." Thus every distinct member of any of these families is a species, and has its specific as well as family name. Thus if the Primrose family, which has members all over the world, be used for illustration, we see them all classed botanically under the family name of *Primula*. Now the common Primrose of our woods is *Primula vulgaris*, a distinct species. The Cowslip is *P. veris*, whilst the tender Chinese Primrose is *P. sinensis*, or *Chinese*. There are scores of other Primrose species. The secondary name given to species is usually determined by its general character or place of growth. Thus *Primula minima* is so called because it is so small, and *P. marginata* because its leaves are margined with yellow, and so on.

Spikes, Racemes.—By the term "spikes" is meant a cluster of flowers gathered on a single stem, long and somewhat pointed in form rather than rounded, as in a truss. Hollyhocks, Snapdragons, Penstemons, Veronicas, all have spikes, and in very pronounced form. Spikes should be erect or stiff, and well held up by the stems on which

they are supported. The common Foxglove of the woods furnishes another excellent illustration of what a spike is. But "racemes" are large clusters of flowers, which hang somewhat loosely or pendant, such as may be found in Laburnum, Wistaria, Flowering Currant, Fuchsia, Orchids, as the Odontoglossum, and other plants. There is much grace and beauty about a tree or plant that bears racemes, because of their drooping expression. Some plants, such as Sea Lavenders, produce stiff or erect racemes.

Sport.—This term indicates something in plants out of the common, and because so it is held to be a sport or abnormal. Thus there are plants that occasionally break into diverse forms on one or most of their branches. Sports frequently occur in Chrysanthemums, for whilst growth and leafage may not differ, one branch on a plant will produce a flower of totally diverse colour from that of the original. Scores of distinct Chrysanthemums have been in that way created. The change or sport is perhaps due to some retention in the plant of certain characters of its progenitors or parents. Green-leaved Zonal Pelargoniums used to sport frequently and produce Silver and Golden variegated forms. Fuchsias have done the same thing, producing diverse flowers or foliage. It is very difficult to account for these variations, and because they show certain evidence of what may be called eccentricity in plants, chiefly so because of our ignorance of the causes, these breaks have been called "sports."

Spurs.—This appears to be an odd name to give to any part of a tree, but is a familiar term to gardeners, and means the small clusters of growths which proper pruning or pinching of shoots will promote on tree branches, but will not produce shoots, only flower-buds, or ultimately fruit. A common method of creating spurs on trees is by the process of summer pruning. Thus tree branches which annually throw a lot of summer shoots or growths are seldom fruitful. The gardener seeks to correct that fault by pinching or cutting back these shoots at the end of July or early in August, to some four or five leaf buds. Possibly the first bud will make a little growth. If so, that can be pinched to one leaf. The lower buds, in the meantime, go through a process of change, and partially become converted to fruit buds. If the stump be cut back to two buds only in the next winter, those buds will become fruit buds or spurs the next summer, and the following year will produce bloom and fruit.

Standard.—Whilst this term has usually many uses in gardening, it is almost exclusively applied to those trees or plants that are trained to have heads on a tall clean stem. By clean stem is meant one that is free from stocks or branches for a space of several feet. The standard form is conspicuous in grass fruit orchards, where Apples, Pears, Plums, and Cherry branches are supported on tall clean stems out of the reach of cattle. Half-standards are trees the stems of which are only from 3 to 4 feet in height. These are generally grown in gardens. Fuchsias are often grown as standards, and very handsome they are when in bloom. Roses as standards are common, but not

always handsome. Some make fine heads, others very poor ones. To make Rose standards tall, stout briar stocks have to be obtained, planted, and budded high up the following summer. Orange trees are often grown as standards.

Stocks.—This term, as used in this instance, does not apply to certain perennial flowering plants so well known, but to all descriptions of hard stems and roots used for the propagation or increase of fruit trees, Roses, and many other things. Stocks are not used to impart beauty to Roses or size or flavour to fruits. They are employed because through their agency the respective varieties can not only be rapidly increased, but be perpetuated for many years. Many stocks also exert a certain influence on the Rose or fruit grafted upon them. Roses are budded on to stocks of an allied nature, such as are raised from the British Briar, or from the Manetti. They are obtained by seed, suckers, and cuttings, and when of suitable dimensions and well rooted are used for budding with Roses of many descriptions. In the case of fruits the common Crab or ordinary Apple pips, Pear seeds, Plum stones, Cherry stones are made the means of raising enormous quantities of young stocks on which to bud these respective fruits and others, and thousands, one might almost say millions, of Paradise for Apples and Quince for Pears are raised by cuttings and suckers.

Stove.—A glass-house in which the night temperature during winter is maintained at 50° F. to 55° F., and in summer 10° to 20° higher. Used for cultivating tropical plants, usually called stove plants.

Suckers.—Many plants have a way of increasing themselves by throwing up shoots or growths from the roots. These are called "suckers," and amongst fruits we have excellent instances in Raspberries. Many things will throw up suckers, as, for instance, Wild Rose stocks, or Manetti stocks, on which good Roses have been budded, and these, if not carefully and promptly removed, quickly become a nuisance. Small Nuts and Filberts throw up numerous suckers from the roots if left alone. Things of this character can be propagated by such suckers if they be got out with roots attached. Some Plums and Damsons throw up suckers freely, but these should always be suppressed. Whilst suckers are out of place in the case of Gooseberries and Red Currant bushes, they are useful in Black Currants as helping to perpetuate them.

Thinning.—When this takes place, it is often needful to use a small saw, and thus cut out large branches close to a main stem, especially such branches as may be crowded or cross each other. When such thinnings take place the branch should always be cut off close to the main stem, the wound pared over with a knife, and then touched over with Stockholm tar. Such wounds soon heal. There is yet another interpretation of thinning, and that is applied to beds or rows of seedling plants that have come up quickly and need early thinning to promote strong growth. This work is always necessary in the case of Carrots, Onions, Beet, &c., for example.

Thrum Eye—Pin Eye.—It is necessary to place those terms together; they are, however, seldom used except by the “florist.” Certain flowers, Auriculas and Polyanthuses, in particular, are assumed to possess certain properties or requirements to enable them to pass the judges at exhibitions, and whilst a primary requirement is found in “thrum” eyes, pin eyes are grave faults. By “thrum” is meant the cluster of stamens or pollen-cases in the mouth of certain flowers. Wherever these are prominent, that is to say, fill the cap or centre of a flower, the style or pistil, which is in other words the *pin*, does not project but is low down in the throat. This thrum invariably proves a most pleasing and attractive feature in any of these flowers. When, however, as often happens in seedlings, the anthers, or thrum, or cluster of pollen-cases is low down in the throat, then the point of the style projects and is called a “pin eye.” This is of little consequence in a border flower, but is a grave fault in one for show.

Top Spit.—Many beginners in gardening are puzzled by the use of strange terms. The term “top spit” is simple enough, but to the beginner in gardening needs explanation. It applies to the soil or ground when it is being dug or trenched. Thus when a spade or fork is forced its full depth into the ground and all the soil it can lift is so treated, that is called the top spit; for by spit is meant that depth of soil a spade or fork lifts when used in digging, trenching, &c. But the term is commonly applied to soil, whether loam or peat, that may be dug and stored for the potting of plants. Thus if loam, the part advised to be so stored is the “top spit,” or first or surface depth of from 6 to 12 inches as it may be thin or deep, poor or good, including the turfy surface if the soil be taken from an old pasture or meadow. That or a top spit, if peat, should be stacked with the herbage downwards in a good heap for several months to enable the grass to decay before it is used.

Trellis.—Almost any open structure to which trees or plants are tied or trained may be called a trellis. Some are composed of wood, especially such as have diamond-shaped openings, a favourite way to make screens or sides of summer-houses. For fruit trees, such as Raspberries, Gooseberries, Currants, Apples, Pears, the trellises are often made of stout wire. It is necessary to fix at either end straight oak posts firmly in the ground, to which the ends of the lengths of wire are fixed by means of screws, so that they can be drawn up tightly. Such trellises may consist of from three to six wires, and reach to heights of from 4 to 6 feet, according to the purposes to which they are put. Supports have to be placed to the wires, about 10 feet apart. To these wires the trees or bushes are tied. Similar trellises may be made of strips of wood, but they are less enduring. Garden walls are often trellised with small wire fixed close together, to which the trees are tied rather than nailed to the walls.

Trenching.—Whilst no term can well be more familiar to all than digging, for to dig in some fashion seems to come to us by nature, to trench is a more laborious and practical matter. It means double

digging or deep working of the soil. It is generally thought by amateur gardeners or beginners sufficient to dig ground for garden purposes some 10 to 12 inches deep. Gardeners, however, know better, as experience shows that ground double dug or trenched gives by far the best crop. Trenching should be done during the winter when some garden ground is vacant. To do this properly a trench 2 feet wide and 1 foot in depth should be thrown out half-way across a plot of vacant ground. Then the broken soil must be broken up another 12 inches deep with a spade or fork, and left; the top 12 inches of the next 2 feet trenching being thrown on to that, and the bottom soil broken also. The entire piece of ground should be thus treated. When ground has been so served two or three times the bottom may be brought to the top, as it is then fertile.

Tubers consist of a mass of fleshy or starchy matter stored up by plants in roots, or root tubers as they are called. These tubers increase in size as the plant grows, and when the plant ceases to grow they mature or ripen. They can then be lifted from the ground, be stored in a dry place for the winter, and if in the spring placed in warmth and damped, they send forth numerous shoots. These can be in part cut off and inserted in sandy soil as cuttings, the rest remaining, and the tubers being divided, each portion forms a separate plant. Dahlias have tuberous roots all attached to one crown, *Salvia patens* the same; Begonias and Gloxinias have solid tuberous or fleshy roots. Potatoes and Artichokes have starchy roots good as food, and for propagation many wild plants have tubers, such as Buttercups, Orchids, &c. Many Anemones and the florist's *Ranunculus* have tuberous roots also, generally differing in form only.

Variety.—This name is applied to flowers, fruits, and vegetables that are neither species nor hybrid. Thus Senator and Dr. Maclean are varieties of Peas, Snowdrop and Up-to-Date are varieties of Potatoes, Ailsa Craig and Main Crop varieties of Onions, and so on. If a collection of quite diverse flowers, fruits, or vegetables be arranged for at a show the term "kinds" should always be used to show that two or more varieties of the same thing cannot be staged. Many troubles arise at shows because such wording is not used.

ITEMS OF INTEREST

Bamboo Blinds.—These are usually made of split bamboos, bound together by kemoetic twine, and are exceedingly light as well as strong, and may be easily rolled up. The bamboo blinds, which are imported from Java, and made by coolies, are not very expensive. In Holland they are superseding the olden wooden blinds. The best means of shading plant houses and of giving temporary protection from early frosts to outdoor crops are subjects upon which the last word has by no means been spoken, and it is right that attention should be drawn to these bamboo blinds.

Blue Hydrangeas.—It is well known that this noble shrub has the peculiarity of changing its normal pink colouring, under certain conditions of soil and situation, to a blue of varying quality and intensity. The strange thing is that the blue colouring is not a matter of soil alone. We have ourselves grown plants from cuttings from bushes whose flowers were of a strong blue. In the hope of retaining the blue colour we even had some of the actual soil in which they came so blue sent to fill two tubs. This was from a place in Sussex, about 10 miles from the sea; the soil, a stiff loam, almost clay, containing a good deal of iron; the place to which they were removed being 45 miles from the sea, nearly half-way between London and Portsmouth, but here the Hydrangeas flowered pink, without a trace of blue. The commonly accepted recipes for inducing the blue colour—iron filings and alum—we have also tried, the result being a change of colour certainly, but only to a muddled mixture of bad pink and greyish purple. This was tried on two tub plants, one of them being one of the Sussex plants in the Sussex soil. The soil of the other tub was a mixture of about two parts peat and one part loam, with some old hot-bed manure. These plants recovered after a year or two and became clear pink again. The muddled between-colours, such as anyone can get by the recipes, are of no use whatever; the good clear pink is lost, and nothing but ugliness is gained. The blue must be a good blue, or we would have none of it.

Botanising Injudicious.—Botany is outside the scope of this book, but it is well never to miss an opportunity of deploring injudicious collecting of rare wild flowers. The true botanist is never to be feared, but what indeed to be dreaded is the host of eager young collectors, abounding in zeal but wanting in discretion and discrimination, that descend upon our precious wastes and woodlands like a swarm of hungry locusts, devouring and destroying by tearing up

beautiful and perhaps rare vegetation, of which not one item in ten will be put to any good use. Sometimes the waste is quite wanton, for nothing is more frequent in the case of Bluebells than to see on the ground gathered handfuls that have been idly picked and then flung away. Many thoughtless people say that picking flowers does no harm if the plants are left, forgetting that if the flower is taken the plant can form no seed. From this cause many copses where a few years ago Primroses were in tens of thousands have now but few, and in a few years will have none at all. Legitimate botanical study in the field is well enough, but our flora is too precious to expose to the thoughtless collecting by those to whom "botanising" is perhaps a mere passing fancy. It has suffered much in the past—so much so that many beautiful flowers are almost extinct.

Bulbs, Planting in Grass.—Here are answers to two very practical questions about this: (1) An important one, where bulbs by the thousand or ten thousand are concerned, is how to plant the bulbs

FIG. 67.—Diagram showing general method of planting bulbs in grass in long drifts. The outer hard line is only a guiding line to be temporarily marked by rope or whiting.

easily and expeditiously and yet suitably. (2) What will happen to them when planted, if sheep and cattle come their way. There is a classical authority for believing that the domestic cow can be induced to eat the pretty Cowslip; will she, even without encouragement, lunch off *Chionodoxa Lucillæ* and dine on *Narcissus poeticus*? Or can these and such like bulbs be planted with safety not only in orchards and copses, but in parks and meadows? As for the shape of the planting, there can be little doubt that in fair-sized spaces the most pictorial effect is gained by planting in long drifts, something like the way leaves are blown into drifts along road edges or on to the ground that lies in long informally parallel ridges. Or imagine some very long slender fish, 20 to 50 feet long, with pointed tails as well as heads laid irregularly on the ground with their heads all one way, or, better still, look at the illustration. For the actual manipulation sticks could be placed at the ends where dots are shown, and ropes laid to show the outside of the drifts, and two or three bulbs put into spade cuts anywhere within the limits. Or the turfing "racer" can be run along one

edge and the turfs hitched back to a rope line on the other. The lines could also be marked with a little whiting and water with a tennis-court marker. If the whole turf is not raised the spade should make two cuts, then a V of turf and earth lifted would make a space to take two or three or more bulbs, according to size. It is always a little difficult to plant bulbs otherwise than too formally, and also somewhat difficult to explain. One way is to throw the bulbs on to the ground and to plant them exactly where they fall. An attempt should be made to plant the middle regions of the groups thickest, giving the effect of an established nucleus from which seed has spread. The inner dots on one drift in the diagram will show what is meant. Daffodils have a poisonous quality, and are generally avoided by cattle in pastures, but the dried leaves in hay are quite harmless.

Camellias for Planting Outdoors.—As considerable interest has been taken of late in the Camellia as an outdoor shrub the following few facts may be useful. They are the outcome of Mr. Scrase-Dickens' experience, an amateur gardener who writes with authority. The best *Camellias* for planting out of doors in the open air are those which bloom late and start late in growth, such, for instance, as *Chandleri elegans* or *Anemonæflora*; the varieties with broad roundish leaves appear to grow in more robust fashion than those having narrow pointed ones with a serrated edge, though the latter will make sometimes very compact bushes. It is possible that those with dark red flowers are hardier than those with pink. The old double white seems to stand the cold well enough, but it hides its flowers rather too much among the foliage to make any effective display of them, though in this way they are often secured from frost or bad weather and made serviceable for cutting. To train against trestles or a wall *Doncke Laari* is very good, and next to *reticulata*, one of the most beautiful when well grown, blooming so freely. *Camellias* appear to grow in almost any aspect, but are naturally sun lovers, and though preferring peat they will grow in most other soils, provided that there is no lime present. The points of the young roots are very sensitive to drought, so should be protected until well established, by light mulching or a surrounding growth, from the risk of being withered up by a fierce sun striking the ground in which they are starting. Unlike many other shrubs, they seem to have the advantage of being exempt from the destructive attention of rabbits; perhaps when snow is on the ground they might be barked, but Mr. Scrase-Dickens says he has not noticed it. Apart from the question of varieties it may be well to draw attention to the fact that only strong healthy plants should be bought, for sickly specimens from a conservatory or greenhouse are very slow indeed to make a start, and will remain sometimes for an astonishing number of years in almost the same pitiable state. Grafted plants should be avoided; if seedlings are not obtainable, cuttings generally can be struck without much difficulty.

Heather and Bracken Planting.—In planting these, it is always best to get the heather from the moors, choosing places where it grows

short, and digging up deep sods. In places where top sods are cut thin for burning and young heather springs up afresh, these, with the young plants about 3 inches high, would do well, or the seedlings could be taken up in hundreds and planted in peaty soil. Bracken can also be planted in the same way, cutting out large deep sods. This is much better than getting the roots out clean, as they take a long time to recover, and very few grow at all. The best places to take it from are where the ground is very poor and it grows very short.

Labour-saving Appliances are Important.—A writer in *The Garden* lays stress upon the importance of having the best labour-saving appliances. "Many, perhaps most, agree that it is 'all in the day's work,' and that any arrangement for simplifying and reducing work is a useless expense, giving the gardener more time to idle about." A long experience shows this to be a serious blunder. If the employer shows no appreciation of the value of time, and no objection to wasting it with inferior tools and appliances, the man naturally follows his employer's lead, and sets little value on his own time, which can easily be wasted in a garden. We always keep the best labour-saving appliances, and see they are used; a poor tool is cleared out of the way, and the men spend the time, which would otherwise be wasted, on improving all round. Work is better done, and many things are done which would be impossible if we went on the principle of using old, bad, or indifferent tools, without consideration as to the time they waste. One of the occupations in which a very large amount of time is wasted is watering. Instead of the water coming to the man, he has to carry it in most private gardens; the watering-pots are clumsy, unhandy, and slow in delivery. This is a point on which we might well take a lesson from the French market gardener, who as a rule will, compared with us, do the same amount of watering in less than half the time, and with much less labour. He arranges his beds so that he can use two cans, one in each hand. The same thing occurs in the pruning; one man will spend more time in climbing up and down a ladder than another requires to do the whole with proper tools, and so on through the garden work. Money devoted to good labour-saving appliances is always well spent, and a good gardener takes a pride both in having and in using them.

Plants for Garden Vases.—The question as to the best plants for this use is one that often arises. In one way it is very easily answered, for there can be no doubt that there are no summer plants that so exactly suit the purpose as Geraniums. The habit and appearance of the plant is exactly of the right character, and rather solid and important, while its stiff half wooden stems enable it to withstand a good deal of wind. Moreover, it comes out its best in the late summer and early autumn, when the gardens where the important stone vases usually find a home are wanted to be at their best. They are also plants that gardeners are so well accustomed to growing that they can depend on attaining the result desired. The choice of varieties is now so large

that there is plenty of alternative, but there can be little doubt that for general good effect those of the softer scarlet colourings and those inclining to a salmon tint are the best. Nothing can well beat the salmon-coloured double King of Denmark. The colour is delightfully satisfying to the eye, both of the critical and untaught; the doubling is just double enough, and it gives the flower an expansive richness without crowding of petals.

We want our double Geraniums, like all other double flowers, to be improved by a reasonable increase of petals, not to be debased by their being crowded into a tight, formless mass, as is the case in many double flowers, of which, among others, many Geraniums, Begonias, Hollyhocks, and Fuchsias may be quoted. The good King of Denmark has also the merit of a handsome and well-marked leaf; in short, it is a type of beauty for a vase as for any other use of these indispensable summer flowers. Geraniums are rather better in vases than in beds, because the vase becomes warmed, and with daily watering the conditions it offers are exactly what the plants like best, sun-warmth to root and top, and free air all round.

So, to recapitulate the main part of the answer to the question as to the best plants for vases, it is "Geraniums far and away the best." Nothing is so well dressed or so exactly suited to this use. Whether or not to add some ivy-leaved kinds to hang over the edge is a matter that must be determined by the form and place of the pot, but they are generally more suitable to a thing of larger design. The choice of the pot plants must depend also on the degree of shelter of the place where the pots or vases stand. In a very sheltered place the best of the Petunias are good pot plants. The best means the good whites, whether single or double, the purples being nearly all infected with an unpleasant rankness of colouring that makes them unbearable to the critical colour eye. They have the advantage of remaining long in beauty, for it must be remembered that the pot plant must be long enduring; it is no use to have a thing that is in beauty for a month—it must be in beauty for three months. A vase in a sheltered place, 2 feet high and as much broad, reckoned independently of any plinth or pier on which it may stand, might be beautifully dressed with a standard Heliotrope in the middle about 2 feet 9 inches high, with a base planting of white Petunia, or the standard of such a height as would show just a little of the stem free above the Petunia. A very well grown Fuchsia of the Mme. Cornellisen type, or any red and white double that is not too double, would also be a good centre plant. Here the pendent habit of the plant would seem to encourage the use of a red or white Ivy Geranium to carry on the same idea throughout.

Where the vases can be carried for the winter into the shelter of some frost-proof place, Hydrangeas, that can remain in them from year to year, are delightful vase plants. For the same use, whether the vase itself is carried into shelter or the plant dropped into it in a large pot, Sweet Verbena, Myrtle, Pomegranate, Oleander, Musa, and the hardier Palms can be used. But to do these things rightly there must be a

knowledge, not only of the plant and its needs, but of proportion and right use of form and colour. It is therefore most important in large places, or places of whatever size that are carefully designed, to have a regular system established, on the advice, if possible, of a competent garden artist, and to keep to the same year after year, for it is a matter that calls for the most highly trained ability.

The few best vase plants are already well known, among them being the Paris Daisy (*Chrysanthemum frutescens*), and it is better to put these to their best use as to proportion and environment than to search about for a larger number of plants that may possibly be used in vases.

Planting a Strip of Woodland.—Amateurs are sometimes placed in the position of the following inquirer, and this letter and answer to it may assist others in need of similar advice: "I have lately thrown a small strip of wood into the garden by pulling down part of the boundary wall. I want advice as to the way to make it as attractive as possible. I am having holes prepared for suitable plants. It is bounded on two sides by a small river, and on the third by a ditch; this and the river usually overflow in winter, and in the summer dry up almost altogether. The soil has never been dug, and is hard like clay, and full of roots. The natural soil of the garden is very good. The trees are mostly Hawthorns, but there are some Beeches, a few Oaks, and a little grove of Wild Cherry trees at one end. I should very much like to grow some Lilies, Japan Anemones, &c., and thought of digging good large holes 2 feet and 3 feet deep, and filling them up during the summer with manure, refuse, and good soil. In one rather shady place there is a little mound. What could I plant to trail over it and hang down?"

To this question we would advise for the chief planting *Leucojum aestivum*, Daffodils, and Solomon's Seal, also hardy Ferns, including Hart's Tongue. One plant likely to do well would be *Iris fetidissima*, also the common Columbines, and Woodruff. Of Lilies the most suitable would be the Martagon and the white variety. For trailing over the mound, Ivy, Periwinkles, and Moneywort. Ivy is charming with Snowdrops coming through it. Snowdrops would also probably do well planted in quantity. If a large effect is desired, *Polygonum Sieboldi* should be used, or if a group of flowering shrubs, Guelder Rose, or still better, its original native form, the Water Elder (*Viburnum Opulus*). In planting in such a place it is well to maintain a different character to that of the garden, by the use of plants that are either hardened natives or might be wild. Nearly all those named are of this nature. Two feet would be deep enough for the prepared holes, and we would not advise making the soil too rich.

Pomegranate, The.—It is very curious and interesting to notice how many beautiful things are seldom seen in an English garden, although suitable for our climate. The Pomegranate is an illustration, as the Curator of the Royal Gardens at Kew says: "Planted at the foot of a south wall and treated generally like a well-groomed Peach tree, it will flower from June to September. Its flowers are as rich in colour as any scarlet flower known, and they last several days if cut

before the crinkled petals burst open. At least three varieties are grown out of doors, namely the type, the big double-flowered variety, with petals margined with white, Picotee-like, and the dwarf variety known as nanum. There are other forms besides these, including a white-flowered one which I have seen in Paris gardens, where old—very old—standard plants are grown and treasured. The dwarf variety is cultivated as a pot plant in some continental countries. I have seen it in the Hamburg florists' shops, pretty little pyramids in 5-inch pots, covered with flowers. Fruits are rarely produced by the Pomegranate in England."

Scum on a Pond.—A well-known correspondent of *The Garden* in replying to a question about freeing a pond from scum on the advent of hot summer weather writes: "I used to be troubled in the same way in a cemented tank of still water, which would keep clear until after two or three days of hot summer, when it would be completely covered with green scum. It had vegetable life in the shape of Nymphæas, and animal life in the golden carp, but the scum appeared in spite of them. A few years ago I collected a large number of water snails and put them into it, since which time I have never had to complain of this scum. Although it would be rather too hasty a generalisation to quote these facts as cause and effect, I mention them as a suggestion for what they are worth, and I believe others have had a similar experience. At any rate, the experiment is worth trying. I suspect also that the introduction of tench would also prove useful for keeping down vegetable growth, for which they are better than carp."

Sticks and Stakes.—Many a garden is sadly disfigured by the clumsy and unsightly way the plants are staked. In dressed grounds the stakes that are necessary for the support of the plant should never show; they should be sufficient for their purpose, but must never obtrude their presence. Often they are much too tall, overtopping the plant by a foot or more. Sometimes it comes from the want of a little foresight, but oftener from an insensibility to much of the ugliness that ought to be obvious. Plenty of stakes of all lengths should be provided in the winter, so that there are enough and to spare of all heights. Where this adequate provision is not made perhaps it happens that there are stakes of short Dahlia height, but none provided for Pæonies; it seems a pity to shorten a good Dahlia stake, so in it goes for the Pæony and sticks up $1\frac{1}{2}$ foot above it, entirely destroying the beauty of the flower and all the poetical aspect of the garden. As a rough rule, it will be enough if the stick comes up two-thirds the height of the plant, especially in the case of graceful things like Lilies. Most Lilies arch over or bend a little one way, and to see them tied up rigidly to a straight stick taller than their fullest height is a grievous sight to the true lover of beauty in a garden. The Bamboo sticks that are so cheap and handy are often used in an unsightly way; they are so very straight, and their light colour makes them conspicuous, though they are excellent if they are

cleverly used. The stick itself cannot be made beautiful. Sticks painted green with gilt tops appear in the lists of some dealers in horticultural sundries. Such things are never seen in good places; they belong to that category of horrors that includes grasses dyed magenta, moss dyed a most unmosslike green, and the coloured glass balls of small continental back gardens. Many gardeners use strips of deal laths carefully rounded. These have a certain neatness in themselves, but are much too conspicuous. No sticks for pot plants are better than Hazel suckers, whether of large size, as for 6 feet high Chrysanthemums, or such as suit a pot of Tulips or Hyacinths. Next to these in merit are Apple prunings; if they are looked over as soon as they are cut and tied together in bundles they dry straight and are extremely useful, the larger ones doing admirably for Carnations of the next season. Plants of a feathery way of growth, like Gypsophila and Michaelmas Daisies, are best supported with branching spray, such as may be cut out of the tops when trees are felled. It is most important to have all these accessories prepared in good time, so that when they are wanted they are ready at hand. But the thing to remember is, that though the sticks must needs be there, they must never show so as to mar the beauty of the garden.

Tub-Gardening.—This is a form of gardening which is rapidly becoming popular. As the name suggests, it means planting in tubs for the decoration of lawn or terrace. It is often possible to grow some handsome plant in a tub and not in the open garden. Tubs of plants may be placed upon the terrace, by the garden path, or on each side of the hall door. Sometimes the foliage is very fragrant, and when brushed against gives off a warm and powerful odour, such as the Lemon plant and the Cape Pelargonium. These tub plants, when no better accommodation exists, such as a conservatory or large plant house, may be stored away in cellars and kept safe from frost by coverings of straw or similar material. The Agapanthus is one of the best of tub plants, and a choice may be made from the following: Myrtles, the Lemon plant or Sweet Verbena (*Aloysia citriodora*), the fragrant-leaved Cape Pelargoniums, the fragrant *Choisya ternata* or Mexican Orange flower; Heliotropes, the Coral tree (*Erythrina Crista-galli*), *Plumbago capensis*, and the Yucca. Tubs can be purchased, or made from paraffin casks and beer barrels cut in two in the centre. Nail a bit of half-round wood in each circle, or nail stout zinc on the outsides of them. Two coats of paint will do, but a third one is an advantage. The two first should be lead colour, and the third green. A coat of black afterwards should be given on the black hoops. As soon as the tubs are cut in two get some shavings or dry straw and upturn each tub over them. Then set fire to them and leave the tubs sufficiently long on fire so that the inner surface is well charred over. For the smaller sizes not less than five holes bored with an inch auger should be made in the bottom of each tub. Larger ones should have more. For the smaller sizes two stout box handles should be screwed on to each one. They can be purchased cheaply from any ironmonger. For the larger tubs stouter ones are best.

ENGLISH NAMES FOR WILD AND GARDEN FLOWERS

IN the following list of English flower-names those familiar to us in the garden are not recorded, for the good reason that throughout the entire work where a sensible English name is available it has been used. Thus, on page 52, "Matthiola bicornis" is called "Night-scented Stock"; and so where an opportunity is given plant nomenclature has been made easy.

ACONITE, Winter (<i>Eranthis hyemalis</i>)	Barberry (<i>Berberis vulgaris</i>)
Adder's-tongue (<i>Ophioglossum vulgatum</i>)	Barley, Wall, Way-bent (<i>Hordeum murinum</i>)
Agrimony, Common (<i>Agrimonia eupatoria</i>)	" Wood (<i>Hordeum sylvaticum</i>)
" Common Hemp (<i>Eupatorium cannabinum</i>)	Bartsia, Alpine (<i>Bartsia alpina</i>)
" Scented (<i>Agrimonia odorata</i>)	" Red (<i>Bartsia Odontites</i>)
Alder, Common (<i>Alnus glutinosa</i>)	" Yellow-viscid (<i>Bartsia viscosa</i>)
Alexanders, Common (<i>Smyrniolum Olusatrum</i>)	Basil, Thyme (<i>Calamintha Acinos</i>)
Alkanet, Common (<i>Anchusa officinalis</i>)	" Wild (<i>Calamintha Clinopodium</i>)
" Evergreen (<i>Anchusa sempervirens</i>)	Bastard-balm (<i>Melittis melissophyllum</i>)
All-good, Good King Henry, Mercury (<i>Chenopodium Bonus-Henricus</i>)	Beak Sedge, Brown (<i>Rhynchospora fusca</i>)
All-seed (<i>Radiola Millegrana</i>)	" White (<i>Rhynchospora alba</i>)
Andromeda, Marsh (<i>Andromeda polifolia</i>)	Bear-berry, Black (<i>Arctostaphylos alpina</i>)
Anemone, Apennine (<i>Anemone apennina</i>)	" Red (<i>Arctostaphylos Uva-Ursi</i>)
" Wood, Wind-flower (<i>Anemone nemorosa</i>)	Beard-grass, Annual (<i>Polypogon monspeliensis</i>)
Angelica, Wild (<i>Angelica sylvestris</i>)	" Perennial (<i>Polypogon littoralis</i>)
Archangel, Yellow (<i>Lamium Galeobdolon</i>)	Bedstraw, Cross-leaved (<i>Galium boreale</i>)
Arrow-grass, Sea (<i>Triglochin maritimum</i>)	" Hedge (<i>Galium Mollugo</i>)
" Marsh (<i>Triglochin palustre</i>)	" Lady's (<i>Galium verum</i>)
Arrow-head, Common (<i>Sagittaria sagittifolia</i>)	" Mountain (<i>Galium sylvestre</i>)
Asarabacca (<i>Asarum Europæum</i>)	" Rough-fruited corn (<i>Galium tricorné</i>)
Ash (<i>Fraxinus excelsior</i>)	" Rough Marsh (<i>Galium uliginosum</i>)
Asparagus, Common (<i>Asparagus officinalis</i>)	" Water (<i>Galium palustre</i>)
Aspen (<i>Populus tremula</i>)	Beech, Common (<i>Fagus sylvatica</i>)
Asphodel, Bog (<i>Narthecium ossifragum</i>)	Bell-flower, Clustered (<i>Campanula glomerata</i>)
" Mountain Scottish (<i>Tofieldia palustris</i>)	" Creeping (<i>Campanula rapunculoides</i>)
Avens, Common, Herb Benet (<i>Geum urbanum</i>)	" Giant (<i>Campanula latifolia</i>)
" Mountain (<i>Dryas octopetala</i>)	" Spreading (<i>Campanula patula</i>)
" Water (<i>Geum rivale</i>)	Bent, Bristle-leaved (<i>Agrostis setacea</i>)
Awl-wort, Water (<i>Subularia aquatica</i>)	" Brown (<i>Agrostis canina</i>)
Azalea, Trailing (<i>Loiseleuria procumbens</i>)	" Fine (<i>Agrostis vulgaris</i>)
BALM (<i>Melissa officinalis</i>)	Betony, Wood (<i>Stachys betonica</i>)
Balsam, Touch-me-not (<i>Impatiens Noli-tangere</i>)	Bindweed, Black (<i>Polygonum Convolvulus</i>)
Bane-berry, Herb Christopher (<i>Actæa spicata</i>)	" Great (<i>Convolvulus sepium</i>)
	" Sea (<i>Convolvulus Soldanella</i>)
	" Small (<i>Convolvulus arvensis</i>)
	Birch, Dwarf (<i>Betula nana</i>)
	" Silver (<i>Betula alba</i>)

- Bird's-foot, Common (*Ornithopus perpusillus*)
 Birthwort (*Aristolochia Clematitis*)
 Bistort, Alpine (*Polygonum viviparum*)
 " Snake-weed (*Polygonum bistorta*)
 Bitter-cress, Hairy (*Cardamine hirsuta*)
 Blackberry, Bramble (*Rubus fruticosus*)
 Bladder-seed (*Physospermum cornubiense*)
 Bladderwort, Common (*Utricularia vulgaris*)
 " Intermediate (*Utricularia intermedia*)
 " Lesser (*Utricularia minor*)
 Blue-bell, Wild Hyacinth (*Scilla nutans*)
 Bog-rush, Black (*Scheuchzeria palustris*)
 Borage, Common (*Borago officinalis*)
 Box, Common (*Buxus sempervirens*)
 Bracken or Brake (*Pteris aquilina*)
 Briar, Sweet (*Rosa rubiginosa*)
 Bristle-grass, Green, Panic (*Setaria viridis*)
 Brome, Barren (*Bromus sterilis*)
 " Compact (*Bromus madritensis*)
 " Smooth (*Bromus racemosus*)
 " Soft, Slop-grass (*Bromus mollis*)
 " Upright (*Bromus erectus*)
 Brooklime (*Veronica beccabunga*)
 Brook-weed (*Samolus valerandi*)
 Broom, Common (*Cytisus scoparius*)
 Broom-rape, Clove-scented (*Orobanchaceae*)
 " Greater (*Orobanchaceae major*)
 " Lesser (*Orobanchaceae minor*)
 " Purple (*Orobanchaceae caerulea*)
 " Red (*Orobanchaceae rubra*)
 " Tall (*Orobanchaceae elatior*)
 Bryony, Black (*Tamus communis*)
 " White (*Bryonia dioica*)
 Buck or Bog-bean (*Menyanthes trifoliata*)
 Buckthorn, Alder, Berry-bearing Alder (*Rhamnus frangula*)
 " Common (*Rhamnus catharticus*)
 " Sea (*Hippophae rhamnoides*)
 Buckwheat, Copse (*Polygonum dumetorum*)
 Bugle, Common (*Ajuga reptans*)
 " Pyramidal (*Ajuga pyramidalis*)
 Bugloss (*Anchusa arvensis*)
 Bullace (*Prunus insititia*)
 Bulrush, Common (*Scirpus lacustris*)
 " Reed-mace or Cat's tail (*Typha latifolia*)
 " Three-edged (*Scirpus triquetus*)
 Bupleur, Narrow-leaved (*Bupleurum aris-tatum*)
 Burdock (*Arctium lappa*)
 Bur-marigold, Nodding (*Bidens cernua*)
 " Trifid (*Bidens tripartita*)
 Burnet, Great (*Poterium officinale*)
 " Salad (*Poterium sanguisorba*)
 Burnet Saxifrage, Common (*Pimpinella saxifraga*)
 Bur-Parsley, Great (*Caucalis latifolia*)
 " (*Caucalis daucoides*)
 Bur-reed, Branched (*Sparganium ramosum*)
 " Floating (*Sparganium natans*)
 " Unbranched, Upright (*Sparganium simplex*)
 Butcher's Broom, Knee Holly (*Ruscus aculeatus*)
 Butter-bur (*Petasites vulgaris*)
 Buttercup (*Ranunculus acris*)
 " Bulbous (*Ranunculus bulbosus*)
 " Creeping (*Ranunculus repens*)
 Butterwort, Alpine (*Pinguicula alpina*)
 " Common (*Pinguicula vulgaris*)
 " Pale (*Pinguicula lusitanica*)
 CABBAGE, Isle of Man (*Brassica monensis*)
 " Jersey (*Brassica cheiranthos*)
 " Wild (*Brassica oleracea*)
 Calamint (*Calamintha officinalis*)
 Campanula, Nettle-leaved, Wild Canterbury Bells (*Campanula trachelium*)
 Campion, Bladder (*Silene inflata*)
 " Moss (*Silene acaulis*)
 " Sea (*Silene maritima*)
 Canary-grass (*Phalaris canariensis*)
 Candytuft, Bitter (*Iberis amara*)
 Caraway, Common (*Carum carui*)
 " Whorled (*Carum verticillatum*)
 Carnation-grass (*Carex panicea*)
 Carrot, Wild (*Daucus carota*)
 Catchfly, English (*Silene anglica*)
 " Nottingham (*Silene nutans*)
 Cat-mint (*Nepeta cataria*)
 Cat's-ear, Smooth (*Hypochaeris glabra*)
 " Spotted (*Hypochaeris maculata*)
 Cat's Tail, Mountain (*Phleum alpinum*)
 " Sea (*Phleum arenarium*)
 Celandine, Lesser, Pile-wort (*Ranunculus ficaria*)
 Celery, Wild (*Apium graveolens*)
 Centaury, Common (*Erythraea centauryum*)
 " Yellow, Yellow-wort (*Chlora perfoliata*)
 Chamomile, Common (*Anthemis nobilis*)
 " Corn (*Anthemis arvensis*)
 " Wild (*Matricaria chamomilla*)
 Cherry, Bird (*Prunus padus*)
 " Dwarf (*Prunus cerasus*)
 Chervil (*Cherophyllum temulum*)
 " Garden (*Anthriscus cerefolium*)
 Chickweed, Common (*Stellaria media*)
 " Field, Mouse-eared (*Cerastium arvense*)
 " Mouse-eared (*Cerastium tetrandrum*)
 " Wayside, Mouse-eared (*Cerastium triviale*)
 " Winter-green (*Trientalis europaea*)
 Chicory, Wild (*Cichorium intybus*)
 Chives (*Allium schoenoprasum*)
 Cicely, Sweet (*Myrrhis odorata*)
 Cinquefoil, Rock (*Potentilla rupestris*)
 " Shrubby (*Potentilla fruticosa*)
 Clary, Meadow (*Salvia pratensis*)
 Cloudberry (*Rubus chamaemorus*)
 Clover, Alsike (*Trifolium hybridum*)
 " Crimson (*Trifolium incarnatum*)
 " Meadow (*Trifolium medium*)
 " Red (*Trifolium pratense*)

- Clover, White or Dutch (*Trifolium repens*)
 Club-moss (*Lycopodium clavatum*)
 Club-rush, Sea (*Scirpus maritimus*)
 " Wood (*Scirpus sylvaticus*)
 Cock's-foot Grass (*Dactylis glomerata*)
 Colt's-foot (*Tussilago Farfara*)
 Columbine (*Aquilegia vulgaris*)
 Comfrey, Common (*Symphytum officinale*)
 " Tuberos (*Symphytum tuberosum*)
 Coral-root (*Dentaria bulbifera*)
 " Spurlers (*Corallorhiza innata*)
 Cord-grass, Common (*Spartina stricta*)
 Corn-cockle (*Githago segetum*)
 Cornflower, Blue-bottle (*Centaurea Cyanus*)
 Corn-salad, Lamb's Lettuce (*Valerianella olitoria*)
 " Toothed (*Valerianella dentata*)
 Corydalis, Climbing (*Corydalis claviculata*)
 Cotton-grass, Alpine (*Eriophorum alpinum*)
 " Common (*Eriophorum angustifolium*)
 " Hare's - tail (*Eriophorum vaginatum*)
 Cotton-weed (*Diotis maritima*)
 Cow-berry (*Vaccinium Vitis-Idæa*)
 Cow-Parsnip, Common, Hog-weed (*Heracleum Sphondylium*)
 Cowslip, Paigle (*Primula veris*)
 Cow-wheat, Common Yellow (*Melampyrum pratense*)
 " Crested (*Melampyrum cristatum*)
 " (*Melampyrum sylvaticum*)
 " Purple (*Melampyrum arvense*)
 Crab-apple (*Pyrus Malus*)
 Cranberry (*Oxycoccus palustris*)
 Crane's Bill, Meadow (*Geranium pratense*)
 " Shining (*Geranium lucidum*)
 Creeping Jenny, Money-wort (*Lysimachia Nummularia*)
 Crocus, Autumn, Meadow Saffron (*Colchicum autumnale*)
 " Naked-flowered (*Crocus nudiflorus*)
 " Purple Spring (*Crocus vernus*)
 Crosswort (*Galium cruciata*)
 Crow-berry (*Empetrum nigrum*)
 Crowfoot, Celery-leaved (*Ranunculus sceleratus*)
 " Corn (*Ranunculus arvensis*)
 " Ivy-leaved (*Ranunculus hedera-ceus*)
 " Mud (*Ranunculus Lenormandi*)
 " Small-flowered (*Ranunculus parviflorus*)
 " Water (*Ranunculus aquatilis*)
 Cuckoo-flower, Lady's Smock (*Cardamine pratensis*)
 Cuckoo-pint, Lords and Ladies, Wake-robin (*Arum maculatum*)
 Cudweed, Dwarf (*Gnaphalium supinum*)
 " Jersey (*Gnaphalium luteo-album*)
 " Least (*Filago minima*)
 " Marsh (*Gnaphalium uliginosum*)
 " Narrow-leaved (*Filago gallica*)
 " Wood (*Gnaphalium sylvaticum*)
 Currant, Black (*Ribes nigrum*)
 Currant, Wild (*Ribes rubrum*)
 Cyperus, Brown (*Cyperus fuscus*)
 Cyphel (*Arenaria Cherleria*)
 DAFFODIL, Lent Lily (*Narcissus Pseudonarcissus*)
 Daisy, Ox-eye (*Chrysanthemum Leucanthemum*)
 " Common (*Bellis perennis*)
 Dandelion (*Taraxacum officinalis*)
 Darnel (*Lolium temulentum*)
 Dead Nettle, Intermediate (*Lamium intermedium*)
 " Red (*Lamium purpureum*)
 " White (*Lamium album*)
 Dock, Broad-leaved (*Rumex obtusifolius*)
 " Curled (*Rumex crispus*)
 " Fiddle (*Rumex pulcher*)
 " Golden (*Rumex maritimus*)
 " Great Water (*Rumex Hydrolapathum*)
 " Sharp (*Rumex conglomeratus*)
 Dodder, Flax (*Cuscuta Epilinum*)
 " Greater (*Cuscuta europæa*)
 " Lesser (*Cuscuta Epithymum*)
 Dog's Tail, Crested (*Cynosurus cristatus*)
 " Rough (*Cynosurus echinatus*)
 Dog's-tooth Grass (*Cynodon Dactylon*)
 Dog-wood, Wild Cornel (*Cornus sanguinea*)
 Dropwort (*Spiræa Filipendula*)
 Duck-weed, Greater (*Lemna polyrrhiza*)
 " Ivy-leaved (*Lemna trisulca*)
 " Lesser (*Lemna minor*)
 Dyer's Greenwood, Woad-waxen (*Genista tinctoria*)
 Dyer's Weed, Wild (*Reseda luteola*)
 ELDER, Common (*Sambucus nigra*)
 " Dwarf, Dane - wort (*Sambucus Ebulus*)
 Elecampane (*Inula Helenium*)
 Elm (*Ulmus montana*)
 Enchanter's Nightshade, Alpine (*Circæa alpina*)
 Enchanter's Nightshade, Common (*Circæa luteiana*)
 Everlasting Pea, Narrow-leaved (*Lathyrus sylvestris*)
 Eye-bright, Common (*Euphrasia officinalis*)
 FENNEL, Common (*Feniculum vulgare*)
 Fenugreek (*Trigonella ornithopodioides*)
 Fern, Bladder (*Cystopteris fragilis*)
 " Bristle (*Trichomanes radicans*)
 " Filmy (*Hymenophyllum tunbridgensis*)
 " Hard (*Lomaria Spicant*)
 " Hart's-tongue (*Scolopendrium vulgare*)
 " Maidenhair (*Adiantum Capillus-Veneris*)
 " Parsley, Rock-brake (*Cryptogramme crispa*)
 " Royal (*Osmunda regalis*)
 " Shield (*Aspidium Lonchitis*)
 Fescue Grass, Tall (*Festuca elatior*)

- Fescue, Reed (*Festuca sylvatica*)
 „ Sheep's (*Festuca ovina*)
 „ Single-husked (*Festuca uniglumis*)
 „ Wall, Rats' Tail (*Festuca Myurus*)
 Fever-few, Common (*Matricaria Parthenium*)
 „ Corn, Scentless Mayweed (*Matricaria inodora*)
 Fig-wort, Balm-leaved (*Scrophularia Scordonia*)
 „ Knotted (*Scrophularia nodosa*)
 „ Water (*Scrophularia aquatica*)
 „ Yellow (*Scrophularia vernalis*)
 Filago, Common, Cudweed (*Filago germanica*)
 Fiorin Grass (*Agrostis alba*)
 Fir, Scotch (*Pinus sylvestris*)
 Fir-rape, Pine Bird's Nest (*Monotropa Hypopitys*)
 Flag, Yellow (*Iris Pseud-acorus*)
 Flax, Common (*Linum usitatissimum*)
 „ Purging (*Linum catharticum*)
 Fleabane (*Inula dysenterica*)
 „ Alpine (*Erigeron alpinum*)
 „ Blue (*Erigeron acre*)
 Fleawort, Field (*Senecio campestris*)
 „ Marsh (*Senecio palustris*)
 Flixweed (*Sisymbrium Sophia*)
 Flote-grass, Manna-croup (*Glyceria fluitans*)
 Fluellin, Male (*Linaria spuria*)
 „ Sharp-pointed (*Linaria Elatine*)
 Forget-me-Not (*Myosotis palustris*)
 „ Mountain (*Myosotis alpestris*)
 „ Wood (*Myosotis sylvatica*)
 Foxglove, Wild (*Digitalis purpurea*)
 Fox-tail, Alpine (*Alopecurus alpinus*)
 „ Marsh, or Floating (*Alopecurus geniculatus*)
 „ Meadow (*Alopecurus pratensis*)
 „ Orange-spiked (*Alopecurus fulvus*)
 „ Tuberous (*Alopecurus bulbosus*)
 Fritillary, Snake's Head (*Fritillaria Meleagris*)
 Frog-bit (*Hydrocharis Morsus-Ranæ*)
 Fumitory, Common (*Fumaria officinalis*)
 „ Ramping (*Fumaria capreolata*)
 Furze, Needle (*Genista anglica*)
 „ Whin, Gorse (*Ulex europæus*)
- GALINGALE, Sweet (*Cyperus Longus*)
 Garlic, Broad-leaved, Ramsons (*Allium ursinum*)
 „ Crow (*Allium vineale*)
 „ Field (*Allium oleraceum*)
 „ Keeled (*Allium carinatum*)
 „ Small Round-headed (*Allium sphaerocephalum*)
 „ Triangular-stalked (*Allium triquetrum*)
 Gentian, Common Autumn (*Gentiana Amarella*)
 „ Field (*Gentiana campestris*)
 „ Marsh (*Gentiana Pneumonanthe*)
 „ Small Alpine (*Gentiana nivalis*)
 „ Spring (*Gentiana verna*)
- Germander, Cut-leaved Annual (*Teucrium Botrys*)
 „ Wall (*Teucrium Chamædrys*)
 „ Water (*Teucrium Scordium*)
 Gipsy-wort, Common (*Lycopus europæus*)
 Glasswort, Jointed, Marsh Samphire (*Salicornia herbacea*)
 „ Rooting (*Salicornia radicans*)
 Globe-flower, Witches' Gowan (*Trollius europæus*)
 Goats'-beard, Jack-go-to-bed-at-noon (*Tragopogon pratense*)
 Goat-weed, Bishop's-weed, Herb Gerard (*Egopodium Podagraria*)
 Gold of Pleasure (*Camelina sativa*)
 Golden-rod (*Solidago Virgaurea*)
 Goldie-locks (*Linosyris vulgaris*, also *Ranunculus auricomus*)
 Gooseberry, Wild (*Ribes Grossularia*)
 Goosefoot, Many-seeded (*Chenopodium polyspermum*)
 „ Maple-leaved (*Chenopodium hybridum*)
 „ Nettle-leaved, Sowbane (*Chenopodium murale*)
 „ Oak-leaved (*Chenopodium glaucum*)
 „ Red (*Chenopodium rubrum*)
 „ Stinking (*Chenopodium Vulvaria*)
 „ Upright (*Chenopodium urbicum*)
 „ White, Fat Hen (*Chenopodium album*)
 Goose-grass, Cleavers (*Galium Aparine*)
 Grass, Blue-eyed (*Sisyrinchium bermudianum*)
 Grass of Parnassus (*Parnassia palustris*)
 Grass-wrack, Common (*Zostera marina*)
 „ Dwarf (*Zostera nana*)
 Gromwell, Common, Grey Millet (*Lithospermum officinale*)
 „ Corn (*Lithospermum arvense*)
 „ Purple (*Lithospermum purpureo-cæruleum*)
 Ground Ivy, Ale-hoof (*Nepeta Glechoma*)
 Ground Pine (*Ajuga Chamæpitys*)
 Groundsel, Common (*Senecio vulgaris*)
 „ Mountain (*Senecio sylvaticus*)
 „ Viscid (*Senecio viscosus*)
 Guelder-rose (*Viburnum Opulus*)
- HABENARIA, Small White (*Habenaria alvida*)
 Hair-bell (*Campanula rotundifolia*)
 Hair-grass, Crested (*Koeleria cristata*)
 „ Early (*Aira præcox*)
 „ Grey (*Aira canescens*)
 „ Silver (*Aira caryophyllea*)
 Hammersedge (*Carex hirta*)
 Hard-grass, Sea (*Lepturus filiformis*)
 Hare's-ear, Common, or Thorow-wax (*Bupleurum rotundifolium*)
 Hare's-tail Grass (*Lagurus ovatus*)
 Hart-wort (*Tordylium maximum*)
 Hawkbit, Autumn (*Leontodon autumnalis*)
 „ Hairy (*Leontodon hirtus*)
 „ Rough (*Leontodon hispidus*)

- Hawk's-beard, Biennial (*Crepis biennis*)
 „ Fetid (*Crepis fatida*)
 „ Marsh (*Crepis paludosa*)
 „ Smooth (*Crepis virens*)
 Hawkweed, Mouse-ear (*Hieracium Pile-
 sella*)
 „ Narrow-leaved (*Hieracium
 umbellatum*)
 „ Shrubby (*Hieracium boreale*)
 „ Wall (*Hieracium murorum*)
 Hawthorn, Whitethorn, May (*Cratægus
 Oxyacantha*)
 Hazel, Common (*Corylus Avellana*)
 Heartsease, Wild Pansy (*Viola tricolor*)
 Heath, Ciliated (*Erica ciliaris*)
 „ Cornish (*Erica vagans*)
 „ Cross-leaved (*Erica Tetralix*)
 „ False Brome (*Brachypodium pin-
 natum*)
 „ Five-leaved (*Erica cinerea*)
 „ Mediterranean (*Erica mediter-
 ranea*)
 „ St. Dabeoc's (*Dabeocia polifolia*)
 Heather, Ling (*Calluna vulgaris*)
 Hedge Parsley (*Caucalis Anthriscus*)
 „ Knotted (*Caucalis nodosa*)
 Hellebore, Green, Bear's-foot (*Helleborus
 viridis*)
 „ Stinking, Setter-wort (*Helleborus
 fatidus*)
 Helleborine, Broad-leaved (*Epipactis lati-
 folia*)
 „ Marsh (*Epipactis palustris*)
 „ Narrow-leaved (*Cephalan-
 thera ensifolia*)
 „ Red (*Cephalanthera rubra*)
 „ White (*Cephalanthera grandis-
 flora*)
 Hemlock, Common (*Conium maculatum*)
 „ Water, Cowbane (*Cicuta virosa*)
 Hemp Nettle, Common (*Galeopsis Tetra-
 hit*)
 Henbane, Common (*Hyoscyamus niger*)
 Herb Paris, True Love Knot (*Paris quadri-
 folia*)
 Herb Robert (*Geranium robertianum*)
 Hog's Fennel, Sulphur-wort (*Peucedanum
 officinale*)
 Holly, Common (*Ilex Aquifolium*)
 „ Sea (*Eryngium maritimum*)
 Holy-grass, Northern (*Hierochloa borealis*)
 Honewort (*Trinia vulgaris*)
 Honeysuckle, Woodbine (*Lonicera Peri-
 clymenum*)
 Hop (*Humulus Lupulus*)
 Horehound, Black (*Ballota nigra*)
 „ White (*Marrubium vulgare*)
 Hornbeam, Common (*Carpinus Betulus*)
 Hornwort, Common (*Ceratophyllum de-
 mersum*)
 Horsebane (*Enanthe Phellandrium*)
 Horse-tail, Paddock-pipes (*Equisetum
 arvense*)
 Hound's Tongue, Common (*Cynoglossum
 officinale*)
 House-leek, Common (*Sempervivum tec-
 torum*)
- Hutchinsia, Rock (*Hutchinsia petraea*)
 Hyacinth, Grape (*Muscari racemosum*)
- IRIS, Foetid, Roast-beef Plant (*Iris fatidis-
 sima*)
 Isnardia, Marsh (*Ludwigia palustris*)
 Ivy, Common (*Hedera Helix*)
- JACOB'S LADDER, Greek Valerian (*Pole-
 monium cœruleum*)
 Juniper (*Juniperus communis*)
- KNAPWEED, Black, Hard-head (*Centaurea
 nigra*)
 Knapel (*Scleranthus annuus*)
 Knot-grass (*Polygonum aviculare*)
 „ Seaside (*Polygonum mari-
 timum*)
 Kobresia, Sedge-like (*Kobresia caricina*)
- LADY'S MANTLE, Common (*Alchemilla
 vulgaris*)
 Lady's Tresses, Autumn (*Spiranthes
 autumnalis*)
 „ „ Summer (*Spiranthes
 æstivalis*)
 Lamb or Swine's Succory (*Arnoseria
 pusilla*)
 Larkspur (*Delphinium Ajacis*)
 Lavender, Common Sea (*Statice Limonium*)
 „ Matted Sea (*Statice reticulata*)
 „ Spathulate Sea (*Statice auri-
 culæfolia*)
 Leek, Sand (*Allium Scorodoprasum*)
 „ Wild (*Allium Ampeloprasum*)
 Leopard's Bane, Great (*Doronicum
 Pardalianches*)
 „ „ Plantain-leaved (*Doro-
 nicum plantagineum*)
 Lily of the Valley (*Convallaria majalis*)
 Lily, Purple Martagon, Turk's Cap Lily
 (*Lilium Martagon*)
 Lime, Common, Linden (*Tilia*)
 Lobelia, Acrid (*Lobelia urens*)
 „ Water (*Lobelia Dortmanna*)
 London Pride, St. Patrick's Cabbage or
 None-so-pretty (*Saxifraga umbrosa*)
 Loosestrife, Great Yellow (*Lysimachia
 vulgaris*)
 „ Hyssop-leaved Purple (*Lythrum
 Hyssopifolia*)
 „ Purple (*Lythrum Salicaria*)
 „ Tufted (*Lysimachia thyrsiflora*)
 Lovage (*Ligusticum scoticum*)
 Lungwort, Common (*Pulmonaria offici-
 nalis*)
 „ Narrow-leaved (*Pulmonaria
 angustifolia*)
 Lyme-grass, Sand (*Elymus arenarius*)
- MADDER, Field (*Sherardia arvensis*)
 „ Wild (*Rubia peregrina*)
 Madwort, Madderwort (*Asperugo pro-
 cumbens*)

- Mallow, Common (*Malva sylvestris*)
 Manna-grass, Reed (*Glyceria aquatica*)
 " Reflexed (*Glyceria distans*)
 " Sea (*Glyceria maritima*)
 Maple, Common or Small-leaved (*Acer campestre*)
 " Great, Sycamore, Plane of Scotland (*Acer Pseudo-platanus*)
 Mare's-tail, Common (*Hippuris vulgaris*)
 Marigold, Corn (*Chrysanthemum segetum*)
 " Marsh, King-cup, Water Blobs, (*Caltha palustris*)
 Marjoram (*Origanum vulgare*)
 Marrem-grass (*Psamma arenaria*)
 Marsh-mallow (*Althæa officinalis*)
 Marshwort, Least (*Apium inundatum*)
 " Procumbent (*Apium nodiflorum*)
 Master-wort (*Peucedanum Ostruthium*)
 Mat-grass (*Nardus stricta*)
 May-weed, Stinking (*Anthemis Cotula*)
 Meadow-grass, Alpine (*Poa alpina*)
 " Annual (*Poa annua*)
 " Bulbous (*Poa bulbosa*)
 " Flat-stalked (*Poa compressa*)
 " Smooth (*Poa pratensis*)
 " Wavy (*Poa laxa*)
 " Wood (*Poa nemoralis*)
 Meadow-rue, Alpine (*Thalictrum alpinum*)
 " Yellow (*Thalictrum flavum*)
 Meadow-sweet, Queen of the Meadows (*Spiræa Ulmaria*)
 Medick, Black, Nonsuch (*Medicago lupulina*)
 " Purple, Lucerne (*Medicago sativa*)
 Medlar (*Pyrus germanica*)
 Melic, Mountain (*Melica nutans*)
 " Wood (*Melica uniflora*)
 Melilot, Common Yellow (*Melilotus officinalis*)
 " White (*Melilotus alba*)
 Mercury, Annual (*Mercurialis annua*)
 " Dog's (*Mercurialis perennis*)
 Mezereon (*Daphne Mezereum*)
 Mignonette, Wild (*Reseda lutea*)
 Milk-vetch, Sweet (*Astragalus glycyphyllos*)
 Milkwort, Chalk (*Polygala calcarea*)
 " Common, Gangweed (*Polygala vulgaris*)
 " Sea (*Glaux maritima*)
 Millet, Red, Finger-grass (*Panicum glabrum*)
 Millet-grass (*Milium effusum*)
 Mint, Corn (*Mentha arvensis*)
 " Horse (*Mentha sylvestris*)
 " Marsh Whorled (*Mentha sativa*)
 " Round-leaved (*Mentha rotundifolia*)
 Mistletoe (*Viscum album*)
 Molinia, Purple (*Molinia cærulea*)
 Moneywort, Cornish (*Sibthorpia europæa*)
 Monkey-flower, Yellow (*Mimulus luteus*)
 Monkshood, Wolfsbane (*Aconitum Napellus*)
 Moonwort (*Botrychium Lunaria*)
 Moor-grass, Blue (*Sesleria cærulea*)
 Moschatel, Common (*Adoxa Moschatelina*)
 Motherwort (*Leonurus Cardiaea*)
 Mountain Everlasting, Cat's-foot (*Antennaria dioica*)
 Mudwort, Common (*Limosella aquatica*)
 Mugwort (*Artemisia vulgaris*)
 Mullein, Dark (*Verbascum nigrum*)
 " Great (*Verbascum Thapsus*)
 " Hoary (*Verbascum pulverulentum*)
 " Moth (*Verbascum Blattaria*)
 " White (*Verbascum Lychnitis*)
 Mustard, Black (*Brassica nigra*)
 " Common hedge (*Sisymbrium officinale*)
 " Garlic, Sauce-alone, Jack-by-the-hedge (*Sisymbrium Alliaria*)
 " Smooth Tower (*Arabis perfoliata*)
 " Treacle, Worm-seed (*Erysimum cheiranthoides*)
 " White (*Brassica alba*)
 " Wild, Charlock (*Brassica Sinapis*)
 NAIAS, Flexible (*Naias flexilis*)
 Nettle, Great (*Urtica dioica*)
 " Roman (*Urtica pilulifera*)
 " Small (*Urtica urens*)
 Nightshade, Black (*Solanum nigrum*)
 " Deadly (*Atropa Belladonna*)
 " Woody, Bitter-sweet (*Solanum Dulcamara*)
 Nipplewort, Common (*Lapsana communis*)
 Nit-grass (*Agrostis australis*)
 OAK, Common (*Quercus Robur*)
 Oat, Downy (*Avena pubescens*)
 " False, Common (*Avena elatior*)
 " Perennial, Narrow-leaved (*Avena pratensis*)
 " Wild, Havers (*Avena fatua*)
 Orache, Frosted Sea (*Atriplex laciniata*)
 " Grass-leaved (*Atriplex littoralis*)
 " Spreading (*Atriplex patula*)
 Orchid, Bee (*Ophrys apifera*)
 " Bird's Nest (*Listera Nidus-avis*)
 " Bog (*Malaxis paludosa*)
 " Butterfly (*Habenaria bifolia*)
 " Dark-winged or Dwarf (*Orchis ustulata*)
 " Fen (*Liparis Loeselii*)
 " Fly (*Ophrys muscifera*)
 " Fragrant (*Gymnadenia Conopsea*)
 " Frog (*Habenaria viridis*)
 " Great Brown-winged (*Orchis purpurea*)
 " Green-winged Meadow (*Orchis Morio*)
 " Lady's Slipper (*Cypripedium Calceolus*)
 " Lax-flowered (*Orchis laxiflora*)
 " Lizard (*Orchis hircina*)
 " Man (*Aceras anthropophora*)
 " Marsh (*Orchis latifolia*)
 " Military (*Orchis militaris*)
 " Musk (*Herminium Monorchis*)
 " Purple (*Orchis mascula*)
 " Pyramidal (*Orchis pyramidalis*)
 " Spider (*Ophrys aranifera*)

Orchid, Spotted (*Orchis maculata*)
 Orpine, or Livelong (*Sedum Telephium*)
 Osier, Common (*Salix viminalis*)
 " Purple (*Salix purpurea*)
 Oxlip (*Primula elatior*)
 Ox-tongue (*Helminthia echioides*)

PARSLEY, Common (*Carum Petroselinum*)
 " Common-beaked (*Anthriscus vulgaris*)

" Corn (*Carum segetum*)
 " Fools (*Ethusa Cynapium*)
 " Milk (*Peucedanum palustre*)
 " Stone (*Sison Amomum*)
 " Wild Beaked or Chervil (*Anthriscus sylvestris*)

Parsnip, Water (*Sium latifolium*)
 " Wild (*Peucedanum sativum*)

Pasque-flower (*Anemone Pulsatilla*)
 Pear, Wild (*Pyrus communis*)
 Pearl-wort, Annual (*Sagina apetala*)
 Pellitory-of-the-Wall (*Parietaria officinalis*)

Penny-cress, Alpine (*Thlaspi alpestre*)
 " Mithsidate Mustard (*Thlaspi arvense*)

Penny-royal (*Mentha Pulegium*)
 Pennywort, Marsh, White-rot (*Hydrocotyle vulgaris*)

" Wall (*Cotyledon Umbilicus*)
 Pepper, Water (*Polygonum Hydropiper*)

Peppermint (*Mentha piperita*)
 Pepperwort, Broad-leaved, Dittander (*Lepidium latifolium*)

" Field (*Lepidium campestre*)
 Periwinkle, Greater (*Vinca major*)

" Lesser (*Vinca minor*)
 Persicaria, Common (*Polygonum Persicaria*)

" Creeping (*Polygonum minus*)
 Pheasant's Eye (*Adonis autumnalis*)

Pig-nut, Common, Earth-nut (*Conopodium denudatum*)

Pillwort (*Pilularia globulifera*)
 Pimpernel, Bastard (*Centunculus minimus*)

" Bog (*Anagallis tenella*)
 " Scarlet, Poor Man's Weather

" Glass (*Anagallis arvensis*)
 " Yellow (*Lysimachia nemorum*)

Pink, Cheddar (*Dianthus cæsius*)
 " Clove, Carnation (*Dianthus Caryophyllus*)

" Deptford (*Dianthus Armeria*)
 " Maiden (*Dianthus deltoides*)

" Wild (*Dianthus plumarius*)
 Pipe-wort (*Eriocaulon septangulare*)

Plantain, Buck's Horn (*Plantago Coronopus*)

" Greater (*Plantago major*)
 " Hoary, Lamb's Tongue (*Plantago media*)

" Seaside (*Plantago maritima*)
 Ploughman's Spikenard (*Inula Conyza*)

Plum, Wild (*Prunus domestica*)
 Pondweed, Common-horned (*Zannichellia palustris*)

Pondweed, Fennel-leaved (*Potamogeton pectinatus*)

" Floating (*Potamogeton natans*)
 " Grassy-leaved (*Potamogeton obtusifolius*)

" Long-stalked (*Potamogeton praelongus*)

" Shining (*Potamogeton lucens*)
 " Small (*Potamogeton pusillus*)

" Tassel (*Ruppia maritima*)
 Poplar, Black (*Populus nigra*)

" White, Abele (*Populus alba*)
 Poppy, Common Red, Corn Rose (*Papaver Rhæas*)

" Long, Rough-headed (*Papaver Argemone*)

" Long, Smooth-headed (*Papaver dubium*)

" Opium (*Papaver somniferum*)
 " Round, Rough-headed (*Papaver hybridum*)

" Yellow-horned (*Glaucium flavum*)
 " Yellow Welsh (*Meconopsis cambrica*)

Prickly Saltwort (*Salsola Kali*)
 Primrose, Bird's Eye (*Primula farinosa*)

" Common (*Primula vulgaris*)
 " Common Evening (*Enothera biennis*)

" Scottish (*Primula scotica*)
 Privet (*Ligustrum vulgare*)

Purslane, Pedunculate Sea (*Atriplex pedunculata*)

" Sea (*Arenaria peploides*)
 " Shrubby Sea, Crab-weed (*Atriplex portulacoides*)

" Water (*Peplis Portula*)

QUAKING-GRASS, Common (*Briza media*)
 " Lesser (*Briza minor*)

Quillwort (*Isoetes lacustris*)
 Quinsy-wort (*Asperula cynanchica*)

RADISH, Wild, White Charlock (*Raphanus Raphanistrum*)

Ragged Robin (*Lychnis Flos-cuculi*)
 Ragwort, Common (*Senecio Jacobæa*)

" Great Fen (*Senecio paludorus*)
 " Hoary (*Senecio erucæfolius*)

" Marsh (*Senecio aquaticus*)
 Rampion, Round-headed (*Phyteuma orbiculare*)

" (*Campanula Rapunculus*)
 " Spiked (*Phyteuma spicatum*)

Rape, Cole-seed (*Brassica Napus*)
 Raspberry (*Rubus Idæus*)

Red-rattle, Marsh, Louse-wort (*Pedicularis palustris*)

" Dwarf (*Pedicularis sylvatica*)
 Reed, Common (*Phragmites communis*)

Reed-grass (*Phalaris arundinacea*)
 Reed-mace, Lesser, Cat's Tail (*Typha angustifolia*)

Rest-Harrow, Wild Liquorice (*Ononis arvensis*)

Rock-cress, Bristol (*Arabis stricta*)

- Rock-cress, Hairy (*Arabis hirsuta*)
 " Mountain (*Arabis petraea*)
 Rocket, London (*Sisymbrium Irio*)
 " Sand (*Diplotaxis muralis*)
 " Wall (*Diplotaxis tenuifolia*)
 Rose, Scotch (*Rosa spinosissima*)
 " Wild, Dog Rose (*Rosa canina*)
 Rose-bay, French Willow (*Epilobium angustifolium*)
 Rose-root (*Sedum Rhodiola*)
 Rowan-tree, Mountain Ash (*Pyrus Aucuparia*)
 Rupture-wort (*Herniaria glabra*)
 Rush, Baltic (*Juncus balticus*)
 " Blunt-flowered, Jointed (*Juncus obtusiflorus*)
 " Capitate (*Juncus capitatus*)
 " Flowering (*Butomus umbellatus*)
 " Forster's Wood (*Luzula Forsteri*)
 " Great Sea (*Juncus acutus*)
 " Hard (*Juncus glaucus*)
 " Heath (*Juncus squarrosus*)
 " Lesser Sea (*Juncus maritimus*)
 " Round-fruited (*Juncus compressus*)
 " Thread (*Juncus filiformis*)
 " Three-flowered (*Juncus triglumis*)
 " Three-leaved (*Juncus trifidus*)
 " Toad (*Juncus bufonius*)
 " Two-flowered (*Juncus biglumis*)
 Rye-grass, Way-bent (*Lolium perenne*)
- SAGE, Wild, Clary (*Salvia Verbenaca*)
 " Wood (*Teucrium Scordonia*)
 Sainfoin (*Onobrychis sativa*)
 St. John's-wort, Common (*Hypericum perforatum*)
 " Large-flowered (*Hypericum calycinum*)
 " Small Upright (*Hypericum pulchrum*)
 Salsify (*Tragopogon porrifolius*)
 Samphire, Golden (*Inula crithmoides*)
 " Rock (*Crithmum maritimum*)
 Sanicle, Wood (*Sanicula europaea*)
 Saussurea, Alpine (*Saussurea alpina*)
 Saw-wort, Common (*Serratula tinctoria*)
 Saxifrage, Mountain Meadow (*Seseli Libanotis*)
 " Pepper (*Silene pratensis*)
 " Purple Mountain, Golden Mountain (*Saxifraga oppositifolia*)
 " White Meadow (*Saxifraga granulata*)
 " Yellow Marsh (*Saxifraga Hirculus*)
 Scabious, Devil's-bit, Premorse (*Scabiosa succisa*)
 " Field (*Scabiosa arvensis*)
 " Small (*Scabiosa Columbaria*)
 Scorpion-grass, Creeping Water (*Myosotis repens*)
 " Early Field (*Myosotis collina*)
 " Field (*Myosotis arvensis*)
 " Parti-coloured (*Myosotis versicolor*)
- Scurvy-grass, Common (*Cochlearia officinalis*)
 " English (*Cochlearia anglica*)
 Sea Beet (*Beta maritima*)
 Sea Blite, Annual (*Suaeda maritima*)
 " Shrubby (*Suaeda fruticosa*)
 Sea-heath (*Frankenia laevis*)
 Sea-kale (*Crambe maritima*)
 Sea Rocket, Purple (*Cakile maritima*)
 Sedge, Alpine (*Carex alpina*)
 " Black (*Carex atrata*)
 " Bladder (*Carex vesicaria*)
 " Curved (*Carex incurva*)
 " Cyperus-like (*Carex Pseudo-cyperus*)
 " Downy-fruited (*Carex tomentosa*)
 " Dwarf Capillary (*Carex capillaris*)
 " Dwarf Silvery (*Carex humilis*)
 " Elongated (*Carex elongata*)
 " Fen (*Cladium Mariscus*)
 " Few-flowered (*Carex pauciflora*)
 " Fingered (*Carex digitata*)
 " Flea (*Carex pulicaris*)
 " Great Drooping (*Carex pendula*)
 " Great or Fox (*Carex vulpina*)
 " Great Panicle (*Carex paniculata*)
 " Great Prickly (*Carex muricata*)
 " Greater Pond (*Carex riparia*)
 " Green-ribbed (*Carex binervis*)
 " Heath (*Carex ericetorum*)
 " Loose (*Carex distans*)
 " Loose-flowered Alpine (*Carex rariflora*)
 " Mountain (*Carex montana*)
 " Mud (*Carex limosa*)
 " Pale (*Carex pallescens*)
 " Rock (*Carex rupestris*)
 " Round-headed (*Carex pilulifera*)
 " Sand (*Carex arenaria*)
 " Short, Brown - spiked (*Carex vaginata*)
 " Slender (*Carex filiformis*)
 " Slender-spiked (*Carex acuta*)
 " Smooth-stalked (*Carex laevigata*)
 " Soft Brown (*Carex disticha*)
 " Stiff Mountain (*Carex rigida*)
 " Water (*Carex aquatilis*)
 " Yellow (*Carex flava*)
 Self-heal (*Prunella vulgaris*)
 Service Tree (*Pyrus torminalis*)
 Sheep's Scabious, Sheep's-bit (*Jasione montana*)
 Shepherd's Needle, Venus' Comb (*Scandix Pecten-Veneris*)
 Shepherd's Purse, Common (*Capsella Bursa-Pastoris*)
 Shore-weed (*Littorella lacustris*)
 Silver-weed, Goose-grass (*Potentilla Anserina*)
 Simethis, Variegated (*Simethis bicolor*)
 Skull-cap, Greater (*Scutellaria galericulata*)
 " Lesser (*Scutellaria minor*)
 Sloe, Blackthorn (*Prunus spinosa*)
 Small Reed, Purple (*Calamagrostis lanceolata*)
 " Wood (*Calamagrostis Epi-gejos*)

- Snapdragon (*Antirrhinum Orontium*)
 Sneezewort (*Achillea Ptarmica*)
 Snowdrop (*Galanthus nivalis*)
 Snowflake, Spring (*Leucojum vernum*)
 " Summer (*Leucojum aestivum*)
 Soapwort, Fuller's Herb (*Saponaria officinalis*)
 Soft-grass, Creeping (*Holcus mollis*)
 " Meadow, Yorkshire Fog (*Holcus lanatus*)
 Solomon's Seal, Angular (*Polygonatum officinale*)
 " " Common (*Polygonatum multiflorum*)
 " " Narrow-leaved (*Polygonatum verticillatum*)
 Sorrel, Common (*Rumex Acetosa*)
 " Mountain (*Oxyria reniformis*)
 " Sheep's (*Rumex Acetosella*)
 Sow-bread, Ivy-leaved (*Cyclamen hederæ-folium*)
 Sowthistle, Blue (*Mulgedium alpinum*)
 " Common, Milk Thistle (*Sonchus oleraceus*)
 " Corn (*Sonchus arvensis*)
 Spearwort, Great (*Ranunculus Lingua*)
 " Lesser (*Ranunculus Flammula*)
 Speedwell, Alpine (*Veronica alpina*)
 " Common (*Veronica officinalis*)
 " Finger-leaved (*Veronica triphyllos*)
 " Germander, Bird's-eye (*Veronica chamædrys*)
 " Green Field (*Veronica agrestis*)
 " Ivy-leaved (*Veronica hederæ-folia*)
 " Marsh (*Veronica scutellata*)
 " Mountain (*Veronica montana*)
 " Spiked (*Veronica spicata*)
 " Thyme-leaved (*Veronica serpyllifolia*)
 " Vernal (*Veronica verna*)
 " Wall (*Veronica arvensis*)
 " Water (*Veronica Anagallis*)
 Spiderwort, Mountain (*Lloydia serotina*)
 Spignel, Mew, Bald-money (*Meum athamanticum*)
 Spike-rush, Least (*Eleocharis acicularis*)
 " Many - stemmed (*Eleocharis multicaulis*)
 " Marsh (*Eleocharis palustris*)
 Spindle Tree, Common, Prickwood (*Eucnemos europæus*)
 Spurge, Broad-leaved (*Euphorbia platyphyllos*)
 " Dwarf (*Euphorbia exigua*)
 " Hairy (*Euphorbia pilosa*)
 " Irish (*Euphorbia hiberna*)
 " Petty (*Euphorbia Peplus*)
 " Portland (*Euphorbia portlandica*)
 " Red (*Euphorbia Peplus*)
 " Sea (*Euphorbia Paralias*)
 " Sun (*Euphorbia Helioscopia*)
 " Wood (*Euphorbia amygdaloides*)
 Spurge Laurel (*Daphne Laureola*)
 Spurrey, Knotted (*Sagina nodosa*)
 Spurrey, Sandwort (*Spergularia marina*)
 " (*Spergula arvensis*)
 Squill, Autumnal (*Scilla autumnalis*)
 " Vernal (*Scilla verna*)
 Squirrel-tail Grass (*Hordeum maritimum*)
 Star-fruit, Thrumwort (*Actinocarpus Damasonium*)
 Star of Bethlehem, Common (*Ornithogalum umbellatum*)
 " Drooping (*Ornithogalum nutans*)
 " Spiked (*Ornithogalum pyrenaicum*)
 " Yellow (*Gagea lutea*)
 Star Thistle, Common (*Centaurea Calcitrapa*)
 Starwort, Autumn Water (*Callitriche autumnalis*)
 " Sea (*Aster Tripolium*)
 " Vernal Water (*Callitriche verna*)
 Stitchwort, Alpine (*Cerastium trigynum*)
 " Bog (*Stellaria uliginosa*)
 " Greater, Satin-flower, Adder's Meat (*Stellaria Holostea*)
 " Lesser (*Stellaria graminea*)
 Stonecrop, Biting, Wall-pepper (*Sedum acre*)
 " English (*Sedum anglicum*)
 " Hairy (*Sedum villosum*)
 " White (*Sedum album*)
 Storks' Bill, Hemlock (*Erodium cicutarium*)
 Strapwort (*Corrigiola littoralis*)
 Strawberry, Barren (*Potentilla Fragariastrum*)
 " Tree (*Arbutus Unedo*)
 " Wild (*Fragaria vesca*)
 Sundew, Great (*Drosera anglica*)
 " Round-leaved (*Drosera rotundifolia*)
 Sweet Flag (*Acorus Calamus*)
 Sweet Gale, Bog-myrtle (*Myrica Gale*)
 TAMARISK (*Tamarix gallica*)
 Tansy, Common (*Tanacetum vulgare*)
 Tare, Common (*Vicia hirsuta*)
 Teasel, Small, Shepherd's Rod (*Dipsacus pilosus*)
 " Wild (*Dipsacus sylvestris*)
 Teesdalia, Naked-stalked (*Teesdalia nudicaulis*)
 Thale-cress (*Sisymbrium thaliana*)
 Thistle, Carline (*Carlina vulgaris*)
 " Cotton (*Onopordon Acanthium*)
 " Creeping Plume (*Carduus arvensis*)
 " Ground (*Carduus acaulis*)
 " Meadow Plume (*Carduus pratensis*)
 " Melancholy (*Carduus heterophyllus*)
 " Musk (*Carduus nutans*)
 " Slender-flowered (*Carduus pycnocephalus*)
 " Spear (*Carduus lanceolatus*)
 " Tuberosus Plume (*Carduus tuberosus*)

Thistle, Welled (*Carduus crispus*)
 „ Woolly-headed Plume (*Carduus eriophorus*)
 Thrift, Sea Pink (*Armeria vulgaris*)
 Thyme, Wild (*Thymus Serpyllum*)
 Tillæa, Mossy (*Tillæa muscosa*)
 Timothy-grass, Meadow Cat's Tail (*Phleum pratense*)
 Toadflax, Bastard (*Thesium linophyllum*)
 „ Ivy-leaved, Mother-o'-Thou-sands (*Linaria Cymbalaria*)
 „ Pale-blue (*Linaria repens*)
 „ Yellow (*Linaria vulgaris*)
 Toothwort (*Lathræa Squamaria*)
 Tormantil, Common (*Potentilla Tormentilla*)
 Travellers' Joy, Old Man's Beard (*Clematis Vitalba*)
 Tree Mallow (*Lavatera arborea*)
 Trefoil, Bird's-foot (*Lotus corniculatus*)
 „ Hare's-foot (*Trifolium arvense*)
 „ Hop (*Trifolium procumbens*)
 Tulip, Wild (*Tulipa sylvestris*)
 Turnip, (*Brassica Rapa*)
 „ Swedish (*Brassica campestris*)
 Tutsan (*Hypericum Androsæmum*)
 Tway-blade, Lesser (*Listera cordata*)
 „ (*Listera ovata*)

VALERIAN, Cats', All-heal (*Valeriana officinalis*)
 „ Red-spur (*Centranthus ruber*)
 „ Small Marsh (*Valeriana dioica*)
 Vernal - grass, Sweet (*Anthoxanthum odoratum*)
 Vervain (*Verbena officinalis*)
 Vetch, Bitter (*Vicia Orobus*)
 „ Common (*Vicia saliva*)
 „ Kidney, Lady's Fingers (*Anthyllis Vulneraria*)
 „ Tufted (*Vicia Cracca*)
 „ Tufted Horseshoe (*Hippocrepis comosa*)
 „ Wood (*Vicia sylvatica*)
 Vetchling, Crimson (*Lathyrus Nissolia*)
 „ Meadow (*Lathyrus pratensis*)
 Villarsia, Water (*Limnanthemum nymphaeoides*)
 Violet, Dames' (*Hesperis matronalis*)
 „ Dog (*Viola canina*)
 „ Sweet (*Viola odorata*)
 „ Water (*Hottonia palustris*)
 Viper's Bugloss (*Echium vulgare*)

WALLFLOWER (*Cheiranthus Cheiri*)
 Wart-cress (*Nasturtium officinale*)
 „ (*Senebiera Coronopus*)
 Water-Blinks (*Montia fontana*)
 Water-Dropwort, Common (*Ænanthe fistulosa*)
 „ Hemlock (*Ænanthe crocata*)
 „ Parsley (*Ænanthe Lachenalii*)

Water-Dropwort, Sulphur-wort (*Ænanthe silaifolia*)
 Water-Lily, White (*Nymphæa alba*)
 „ Yellow, Brandy-bottle (*Nymphæa luteum*)
 Water Plantain, Floating (*Alisma natans*)
 „ Lesser (*Alisma ranunculoides*)
 „ (*Alisma Plantago*)
 Water Soldier (*Stratiotes aloides*)
 Water-milfoil, Alternate-flowered (*Myriophyllum altireiflorum*)
 „ Spiked (*Myriophyllum spicatum*)
 „ Whorled (*Myriophyllum verticillatum*)
 Water-thyme (*Anacharis canadensis*)
 Water-wort (*Elatine hexandra*)
 Wayfaring Tree (*Viburnum Lantana*)
 Whitlow-grass, Vernal (*Erophila verna*)
 „ Yellow Alpine (*Draba aizoides*)
 Whorl-grass, Water (*Calatropa aquatica*)
 Whortle-berry, Bilberry (*Vaccinium Myrtillus*)
 „ Bog (*Vaccinium uliginosum*)
 Willow, Almond-leaved or French (*Salix triandra*)
 „ Bay-leaved (*Salix pentandra*)
 „ Crack, Withy (*Salix fragilis*)
 „ Downy Mountain (*Salix Lapponum*)
 „ Dwarf Silky (*Salix repens*)
 „ Goat, Common Sallow (*Salix Caprea*)
 „ Least (*Salix herbacea*)
 „ Round-eared or Sallow (*Salix aurita*)
 „ Small Tree (*Salix Arbuscula*)
 „ Tea-leaved (*Salix phylicifolia*)
 „ White (*Salix alba*)
 „ Woolly Broad-leaved (*Salix lanata*)
 Willow-herb, Broad, Smooth-leaved (*Epilobium montanum*)
 „ Great, Codlins and Cream (*Epilobium hirsutum*)
 „ Small-flowered Hairy (*Epilobium parviflorum*)
 Winter Cress, Common (*Barbarea vulgaris*)
 Winter-green, Lesser (*Pyrola minor*)
 „ One-sided (*Pyrola secunda*)
 „ Round-leaved (*Pyrola rotundifolia*)
 „ Single-flowered (*Pyrola uniflora*)
 Woad (*Isatis tinctoria*)
 Woodruff, Sweet (*Asperula odorata*)
 Wood-sedge, Loose-spiked (*Carex stricta*)
 „ Starved (*Carex depauperata*)
 „ (*Carex sylvatica*)
 Wood Sorrel, Alleluia (*Oxalis Acetosella*)
 Wormwood, Common (*Artemisia Absinthium*)
 „ Field (*Artemisia campestris*)

Wormwood, Sea (*Artemisia maritima*)
 Wound-wort, Corn (*Stachys arvensis*)
 " Downy (*Stachys germanica*)
 " Hedge (*Stachys sylvatica*)
 " Marsh (*Stachys palustris*)

YARROW, Common, Milfoil (*Achillea Millefolium*)

Yellow-Cress, Amphibious (*Nasturtium amphibium*)
 " Creeping (*Nasturtium sylvestre*)
 " Marsh (*Nasturtium palustre*)
 Yellow-rattle, Cock's Comb (*Rhinanthus Crista-galli*)
 Yew (*Taxus baccata*)

USEFUL TABLES AND LISTS

THE object of the following tables and lists is to compress as much useful information into as small a space as possible, and to give the beginner a ready guide to matters of garden importance.

ANNUAL FLOWERS

An annual flower is so called because seed sown in the spring results in seedlings that flower the same year. A *Tropæolum* (*Nasturtium*) is an annual for this reason; and a biennial means a plant the seed of which is sown the year before the seedlings bloom. Gardeners, and the term is used in its broadest sense, have yet to unlock the treasures of the annual group of flowers. Their true value is almost unknown, even amongst those who, we presume, know much of the great flower life about them. Of late years many charming kinds have been raised, flowers which show a marked improvement upon the weedy things of former days, and offering too a greater variety of colours.

LIST OF ANNUALS

HH=Half-hardy. Seed must be sown in boxes or pots in slight warmth, in early spring, subsequently planting out in May in good garden soil. Many kinds may be sown later (May) in the open ground.

H=Hardy. These may be sown in early spring in the open ground.

Soil and Aspect.—All the annuals named in this chart can be grown in ordinarily good garden soil and in nearly any aspect, except where otherwise stated.

NAME.	COLOUR.	HEIGHT IN FEET.	TIME OF FLOWERING.
Acroclinium (Everlasting) . . (hh)	Rose	1	July, August
Alyssum odoratum . . . (h)	White, Fragrant	$\frac{1}{2}$	July to Sept.
" Little Gem . . .	"	$\frac{3}{4}$	" "
Anthemis Kelwayi . . . (h)	Soft Yellow	$1\frac{1}{2}$	June, August
Asters— (hh)			
Dwarf Chrysanthemum, Comet,	{ Blue, White, } and various shades	$\frac{1}{2}$ to $1\frac{1}{2}$	July to October
Triumph, Light Blue, Mignon,			
Ostrich Feather, White Lady, &c. .	Purple	1	Summer
Aster sinensis (very fine flower), single (h)	Various	1 to 2	July, Sept.
Balsams, in variety . . . (hh)	Rich Orange	1	July, October
Calendula (Marigold) officinalis (h)	Orange Striped	1	" "
" " Meteor, fl. pl. (h)	Sulphur	1	" "
Calliopsis grandiflora atrosanguinea (h)	Dark Crimson	2	" "
" Drummondii . . . (h)	{ Yellow, and } Crimson centre	$1\frac{1}{2}$	July, Sept.
" Crimson King . . . (h)	Crimson	$\frac{3}{4}$	July, August
Canary Creeper (see Annual Climbers). (h)			
Candytuft, in variety . . . (h)	{ Crimson, } Purple, &c. }	$\frac{3}{4}$	July, Sept.
Celosia pyramidalis coccinea . (hh)	Scarlet	2	" "
" " aurea . . .	Golden	2	" "
" " Thompsoni . . .	Crimson	2	" "
Note.—These especially require to be sown in frames early in April, and transplanted to permanent quarters later on.			

NAME.	COLOUR.	HEIGHT IN FEET.	TIME OF FLOWERING.
Centaurea Cyanus (Corn-Flower) . (h)	{ Blue, Purple, } Rose, Flesh }	3	Early Summer
Chrysanthemum tricolor . . . (h)	White & Yellow	1	{ Early Summer. The double kinds are capi- tal pot plants July to Sept.
" " atrococcineum	Dark Scarlet	1	
" " burridgeanum	White & Crimson	1	
" " Eclipse . . .	Yellow & Scarlet	1	
Clarkia elegans rosea pl. . . (h)	Rose	2	July to Sept.
" " Purple King . . .	Purple	2	" "
" " Salmon Queen . . .	Salmon-Rose	2	" "
" pulchella integripetala . . .	Magenta	2	" "
" " Mrs. Langtry . . .	White & Crimson	1½	" "
Cockscombs, in variety . . . (hh)			
<i>Note.</i> —Best grown quickly as pot plants; require most liberal treatment.			
Collinsia bicolor	Reddish	1	Summer A dainty flower for cutting.
Cosmos bipinnatus	Purplish, White, &c.	Varies	Autumn This autumn- flowering annual has quickly gained favour since it has been rather recently brought forward. Its flowering sea- son unfortu- nately is too late —October—ex- cept in very mild autumns. But a correspondent advises sowing in February in slight heat, trans- planting the seedlings to a cold frame when 2 inches high, and planting in April in a sunny place.
" " Early-flowering . . .	Red, Rose, White	4	This new race is much better than the old type, as the plants com- mence to flower in July
Dianthus imperialis (Double Crimson) (h)	Crimson	1	July, August
" sinensis Heddewigii, in variety	Various	¾	" "
" " The Bride . . .	{ White predo- minating }	¾	" "
" " laciniatus superbus		¾	" "
" " grandiflorus . . .	Various	¾	" "
<i>Note.</i> —The above forms of the Pink are very beautiful in beds or in lines, and all are of quite easy culture.			

NAME.	COLOUR.	HEIGHT IN FEET.	TIME OF FLOWERING.
<p>Eschscholtzias (Extinguisher flowers) (h) <i>Note.</i> — These glowing annuals are especially well suited to poor stony soil, and frequently grow and flower quite freely in the gravel paths.</p>		$\frac{3}{4}$	June to Oct.
Erysimum peroffskianum . . . (h)	Orange	$\frac{3}{4}$	June, July
Eucharidium Breweri . . . (h)	Pale Rose	$\frac{3}{4}$	" "
Eutoca viscida (h)	{ Fine intense Blue }	2	July, Sept.
Gaillardia picta (hh)	{ Yellow & Crimson Dark Crim- son and Yellow }	2	" "
" " lorenziana	{ "	$1\frac{1}{2}$	" "
<p><i>Note.</i> — These are best sown in autumn in frames and planted out early in spring, end of March or thereabouts.</p>			
Godetia, Lady Albemarle . . (h)	Crimson	$1\frac{1}{2}$	" "
" carminea aurea	Rose & Yellow	1	" "
" Princess of Wales	Dark Crimson	$1\frac{1}{2}$	" "
" Duchess of Albany	White	$1\frac{1}{2}$	" "
" Fairy Queen	White chiefly	1	" "
Gypsophila elegans rosea . . (h)	Rose	$1\frac{1}{2}$	See Note
<p><i>Note.</i> — By sowing at intervals of every three weeks this may be flowered for months in succession.</p>			
Helianthus (Sunflower) cucumerifolius (h)	Deep Yellow	3	July, October
" " Stella	Rich Yellow	3	" "
" Golden Nigger	Yellow	5	August, Sept.
" Leviathan	Largest Yellow	10	Sept., October
" (Tithonia) speciosa . (hh)	Scarlet	4 to 6	August, Sept.
<p><i>Note.</i> — Leviathan is a noble plant, and a splendid ornament among shrubs, &c.; rich and deep soil.</p>			
Helichrysum, in variety . . (hh)	Various	2	August, Sept.
<p><i>Note.</i> — These are the so-called "Everlastings," and may be cut and dried and kept for use in winter in vases.</p>			
Heracleum giganteum (h)	White	12	August
<p><i>Note.</i> — Cow parsnips of huge proportions; most suitable for the wild garden or woodland.</p>			
Ionopsidium acaule (h)	Sky Blue	3 inches	June
<p><i>Note.</i> — Sow this charming carpet plant at intervals.</p>			
Larkspur, Dwarf Rocket, and other kinds (h)	Various	1 to 2	Midsummer
Leptosiphon hybridus (h)	"	1	" "
Limnanthes Douglasi (h)	White & Yellow	$\frac{1}{2}$	{ May & June, & July & Aug.
<p><i>Note.</i> — Fine bee plant; good for autumn sowing.</p>			
Lathyrus azureus (Lord Anson's Pea) (h)	Blue	2	Summer
" odoratus, in many varieties .	Various	3 to 4	"
<p><i>Note.</i> — The Sweet Pea of Commerce. See special article (p. 56).</p>			

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NAME.	COLOUR.	HEIGHT IN FEET.	TIME OF FLOWERING.
Lavatera (Tree Mallow) trimestris (h)		3 to 6	Summer This is a very beautiful annual. It is, though tall, not ungainly, and the flowers are not unlike those of a small Hollyhock; they are rose, and in the variety alba, pure white. Sow seed in April or May, outdoors, or in gentle heat in March, and plant out the seedlings. It wants a space of quite eighteen inches.
Linum grandiflorum rubrum . (h)	Scarlet	1	Summer
Love Lies Bleeding, in variety . (h)	Various	2½	{ Summer and Early Autumn
Lupinus (Lupine) luteus . . (h)	Yellow	2	June to August
" nanus . . .	Blue & White	1½	" "
" hybridus, in variety .	Various	...	" "
" subcarneus . .	Flesh & White	2	" "
Malope grandiflora . . . (h)	Crimson	2	{ Summer and Autumn
" " alba . . .	White	2	" "
" " rosea . . .	Rose	2	" "
Marigolds, in variety . . . (h)	Various	1 to 2	" "
<i>Note.</i> —Some are given under their botanical name— <i>Calendula</i> , which also see.			
Mignonette, Crimson Giant . . (h)	Crimson	1	{ By frequent sowings, December in pots for earliest. Then in March in open, or February in frames, and in succession in April, May, and June. Summer and Early Autumn
" Bismarck . . .	Buff	1	
" Golden Machet . . .	Golden	1	
" Machet . . .	Buff	1	
" Ruby . . .	Red	1	
" Salmon Queen . . .	Salmon	1	
Nasturtium, Tom Thumb varieties (h)	Various	1	{ Summer and Early Autumn
" tall climbing sorts . .	Various	Climber	
<i>Note.</i> —These flower best in poor soil.			
Nemophila insignis . . . (h)	{ Blue, White } centre	½	Early Summer
Nicotiana (Tobacco) sylvestris . (hh)	White	4	August to Oct.
" affinis . . .	"	2 to 3	" "
" Hybrids . . .	Various	"	" "
<i>Note.</i> —Sow in March in frames; plant out end of May.			
Nigella damascena (Love-in-a-Mist) (h)	Light Blue	1	August, Sept.
Pea, Sweet. See page 56.			

NAME.	COLOUR.	HEIGHT IN FEET.	TIME OF FLOWERING.
Phacelia campanularia . . . (h)	Intense Blue	1	{ June to August, warm soils Early and Late Summer
Poppies, in variety (h)	Various	1½ to 2	
<i>Note.</i> —Such as the Shirley, Carnation-flowered, and French kinds are recommended.			
Rudbeckia bicolor superba . . . (h)	Black & Gold	2½	August, Oct. Summer.
Salpiglossis sinuata (hh)	Various	3 to 5	
			A very graceful annual, useful to cut for the house, but unfortunately it frequently dies off wholesale. A well-known gardener writes:— “I think I may safely say that one reason why they are not more often seen in gardens is the aggravating habit they have of dying off wholesale and leaving blanks in the beds or borders. Gardeners fight shy of such plants when there are other things that can take their places with greater certainty. I feel perfectly safe in tracing the cause of this tiresome habit to the method recommended for cultivation, <i>i.e.</i> raising the plants in warmth and treating them as half-hardy annuals. Failure is courted in this way, as a large number of the plants so raised is almost certain to collapse. If growers were content to leave the seeds in the packets until May, and

NAME.	COLOUR.	HEIGHT IN FEET.	TIME OF FLOWERING.
Salpiglossis sinuata . . . (hh)	Various	3 to 5	then sow where the plants are to stand, there would be no fear of blanks and very much better growth would result. The seed germinates quickly, and the seedlings grow slowly at first, though after they are about 3 inches high progress is again rapid, and by the middle of August, or earlier in hot seasons, there will be a glorious display of flower, lasting until the advent of frost and an abundance to cut from in the meanwhile. I do not claim that there will be no losses, as some are certain to die, but by judicious thinning, and spreading this operation over three or four weeks, there will be no blanks in the bed or plot, and satisfactory results will ensue. A check to growth is the great bane of this and a few other tender annuals, the Zinnias for instance, and I am sure that those who grow Salpiglossis largely will agree with me that the above is the only way to deal with them in order to command success." The flowers of

NAME.	COLOUR.	HEIGHT IN FEET.	TIME OF FLOWERING.
Salpiglossis sinuata . . . (hh)	Various	3 to 5	the Salpiglossis appear on slender stems about 3 feet in height, and are quaintly striped and coloured. Sometimes self-coloured varieties occur, a pure yellow or crimson, and these must be treasured.
Saponaria calabrica . . . (h)	Pink	$\frac{1}{2}$	July, August
" " Scarlet Queen . . . (hh)	Scarlet	$\frac{1}{2}$	" "
Schizanthus pinnatus . . . (hh)	Purple & White	$1\frac{1}{2}$	June, August
" papilionaceus . . .	Chequered	$1\frac{1}{2}$	" "
Schizopetalon Walkeri . . . (h)	White	1	Summer
Statice Suworowi . . . (h)	{ Rose, Crimson, and White }	$1\frac{1}{2}$	{ Early Summer. Very fine }
Sweet Sultans, in variety . . . (h) <i>Note.</i> —Sow in succession.	{ Purple, White, and Golden Yellow }	$1\frac{1}{2}$	June to August
Tagetes (French Marigold)—			
" signata pumila . . . (hh)	Yellow	6 inches	{ Very bright flowers for rich soil. Most effective in masses.
" patula, Legion of Honour (hh)	{ Yellow and Rich Brown }	A few inches	{
" erecta (African Marigold) (hh)	Orange and Yellow	2	Autumn. The African Marigolds are splendid annuals, making masses of colour in the autumn garden. They should be more often grown. Lemon Queen, lemon colour, and Prince of Orange, orange, are very rich.
Venus' Looking-Glass . . . (h)	Blue	$\frac{1}{2}$	Summer
Virginian Stock, in various colours (h)	{ Red, White, Crimson }	$\frac{1}{2}$	Early Summer
Viscaria cardinalis . . . (h)	Crimson	$1\frac{1}{2}$	{ Summer and Early Autumn.
" cœrulea	Blue	$1\frac{1}{2}$	{ Very profuse flowering
" Dunnetti	Rose	$1\frac{1}{2}$	

Annual Climbers.—The small garden, and for that matter the larger ones too, would suffer if the annual climbers were not available. The Canary Creeper (*Tropæolum canariense*), which will cover a pole or hide a stretch of fence in a single season, is one of the most useful kinds, and there is fresh beauty in its green leaves and bright yellow flowers. The Japanese Hop is a climber of wonderful growth. It is irresistible, covering a pergola or summer-house even in a few weeks. Its variegated form is pretty and distinct. Sweet Peas will hide a fence or scramble over some ugly spot, not of great height; and amongst other climbers are the popular climbing Nasturtiums or Tropæolums, varieties of *T. lobbianum*, and the bright-coloured, always welcome *Convolvulus major*. A very pretty red and yellowish tender annual is *Mina lobata*, but it is not always a success, requiring a very warm spot and thoroughly well-drained soil. The seeds of this must be sown in heat in spring, and the same may be written of *Thunbergia alata*. Mr. Greenwood Pim, a sincere lover of flowers, writes of the *Thunbergia* that, "though in cultivation for three-quarters of a century, it is not so often seen as its merits deserve." It belongs to the order of Acanthaceæ, and is a very slender, twining plant, practically an annual, though, under favourable circumstances, perennial. It occurs commonly in six varieties: white, light buff, and light orange, each with a self-coloured throat, and the same series with a purple-black throat, from which it sometimes gets the name of Black-eyed Susan. It is extremely easily grown, and will do in the stove, greenhouse, or, after a fashion, outside, but an airy greenhouse seems to suit it best. Sown in January, it will flower all the summer with ordinary care, but look out for red spider. *Ipomæa rubro-carulea* is a lovely blue-flowered climber for warm wall. Sow the seeds under glass in April, transplant in June. A tender plant.

Annual Grasses.—Many of these are of delicate beauty; they may be raised from seed sown in spring in the open ground. A good selection would comprise: *Agrostis pulchella*, a beautiful small grass; *A. nebulosa*, and the popular fluffy Hare-tail Grass (*Lagurus ovatus*), which should be chosen first, because of its distinctness. Also beautiful are the large Quaking Grass (*Briza maxima*), *B. minima*, which is smaller, hence the name; *Eragrostis elegans*, a very graceful grass; and the Barley Grass (*Hordeum jubatum*). The seed should be sown early in April; and the seed of some kinds, *Agrostis pulchella* in particular, is so fine that it is necessary to mix it with fine soil to ensure even distribution. Sow the seeds where they are to remain, and when the sowings have been thick, thin out judiciously. *Eragrostis elegans* is pretty by waterside, and will sometimes perpetuate itself. These grasses are very pretty and useful for winter decoration, and when required for this purpose it is needful to gather them before heavy rains occur. Gather them on a bright afternoon, tie them into small bundles, place in a dry room away from the window, and in an upright position.

A SELECTION OF ALPINE AND ROCK PLANTS

ABBREVIATIONS as follows:—s, *shade*; hs, *half shade*; p, *peat*; o, *ordinary garden soils*; l, *loam*; gl, *gritty loam*; rl, *rich loam*; c, *carpet plants*; t, *tuberous rooted*; tg, *of trailing habit*; b, *bulbs*.

See also lists on pages 141 and 156.

NAME.	COLOUR.	TIME OF FLOWERING.	HEIGHT IN INCHES.	SOIL.
Acæna microphylla (c)	Crimson	June, Aug.	4	o
Acantholimon glumaceum (Prickly Thrift)	Rose	June, July	6	o
" venustum	Pink	July, Aug.	6	gl
Achillea (Milfoil) ageratioides	White	July, Sept.	9	gl
" aurea (c)	Golden	" "	6	o
" tomentosa (c)	Yellow	" "	6	o
" Clavennæ	White	June, July	9	o
Adonis vernalis	Yellow	Mar., April	9	rl
" pyrenaica	"	May, June	9	s, gl
Æthionema grandiflorum	Pink	July, Aug.	6	gl
Ajuga genevensis (c)	Pale Blue	May, July	9	o
" pyramidalis (c)	Lilac Blue	" "	9	o
" reptans purpurea (c)	Blue	" "	6	o
Alyssum saxatile	Yellow	Spring	4	o
A most useful flowering plant.				
Androsace lanuginosa (tg)	Pink	June, Oct.	6	gl
" sarmientosa	Rose	June	6	gl, hs
" carnea	Flesh-pink	May, June	4	gl
Anemone alpina (Windflower)	Blue	" "	1½ ft.	rl
" " sulphurea	Sulphur	" "	1½ ft.	rl
" " blanda (t)	Various	Mar., April	6	l
" Halleri	Purple	July	9	l
" narcissiflora	White	July, Aug.	12	o, l
" palmata (t)	Yellow	May, June	12	p, l, s
" Pulsatilla (Pasque-flower)	Purple	Mar., May	12	rl
" robinsoniana (t)	Sky Blue	April	6	rl
Antennaria tomentosa (Cat's Ear) (c)	White	July, Aug.	6	o
Anthyllis montana	Purple	" "	6	o
Aquilegia (Columbine) alpina	Blue	June	9	gl
" " coerulea	Pale Blue	June, July	15	l
" " Stuarti	{ Deep Blue } { and White }	May, June	9	gl
Arabis (Rock Cress) albida	White	Spring	6	o
There is a very pretty double white.				
" " lucida fol. var.	"	June, July	4	o
Arenaria balearica (Sandwort) (c)	"	" "	2	grit
" grandiflora (tg)	White, large	May, June	4	o, l
Armeria alpina rosea (Thrift)	Rose	" "	6	o
Arnebia (Macrotomia) echioides } (Prophet-flower) }	Straw Yellow	{ Spring & } { Autumn }	12	p, l
Aster alpinus	Lilac Blue	May, June	8	o
" " albus	White	" "	8	o
" " ruber	Rose	" "	8	o
Astragalus dasyglottis (Milk Vetch)	Purple	July, Sept.	3 trailing	o

NAME.	COLOUR.	TIME OF FLOWERING.	HEIGHT IN INCHES.	SOIL.
<i>Astrantia major</i>	Blush	July, Sept.	9	o
<i>Aubrietia deltoidea grandiflora</i>	Purple	April, June	4	o
" <i>Leichtlini</i>	Rose	May, June	4	o
" <i>græca superba</i>	Lilac	May, July	4	o
" <i>Hendersoni</i>	Purple	" "	5	o
" <i>Souvenir de Wm. Ingram</i>	Red-striped	May, June	4	o
All this group are dense growing carpet plants, covered with bloom in spring; masses of colour.				
<i>Bulbocodium vernum</i> (b)	Purple	Feb., Mar.	4	o, l
<i>Campanula (Bellflower) alpina</i>	Dark Blue	July, Aug.	9	o, l
" <i>garganica</i>	Blue & White	July, Sept.	Trailing	o
" " <i>hirsuta</i>	" Blue "	" "	"	o
" <i>Hendersoni</i>	" Blue "	Sept., Oct.	12	rl
" <i>Hostii</i>	Dark Blue	July, Aug.	12	o
" " <i>alba</i>	White	" "	12	o
" <i>pelviformis</i>	Palest Blue	June, July	6	gl, s
" <i>muralis</i>	Light Blue	May, June	4	o
" <i>pulla</i>	Deep Purple	July, Aug.	6	gl, s
" <i>pusilla alba</i>	White	June, July	6	o
" <i>Raineri</i>	Blue	" "	4	l, p, s
" <i>G. J. Wilson</i>	"	July, Sept.	6	o
<i>Cheiranthus alpinus (Alpine Wall-flower)</i>	Sulphur	April, May	6	gl
" <i>Marshalli</i>	Orange Yellow	" "	6	gl
<i>Chionodoxa Lucilæ (Glory of the Snow)</i> (b)	Blue & White	Feb., Mar.	6	o
" <i>gigantea</i>	Blue	Spring	6	o
" <i>sardensis</i> (b)	Deep Blue	Mar., April	6	o, l
<i>Colchicum autumnale</i> (b)	Lilac	September	6	o
" " <i>plenum</i> (b)	"	"	6	o
" " <i>album pl.</i> (b)	White	"	6	o
" <i>speciosum</i> (b)	Rose Lilac	Sept., Oct.	9	rl
<i>Corydalis nobilis</i> (t)	Yellow	April, May	9	p, s
<i>Crocus speciosus</i> (b)	Purple	Sept., Oct.	6	l
<i>Crucianella stylosa coccinea</i> (c, tg)	Scarlet	July, Sept.	6	o
<i>Cyananthus lobatus</i>	Blue	Aug., Oct.	4	gl, p
<i>Cyclamen hederæfolium</i> (b)	Pink	Sept., Oct.	6	l, p, s
" " <i>album</i> (b)	White	" "	6	l, p, s
<i>Daphne rupestris</i>	Purple	Aug., Sept.	4	p, s
" <i>Cneorum</i>	Rose Purple	April, May	6	p, s
<i>Dianthus (Pinks) alpinus</i>	Red	July, Aug.	4	gl
" <i>callizonus</i>	Rose	Summer	4	gl
" <i>neglectus</i>	Pink	July, Aug.	4	gl
" <i>dentosus</i>	Crimson	" "	6	o, l
" <i>glacialis (Rock Pink)</i>	Rose Red	" "	3	gl
" <i>squarrosus</i>	White	Aug., Sept.	9	o
" <i>fimbriatus</i>	Lilac	July, Aug.	9	o
" <i>deltoides (Maiden Pink)</i>	Red	June, Aug.	9	o
" <i>cruentus</i>	Blood Red	" "	12	l
" <i>arenarius</i>	White	" "	6	gl
<i>Draba aizoides</i>	Yellow	Mar., April	4	o, l
" <i>ciliata</i>	White	April	4	o, l
<i>Dryas Drummondii</i> (tg)	Yellow	July, Aug.	Trailing	gl
" <i>octopetala</i> (tg)	White	" "	"	gl
<i>Edraianthus serpyllifolius</i>	Violet Purple	June, July	6	gl
<i>Epilobium obcordatum (Willow Herb)</i>	Rose Pink	Aug., Oct.	9	gl, p
<i>Epimedium alpinum</i>	Red	May, June	9	p, s
" <i>pinnatum elegans</i>	Yellow	Mar., May	12	p, l, s
" <i>muscbianum</i>	White	" "	9	p, l, s

NAME.	COLOUR.	TIME OF FLOWERING.	HEIGHT IN INCHES.	SOIL.
<i>Erigeron aurantiacus</i>	Orange	July, Aug.	6	o, l
" <i>glaucus</i>	Lilac	June, July	9	o, l
<i>Erinus alpinus</i>	Lilac Purple	March, May	3	grit
" <i>albus</i> (Stork's-Bill)	White	July, Sept.	3	grit
<i>Erodium</i> (Stork's-Bill) <i>hymenoides</i>	Pink	July, Sept.	12	o
" <i>Manescavi</i>	{ Purplish } Crimson	June, Aug.	15	o
" <i>macradenum</i>	Pale Purple	July, Oct.	9	gl
" <i>Reichardi</i>	White	July, Oct.	Carpet	gl, s
<i>Genista prostrata</i> (tg)	Yellow	July, Aug.	Trailing	} o, l
" <i>tinctoria fl. pl.</i> (tg)	Golden	" "	and Shrubby	
<i>Gentiana acaulis</i> (<i>Gentianella</i>)	Blue	Spring	6	o
" <i>bavarica</i>	Intense Blue	Summer	3	p, l, s
" <i>septemfida</i>	Blue & White	Spring	9	gl, s
" <i>verna</i>	Deep Blue	Spring	3	l, s
<i>Geranium cinereum</i>	Rose Pink	June, Oct.	12	o
" <i>sanguineum</i>	Red	June, Sept.	6	o
" " <i>album</i>	White	" "	6	o
<i>Geum montanum</i>	Golden	May, July	9	rl
<i>Gypsophylla cerastioides</i>	White	June, Aug.	6	gl
" <i>prostrata</i> (tg)	Blush	" "	Trailing	o
<i>Haberlea rhodopensis</i>	Bluish lilac	May, June	6	gl
<i>Hedysarum alpinus</i>	Red	" "	6	o
" <i>sibiricum</i>	{ Reddish } Crimson	" "	6	o
<i>Helianthemum</i> (Sun Rose), in variety	Various	June, Sept.	{ Sub-trailing shrubs	} o
<i>Hepatica</i> , in variety	"	Mar., April	6	
<i>Herniaria glabra</i> (c)	Greenish	" "	Carpenter	rl, s
<i>Heuchera sanguinea</i>	Scarlet	June, July	15	o
<i>Horminum pyrenaicum</i>	Bluish Purple	July, Aug.	8	rl, hs
<i>Hutchinsia</i> (<i>Nocca</i>) <i>alpina</i> (c)	White	June, July	6	rl, s
<i>Iberis correaefolia</i> (Candytuft)	"	May, June	8	o, l
" <i>sempervirens</i>	"	" "	8	o
" <i>tenoreana</i>	White & Lilac	" "	6	o
<i>Iris cristata</i>	Blue	June, July	4	gl
" <i>nudicaulis</i>	Purple Blue	May, June	9	o
" <i>pumila</i> , in variety	Various	April, May	6	o
" <i>stylosa</i>	Sky Blue	Dec. to Mar.	12	p, l, s
" " <i>alba</i>	Ivory White	" "	12	p, l, s
" " <i>speciosa</i>	Azure Blue	Feb., Mar.	9	p, l, s
" <i>reticulata</i> (b)	Rich Violet	" "	9	rl
<i>Lewisia rediviva</i>	Rose & White	May, July	4	{ gl, in rock crevice
<i>Leontopodium</i> (<i>Gnaphalium</i>) <i>alpinum</i> (Edelweiss)	{ Pale Yellow } and White Woolly-heads	July	6	{ l, and limestone
<i>Linaria alpina</i> (Alpine Toadflax)	Blue & Purple	June, Aug.	4	gl
<i>Lithospermum prostratum</i> (Gromwell)	Deep Blue	May, Sept.	Trailing	gl, s
<i>Lychnis alpina</i>	Pink	April, May	6	o
" <i>Lagascæ</i>	Rose	June, Aug.	4, trailing	gl
" <i>pyrenaica</i>	White	April, June	6	gl
<i>Myosotis alpestris</i> (Alpine Forget-me-not)	Blue	" "	4	gl, s
" <i>azorica</i>	Deep Blue	June, July	6	l, s
<i>Narcissus Bulbocodium</i> (b)	Pale Yellow	Mar., April	4	l, p
" <i>minor</i> (b)	Yellow	" "	6	rl

NAME.	COLOUR.	TIME OF FLOWERING.	HEIGHT IN INCHES.	SOIL.
<i>Narcissus minimus</i> (b)	Yellow	Mar., April	4	rl
" <i>pallidus præcox</i> (b)	{ Sulphur & Yellow }	" "	9	gi
<i>Nierembergia rivularis</i> (White Cup) (c)	White	June, July	6	l, s
<i>Omphalodes</i> (Navel-Wort) <i>luciliæ</i> .	Palest Blue	July, Oct.	5	gl, p, hs
" <i>verna</i> (Creeping Forget-me-not) (c) {	Deep Blue	Mar., May	3	l, s
<i>Oenothera macrocarpa</i> (Evening Primrose) (tg)	Yellow	June, Sept.	9	rl
" <i>taraxacifolia</i>	White	June, Aug.	6	o, l
<i>Onosma tauricum</i> (Golden Drop) .	Yellow	May, July	9	{ gl, on rocky ledge
<i>Othonnopsis cheirifolia</i>	"	May, June	12	l
<i>Ourisia coccinea</i>	Scarlet	July, Aug.	9	rl, s
<i>Pentstemon glaber</i>	Blue	" "	9	l
" <i>heterophyllus</i>	Red and Blue	July, Sept.	12	l
" <i>speciosus</i>	Blue	" "	6	l
" <i>Menziesi</i>	Scarlet	June, Aug.	6	gl
<i>Petrocallis pyrenaica</i>	Blush	May	4	gl
<i>Phlox canadensis</i>	Slate Blue	April, May	12	rl
" <i>frondosa</i> (c)	Pink	" "	4	l
" <i>Nelsoni</i> (c)	White	" "	4	l, hs
" <i>ovata</i>	Red	May, July	12	rl
" <i>procumbens</i> (c)	Pale Purple	June, July	4	gl s
" <i>verna</i> (tg)	{ Reddish Crimson }	May, June	Creeping	gl
" <i>amoena</i> (c)	Reddish Pink	" "	6	rl
" <i>setacea</i> (c) as follows:—				
<i>The Bride</i>	White	April, June	4	rgl
<i>Compacta</i>	Rose	" "	4	rgl
<i>Vivid</i>	Scarlet	" "	4	rgl
<i>Model</i>	Mauve Pink	" "	4	rgl
<i>Atropurpurea</i>	Dark Purple	" "	4	rgl
<i>Phyteuma comosa</i>	Blue	June	6	{ gl, rock crevice
<i>Plumbago Larpentæ</i> (<i>Ceratostigma</i> <i>plumbaginoides</i>)	Ultra Blue	Aug., Sept.	12	rl
<i>Polemonium</i> (Jacob's ladder) <i>confertum</i>	Blue	May, June	8	gl
" <i>Melittum</i>	White	" "	8	gl
<i>Polygala chamaebuxus</i>	{ White and Yellow }	" "	6	l, p, s
" " <i>purpurea</i>	{ Yellow and Purple }	" "	6	l, p, s
<i>Polygonum brunonis</i>	Rose	Aug., Oct.	9	o
" <i>vaccinifolium</i>	Pink	Aug., Sept.	6	l, p
<i>Potentilla alpestris</i>	Yellow	May, Aug.	6	rl
" <i>Menziesi</i>	Orange	" "	6	rl
" <i>atro-sanguinea</i>	Deep Red	Aug., Sept.	9	l
<i>Primula</i> (Primrose) <i>rosea</i>	Rose Scarlet	Early Spring	6 to 12	rl, s
" <i>cashmeriana</i>	Lilac Purple	" "	18	rl
" <i>denticulata</i>	Pale Lilac	" "	12	rl
" " <i>alba</i>	White	" "	12	rl
" " <i>Munroi</i>	Ivory White	{ Early Summer }	6	rl, s
" <i>viscosa</i>	Rose Purple	Spring	4	gl, s
" " <i>nivea</i>	Snow White	"	4	gl, s

Note.—Almost every known species of Hardy *Primula* would be permissible in this list, and quite worthy of inclusion, but the

NAME.	COLOUR.	TIME OF FLOWERING.	HEIGHT IN INCHES.	SOIL.
number is too formidable to give in detail. The large majority, however, may be safely regarded and treated as in the case of the last named.				
<i>Puschkinia scilloides</i> . . . (b)	Blue & White	Spring	6	rl
<i>Ramondia pyrenaica</i> (Rosette Mul- lein) }	Purple	June, July	6	{ moist shady rocks
" " <i>alba</i> }	White	" "	6	
<i>Ranunculus</i> (Buttercup) <i>alpestris</i> (t)	"	April, June	4	gl
" <i>amplexicaulis</i> (t)	"	"	4	rl
<i>Saponaria</i> (Soap-Wort) <i>ocymoides</i> }	Rose Crimson	Summer	Rock trailers	{ o, l o, l
<i>splendens</i> (tg)	White	"		
" " <i>alba</i> (tg)	White	"	6	gl
<i>Saxifraga aretioides primulina</i> . . . }	Primrose	April, May		
" <i>burseriana</i> }	Yellow	Mar., April	4	gl
" " <i>major</i> }	White	"	4	gl
" <i>coriophylla</i> }	"	April, May	6	gl
" <i>cochlearis</i> }	White,	May, June	9	gl
" <i>Cotyledon</i> }	Pink spots	June	12 to 18	gl
" <i>longifolia</i> }	"	Summer	9 to 18	gl
" <i>muscoides</i> (c)	Pale Yellow	Early Spring	3	{ moist ordinary
" " <i>atropurpurea</i> (c)	Crimson	" "	4	
" <i>hypnoides</i> (c)	White	" June	5	{ loam, or a posi- tion of
" <i>oppositifolia</i> (c)	"	Mar., April	3	
" " <i>pyrenaica</i> , }	Rose Purple	" "	3	{ half- shade
<i>splendens</i> , and others . (c)	White, Large	May, June	6	
" <i>Wallacei</i> (c)				
<i>Note.</i> —The remarks at foot of Primulas apply with equal force to this very numerous family, which, indeed, is largely composed of the best forms of Alpine vegetation.				
<i>Sedums</i> }	Various	August	Various	Various
<i>Sempervivums</i> }	Various	"	Various	Various
<i>Note.</i> —These may be included, the former being frequently used as carpets to other flowers, the latter in dry, sunny positions, or in rocky chinks and crevices, where few things thrive.				
<i>Silene</i> (Catchfly) <i>acaulis</i> }	Rose	June, July	2	gl
" <i>alpestris</i> (c)	White	" "	5	o, l
" <i>maritima plena</i> (tg)	Double White	" "	Trailing	o, l
<i>Sisyrinchium</i> (Satin-flower) <i>grandi- florum</i> (t)	Red Purple	Mar., April	9	rl
" " <i>album</i> (t)	Satin White	"	9	rl
<i>Thalictrum anemonoides</i> }	White	April, May	6	l, p, s
<i>Thymus lanuginosus</i> (c)	Purple	June, July	Carpet	o, l
<i>Tiarella cordifolia</i> (Foam-flower) . }	Creamy	May, June	12	rl
<i>Veronica Allioni</i> }	Deep Blue	May, June	6	o, l
" <i>prostrata</i> }	"	June	3	o, l
" <i>rupestris</i> }	Rich Blue	June, July	4	o, l
<i>Zauschneria californica</i> }	Vermillion	July, Sept.	12	gl
" <i>splendens</i> }	Scarlet	" "	12	gl

A FINE PLANT OF SAXIFRAGA LONGIFOLIA MAGNIFICA.

THE ALKANET, *ANCHUSA ITALICA* (DROPMORE VARIETY), BY THE WATERSIDE.

HARDY PERENNIALS

EXCLUDING BULBS AND ANNUALS

Except where otherwise stated the plants named in the following tables can be grown in ordinarily good garden soil.

NAME.	COLOUR.	HEIGHT AND TIME OF FLOWERING.	GENERAL REMARKS.
Acanthus (Bear's Breech) .	Brownish and White	About 3 ft., Summer	Valuable for their foliage. Useful to group in the garden; warm soil; hardy; several kinds— <i>H. spinosissimus</i> and <i>A. mollis latifolius</i> the finest.
Achillea mongolica . . .	White	1½ ft., April & May	Very useful for cutting.
„ Ptarmica (The Pearl)	Double White	2½ ft., June & July	This is better than the ordinary Sneezewort (<i>A. Ptarmica</i> fl. pl.).
„ „ Perry's Var	„ „	„ „	Valuable novelty.
Aconitum (Aconite) . . .	Blue	Autumn, 3 ft. to 5 ft.	{ <i>A. Napellus</i> has a poisonous root.
„ Napellus . . .			
„ autumnale . . .			
Alstroemerias (Peruvian Lilies)	Various colours	About 2½ ft., Oct.	There are several kinds and hybrids. <i>A. aurea</i> is very rich in colour. Masses of these in a rich, warm soil are very charming. They are often finer against a warm wall than in the border. Plant about 6 inches deep; remove seed pods; mulch in summer, and protect the crowns in severe winters with well-decayed leaves or similar material.
Anchusa italica (Dropmore variety)	Blue	About 3 ft., Summer.	A useful plant for bees.
Anemone blanda (Wind-flower)	Blue, White, and other shades	Quite early in year, 6 in.	Very pretty in rock garden in warm soils.
„ apennina . . .	Blue	Spring, 6 in.	Very beautiful in colonies in grass, border, or rock garden.
„ Pulsatilla (Pasque-flower)	Purple	About Easter, 9 in.	Warm, gritty soil.
„ sylvestris and <i>S. plena</i> (Snowdrop Wind-flower)	White	May & June, 1½ ft.	Not very trustworthy, but very pretty.
„ japonica rubra . . .	Red		{ Noble plants for the border; grow well in masses, especially the white kind. The white Japanese Anemone is one of the first hardy perennials the beginner should grow. Its tall stems of white flowers are very beautiful, and very useful for cutting.
„ „ alba (Japanese Wind-flowers)	White	{ 3 to 4 ft., Aug., Sept., Oct.	

NAME.	COLOUR.	HEIGHT AND TIME OF FLOWERING.	GENERAL REMARKS.
Anthericum (St. Bruno's Lily) <i>Liliastrum</i>	White	{ 2 ft., Early Summer	{ The major form is very fine in the border; rather warm soil; divide roots in autumn for increase.
„ <i>Liliastrum major</i>	White, large flower		
<i>Aquilegia</i> (Columbine) Californica hybrids	Beautiful Orange Scarlet, &c.	2 ft., May-July	{ Special note on p. 10.
„ <i>cœrulea</i> hybrids.	Blue, White, &c.	1½ ft., June-July	
„ <i>chrysantha</i> .	Pale Yellow	3 ft. to 4 ft.	
„ <i>glandulosa</i> .	Blue and White	2½ ft.	
<i>Arnebia</i> (<i>Macrotomia</i>) <i>echinoides</i> (Prophet-flower)	Sulphur Yellow, with dark spots, which disappear as the flower ages.	1 ft.	A well-drained soil. Increased by division in Spring and by seeds when available.

ASTERS—STARWORTS OR MICHAELMAS DAISIES

NAME.	TIME OF FLOWERING.	HEIGHT. FEET.	REMARKS.
<i>Aster acris</i> . . .	Aug. 3rd wk.	3	Light blue, very effective, and fine for any purpose.
<i>Acris albus</i> . . .	Aug.	2	Pretty white variety.
„ <i>roseus</i> . . .	„	2	Rosy mauve.
<i>Amellus bessarabicus</i> . . .	Sept. 1st „	2½	Pleasing blue, large flowers.
„ <i>Beaute Parfait</i> .	„	2	Deep blue, splendid variety.
„ <i>H. J. Cutbush</i> .	„	2	Rosy pink, extra.
„ <i>Perry's Pink</i> . . .	„	2	Reddish pink, one of the best.
„ <i>Ultramarine</i> . . .	„	2	Deepest blue, starry flowers.
„ <i>Comet</i> . . .	„	2	Deep mauve, charming variety.
„ <i>Perle Rose</i> . . .	„	1½	Palest rose, dwarf.
„ <i>major</i> . . .	„ 1st „	2½	Larger flowers, and more compact than above.
„ <i>Framfieldi</i> . . .	Oct. 1st „	2½	Lilac blue.
„ <i>Riverslea</i> . . .	Sept. 4th „	2½	Deep purplish blue, distinct.
<i>Ptarmicoides</i> . . .	„ 1st „	1	Very small white flowers, dwarf and compact.
<i>Corditolius major</i> . . .	„ 3rd „	5	Beautiful lilac flowers.
„ <i>elegans</i> . . .	Oct. 1st „	5	Very graceful habit, soft lilac flowers in abundance.
„ <i>Diana</i> . . .	„ 2nd and 3rd wk.	4½	Charming and distinct variety, one of the best.
„ <i>White Diana</i>	Oct.	3	Graceful sprays, white.
„ <i>Little Boy Blue</i>	„	3	Pale blue, greatly admired.
„ <i>Little Bo Peep</i>	„	3½	Colour, French grey, beautiful variety.
„ <i>Ideal</i> . . .	„	3½	Lovely shade of pale blue.
<i>Corymbosus</i> . . .	Aug. 1st „	1½	Very early white, distinct species.
<i>Diffusus horizontalis</i> . . .	Oct. 2nd „	2½	Bronzy red and white flowers, very effective.

NAME.	TIME OF FLOWERING.	HEIGHT. FEET.	REMARKS.
Diffusus Coombe Fish-acre	Oct. 2nd wk.	3	Flesh-coloured flowers, very free and fine, one of the best to withstand the wet.
" Bianca . . .	"	4	Lovely pure white variety.
Dumosus (syn. fragilis) .	Sept. 4th "	1½	Very bushy and compact, mauve flowers.
Ericoides . . .	Oct. 3rd "	3	Drooping sprays of white flowers.
" elegans . . .	" 1st "	3	Earlier than above, and very free flowering.
" Perfection . . .	"	4	The best white variety in this class.
" Daydream . . .	"	3½	Lovely shade of mauve.
" Desire . . .	"	4	Of upright growth, reminded one of a large growing heath; white.
" Hon. Edith Gibbs . . .	"	4	Charming mauve variety.
" Star Shower . . .	"	3½	Graceful sprays, white.
" Simplicity . . .	"	4	Pale blue, one of the best.
Asteroides . . .	Sept. 2nd "	6	Pale flesh-coloured flowers, very pleasing and lasting.
Henryi (species) . . .	" 1st "	2	Bright blue flowers, distinct species.
Shorti (species) . . .	" 1st "	4	Pale blue flowers, very good.
Vimineus . . .	Oct. 2nd "	3	Similar to ericoides, but of more twiggy growth.
" Cassiope . . .	Sept. 4th "	2½	Earlier, and very dense growth.
" nanus . . .	" 4th "	1½	Earlier, and much smaller flowers.
" Hon. Vicary Gibbs . . .	Oct.	2	Lovely shade of pink, distinct.
" Esther . . .	"	1½	Dwarf and distinct pink.
Pyrenæus . . .	Aug. 3rd "	1½	Dwarf, large pale blue flowers.
Umbellatus . . .	" 4th "	5	Silvery white flowers, very distinct species.
Lindleyanus nanus . . .	Oct. 2nd "	2	Very compact, small rosy lilac flowers.
Turbinellus . . .	" and Nov.	4	Light and graceful, large violet flowers, tipped rose.
" albus . . .	" 3rd wk.	3½	Smaller than above, with white flowers.
Grandiflorus . . .	Nov. 2nd "	3	Large deep violet flowers, very late and distinct.
Tradescantia (species) . .	" 2nd "	4	Pure white, very effective.
Chapmanni (species) . .	Oct. 3rd "	5	Blue, very graceful.

ASTERS—NOVI BELGI TYPE AND HYBRID VARIETIES

NAME.	TIME OF FLOWERING.	HEIGHT. FEET.	REMARKS.
Arcturus . . .	Sept. 4th wk.	4½	Purplish blue flowers, very showy.
Amethyst . . .	Oct.	4½	Lovely blue-flowered variety.
Bovius . . .	"	4½	Bright pink, large flowers, good habit.
St. Egin . . .	Early Oct.	3	Large pink flowers.

NAME.	TIME OF FLOWERING.	HEIGHT. FEET.	REMARKS.
Avalanche . . .	Oct.	4	The best large-flowered white ; bushy habit.
Peggy Ballard . . .	"	3	Semi-double, distinct colour, pale purple.
Lævigatus . . .	Sept. 4th wk.	2½	Bright pink, excellent.
White Spray . . .	" 3rd "	5	Best late white, large twisted petals.
Formosissimus . . .	Sept. 4th "	4	Erect habit, rosy lilac flowers.
Madonna . . .	" 3rd "	3	Compact, large flowered white.
Minerva . . .	Oct. 2nd "	4	Deep rosy lilac, large and free.
Purity . . .	Sept. 3rd "	5	Early flowering white.
Versicolor . . .	" 1st "	4½	White, changing to purple.
" Themis . . .	Oct. 2nd "	2	White, changing to purple, compact and free.
Beauty of Colwall (Novæ Belgi)	Sept.	4	Flowers double, violet blue. Handsome variety.
Climax (Novæ Belgi) .	Oct.	5-6	The grandest blue-flowered Michaelmas Daisy yet raised.

ASTERS—NOVÆ ANGLIÆ TYPE

NAME.	TIME OF FLOWERING.	HEIGHT. FEET.	REMARKS.
Novæ Angliæ præcox .	Sept. 2nd wk.	4½	Crimson and purple flowers, earliest of this type.
Novæ Angliæ (Mrs. J. F. Raynor) . . .	Oct. 1st "	4½	Vivid large crimson flowers, improvement on N. A. ruber.
Novæ Angliæ roseus .	" 2nd "	5	Rose-coloured flowers.
Novæ Angliæ ruber .	" 3rd "	5½	Rich crimson flowers.
Novæ Angliæ pulchellus	" 2nd "	4½	Violet blue flowers.
Novæ Angliæ (Wm. Bowman)	" 1st "	5	Rosy purple, with golden bronze disc.
Novæ Angliæ (Melpomene)	" 2nd "	4½	Large light purple.
Lil. Fardell . . .	Oct.	4	Large, rosy-coloured flowers, with a silvery sheen.

ASTERS—DWARF ALPINE VARIETIES

SUITABLE FOR THE FRONT OF HERBACEOUS BORDER OR ROCKERY

NAME.	TIME OF FLOWERING.	HEIGHT.	REMARKS.
Aster alpinus albus .	May to June.	9 in.	A good white variety.
" " rubra . . .	" "	9 in.	An attractive red.
" " magnificus .	" "	9 in.	The largest of Alpine varieties, bright violet blue.
" " superbus . .	" "	1 ft.	Branching stems surmounted with purplish blue flowers.
" Thompsoni (species)	July, November.	2 ft.	Pale lavender ; is one of the best border plants grown.

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
<i>Bocconia cordata</i> (Plume Poppy)	Brownish	Over 6	A very handsome plant for rougher parts of the gar- den. Picturesque silvery- toned leaves and brownish flower scapes. Easily in- creased by division of the roots.
<i>Bupthalmum speciosum</i> .	Yellow	Tall	This is not a plant for small borders, it is too rough ; but for grouping in the wilder parts is very useful. Increased by root division. Also called <i>Telekia spe-</i> <i>ciosa</i> .
<i>Camassia esculenta</i> (Qua- mash)	Blue, but there is a white variety; July	1½ to 3	Very pleasing plant ; likes a rather moist soil.
<i>Campanulas</i> (Bell-flowers) .	...	Various	See separate note (p. 17).
<i>Catananche cærulea</i> (Blue Cupidone)	Blue and White	2½	Easily grown and raised from seed.
<i>Centaurea babylonica</i> .	Yellow ; Summer and early Autumn	10	Loamy soil ; very strong- growing, silvery - leaved plant ; spikes of yellow flowers ; often beautiful on a wall.
„ <i>macrocephala</i> .	Golden Yellow ; Summer	5	Strong plant ; too much so ordinary borders.
„ <i>montana</i> .	Red & White ; 2 forms ; Summer	2½	Quite happy almost any- where.
<i>Centranthus ruber</i> (Red Valerian)	Red ; Summer and Autumn	2	A very hardy and beautiful plant, particularly useful for old walls or rockwork where bold effects are desired.
<i>Cheiranthus Cheiri</i> (Com- mon Wallflower)	Spring	Various	The Wallflower is a fra- grant and familiar garden flower, scenting the bor- ders with its rich perfume in the springtime of the year. It is often happy in the chinks and crevices of old walls. Very effec- tive are such sorts as Belvoir Castle, much used in the famous spring gar- dening at Belvoir Castle ; Harbinger, and the rich-coloured blood-red. There are double Wall- flowers, too. Single Wallflowers are easily raised from seed sown in early May. Trans- plant the seedlings, other- wise the tap root de- velops unchecked. It is wise to plant the Wall- flowers in their perma-

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Cheiranthus Cheiri (Common Wallflower)	Spring	Various	nent quarters about the end of June. When planted very late in the autumn or in the following spring, frosts play havoc with the growth.
Chelone Lyonl . . .	Deep Pink ; Late Summer	2½	Very graceful plants, with spikes of bright blossom. Increased by division, seeds, or by cuttings. A group of them is interesting.
„ obliqua . . .	Lighter Pink ; Late Summer	2½	
Chrysanthemum maximum	White ; July, Aug.	2	A good border plant, easily grown.
Convolvulus mauritanicus .	Blue	...	This is a prostrate plant, and very beautiful as an edging in warm soils and sunny positions.
Coreopsis lanceolata grandiflora	Golden Yellow ; July-Sept.	2 or 3	A glorious plant. Sow seeds in spring, and plant out in autumn for flowering next year.
Dictamnus (Burning Bush)	Reddish	3	A quaint border, called also Burning Bush ; light, dry soil ; partial shade.
Fraxinella . . .	July, Aug. White	3	
„ alba . . .	White	3	Vigorous, early-flowering border plants.
Doronicum Clusi . . .	{ Rich Yellow ; April, May }	2 3	
„ plantagineum excelsum	{ Rich Yellow ; April, May }	2 3	See separate article (p. 18).
Delphinium (Perennial Larkspurs)	Various Colours	Various	
Delphinium Belladonna .	Pale Blue	2	A charming kind. Slugs are very fond of it. A good group is delightful.
Dielytra spectabilis (Lyre-flower or Bleeding Heart)	Rose	2	A pretty early border plant, so early that it sometimes gets cut by late frosts ; light soil ; much grown in pots.
Dodecatheon Jeffreyi (American Cowslip)	Purple ; early Summer	2	A favourite hardy border plant, one of the best of its group. Good loam, and increased by division.
Echinacea purpurea . .	Reddish-Purple ; Aug., Sept.	3½	Ordinary soil.
Echinops (Globe Thistle) Ritro	Bluish heads	4	Ordinary soils, but not too damp.
„ sphærocephalus .	White heads Aug., Sept.	4	
Eremurus himalaicus . .	White	4-5	Noble plants to group with bold, hardy perennials. Rich loam, not heavy ; well drained, sheltered position. Give yearly mulch of well-decayed manure. Plant in autumn. During severe weather give protection with some such material as coconut fibre refuse.
„ robustus . . .	Pink & Peach ; May, June	9-10	
Erigeron (Fleabane) speciosus superbus	Purplish Blue ; May, June, and Autumn	2½	Almost any soil. Most useful plant for its long flowering-time.

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Eryngiums (Sea Hollies)	Steely-Blue bracts; Autumn	Various	The Eryngiums form an important group of garden plants. Their steely-blue stems are useful in winter decorations. A warm, dry border is the place for them. <i>E. maritimum</i> is our native Sea Holly of the beach. The finest kinds are the small-flowered <i>E. planum</i> , <i>E. olivierianum</i> , <i>E. alpinum</i> , and <i>E. giganteum</i> .
Funkias (Plantain Lilies)	Various	"	There are several beautiful Funkias, plants of importance for their handsome foliage, and spikes of often very fragrant white flowers. A few have variegated foliage, one of the most pleasing being <i>F. undulata variegata</i> . <i>F. lancifolia</i> has white flowers, and of this species there are pretty variegated forms. <i>F. ovata</i> is also well known, and <i>F. Sieboldi</i> . But for ordinary gardens, <i>F. subcordata grandiflora</i> and <i>F. Sieboldi</i> are the only Funkias one need trouble about. If the flower is wanted (and it is a pretty and desirable bunch of white, lily-like bloom), <i>F. grandiflora</i> should have a sunny place, but here the leaves are apt to burn, and to turn yellow. Its best use is probably as a plant for foliage, and in a half shady place, where it never receives direct sunshine, it may be seen at its best. It is also a capital pot or tub plant, especially for town gardens. Plant in autumn.
Gaillardias	Crimson, Yellow and Old Gold; Summer, Autumn	"	Warm soils. Easily raised from seeds. Sow in March.
Galax aphylla (Wand Plant)	White; Summer	8 inches	The leaves of this neat North American plant are heart-shaped and prettily toothed at the edges, of thin but firm texture, and boldly carried on strong but slender wire-like stalks from 4 inches to

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Galax aphylla . . .	White; Summer	8 inches	9 inches high, and sometimes higher still when well-established clumps are growing in the moist peaty leaf-mould that suits it best. The bloom is a slender spike of white flowers in July; but in midwinter the beauty of the plant is in the high colouring of the leaves. Some are of a fine red tint throughout; others are spotted and marbled with red upon a ground of pale green, and have a border that is almost scarlet. One may look at a dozen leaves and find in each a different proportion and disposition of the red colouring, but all have the same aspect of neat and well-ordered beauty. It is perfectly hardy; a plant for all Great Britain, in cool rocky nooks or peat-bed edges.
Gentiana acaulis (Gentianella)	Blue; April, May	$\frac{1}{2}$	{ This is a trio of very beautiful Gentians for the border. G. asclepiadea likes shade and shelter, and for that reason may be put in the woodland. Septemfida enjoys a moist, light soil.
„ asclepiadea .	Purple Blue; Aug., Sept.	2	
„ septemfida .	Bright Blue; July-Sept.	$\frac{1}{2}$	
Geranium armenum . .	Crimson Purple; June, July	2	{ Beautiful border plants; G. armenum is one of the finest.
„ Endressi . .	Rose; June-Sept.	1 $\frac{1}{2}$	
Galega (Goat's-rue) officinalis	Purplish	2-3	{ Quite at home in ordinary soils. Both are very useful for cutting.
„ „ alba	Pure White; Summer	2-3	
Gaura Lindheimeri . .	Rose; Summer	4	Warm, light soils.
Geum coccineum plenum .	Shades of Orange and Scarlet; July, Aug.	2	
„ Heldreichi . .	Ditto; June, July	1 $\frac{1}{2}$	{ Effective border plants, and very useful. Continue long in bloom.
„ miniatum . . .	{ Ditto; Spring; Scarlet, Autumn }	2	
„ Mrs. H. J. Bradsha			
Gillenia trifoliata . .	White; June, July	2 $\frac{1}{2}$	A pretty, slender-spiked flower.
Gypsophila paniculata .	Small, white, fleecy, lace-like flowers; Aug.	2	{ This is a very useful plant, making billowy masses of white bloom. The lace-like flowers are much sold in the London streets.
„ „ fl. pl.	Double	2	

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Helianthus (Perennial Sun- flowers)	Yellow, Autumn	Various	Strong-growing plants; useful for cutting.
Helleborus niger (Christ- mas Rose)	White, Winter	I	The Christmas Rose is a beautiful pearly flower of winter, evergreen, and a pleasure to seek for in December, when the rose- tinted buds nestle among the full green foliage. There are several charm- ing varieties, and by judi- cious selection flowers may be obtained through- out the winter months. Hellebores are not diffi- cult to manage. Their chief requirement is a well-prepared soil and sheltered position. Be- fore planting well trench the site three feet deep, adding plenty of well- decayed manure; and choose strong crowns, putting them about three feet apart each way. When the Hellebores are planted to form a margin it is not, of course, pos- sible to put a hand-light or frame over them with- out probably making an ugly blotch in the garden; but a hand-light certainly protects the flowers from rains and frosts, and, when protection is given before the buds open, the fully expanded flowers are quite unsullied. A few clumps of Hellebores pro- vide plenty of material for cutting. Where cut flowers, especially in win- ter, are desired, put a strong crown or crowns in tubs, or even deep boxes, and transfer to the greenhouse to flower. The time to plant Christ- mas Roses is the autumn. Propagation is best effected by division of the roots in August and September. The most beautiful varieties are the following:— <i>Maxi- mus</i> , also known as <i>alti- folius</i> , should be selected where there is space for only one kind; it blooms

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
<p>Helleborus niger (Christmas Rose)</p>	<p>White</p>	<p>I</p>	<p>early (November), and has white or rose-tinted flowers about 3 inches across, and three flowers sometimes appear on each stem. <i>Angustifolius</i>, as the name suggests, has narrow leaves; its flowers are very pure. St. Brigid (syn. <i>Juvernus</i>) has pale green leaves, apple-green flower stems, and very pure white, cup-shaped flowers. <i>Major</i>, or the Bath variety, is a noble kind, and much grown as a market flower. It is a strong form of the ordinary <i>H. niger</i>. <i>Riverton</i> is a tall, strong plant, with large, quite pure white flowers on apple-green stems. Apple Blossom, or <i>H. n. carnea</i>, has dark stems and leaves and flesh-tinted flowers. Those who are interested in raising new forms should cross-fertilise the best flowers on a few plants, and make a sowing of seed every year. When the seed is sown, as soon as it is ripe, say in June, the seedlings will appear above ground during the following March or April. The young plants grow freely, and flower from the third to the fifth year from seed. These seedling plants are luxuriant, and yield a larger proportion of large and well-shaped flowers than, as a rule, the divided plants. These flowers, although freely visited by bees and flies, rarely seed abundantly unless cross-fertilised with pollen from other individual plants or varieties. It is best to get pollen-bearing flowers from a friend's garden at a distance, as the late "St. Brigid" always used to do.</p> <p>The Lenten Roses are so called because of their</p>

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Helleborus niger (Christmas Rose)	White	1	<p>flowering about the time of the Lenten season, though many kinds bloom in January. This race has been secured by free cross-fertilisation of several species. There are many lovely hybrids, some almost self, others blotched and suffused with colour, as rich and effective as anything painted upon the flower of an orchid. Many of the hybrids are named, others seedlings, and amongst these occur flowers of beautiful and diversified colouring. <i>H. orientalis</i> is very charming, a creamy white flower touched with green; <i>H. o. antiquorum</i>, Willie Barr, rose-colour; <i>H. o. Commerzienrath Benary</i>, white, with spots of crimson; <i>H. o. Gertrude Jekyll</i>, pure white; <i>H. o. Gretchen Heinemann</i>, rose-purple; <i>H. o. guttatus</i>, white; <i>H. o. punctatissimus</i>, rose-purple, with rich spots of colour; and <i>H. o. roseus</i>, deep rose. The Lenten Roses are very easily grown in a fairly shady border, and may be raised from seed sown when ripe out of doors. It is needful to watch the plants when about to flower. Mice have a strange fondness for the buds. The flowers when gathered for the house quickly fade unless the base of the flower stem is split into four divisions for about 3 inches up the stem, or stalk, to use a more popular word.</p> <p>There are many other Hellebores. <i>H. fatidus</i>, a native species, is handsome when grouped; it has luxuriant deep green foliage, and spikes of greenish coloured flowers; the association of leaf and flower colour is pleasant to see.</p>

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
<i>Helenium autumnale</i> . .	Yellow; Summer and Autumn	3	The <i>Heleniums</i> are very useful, strong, vigorous, and free, with yellow flowers. <i>H. autumnale</i> is the best known, and of this there is a fine form named <i>grandiflorum</i> .
„ <i>pumilum</i> . .	Golden; Summer and Autumn	2	
„ <i>grandicephalum striatum</i> .	Crimson and Gold; Summer and Autumn	4-6	
<i>Hemerocallis</i> (Day-Lily), <i>flava</i> . .	Rich Yellow, June, July	2½	There are many kinds, but these are the most useful. The flowers of the Day-Lily last only about a day, but a succession is maintained. They are a success in ordinary soil in shady places, and are very useful in small gardens for filling places almost entirely in the shade.
„ <i>Thunbergi</i> . .	Soft Yellow, July-September	2	
„ <i>Kwanso fl. pl.</i> . .	Bronzy-Orange, July, August	3	
„ <i>aurantiaca major</i> .	Golden-Orange, July, August	3	
<i>Hesperis matronalis albo plena</i> (Double White Rocket)	White, Summer	2	A beautiful old-fashioned plant; any good soil. Useful for wild garden.
<i>Heuchera sanguinea</i> . .	Scarlet, May, June	2	Very bright flowers for warm soils, but propagate by division of the tufts after flowering, because seedlings vary considerably. Some of the <i>Heucheras</i> , <i>H. glabra</i> , and <i>H. Richardsoni</i> , have very highly-coloured leaves in winter.
„ <i>s. splendens</i> . .	Vermilion, May, June	2	
<i>Iberis correæfolia</i> . .	White, May, June	½	Very hardy and free.
Hollyhocks	...	...	See separate list (p. 19).
<i>Incarvillea Delavayi</i> . .	Purplish Crimson; May, June	2	This is a beautiful hardy plant, little understood; it is named after a French missionary, the Abbé Delavay, who discovered it in China, at an elevation of between 8000 to 10,000 feet. At first it was grown under glass, but in rich friable loam it has proved quite hardy, and is easily raised from seed.
Irises	...	...	See separate list (p. 19).
<i>Kniphofia</i> (<i>Tritoma</i>). (Red-hot Poker)	Autumn	Various	This group is known as the Flame-flower, because of the brilliant colouring of the scapes. There are many noble kinds, <i>grandis</i> being one of the most handsome; <i>gracilis</i> is another. These two, with the common <i>Uvaria</i> (<i>aloïdes</i>),

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Kniphofia (Tritoma) .	Autumn	Various	will suffice in a small garden. Deep, well-drained soil is necessary. Hard winters frequently kill the plants, but danger of this is reduced if the roots are put well down, and then a thick covering of dry leaves put over the crowns. Top dress with well-decayed manure in spring. For increase, divide the roots in March or April.
Lobelias, Scarlet (Lobelia cardinalis)	Scarlet; Summer	3, with spike	There are many charming forms of the Scarlet Lobelia. Queen Victoria and Firefly are the two most brilliant, with bronzy brown foliage, too—a rich contrast. Plant in spring, and in very cold localities lift and plant in a frame, as they are not very hardy. A deep bed in which is mixed well-decayed manure is necessary; they also enjoy moisture. For increase, divide in spring. Seed may be sown in January and February in shallow pans of light soil, and the seedlings planted out in the following spring.
Lunaria biennis (Honesty)	Various; mostly Purple	2½	Really a biennial. Very useful for wild garden.
Lupinus arboreus (Tree Lupine)	Soft Yellow; June–August	4–6	<div style="display: flex; align-items: center;"> <div style="font-size: 4em; margin-right: 10px;">{</div> <div> <p>The Tree Lupine likes plenty of warmth, sunshine, and a light soil. Seeds are easily raised, but plants vary considerably. When a good form is got, perpetuate it by cuttings taken from the branch with a little heel, and put in pots in a cold frame. The others are handsome, especially the white polyphyllus on banks and borders.</p> </div> </div>
„ nootkanensis .	Dark Blue; May	1½	
„ polyphyllus .	Purple; July	3	
„ p. albus .	Pure White; June, July	3	
Lychnis (Campion) chalcidonica plena .	Scarlet; July, August	3	<div style="display: flex; align-items: center;"> <div style="font-size: 4em; margin-right: 10px;">{</div> <div> <p>A beautiful family. L. chalcidonica is a handsome border plant. All the kinds like a warm soil and sunny place.</p> </div> </div>
„ dioica rubra plena .	Red-Crimson; May, June	2	

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
<i>Lychnis Vespertina plena</i> .	Double White ; July-Sept.	3	A beautiful family. <i>L. chalcedonica</i> is a handsome border plant. All the kinds like a warm soil and sunny place.
„ <i>haageana</i> , in variety	Vermilion-Scarlet ; August, September	2	
„ <i>Viscaria splendens plena</i>	Red-Crimson ; June-August	1½	
<i>Meconopsis integrifolia</i> .	Yellow ; May-June	1½	Both need peaty soil and some shade and both are really biennials.
„ <i>Wallichii</i> .	Lavender Blue	2½	
<i>Megaseas</i>	Spring	1½	Handsome plants, with bold, thick, quite leathery leaves, which, in winter, take on beautiful rose-crimson and bronzy-green colours. Succeed almost anywhere. Make good edgings or rough groups in the shrubbery margin and flower garden.
<i>Mertensia sibirica</i> . . .	Beautiful Bluish ; Early Summer	1½	Moist, peaty soil.
„ <i>virginica</i>	Lavender Blue ; April-May	1½	„ „
<i>Monarda</i> (Bee Balm) <i>didyma</i>	Crimson-Scarlet ; June-July	2½	This is known as the Bee Balm or Oswego Tea ; scarlet flowers ; likes moisture, but will do in ordinary border ; flowers for several weeks. Leaves fragrant when crushed.
<i>Mimulus</i> (Monkey-flower) .	Various ; Summer	½	The <i>Mimulus</i> includes the Common Musk, which is happy out of doors in a cool moist place like all the rest of the family. <i>M. cardinalis</i> and <i>M. cupreus</i> are very bright, and the hybrids usually grown in pots especially so. The Musk and the larger variety named Harrison's are excellent for pots.
<i>Morina longiflora</i> . . .	Rose coloured ; June, July	2	A picturesque thistle-like plant for the border.
<i>Myosotis</i> (Forget-me-not) .	Blue	½	There are many Forget-me-nots, but the chief one for the small garden or for the beginner is <i>M. dissitiflora</i> , which may be easily raised from seed sown as soon as ripe, or roots may be divided. But it sows itself about freely, and the pretty blue colouring of the flowers is welcome.

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Montbretias	Yellow, Orange; Summer, Autumn	2-3	The Montbretias are delightful for warm borders. Although they succeed in heavy soils, porous, well-drained ones are the best. An up-to-date set of Montbretias should include Star of the East, orange; Prometheus, dark orange; Lord Nelson, darkest orange; and Lady Hamilton, palest orange. There are others, but those named are indispensable. The roots should be lifted each autumn and treated like Gladioli. The following hybrids are very beautiful: M. Bouquet Parfait, yellow and vermilion; Drap d'Or, golden; Etoile de Feu, orange-red and yellow; Phare, crimson; Rayon d'Or, deep yellow; and Solfaterre, primrose colour.
Enothera (Evening Primrose)	Yellow;	Various	Any good garden soil.
Omphalodes verna (Creeping Forget-me-not)	Summer Deep Blue; Spring	1	A charming plant, with beautiful blue flowers. It is at home under shrubs, and likes a cool moist soil.
Pyrethrum	Various; Early Summer	2	The Pyrethrums are very useful border plants, thriving best in deep soils; many kinds, double and single, and in colour varying from white to intense crimson.
Pæonia (Pæony) . . .	...	...	See separate article (p. 22), for description of the garden kinds.
„ corallina	Carmine Single; Summer	3	This has coral-coloured seeds, which render the plant attractive in autumn.
„ Emodi	White; Summer	3	A very beautiful species.
„ paradoxa	Purple Red; Single	3	An attractive kind for its colour.
„ peregrina	Rich Crimson; Single	3	Of this there are several varieties, such as Brilliant and Blushing Maid.
„ tenuifolia	Rich Crimson; Single	2	This is easily known by its feathery foliage; quite a good garden plant; the double form is handsome.

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
<i>Pæonia wittmaniana</i> . . .	Single; Prim- rose Yellow	3	Very handsome. The single Pæonies (species) such as those enumerated are amongst the most beautiful of garden plants, and appreciate partial shade. This, too, prolongs the beauty of the flowers.
„ tree and herbaceous	Various; May, June, July	Various	See separate article (p. 21).
<i>Pentstemon barbatus</i> Torreyi	Scarlet; June- August	2½	A very graceful and effective plant for warm soils. The garden Pentstemons are described in a separate article (p. 24).
<i>Papaver</i> (Poppy) . . .	Various	Various	See separate articles and notes (p. 28).
<i>Papaver orientale</i> (Eastern Poppy)	Crimson, Scarlet, and Orange; May, June	2½	The finest variety is bracteatum. A noble group of perennials for wild places or the larger borders.
<i>Phlox</i> , herbaceous . . .	Various; June, July, & August	Various	See separate article (p. 25).
<i>Phygелиus capensis</i> . . .	Scarlet; Summer	3	This is most at home on a warm sunny border.
<i>Physalis</i> (Winter Cherry)	A winter plant	2	The <i>Physalis</i> is grown for winter effect, and is of value for its orange-scarlet, bladder-like calyx enclosing a small tomato-like fruit. P. A. Franchetti is larger in all its parts. These stems of showy "bladders" are useful for indoor decorations. Warm, fairly light soils.
Alkekengi	...	...	
„ Franchetti . . .	...	...	
Pinks	...	...	See separate article (p. 27).
<i>Platycodon grandiflorum</i> .	Bluish Purple; Summer	1½	A well-drained, deep, loamy soil. Good border plant. Mariesi is a quite dwarf variety, same colour; but there is a white form. Propagate by root division in the spring.
<i>Plumbago Larpentæ</i> (<i>Cerastostigma plumbaginoides</i>)	Blue; Autumn	1	Neat plant; warm soil; sunny place; good for sunny rockwork.
<i>Polemonium ceruleum</i> (Jacob's Ladder)	Blue; also White varieties	1½	The Jacob's Ladders are a very pleasing group of hardy plants, requiring well-drained soil, otherwise they will certainly damp off in winter.
„ Richardsoni .	Blue, and also White form	2	
„ himalaicum .	„	2	
<i>Polygonatum</i> (Solomon's Seal)	Creamy White	2	P. multiflorum is a charming plant; most happy in

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Polygonatum (Solomon's Seal)	Creamy White	2	shade of tree, copse, or by some shady walk. <i>P. officinale</i> is a smaller form. A moist, rich loam is the best soil; and it is advisable to top-dress the plants yearly with leaf-mould. Solomon's Seal may be increased by seed in spring or division in autumn or spring.
Polygonums (Knot Weeds)	Creamy White; Autumn	Various	The Polygonums are better adapted for quite rough places, or to stand singly on the lawn. <i>P. cuspidatum</i> and its variety <i>compactum</i> are the most common, but the roots run all over the garden. <i>P. sachalinense</i> is handsome by the waterside; it is 8 or 9 or even more feet high. <i>P. molle</i> is very beautiful, almost a climber, with white fleecy flowers in autumn.
Primulas (Primroses, &c.).	...	...	See separate article (p. 29).
Potentillas.	Various; Summer	1	A race of good garden flowers in light soil or sunny places. There are several fine varieties.
Ranunculus aconitifolius (Fair Maid of France)	White; April, May	2	Cool, moist place. The double kind is effective.
Rockets, Sweet.	...	...	See separate article (p. 31).
Rudbeckia Newmani	Gold and Black; August-October	2	A free-growing, good, border plant. Very effective.
„ purpurea.	Purple; Autumn	6	Tall, late, and welcome.
Saponaria officinalis fl. pl. (Soapwort)	Blush; Autumn	3	A very strong and free-growing plant. Will live almost anywhere.
Saxifragas (Rock foils)	Various	Various	Saxifragas form a most important family, and comprise a host of species and varieties. Some are mentioned in the list of rock plants. Others of importance are <i>S. Camposi</i> , which blooms in early spring, and has large white flowers. <i>S. Cotyledon</i> and its variety <i>pyramidalis</i> , especially the last named, are delightful; produce panicles of white, pink-dotted flowers. <i>S. granulata</i> is the native Meadow Saxi-

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Saxifragas (Rock foils)	Various	Various	frage; its double variety is charming. <i>S. hypnoides</i> is the Mossy Saxifrage so much used for edgings; will grow almost anywhere. <i>S. longifolia</i> , with its crusted foliage and flower panicles, <i>S. sarmentosa</i> , "Mother of Thousands" of cottage-windows, the London Pride (<i>S. umbrosa</i>), and the brilliant early dwarf, <i>S. oppositifolia</i> and its forms, must also be included.
Scabiosa caucasica	Blue-Lilac; June-Sep- tember	2½	Tall, graceful stems; must have well-drained, light soil.
" " alba " " magnifica	White See coloured plate	...	
Sedum (Stonecrop)	Various	Various	Several kinds are given in the rock-garden list. The Stonecrops are delightful plants for edgings. A popular, tall kind (1½ ft.) for gardens, town or country, is <i>S. spectabile</i> , which makes quite a little bush, with rose-coloured flower clusters in autumn. Will grow almost anywhere. <i>S. s. atropurpurea</i> is a deep-coloured variety.
Senecio japonicus	Deep Orange; Summer	5	Only suitable for rich, moist soils.
" pulcher	Warm Purple; September	1½	Only in rich soils, and positions screened from keen winds.
Solidago (Golden Rod)	Yellow; Autumn	Various	Grow anywhere; rather too vigorous, but effective in borders and rough places.
Thalictrum aquilegifolium	Creamy; June	2½	Tall plants; quite ball-like flower heads; very graceful and beautiful with their bold fern-like leaves too.
" " purpureum	Purple; June	2½	
" dipterocarpum	Violet; August	4-6	
Tiarella cordifolia (Foam-flower)	Creamy; May and June	1	Moist, cool soils. Very charming in groups in front of borders or to form a kind of margin.
Trillium (Trinity-flower, or White Wood Lily)	Various	1	The most beautiful of this group is <i>T. grandiflorum</i> , which has pure white flowers, and is delightful for a moist, shady, peaty

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A LARGE-FLOWERED VARIETY OF THE CAUCASIAN SCABIOUS
(*SCABIOSA CAUCASICA MAGNIFICA*).

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Trillium (Trinity-flower, or White Wood Lily)	Various	1	place in the rock-garden, or at the margins of evergreen or deciduous shrubs. <i>T. sessile</i> , <i>T.</i> <i>californicum</i> , <i>T. erectum</i> , and one or two others are good too, but none approach <i>grandiflorum</i> .
Trollius (Globe flower)	Various; Spring and Summer	Various	The Trolliuses, or Globe flowers, are charming early-flowering perennials. They like moisture and rich soil. You cannot do better than have the rich yellow <i>T. napellifolius</i> , deep orange <i>T. Fortunei</i> (<i>japonicus fl. pl.</i>), golden- coloured <i>Asiaticus</i> , and a variety called Orange Globe.
Tropæolum polyphyllum	Yellow; Summer	Trails	A pretty trailing plant; not always happy in gardens. The leaves are greyish; flowers yellow in long trails.
Tropæolum speciosum (Flame Nasturtium)	Crimson; Summer	Trails	Every enthusiastic amateur almost tries to establish this <i>Tropæolum</i> , but it is fickle. This is the climber that covers many a High- land cottage with beauty, and it enjoys the bracing mountain air. The best soil is moist loam mixed with some peat, and shade is important. Put the roots half a foot deep, and do not disturb them.
Tussilago fragrans (Winter Heliotrope)	Greyish; Winter	$\frac{1}{2}$	This is a flower of winter, with nutty perfume, and grows in ordinary soils. Only of value for its per- fume and winter flower- ing.
Verbascum (Mullein)	Various	Various	Very useful bold plants for the wild garden.
Veronicas	Various	Various	The Veronicas are a pretty family. <i>V. subsessilis</i> , which is about 3 feet high, is one of the most important: its flowers are blue. <i>V. rupestris</i> and <i>V. repens</i> are creeping, and form quite a green mat, covered respectively with blue and white flowers in summer. <i>V.</i> <i>incana</i> is welcome for its

NAME.	COLOUR, AND TIME OF FLOWERING.	HEIGHT. FEET.	GENERAL REMARKS.
Veronicas	Various	Various	silvery foliage. <i>V. genianoides</i> and its varieties are suitable too, but the best for the ordinary border is <i>subsessilis</i> . They succeed in ordinary soil.
<i>Xerophyllum asphodeloides</i> (Turkey Beard)	Ivory White; Summer	2	A graceful plant, with dense spikes of bloom; appreciates moisture, shade, and a peaty soil. It has grassy foliage, and is not a plant for every garden.
<i>Zauschneria californica</i> . " " splendens	Vermilion- Scarlet; Early Autumn	1	The variety <i>splendens</i> is a fine form in warm, light soil, and we have known this plant happy in the chinks of old walls. Propagate by root division or seeds in spring.

ROSES

BUSH VARIETIES FOR QUITE A SMALL GARDEN

The cultivation of Roses is fully dealt with on pages 67-95

NAME.	COLOUR.	CLASS.	STOCK.
Common Moss	Pink .	Moss	Own Root
Jessie	Bright Crimson	Polyantha	Briar or Own Root
Hugh Dickson	Red	Hybrid Perpetual	"
Mrs. J. Laing	Pink	"	"
Mme. Abel Chatenay . .	Rosy Salmon	Hybrid Tea	"
Mme. Ravary	Golden Yellow	"	"
Aimée Vibert (climber) .	White	Noisette	"
La France	Pink	Hybrid Tea	"
Caroline Testout	Deep Pink	"	"
Viscountess Folkestone .	Blush White	"	"
Mme. Jules Grolez . . .	Deep Rose	"	"
Marie Van Houtte	Pale Yellow	Tea	"
Gloire de Dijon (for wall or fence)	Cream	"	"
W. A. Richardson	Orange & White	Noisette	"
Common Monthly	Pale Pink	Chinese	Own Root
Mme. Laurette de Messimy .	{ Rose & other shades }	"	"
Hon. Edith Griffith	Ivory White	Tea	Briar or Own Root
Gruss an Teplitz	Crimson	Hybrid Tea	"

ROSES AS BUSHES OR SHORT STANDARDS FOR
WINDY PLACES

NAME.	COLOUR.	CLASS.	STOCK (if as bushes).
Charles Lawson . . .	Rose	Hybrid Chinese	Own Root
Mme. Plantier . . .	White	"	"
Conrad F. Meyer . . .	Pink	Hybrid Rugosa	Own Root or Manetti
Chenedole . . .	Crimson	Hybrid Chinese	Own Root
Scotch Roses . . .	Various	Scotch	"
Mme. Hardy . . .	White	Damask	"
La Ville de Bruxelles . . .	Rosy Pink	"	"
Maiden's Blush . . .	Blush	Alba	Own Root or Manetti
Blanc Double de Courbet . . .	White	Rugosa	"
Mrs. A. Waterer . . .	Red	"	"
Rugosa rosea . . .	Pink	"	"
" alba . . .	White	"	"
Blanche Moreau . . .	"	Moss	"
Gen. Jacqueminot . . .	Red	Hybrid Perpetual	"
Jules Margottin . . .	Cherry	"	"
John Hopper . . .	Pink	"	"
Magna Charta . . .	Deep Pink	"	"
Caroline Testout . . .	Rose	Hybrid Tea	"
Mrs. J. Laing . . .	Pink	Hybrid Perpetual	"
Ulrich Brunner . . .	Red	"	"
Hugh Dickson . . .	Crimson	"	"
Armosa . . .	Silvery Pink	Bourbon	Own Root.
Common Monthly . . .	Pink	Chinese	"
Fellenberg . . .	Light Red	Noisette	"
Mrs. Paul . . .	Blush	Bourbon	Own Root or Manetti
Cheshunt Hybrid . . .	Magenta	Hybrid Tea	Own Root or Briar
Gloire de Dijon . . .	Cream	Tea	"
Camoens . . .	Deep Rose	Hybrid Tea	"

ROSES FOR ARCHES AND PERGOLAS

NAME.	COLOUR.	CLASS.	STOCK.
Reine Olga de Wurtemberg .	Light Crimson	Hybrid Tea	Own Root or Briar
Excelsa . . .	Crimson	Wichuraiana	"
Aimée Vibert . . .	White	Noisette	"
Alberic Barbier . . .	Creamy White	Wichuraiana	"
American Pillar . . .	Blush Pink	Multiflora	"
The Garland . . .	Buff	Hybrid Musk	"
Félicité Perpetue . . .	White	Sempervirens	Own Root
Flora . . .	Pink	"	"
Psyche . . .	Flesh Pink	Multiflora	Own Root or Briar
Mme. Alfred Carriere . . .	Creamy White	Tea	"
Blush Rambler . . .	{ Apple Blossom Colour }	Multiflora	"
Ard's Pillar . . .	{ Rich Velvety }	Hybrid Perpetual	"
	{ Crimson }		
Dorothy Perkins . . .	Rose, flowers late	Wichuraiana	"
Tausendschön . . .	Blush Pink	Multiflora	Own Root

HYBRID TEA ROSES
TWENTY-FOUR FOR BEDDING

NAME.	COLOUR.	STOCK.
Antoine Rivoire . . .	Rosy Flesh	{ Briar, Seedling, or Cutting, or own Root
* Augustine Guinoisseau . . .	{ Rosy White, very sweet ; flowers well in autumn }	"
* Camoens	{ Glossy Rose, most abundant and continuous bloomer }	"
*Grace Darling	{ Cream, Shaded Pink, splendid grower and very hardy }	"
*Grand Duc A. de Luxembourg . . .	{ Clear Pink, reverse of petals Rich Rose }	"
* General MacArthur	Scarlet	"
* Madame Ravary	Golden Yellow	"
* Duchess of Wellington	Saffron Yellow	"
*Killarney	Flesh Pink, lovely buds	"
Liberty	Very Crimson, very fine	"
* La France	Silvery Pink, one of the best	"
La Tosca	Rose, very vigorous	"
Lady Battersea	Crimson shade	"
* Mme. Abel Chatenay	{ Carmine, Shaded Deep Salmon, an exquisite variety and most fragrant }	"
* Lady Ashtown	Pink	"
* Mme. Jules Grolez	{ China Rose colour, very bright and pretty }	"
Mme. Leon Pain	Soft, Creamy Pink	"
* Mme. Pernet-Ducher	{ Canary Yellow buds, expanding White, one of the very best for a large mass }	"
* Mme. Segond Weber	Salmon	{ Briar, Seedling, or Cutting, or Own Root
* Mrs. H. Stevens	White	"
Pharisaer	Rosy White	"
Prince de Bulgarie	{ Soft Salmon Rose, a very pretty flower }	"
Sulphurea	{ Pale Yellow, very free, good garden rose }	"
* Viscountess Folkestone	{ Creamy Pink, Shaded Salmon, very free and beautiful }	"

The varieties marked thus * are good also as standards, and those marked || are the best for pot culture. In addition to the latter, the following are first-rate for the same purpose:

NAME.	COLOUR.	STOCK.
Clara Watson		{ Briar, Seedling, or Cutting, or Own Root
Duchess of Albany	{ Salmon Pink, fine, almost a red La France, splendid }	"
Gloire Lyonnaise	Lemon White	"
Liberty	Crimson	"
Sunburst	Golden Yellow	"
Souvenir de G. Prat	Yellow	"
Souvenir du President Carnot	{ Rosy Flesh, Shaded White, beautiful long buds }	"
Richmond	Scarlet	"

ROSE GUSTAVE REGIS AS A LARGE BUSH OR DWARF PILLAR.

ROSE UNA AS A PILLAR.

**PILLAR ROSES THAT WILL GROW TO A HEIGHT OF
7 TO 10 FEET**

NAME.	COLOUR.	CLASS.	STOCK.
American Pillar	Pink and White	Multiflora	Own Root
Blush Rambler	Blush	"	Briar or Own Root
Gloire de Dijon	Cream and Buff	Tea	"
François Crousse	Scarlet	"	"
Reine Marie Henriette . .	Cherry Red	Hybrid Tea	"
W. A. Richardson	Orange	Noisette	"
Carmine Pillar	Carmine	Hybrid	"
Crimson Rambler	Crimson	Multiflora	"
Bennett's Seedling	White	Ayrshire	"
Reine Olga de Wurtemberg .	Rosy Red	Hybrid Tea	"
Mme. Berard	Salmon Rose	Tea	"
Aimée Vibert	White	Noisette	"
Longworth Rambler	Light Crimson	"	"
Una	Creamy White	Hybrid Briar	"
Dorothy Perkins	Pink	Wichuraiana	"

The Penzance Briars also make splendid pillars.

SIX PILLAR ROSES OF MORE MODERATE GROWTH

NAME.	COLOUR.	CLASS.	STOCK.
Alister Stella Gray	Yellowish White	Noisette	Own Root or Briar
Climbing Cramoie Supérieure	Crimson	China	"
Gloire de Margottin	Scarlet	Hyb. Perpetual	"
Gruss an Teplitz	"	Hybrid Tea	"
Gustave Regis	Cream	"	"
Zephirine Drouhin	Cerise	Bourbon	"

CLIMBING ROSES FOR GREENHOUSE ROOF OR PILLARS

NAME.	COLOUR.	STOCK.
Bouquet d'Or	Rich Coppery Yellow	{ Briar, Seedling, or Cutting
Celine Forestier	Primrose	"
Cheshunt Hybrid	{ Magenta Crimson, a bad colour outdoors, but attractive under glass }	"
Climbing Belle Siebrecht . .	Imperial Pink, grand	"
Climbing Kaiserin A. Victoria	Creamy White	"
Climbing Lady Ashtown . . .	Pink	"
Climbing Niphetos	Pure White	"
Climbing Perle des Jardins .	Golden Yellow	"
Fortune's Yellow	Orange, Rose, and many tints	"
François Crousse	Scarlet	"
Gloire de Dijon	Salmon Yellow	"
Gustave Regis	Canary Yellow	"
L'Ideal	{ Coppery Rose, very beautiful tints }	"
Madame Berard	Salmon Rose	"
Maréchal Niel	{ Golden Yellow. The king of Roses }	"
Monsieur Desir	Velvety Crimson, fine	"
Reine Marie Henriette . . .	{ Pale Crimson, known as the red Gloire de Dijon }	"
Rêve d'Or	Coppery Yellow buds	"
Solfaterre	Sulphur Yellow	"
W. A. Richardson	Orange Yellow	"

SO-CALLED CLIMBING ROSES GROWN AS LARGE BUSHES

Where walls, fences, &c., are limited, many of the splendid vigorous Teas and Noisettes may be successfully grown in bush or shrub form. Plant them in October, 3 or 4 feet or more apart, and in March shorten the growths to 2 feet. Each season the annual growths must be thus cut back, and some of the very old wood entirely removed.

NAME.	COLOUR.	STOCK.
Bouquet d'Or	Apricot	Briar
Belle Lyonnaise	Pale Yellow	"
Conrad F. Meyer	Rose, very sweet	"
Gloire de Dijon	Cream	"
Gruss an Teplitz	Scarlet	Own Root
Lady Waterlow	Pink and Cream	Briar
Madame Chauvry	Apricot	"
" Berard	Salmon Rose	"
Mons. Desir	Velvety Crimson & Purple	"
Pink Rover	Pink, very sweet	"
Waltham Climber	Crimson	"
W. A. Richardson	Orange	"

HYBRID PERPETUAL ROSES FOR POTS

VARIETY.	COLOUR.	STOCK.
Captain Hayward	Crimson Carmine	Briar or Own Root
Duke of Wellington	Scarlet Crimson	"
Frau Karl Druschki	White	"
General Jacqueminot	Scarlet Crimson	"
Hugh Dickson	Scarlet	"
Mlle. G. Luizet	Silvery Pink	"
Magna Charta	Rose	"
Marie Baumann	Red	"
Merveille de Lyon	White	"
Mrs. G. Dickson	Pink	"
Mrs. J. Laing	Rosy Pink	"
Mrs. S. Crawford	"	"
Pride of Waltham	Salmon Pink	"
Prince Arthur	Rich Red	"
Spenser	Blush Pink	"
Ulrich Brunner	Cherry Red	"
Victor Verdier	Rose	"
Violette Bouyer	White, Shaded Pink	"

SINGLE AND SEMI-DOUBLE ROSES

Most of these should receive no pruning beyond thinning out the old worn-out wood in autumn.

SOME SINGLE AND SEMI-DOUBLE ROSES

NAME.	COLOUR.	STOCK.
Altaica	White; large	Own Root
Andersoni	Pink	Manetti
Austrian Copper	Copper	"
" Yellow	Yellow	"
Bardou Job	Crimson and Black	Briar
*Carmine Pillar	Carmine	Own Root
Hebe's Lip	White, edged Red	Briar
*Hiawatha	Scarlet	"
Hugonis	Yellow	"
Irish Elegance	Apricot and Pink	"

Those marked thus * are Ramblers; the others are Bushes or Pillars.

NAME.	COLOUR.	STOCK.
Lady Penzance	{ Coppery Yellow; Sweet Briar foliage }	Briar
*Leuchstern	Pink; large White Eye	Own Root
Macrantha	Blush; large	"
Meg Merrilies	{ Crimson; Sweet Briar foliage }	"
Moschata alba	White	"
*Polyantha grandiflora	Large White	"
Rugosa	Pink; fine seed-pods	"
" alba	Pure White; fine seed-pods	"
sinica Anemone	Pink	"

Those marked thus * are Ramblers; the others are Bushes or Pillars.

The following are beautiful as standards or for steep rough banks. Very strong.

NAME.	COLOUR.	STOCK.
Wichuraiana	White; creeps like ivy	Own Root
" *Alberic Barbier	{ Cream, deepening to Yellow; semi-double, dark leaves }	"
" *Auguste Barbier	Rose Lilac; semi-double	"
" *Jersey Beauty	White; buds yellow	"
" *Paul Transon	Rose; double	"
" *René André	Saffron Yellow	"
" Repens alba	{ White; very beautiful, makes excellent standard }	"

* These are hybrids.

DWARF GROWING TEA ROSES FOR THE GARDEN

VARIETY.	COLOUR.	STOCK.
*Anna Olivier	Salmon Rose	{ Seedling, Briar, or Own Root
Comtesse F. Hamilton	Reddish Apricot	"
Dr. Grill	Coppery Yellow	"
Francisca Kruger	"	"
Francis Dubrieul	Crimson	"
*G. Nabonnand	Rose	"
*Hon. E. Gifford	Flesh White	"
Jean Pernet	Bright Yellow	"
*Lady Roberts	Apricot	"
*Mme. Antoine Mari	Rose and White	"
Mme. Falcot	Apricot	"
*Mme. Hoste	Clear Yellow	"
*Mme. Lambard	Salmon Pink	"
Maman Cochet	Flesh Pink	"
*Marie Van Houtte	Yellow and White	"
Mrs. H. Stevens	White	"
Mrs. R. Smith	Blush	"
Souvenir de C. Gaillot	Golden Red	"
*Souvenir de S. A. Prince	Pure White	"
Souvenir d'un Ami	Salmon Rose	"
*Sulphurea	Pale Yellow, very free	"
White Maman Cochet	White, Tinted Blush	"

Those marked thus * are especially good for bedding.

STRONG GROWING TEA, HYBRID TEA, AND NOISSETTE ROSES

To grow as large bushes or for pegging down.

VARIETY.	COLOUR.	STOCK.
Belle Lyonnaise	Yellow	Briar or Own Root
Billiard et Barre	Deep Yellow	"
Bouquet d'Or	Deep Coppery Yellow	"
Celine Forestier	Primrose	"
Corallina	Bright Rose-Crimson	"
Crepuscle	Orange	"
Dr. Rouges	Reddish Bronze	"
Gloire de Dijon	Salmon Yellow	"
Gustave Regis	Yellow-Cream	"
Kaiserin Friedrich	Yellow, Shaded Pink	"
Lady Waterlow	Pink and Cream	"
L'Ideal	Metallic Red	"
Mme. Berard	Fawn-Yellow	"
Mme. Jules Siegfried	Cream	"
Mme. Moreau	Coppery Yellow	"
Mme. P. Cochet	Orange	"
Mme. Wagram	Satin Rose	"
W. A. Richardson	Orange	"

It will be noticed that the majority of sorts in this list are of yellow colours, but all are distinct. They are the best varieties to grow in order to provide a good supply of yellow Roses. Although often planted against walls, they will succeed admirably as bushes by leaving their growths about 2 feet long when pruning, and bending over the longer shoots as devised in pegging down.

TWENTY TEA ROSES FOR POT CULTURE

VARIETY.	COLOUR.	STOCK.
Anna Olivier	Salmon Rose	Briar or Own Root
Bridesmaid	Bright Pink	"
Catherine Mermet	Flesh	"
Etoile de Lyon	Clear Yellow	"
Hon. E. Gifford	Flesh White	"
Lady Hillingdon	Golden	"
Lady Roberts	Apricot	"
Mme. de Watteville	White, edged Rose	"
Mme. Hoste	Clear Yellow	"
Mme. Lambard	Salmon Pink	"
Maman Cochet	Flesh Pink	"
Marie Van Houtte	Yellowish White	"
Mrs. Foley Hobbs	White and Blush	"
Mrs. H. Stevens	White	"
Niphetos	Snow White	"
Perle des Jardins	Yellow	"
Souvenir d'un Ami	Rose	"
Sunrise	Apricot, Shaded Carmine	"
Sunset	Apricot	"
The Bride	White	"

**TWENTY-FOUR HYBRID PERPETUAL ROSES AS
BUSHES OR STANDARDS**

VARIETY.	COLOUR.	STOCK FOR DWARFS.
A. K. Williams	Rich Red	Briar
*Alfred Colomb	Light Red	{ Briar, Manetti, or Own Root
Beauty of Waltham	Cherry Red	"
*Captain Hayward	Crimson Carmine	"
Charles Lefebvre	Velvety Crimson	"
*Clio	Pale Flesh	"
*Commandant Felix Faure	Scarlet	"
Comte Raimband	Clear Crimson	"
*Dr. Andry	Bright Crimson	"
Duke of Edinburgh	Scarlet Crimson	"
*Dupuy Jamain	Cerise	"
Eugene Furst	Velvety Crimson	"
*Fisher Holms	Crimson Scarlet	"
Frau Karl Druschki	White	"
*General Jacqueminot	Scarlet Crimson	Briar or Own Root
Geoffrey Henslow	Dark Crimson	"
Gloire de Ched. Guinoisseau	Crimson	"
*Jeannie Dickson	Silvery Rose	{ Briar, Manetti, or Own Root
*John Hopper	Rose	"
Mme. G. Luizet	Silvery Pink	"
*Mrs. John Laing	Rosy Pink	"
*Mrs. Sharman Crawford	"	"
Prince C. de Rohan	Crimson Maroon	"
*Ulrich Brunner	Cherry Red	"

Those marked * are good for bedding.

**ROSES FOR SMOKY DISTRICTS, OPEN SPACES NEAR
LARGE TOWNS, OR WHERE SOIL IS VERY POOR**

Those marked thus * would be especially good sorts to plant in gardens near the sea, and the bushes should be upon their own roots. Those marked thus ** are Rambling Roses. Dig the ground deeply before planting; incorporate some manure at same time. If the texture is heavy, add grit, road scrapings, and at all times burnt garden refuse is very valuable to mix in. If the soil be light and sandy, give preference to the Teas, Hybrid Teas, and Chinese, and work in some clayey soil if procurable, failing that a good dressing of cow manure is very helpful, especially if a good layer is put underneath at a depth of about 2 feet.

NAME.	COLOUR.	CLASS.	STOCK.
**Aglaia	Yellow	Polyantha	Own Root or Briar
**Aimée Vibert*	White	Noisette	"
Armosa*	Rosy Pink	Bourbon	Own Root
Baron de Wassanaer	Red	Moss	"
Beaute de Lyon	Terra Cotta	Pernetiana	"

NAME.	COLOUR.	CLASS.	STOCK.
Blairii No. 2	Blush Pink	Hybrid Chinese	Own Root
Blanc Double de Courbet*	White	Rugosa	Own Root or Briar
Camoens	Rose	Hybrid Tea	"
**Carmine Pillar* (single)	Carmine	Hybrid	Own Root or Manetti
Caroline Testout*	Rich Pink	Hybrid Tea	Own Root or Briar
Celestial*	Blush Pink	Alba	Own Root or Manetti
Charles Lawson*	Rose	Hybrid Chinese	Own Root
Chenedole	Crimson	"	"
Cheshunt Hybrid*	Magenta	Hybrid Tea	Own Root or Briar
Clio	Blush	Hybrid Perpetual	"
Clothilde Soupert	Peach & White	Polyantha	"
Common China*	Pink	Chinese	Own Root
Common Moss*	"	Moss	"
Conrad F. Meyer*	"	Hybrid Rugosa	"
**Crimson Rambler*	Crimson	Polyantha	Own Root or Briar
Dupuy Jamain	Cerise	Hybrid Perpetual	"
Enchantress*	Creamy Buff	Tea	"
**Félicité Perpetue	White	Ayrshire	Own Root
Fellenberg	Red	Noisette	Own Root or Briar
**Flora	Pink	Evergreen	Own Root
Gen. Jacqueminot*	Red	Hybrid Perpetual	Own Root or Briar
**Gloire de Dijon*	Cream	Tea	"
Gloire des Polyantha*	Deep Pink	Polyantha	"
Grace Darling*	Peach & Yellow	Hybrid Tea	"
**Grandiflora* (single)	White	Polyantha	Own Root
Gruss an Teplitz	Scarlet	Hybrid Tea	Own Root or Briar
Harrisonii	Yellow	Australian Briar	Own Root
Hybrid Sweet Briars*	Various	Sweet Briar	"
John Hopper	Rose Pink	Hybrid Perpetual	Own Root or Briar
Jules Margottin*	Cherry	"	Own Root
Juliet*	{ Carmine and } { Old Gold }	Pernetiana	"
La France*	Pink	Hybrid Tea	Own Root or Briar
La Ville de Bruxelles*	Rose	Damask	Own Root
**Mme. Alf. Carriere*	Creamy & White	Tea	Own Root or Briar
Mme. Hardy	White	Damask	Own Root
Mme. Lambard*	Pink & Red	Tea	Own Root or Briar
Mme. Plantier	White	Hybrid Chinese	Own Root
Mme. Wagram*	Carnation Pink	Hybrid Tea	Own Root or Briar
Magna Charta*	Deep Pink	Hybrid Perpetual	"
Maharajah	Crimson	"	"
Maman Cochet	Rosy Pink	Tea	"
Marie Van Houtte*	Pale Yellow	"	"
Mrs. A. Waterer	Red	Rugosa	"
Mrs. J. Laing	Pink	Hybrid Perpetual	"
Nova Zembla*	White	Hybrid Rugosa	"
Paul Ricant	Red	Hybrid Chinese	Own Root
**Reine Olga de Wurtem- burg	Crimson	Hybrid Tea	Own Root or Briar
Rose a parfum de l'Hay*	Red	Hybrid Rugosa	"
Ruga	Blush	Ayrshire	Own Root
Rugosa rosea	Rosy Pink	Rugosa	Own Root or Briar
Souvenir de Malmaison	Blush White	Bourbon	"
Stanwell Perpetual*	Blush	Perpetual Scotch	Briar
**The Garland	Fawn	Hybrid Musk	Own Root
Ulrich Brunner*	Red	Hybrid Perpetual	Own Root or Briar
Viscountess Folkestone*	Pink & Cream	Hybrid Tea	"
**Waltham Climber, No. 1*	Crimson	Tea	"

ROSES AS LARGE BUSHES

Roses that form themselves into huge bushes have their advocates nowadays. We do not advise amateurs to grow them unless they have abundance of space. Such plants are best given a support in the form of a centre stake. Allow them to grow at random, merely removing dead or very old growths. The following varieties are excellent :

NAME.	COLOUR.	CLASS.	STOCK.
Blairii No. 2	Blush Pink	Hybrid Chinese	Own Root
Blanc Double de Courbet	White	Rugosa	Own Root or Briar
Climbing Souv. de Wootton	Rosy Red	Hybrid Tea	"
Conrad F. Meyer	{ Very early, } Rose, fine }	"	"
De la Grifferaie	Rosy Pink	Multiflora	Own Root
Dawn	Blush	Hybrid Tea	Own Root or Briar
Dawson Rose	Pink	Multiflora	"
Félicité-et-Perpétue	White	Evergreen	Own Root
Fellenberg	Rosy Red	Noisette	"
Flora	Pink	Evergreen	"
Gloire de Dijon	Cream	Tea	Own Root or Briar
Gruss an Teplitz	Scarlet	Hybrid Tea	"
Juliet	{ Carmine and } Old Gold }	Pernetiana	"
Longworth Rambler	Cherry Red	Hybrid Tea	"
Macrantha	Blush	Gallica	"
Mme. Alfred Carriere	White & Cream	Tea	"
Mme. Plantier	White	Hybrid Chinese	"
Magna Charta	Deep Pink	Hybrid Perpetual	"
Maiden's Blush	Blush	Alba	Own Root
Paul's Single White	White	Noisette	"
Polyantha Simplex	"	Multiflora	"
Reine Olga de Wurtemberg	Crimson	Hybrid Tea	Own Root or Briar
Rugosa rosea	Rose	Rugosa	"
Souvenir de Mme. Joseph Metral	Cerise	Tea	"
Ulrich Brunner	Red	Hybrid Perpetual	"
Waltham Climber No. 1	Crimson	Tea	"

A FEW OF THE BEST SPECIES OF ROSE

On own roots where possible to procure them.

NAME.	COLOUR.	HABIT.
R. alba	Blush	Bush
" alpina	Purple; lovely heps	"
" canina (this is the dog rose of our hedgerows)	Various	"
" ferruginea or rubrifolia	Pink	{ Bush, mostly grown for its lovely red foliage
" hispida	Yellow	Bush
" hugonis	"	"
" indica	{ Pink. This is the type from which Tea Roses have sprung }	"

NAME.	COLOUR.	HABIT.
R. <i>lævigata</i> or Cherokee Rose .	White	Wall Climber
„ <i>lucida</i> and double variety .	Bright Red	Bush
„ <i>lutea</i>	Yellow	„
„ <i>moschata alba</i>	White and Pink	„
„ <i>Moyseii</i>	Brown and Crimson	„
„ <i>multiflora</i>	White	„
„ <i>rugosa</i>	Rose	„
„ <i>setigera</i> , Prairie Rose	Pink, late flowering	„
„ <i>spinossissima</i> , the single Scotch Rose	Various	„
„ <i>wichuraiana</i> . Many lovely hybrids are now being raised from this species	White	{ Creeping on the ground like ivy

BUTTON-HOLE ROSES FOR OUTDOOR CULTURE

Only such varieties as produce neat flowers are mentioned. Common Moss, Blanche Moreau, A. K. Williams, Gloire Lyonnaise, Alfred Colomb, Victor Hugo, Souvenir de Malmaison, Bouquet d'Or, W. A. Richardson, L'Idéal, Gustave Regis, Mme. Berard, Mme. Moreau, Anna Olivier, Catherine Mermet, Francis Dubrieul, Mme. C. Guinoisseau, Mme. Falcot, Mme. Hoste, Mme. P. Perny, Marie Van Houtte, Mrs. Alfred Tate, Papa Gontier, Corallina, Souvenir de C. Guillot, Sunrise, Killarney, Mme. Abel Chatenay, Souvenir du President Carnot, Mrs. H. Stevens, Carino, Florence H. Veitch.

ROSES CLASSED ACCORDING TO COLOUR

Roses vary so much in colour that classification is difficult. Where space allows, it is always advisable to plant a bed or group of one sort. For instance, if a mass of rich pink were required, far better to plant a Rose like Caroline Testout than several varieties approaching it in colour. But as this work is for the beginner, we have given the names of a few of the best varieties of their colour. Those marked ** are very vigorous, and best as large bushes or in clusters in beds. Others marked thus * are vigorous.

NAME.	CLASS.	STOCK.
<i>Pure White—</i>		
Niphetos	Tea	Briar or Own Root
*Blanc Double de Courbet	Rugosa	„
Frau Karl Druschki	Hybrid Perpetual	„
Souvenir de S. A. Prince	Tea	„
Anna Marie de Montravel	Polyantha	„
Molly S. Crawford	Tea	„
Mrs. H. Stevens	„	„
British Queen	Hybrid Tea	„
<i>White-tinted Blush or Lemon—</i>		
The Bride	Tea	Briar or Own Root
Mme. Leon Pain	Hybrid Tea	„
*Margaret Dickson	„	„
*White Maman Cochet	Tea	„

NAME.	CLASS.	STOCK.
<i>White-tinted Blush or Lemon—</i>		
*Clio	Hybrid Perpetual	Briar or Own Root
Sulphurea	Tea	"
Hon. E. Clifford	"	"
Augustine Guinoisseau	Hybrid Tea	"
*Gloire Lyonnaise	"	"
Souvenir de la Malmaison	Bourbon	"
Pharisaer	Hybrid Tea	"
Peace	Tea	"
Antoine Rivoire	Hybrid Tea	"
Prince de Bulgarie	"	"
<i>Creamy White or Buff—</i>		
Enchantress	Tea	Briar or Own Root
Anna Olivier	"	"
**Gloire de Dijon	"	"
Mrs. A. Munt	Hybrid Tea	"
<i>Flesh Pink—</i>		
Captain Christy	Hybrid Tea	Briar or Own Root
*Clara Watson	"	"
*G. Nabonnand	Tea	"
La Tosca	Hybrid Tea	"
<i>Pale Pink—</i>		
Baroness Rothschild	Hybrid Perpetual	Briar or Own Root
*Mme. G. Luizet	"	"
La France	Hybrid Tea	"
Maman Cochet	Tea	"
Killarney	Hybrid Tea	"
*Grace Darling	"	"
*Mrs. J. Laing	Hybrid Perpetual	"
Mme. Segond Weber	Hybrid Tea	"
<i>Rosy Pink—</i>		
Mlle. Marie Finger	Hybrid Perpetual	Briar or Own Root
*Caroline Testout	Hybrid Tea	"
Mrs. Sharman Crawford	Hybrid Perpetual	"
Mrs. W. J. Grant	Hybrid Tea	"
Bridesmaid	Tea	"
*Mme. Lambard	"	"
*Mme. A. Chatenay	Hybrid Tea	"
Mrs. A. Tate	"	"
Lady A. Stanley	"	"
<i>Rose—</i>		
*Jeannie Dickson	Hybrid Perpetual	Briar or Own Root
Marquise de Castellane	"	"
Suzanne M. Rodocanachi	"	"
Camoens	Hybrid Tea	"
Mme. J. Grolez	"	"
*Mme. Laurette Messimy	China	"
Mrs. W. Christie Miller	Hybrid Perpetual	"
Rose Queen	Hybrid Tea	"
<i>Cerise—</i>		
Helen Keller	Hybrid Perpetual	Briar or Own Root
*Dupuy Jamain	"	"
<i>Light Red—</i>		
*Ulrich Brunner	Hybrid Perpetual	Briar or Own Root
Alfred Colomb	"	"
Lady Battersea	Hybrid Tea	"
<i>Carmine Rose—</i>		
Marquise Litta	Hybrid Tea	Briar or Own Root
*Mme. Isaac Periere	Hybrid Briar	"
Marie d'Orleans	Tea	"

NAME.	CLASS.	STOCK.
<i>Light Crimson—</i>		
*Mme. V. Verdier	Hybrid Perpetual	Briar or Own Root
A. K. Williams	"	"
George C. Waud	Hybrid tea	"
Jessie	Polyantha	"
Papa Gontier	Tea	"
*General McArthur	Hybrid Tea	"
<i>Approaching Scarlet—</i>		
*Duke of Edinburgh	Hybrid Perpetual	Briar or Own Root
*Gloire de Margottin	"	"
*Captain Hayward	"	"
**Gruss an Teplitz	Hybrid Tea	"
Cramoisie Supérieure	China	"
Mrs. E. Powell	Hybrid Tea	"
Richmond	"	"
<i>Scarlet Crimson—</i>		
Liberty	Hybrid Tea	Briar or Own Root
Fisher Holmes	Hybrid Perpetual	"
*General Jacqueminot	"	"
Lieut. Chaure	Hybrid Tea	"
Marquise de Salisbury	"	"
Princesse de Sagan	Tea	"
<i>Velvety Crimson—</i>		
*Charles Lefebvre	Hybrid Perpetual	Briar or Own Root
Victor Hugo	"	"
*Eugene Furst	"	"
Louis Van Houtte	"	"
<i>Maroon and nearly Black—</i>		
*Prince de C. Rohan	"	"
Chateau de Clos Vougeot	Hybrid Tea	"
<i>Violet or Purple—</i>		
Sir R. Hill	Hybrid Perpetual	Briar or Own Root
Jean Cherpin	"	"
<i>Pale Yellow and Cream—</i>		
*Marie Van Houtte	Tea	Briar or Own Root
Mme. Hoste	"	"
*Mme. Pernet Ducher	Hybrid Tea	"
**Belle Lyonnaise	Tea	"
Souvenir de G. Prat	Hybrid Tea	"
*Kaiserin Aug. Victoria	"	"
<i>Lemon Yellow—</i>		
**Celine Forestier	Noisette	Briar or Own Root
Amazona	Tea	"
Mme. C. Guinoisseau	"	"
<i>Golden Yellow—</i>		
**Maréchal Niel	Noisette	Briar or Own Root
*Mme. Eugene Verdier	Tea	"
Melody	Hybrid Tea	"
Lady Hillingdon	Tea	"
Sunburst	Hybrid Tea	"
<i>Pure Yellow—</i>		
Rayon d'Or	Pernetiana	Briar or Own Root
<i>Orange and Orange Scarlet—</i>		
**W. A. Richardson	Noisette	Briar or Own Root
*Mme. Pierre Cochet	"	"
Ma Capucine	Tea	"
Crépuscle	Noisette	"
*Marquise de Sinety	Hybrid Tea	Briar or Own Root
<i>Apricot shaded—</i>		
*Safrano	Tea	"

NAME.	CLASS.	STOCK.
<i>Apricot shaded—</i>		
Mme. Falcot	Tea	Briar or Own Root
*Francisca Kruger	"	"
Queen Mab	China	"
Duchess of Wellington	Hybrid Tea	"
<i>Nankeen Yellow—</i>		
*Arthur R. Goodwin	Pernetiana	Briar or Own Root
Perle d'Or	Polyantha	"
<i>Coppery Red and Coppery Rose—</i>		
*L'Ideal	Noisette	Briar or Own Root
Mrs. A. R. Waddell	Hybrid Tea	"
Mme. E. Resal	China	"
Souvenir de J. B. Guillot	Tea	"
<i>Rosy Flesh, Pink, or Cream, with Yellow or Orange Base—</i>		
Mme. Cadeau Ramey	Hybrid Tea	Briar or Own Root
Lyons Rose	"	"
Mme. E. Bouillet	"	"
Ferdinand Batel	"	"
<i>Striped Roses—</i>		
Rosa Mundi, or York and Lancaster	Damask	Briar or Own Root
Pride of Reigate	Hybrid Perpetual	"
Rainbow	Tea	"

HEDGE ROSES

For this purpose we would advise the following :

NAME.	COLOUR.	CLASS.	STOCK.
Aglaia	Yellow	Multiflora	Own Root
Carmine Pillar	Carmine	Hybrid Tea	"
Conrad F. Meyer	Rose	Rugosa	"
Crimson Rambler	Crimson	Multiflora	"
Euphrosyne	Pink	"	"
Félicité et Perpétue	White	Sempervirens	"
Flora	Pink	"	"
Gloire de Dijon	Buff	Hybrid Tea	"
Jersey Beauty	{ Creamy White, Single	{ Hybrid Wichuraiana }	Briar or Own Root
Juliet	Pink	Pernetiana	"
Mme. Alfred Carrière	Creamy White	Hybrid Tea	"
Mme. Berard	{ Salmon Rose } and Yellow }	"	"
Penzance Briars	Various	Sweet Briar	"
Reine Marie Henriette	Red	Hybrid Tea	"
Reine Olga de Wurtemberg	Crimson	"	"
Sweet Briar	Various	Sweet Briar	"
Tausendschön	Blush Pink	Multiflora	Own Root
The Garland	Buff	Hybrid Musk	"
Virginian Rambler	Blush	Ayrshire	"
Zephirine Drouhin	Cerise	Bourbon	"

A moderately high rose hedge could be formed with the following :

NAME.	COLOUR.	CLASS.	STOCK.
Aimée Vibert	White	Noisette	Own Root or Briar
Alister Stella Gray	Orange	"	"
Armosa	Pink	Bourbon	"
Beaute de Lyon	Blush	Pernetiana	"
Billiard et Barre	Deep Yellow	Hybrid Tea	"
Blanc Double de Courbet	White	Rugosa	"
Charles Lawson	Rose	Hybrid China	"
Common China	Blush	China	"
Dawson Rose	Pink	Hybrid Tea	"
Ella Gordon	Crimson	Hybrid Perpetual	"
Fellenberg	Cherry Red	Noisette	"
Gruss an Teplitz	Scarlet	Hybrid Tea	"
Harrisonii	Yellow	Austrian Briar	"
Hebe's Lip	{ White, edged } Rose	Gallica	"
Hugh Dickson	Crimson	Hybrid Scotch	"
Lina Schmidt Michel	Pale Pink	Hybrid Tea	"
Longworth Rambler	Cherry Red	Noisette	"
Macrantha	Blush	Gallica	"
Maiden's Blush	"	Alba	"
Mme. G. Bruant	White	Rugosa	"
Mme. G. Luizet	{ Pale Pink } White	Hybrid Perpetual	"
Mme. Plantier	White	Hybrid Noisette	"
Mrs. A. Waterer	Crimson	Rugosa	"
Mrs. J. Laing	Pale Pink	Hybrid Perpetual	"
Stanwell Perpetual	Blush	Hybrid Scotch	"
Ulrich Brunner	Light Red	Hybrid Perpetual	"
Una	{ Yellow, pass- } ing to Cream, very beauti- ful, excellent pegged down	"	"
Waltham Climber No. 1	Crimson	Tea	"

When a low rose hedge is required round lawn tennis ground or similar places, the following are very useful :

NAME.	COLOUR.	CLASS.	STOCK.
Scotch Roses	Various	Scotch	Own Root
Common Moss	Pink	Moss	"
Mme. L. Messimy	Rosy Pink	China	Own Root or Briar
Mrs. Bosanquet	Buff	"	"
Marie Van Houtte	Cream	Tea	"
Mme. Lambard	Pink	"	"
Cameons	Deep Rose	Hybrid Tea	"
Viscountess Folkestone	Creamy White	"	"
Anna Olivier	Buff	Tea	"
Mme. Hoste	Cream	"	"
Marie d'Orleans	Rose	"	"
Corallina	Coral Red	"	"
Enchantress	Cream	"	"
Mme. Wagram	Carnation	"	"
Mme. Abel Chatenay	Vermilion Pink	Hybrid Tea	"
Perle d'Or	Nankeen	Polyantha	"
Gloire des Polyantha	Rose	"	"
Cecile Brunner	White & Flesh	"	"
Common China	Pink	China	"

SOME GOOD FRAGRANT ROSES

NAME.	COLOUR.	CLASS.	STOCK.
A. K. Williams . . .	Crimson	Hybrid Perpetual	Own Root or Briar
Alfred Colomb . . .	Bright Red	"	"
Augustine Guinoiseau . .	Pinky White	Hybrid Tea	"
Baron de Bonstetten . .	Maroon	Hybrid Perpetual	"
Beauté Inconstante . . .	Metallic Red	Tea	"
Beauty of Waltham . . .	Cherry	Hybrid Perpetual	"
Charles Lefebvre . . .	Dark Crimson	"	"
Charles Lawson . . .	Rose	Hybrid Chinese	Own Root
Chateau de Clos Vougeot .	Maroon Crimson	Hybrid Tea	Own Root or Briar
Common Provence or Cab-			
bage Rose . . .	Pink	Provence	Manetti
Conrad F. Meyer . . .	Rose	Hybrid Rugosa	Own Root or Briar
Countess of Pembroke . .	Rose	Hybrid Tea	"
Crested Provence . . .	Pink	Provence	Manetti
Crimson Queen . . .	Crimson	Hybrid Perpetual	Own Root or Briar
Devoniensis . . .	Blush	Tea	"
Dr. Andry . . .	Rich Red	Hybrid Perpetual	"
Dr. O'Donel Browne . . .	Carmine Rose	Hybrid Tea	"
Duchess of Albany . . .	Deep Pink	"	"
Emperor . . .	Blackish Crimson	Hybrid Perpetual	"
E. Y. Teas . . .	Red	"	"
Fisher Holmes . . .	Crimson	"	"
General Jacqueminot . . .	Red	"	"
Gloire de Dijon . . .	Cream	Tea	"
Goubault . . .	Pink	"	"
Heinrich Schultheis . . .	Rosy Pink	Hybrid Perpetual	"
Juliet . . .	Rose and Old	Pernetiana	"
	Gold		
Kaiserin Friedrich . . .	Cream and Pink	Tea	"
Kakanlyk . . .	Pink	Provence	Manetti
<i>Note.</i> —This rose is grown in Bulgaria for Attar of Roses.			
Lady A. Stanley . . .	Pink and Rose	Hybrid Tea	Own Root or Briar
La France . . .	Silvery Pink	"	"
La Rosière . . .	Rich Maroon	Hybrid Perpetual	"
L'Ideal . . .	Bronzy Red	Noisette	"
Louis Van Houtte . . .	Deep Crimson	Hybrid Perpetual	"
Luciole . . .	Pink & Apricot	Tea	"
Magna Charta . . .	Deep Pink	Hybrid Perpetual	"
Maréchal Niel . . .	Yellow	Noisette	"
Marie Baumaun . . .	Red	Hybrid Perpetual	"
Maurice Bernardin . . .	Blackish Crimson	"	"
Meta . . .	Strawberry	Tea	"
Mme. Abel Chatenay . . .	Vermillion Rose	Hybrid Tea	"
Mme. de Watteville . . .	Blush and Pink	Tea	"
Mrs. A. E. Coxhead . . .	Claret-Red	Hybrid Tea	"
Mrs. Foley Hobbs . . .	White	Tea	"
Mrs. John Laing . . .	Pink	Hybrid Perpetual	"
Papa Lambert . . .	Rich Rose	Hybrid Tea	"
Pink Rover . . .	Pink	"	"
Pierre Notting . . .	Maroon	Hybrid Perpetual	"
Preciosa . . .	Light Red	"	"
Prince Arthur . . .	Red	"	"
Princess Bonnie . . .	Rosy Red	Hybrid Tea	"
Senateur Vaisse . . .	Rich Red	Hybrid Perpetual	"

NAME.	COLOUR.	CLASS.	STOCK.
Souvenir d'un Ami . . .	Pink	Tea	Own Root or Briar
Sultan of Zanzibar . . .	Crimson	Hybrid Perpetual	"
The Dandy	Crimson	Hybrid Tea	"
Ulrich Brunner	Red	Hybrid Perpetual	"
Viscountess Folkestone . .	Creamy Pink	Hybrid Tea	"
W. F. Bennett	Purplish Red	"	"
Wm. Warden	Deep Pink	Hybrid Perpetual	"

DWARF ROSES FOR FRAME OR HOUSE CULTURE

NAME.	COLOUR.	STOCK.
Anna Olivier	Cream and Buff	Briar
Camoens	Rosy Pink	"
Captain Hayward	Crimson Scarlet	Briar or Manetti
Caroline Testout	Rich Pink	Briar
Enchantress	Cream	"
Fisher Holmes	Rich Red	"
General Jacqueminot	Red	{ Briar, Manetti, or Own Root
La France	Silvery Pink	"
Mme. Hoste	Pale Yellow	Briar
Mme. Lambard	Rosy Salmon	"
Marquise Litta	Vermilion Rose	"
Marie Van Houtte	Pale Yellow	"
Mrs. J. Laing	Pink	Briar or Manetti
Mrs. W. J. Grant	Imperial Pink	Briar
Souvenir de S. A. Prince . .	White	"
Ulrich Brunner	Light Red	Briar or Manetti
White Lady	Pinkish White	Briar

SHRUBS¹

Selection of Deciduous Flowering Shrubs for Small Gardens

Cydonia Maulei superba	Prunus japonica flore alba pleno
Daphne Mezereum (The Mezereon)	" triloba flore pleno
Diervilla (Weigelas)	Ribes sanguineum atrorubens
Escallonia philippiana	Robinia hispida inermis (Rose Acacia)
Forsythia suspensa	Sophora viciifolia
Hydrangea paniculata grandiflora	Spiræa arguta
Hypericum moserianum	" Menziesii triumphans
Magnolia stellata	" japonica Anthony Waterer
Philadelphus Lemoinei erectus (Dwarf Mock Orange)	Syringas (Lilacs) in variety
	Viburnum tomentosum plicatum

¹ These selections are only intended for quite small gardens, therefore many good kinds must necessarily be omitted. Descriptions and cultural hints are given in alphabetical order, p. 212.

A CURIOUS FORM OF WEEPING BEECH.

A FINE SPECIMEN OF THE WEEPING SCOTCH ELM (*ULMUS MONTANA PENDULA*).

Deciduous Flowering Trees for Small Gardens

<i>Æsculus carnea</i> Briotii (Red-flowered Horse Chestnut)	<i>Prunus Amygdalus</i> (Almond)
<i>Amelanchier canadensis</i> (Snowy Mespilus)	" <i>Avium flore pleno</i> (Double White Cherry)
<i>Catalpa bignonioides</i>	" <i>serulata flore pleno</i>
<i>Cratægus</i> (Thorns). Forms with double scarlet, rose, and white flowers	" " James H. Veitch
<i>Laburnum vulgare</i>	<i>Pyrus Aria majestica</i>
" <i>alpinum</i>	" <i>floribunda atrosanguinea</i>
<i>Magnolia conspicua</i>	" <i>spectabilis flore pleno</i>

Evergreen Flowering Shrubs for Small Gardens

<i>Berberis Darwinii</i>	<i>Olearia Haastii</i>
" <i>stenophylla</i>	<i>Rhododendrons</i> in variety
<i>Choisya ternata</i>	<i>Veronica Traversii</i>
<i>Escallonia macrantha</i> (semi-tender)	<i>Viburnum Tinus</i> (Laurustinus)
<i>Kalmia latifolia</i>	<i>Yucca gloriosa</i>
<i>Ligustrum japonicum</i>	" <i>recurvifolia</i>
" <i>lucidum</i>	

Trees and Shrubs with Beautiful Fruit

<i>Arbutus Unedo</i>	Hollies of sorts
<i>Berberis</i>	<i>Pernettyas</i> of sorts
<i>Cotoneasters</i>	<i>Pyrus</i> of sorts
<i>Cratægus</i> (Thorns) of sorts	<i>Sambucus racemosus</i>
<i>Euonymus</i> (Spindle Tree) <i>europæus</i>	<i>Skimmias</i>
" <i>latifolius</i>	<i>Symphoricarpus racemosus</i> (Snowberry)
<i>Hippophæ rhamnoides</i> (Sea Buckthorn)	<i>Viburnum Opulus</i> (Wild Guelder Rose)

Evergreen Trees and Shrubs Suitable for Planting near the Sea Coast

<i>Arbutus Unedo</i>	<i>Euonymus</i>
Austrian Pine (a splendid shelter)	<i>Garrya elliptica</i>
<i>Buxus</i> (Box) <i>sempervirens</i>	<i>Osmanthus ilicifolius</i>
<i>Choisya ternata</i> (Mexican Orange-flower)	<i>Pernettyas</i>
<i>Cotoneaster microphylla</i>	<i>Pinus insignis</i> (not an Evergreen)
<i>Cupressus macrocarpa</i>	<i>Quercus Ilex</i> (Evergreen Oak)
<i>Escallonias</i>	<i>Veronicas</i>

Deciduous Shrubs Suitable for Planting near the Sea Coast

<i>Deutzias</i>	<i>Hippophæ rhamnoides</i> (Sea Buckthorn)
<i>Fuchsia Riccartoni</i>	<i>Hydrangeas</i>
" <i>globosa</i>	<i>Leycesteria formosa</i>
" <i>macrostemma</i> , and others	<i>Sambucus canadensis aurea</i>
<i>Fuchsia Riccartoni</i> makes a charming hedge; crimson with flowers from summer onwards	<i>Symphoricarpus</i> (Snowberry) <i>racemosus</i>
	<i>Tamarisk</i> (all the kinds)
	<i>Viburnum Opulus</i> (Wild Guelder Rose)

Trees and Shrubs with Conspicuous Bark in Winter

<i>Betula alba</i> (White Birch)	<i>Rubus biflorus</i> (with quite white stems)
<i>Cornus alba</i> (Dogwood)	" <i>lasiostylus</i>
<i>Fraxinus</i> (Ash) <i>excelsior aurea</i>	<i>Salix vitellina</i> (Golden Willow)

Weeping Trees and Shrubs

<i>Betula</i> (Birch) <i>alba pendula</i>	<i>Populus</i> (Poplar, or Aspen) <i>tremula pendula</i>
" <i>alba Youngii</i>	" <i>tremuloides</i> (Parasol de St. Julien)
<i>Fagus</i> (Beech) <i>sylvatica pendula</i>	<i>Salix</i> (Willow) <i>babylonica</i>
<i>Fraxinus</i> (Ash) <i>excelsior pendula</i>	" <i>elegantissima</i>
<i>Ilex</i> (Holly) <i>Aquifolium argentea pendula</i>	<i>Taxus</i> (Yew) <i>baccata Dovastoni aurea pendula</i>
" <i>Aquifolium pendula</i>	" <i>baccata pendula</i>
" " <i>aurea</i>	<i>Ulmus</i> (Elm) <i>montana pendula</i>
<i>Picea morinda</i>	

Shrubs Suitable for Planting under the Shade and Drip of Large Trees

Aucubas	Gaultheria Shallon
Berberis Aquifolium	Hypericum calycinum (St. John's Wort)
Box	Ivy
Cornus (Dogwood)	Phillyraea media
Cotoneaster microphylla	Ruscus (Butcher's Broom)
Daphne Laureola	Symphoricarpus racemosus (Snowberry)
„ pontica	Vincas (Periwinkles)

Trees not to Plant near Smoky Towns

Abies	Pinus (Pine)
Araucaria imbricata (Monkey Puzzle or Chili Pine)	Podocarpus
Picea	Sciadopitys verticillata
	Thuja dolabrata, and Conifers generally

As a rule all Pines and Conifers are a complete failure in or near large towns.

Shrubs Suitable for Winter Bedding and Window Boxes

Aucubas	Ligustrum ovalifolium foliis aureis
Box, gold and silver-leaved varieties	Osmanthus
Cryptomeria elegans	Pernettyas
Cupressus lawsoniana erecta viridis	Pieris floribunda
„ „ Silver Queen	Retinosporas
„ „ aurea	Skimmias
Ericas (Heaths)	Taxus (Yew) baccata elegantissima
Euonymuses	Thuya (Biotia) orientalis semperaurescens
Laurustinus	Tree Ivies
Ligustrum (Privet) japonicum	Yucca recurvifolia

Trees and Shrubs for Forcing

Azaleas (Mollis and forms)	Kerria japonica flore pleno
Choisya ternata (Mexican Orange-flower)	Magnolia stellata
Deutzia gracilis	Prunus (Plum) of sorts
„ Lemoinei	Spiræa media
Forsythia suspensa	„ Thunbergii
Guelder Rose	Staphylea colchica
Hydrangea paniculata	Syringas (Lilacs)
Kalmia latifolia	Wistaria

Low-Growing Shrubs and Conifers for the Rock-Garden

Cryptomeria japonica nana	Genista dalmatica
„ elegans nana	Helianthemum (Sun Rose) of sorts
Daboecia polifolia and its varieties	Juniperus (Juniper) prostrata
Daphne Cneorum	Leiophyllum buxifolium
„ alpina	Picea excelsa claustrasiliana
„ blagayana	„ pygmæa
Empetrum nigrum	Rhododendron ferrugineum
Ericas (Heaths) of sorts	„ anthopogon
Gaultheria procumbens	Spiræa bullata

Hedge Plants

Beech	Holly
Berberis Darwinii	Hornbeam
„ vulgaris	Juniperus chinensis
Box Tree	Privet
Buckthorn	Quick or Thorn
Cupressus lawsoniana	Taxus baccata (Yew)
„ nootkatensis	Thuya plicata
Euonymus japonicus	„ occidentalis
Fuchsias	

Plants for Pond Sides

Arrowhead, Double White	Iris sibirica (Siberian Iris)
Arum Lily (where mild enough)	„ Pseudacorus (English Iris)
Buckbeam	Japan Primrose (Primula japonica)
Caltha polypetala	Loosestrife (Lythrum Salicaria and roseum superbum)
Cardinal and Yellow Willows	Marsh Marigolds (Caltha palustris)
Day Lilies	Polygonum sachalinense, 9 ft.
Ferns, especially the Royal Fern	„ cuspidatum
Globe-flowers (Trollius)	Ranunculus Lingua (Great Spearwort)
Gunnera scabra	Spiræa palmata
„ manicata	„ gigantea
Herbaceous Phloxes	Willow Herb (Epilobium)
Iris Kæmpferi (Japan Iris)	

A Few Plants for Water Surface

Nymphæas (Water Lilies), many lovely hybrids, colours from white to intense crimson	Cape Pond-flower (Aponogeton distachyon)
	Water Forget-me-not

CONIFERS

These shrubs and trees are not so popular as formerly, and we are in a measure thankful for this, as they were chosen recklessly, many very tender kinds being planted in gardens. It is a great mistake to put the Chili Pine (*Araucaria imbricata*), also known as the Monkey Puzzle, in a small garden, when we have so many beautiful flowering shrubs. One may write the same of the Deodar. Conifers are useless in towns. *Abies* and *Piceas* are much confused in nurseries, so we give the names according to the Kew standard. The finest Conifers are:

Abies cephalonia (Grecian Silver Fir), will grow to a height of 60 feet; light green leaves, silvery underneath, north aspect best.

A. *amabilis*, vigorous, handsome, deep glossy green, silvery white lines on under side of leaf.

A. *concolor* and variety *violacea*, both good hardy and effective trees.

A. *nobilis*, will grow 250 feet high in its native home of California; give moist soil, open position.

A. *nordmanniana* (Nordmann's Fir), one of the most beautiful of Silver Firs.

Cedrus Deodara (Deodar Cedar).—Very elegant, Himalaya, good for lawn or to form an avenue. Robusta, erecta, and variegata are very distinct.

C. *Libani* (Cedar of Lebanon) is well known, and another beautiful cedar is C. *atlantica*, which is quite hardy and is a success in hungry soils. Good varieties of the latter are *fastigiata*, erect in growth; *aurea*, with golden foliage; and *glauca*, silvery.

Cryptomeria japonica (Japan Cedar); sheltered position, rich soil, but must not be exposed to biting winds. *Elegans* is a graceful variety. In spring its narrow pointed leaves are pale green and in winter quite bronzy colour. *Lobbi* and *Lobbinana* are good forms.

Cupressus.—An important Conifer group for small gardens. The kinds named succeed in ordinary soil. *Retinosporas* are included amongst the *Cupressus*. C. *macrocarpa* (Monterey Cypress), excellent for sea coast; *lutea* is a good golden form. C. *nootkatensis* (*Thujaopsis borealis*) is very handsome, perfectly hardy, and graceful, suitable for lawns. The finest varieties are *compacta*, *pendula*, *gracilis*, *aurea*, *variegata*, and *lutea*, the last named being very showy. C. *lawsoniana* (Lawson Cypress) is free, graceful, succeeds in almost any soil, and makes a good hedge, as it does not mind pruning. It is very pretty in spring when its male catkins appear in profusion. The most distinct varieties are: *Darleyensis*, bronzy yellow leaves, useful for small gardens, and effective in winter; *gracilis*, *albo-spica*, tipped with creamy white, and *lutea*, rich yellow foliage. C. *obtusa* (*Retinospora obtusa*) is an excellent Conifer for small gardens, as also are its varieties *compacta*, *filifera*, with long pendulous thread-like shoots; *aurea*, rich yellow foliage, touched with bronze brown in winter; and the golden-leaved *gracilis aurea*. C. *pisifera* (*Retinospora pisifera*) is of elegant growth; moist soil—*aurea* is a golden-leaved form. C. *plumosa* is a charming lawn Conifer, and the variety *aurea*, one of the best variegated shrubs in gardens. A well-drained soil and position are needful.

- Ginkgo biloba** or **Salisburia adiantifolia** is a very distinct and quite hardy Conifer, especially adapted for town gardens. Its autumn tints are rich yellow and orange.
- Juniperus** (Junipers).—The following are quite hardy and happy in well-drained soil: Red Cedar (*J. virginiana*), excellent for fringe of lawn, rich green leaves, passing to brown in winter. *J. chinensis* is erect, with small, stiff glaucous leaves; the silver-leaved variety *albo variegata* and the golden form *aurea* are effective, especially the last-named in winter. The Savin is a beautiful shrub for dry banks, and the variety *procumbens* is especially ornamental in winter. Other good varieties of the common Savin are *humilis*, *tamariscifolia*, *prostrata*, and *variegata*.
- Larch** is valuable, but too well known to need description. May be propagated from seed sown thinly in raised beds; cover seed with fine soil.
- Piceas**.—Closely allied to Abies; useful for park and garden. *P. Englemanni* and the variety *glauca* are very hardy and free; good for lawns. *P. Morinda* (*Abies Smithiana*) is a noble spruce, very hardy, pendulous growth, and very suitable for lawns. *P. pungens* and its varieties, *pungens* and *pendula*, are very ornamental. *P. excelsa* and forms are good garden kinds.
- Pines**.—These must be for large gardens; but one cannot leave them out of a book of this kind. *P. Strobus* (Weymouth Pine) is elegant, with straight, much-branched trunk, and long glaucous leaves. *P. Laricio* (Corsican Pine) is a fine seaside Pine, and makes a handsome shelter. *P. austriaca* (Austrian Pine) is one of the most popular Pines, very hardy and vigorous, and makes a good shelter on the coast. *P. Cembra* (Swiss Stone Pine) is a beautiful lawn tree. *P. Pinea* (Stone Pine) is a fine lawn tree, but rather tender; loamy soil. *P. excelsa* (Bhotan Pine) hardy, graceful, and likes dry soil.
- Taxus** (Yew).—The English Yew is *T. baccata*, and is beautiful on the lawn, and its adaptability for hedges and windbreaks is well known. It enjoys best a rather moist soil, but will grow almost anywhere. Plant in spring or autumn. Get seedling plants.
- Thuyas**.—An important group. *T. plicata*, or *gigantea* as it is called, is an excellent Conifer. *T. japonica* is pretty in winter. *T. occidentalis* (American Arbour Vitæ) makes an excellent hedge. *T. orientalis* makes a bushy shrub. *T. ericoides*, or *Retinospora ericoides*, is a popular Conifer, with delicate green leaves, stained with violet brown.

PLANTS SUITABLE FOR COLD GREENHOUSE

Shrubby Plants

In House absolutely Unheated.

Abelia rupestris
 Amygdalus nanus (Dwarf Almond)
 Azalea, Ghent and mollis varieties
 Berberis Darwini
 Camellia japonica varieties
 " Sasanqua
 Choisyia ternata (Mexico Orange-flower)
 Cistus lusitanicus
 Coronilla glauca
 Daphne Mezereum (Common Mezereon)
 Deutzia gracilis
 " Lemoinei
 Erica (Heath) herbacea
 " mediterranea
 Fabiana imbricata
 Fuchsia Mme. Cornellison
 Hydrangea hortensis
 " Thomas Hogg
 Hypericum moserianum
 " patulum
 Jasminum nudiflorum (Winter-flowering
 Jasmine)
 Magnolia conspicua (the Yulan)

In House with Winter Temperature not below 35°.

Abutilon vitifolium
 Acacia armata
 Azalea indica varieties
 Brugmansia (Trumpet-flower) sanguinea
 " suaveolens
 Cassia corymbosa
 Cistus purpureus
 Clanthus puniceus (Glory Pea)
 Cytisus prolifera
 Daphne indica
 Echium fastuosum
 Lemon and Orange Trees
 Nerium oleander
 Pæonies, Moutan, in pots
 Poinciana Gilliesi
 Polygala dalmaisiana
 Rubus rosæfolius
 Veronica Hulkeana

*In House absolutely Unheated.**In House with Winter Temperature not below 35°.*

Magnolia stellata (pots)
 Myrtle, Large and small-leaved
 Nerium oleander
 Pernettya mucronata
 Prunus sinensis fl. pl.
 " triloba
 Ribes (Flowering currant) sanguinea and
 sanguinea alba (small plants in pots)
 Rhododendron
 " dahuricum
 " Early Gem
 " ignescens
 " nobleanum
 " racemosum
 " præcox, and other florist
 varieties
 Veronica Andersoni, and other shrubby
 varieties
 Viburnum Tinus (Laurustinus)
 " lucidum
 " plicatum
 Weigela hortensis nivea

Climbers

Akebia quinata
 Clematis calycina and florist varieties
 (Patens type)
 Humulus japonicus (Japanese Hop) (ann.)
 Mina lobata (ann.)
 Smilax aspera
 Solanum jasminoides
 Stauntonia latifolia
 Roses. (See special list, p. 58o.)
 Clematis indivisa
 Hibbertia dentata
 Habrothammus elegans
 " fascicularis
 Kennedya Marryattiae
 " lilacina
 Lapageria
 Lonicera (Honeysuckle) sempervirens
 Maurandya barclayana
 Mandevillea suaveolens
 Nasturtium (Tropæolum lobbianum varie-
 ties)
 Tropæolum azureum
 " pentaphyllum
 " tricolor

Bulbs and Tubers

Allium (Onion) neapolitanum
 Anemone apennina (Apennine Windflower)
 " blanda
 " coronaria
 " fulgens
 " stellata (hortensis)
 Anomatheca cruenta
 Anthericum (St. Bruno's Lily) Liliastrum
 Chionodoxa (Glory of the Snow) lucilæ
 " sardensis
 Crinum Powellii
 Crocosmia aurea
 Crocus Imperati, and others
 Cyclamen coum
 " europæum
 " hederæfolium
 " vernum
 Erythronium denscanis (Dog's-tooth Violet)
 Fritillaria (Snake's-head) Meleagris
 Agapanthus (African Lily) umbellatus
 Alstroëmeria (Peruvian Lily) pelegrina alba
 Amaryllis formosissimus
 Anoganthus brevifolius
 Blandfordias
 Cannas
 Clivia miniata
 Crinum Moorei
 Hæmanthus albiflos
 Iris chinense
 Ixias
 Lachenalias Nelsoni
 " pendula
 " tricolor, and others
 Libertia formosa
 Lilium (Lily) longiflorum
 " tenuifolium, and others
 Ornithogalum (Star of Bethlehem) ara-
 bicum

In House absolutely Unheated.

Fritillaria alba
 „ *pallidiflora*
 „ *pudica*
Funkia grandiflora
 „ *Sieboldi*
Galtonia candicans (Cape Hyacinth)
Gladiolus ramosus section—*Colvillei*, *albus*,
 &c.
Hyacinths, Florists' and Roman
Iris alata
 „ *reticulata*
 „ *stylosa*
 „ *tuberosa*
 „ Spanish vars.
Jonquils, *N. capax* fl. pl.
 „ *N. odorus*
Kniphofia (*Tritoma*) *corallina* (Flame-flower)
 „ *Macowani*
 „ *longicollis*
Lilium (*Lily*) *candidum*
 „ *davuricum*
 „ *speciosum*
 „ *tigrinum*, &c.
Lily of the Valley
Milla uniflora
Montbretias
Muscari (*Grape Hyacinth*) *botryoides album*
Narcissi (*Trumpet Daffodils*)
 „ *Emperor*
 „ *Horsfieldi*
 „ *Golden Spur*
 „ *obvallaris*
 „ *Soleil d'Or* (*Tazetta* vars.)
 „ *Grand Monarch*
 „ *Bulbocodium* (*Corbularias*)
 „ *citrina*
 „ *monophylla*
 „ *triandrus*, &c.
Ornithogalum nutans
Ranunculus (*Buttercup*) *Persian* vars.
Schizostylis coccinea (*Winter Gladiolus*)
Scilla hispanica
 „ *sibirica*
Sisyrinchium grandiflorum (*Satin-flower*)
Tecophilæa cyano-crocus
Trillium grandiflorum (*White Wood Lily*)
Tulipa (*Tulip*) *clusiana*
 „ *fragrans*
 „ *retroflexa*, and florists' vars.
Zephyranthes candida
 „ *rosea*

In House with Winter Temperature not below 35°.

Oxalis cernua
 „ *versicolor*
Vallota purpurea
Veltheimia viridifolia
Zephyranthes carinata

Some Foliage Plants

<i>Acanthus latifolius</i>	<i>Aspidistra</i> (<i>Parlour palm</i>) <i>lurida</i>
„ <i>mollis</i>	<i>Dracæna australis</i>
„ <i>spinosa</i>	„ <i>indivisa</i> (in pots)
<i>Aralia japonica</i>	<i>Eulalia zebrina</i>
<i>Asparagus verticillatus</i>	<i>Ruscus racemosus</i>
<i>Aucubas</i>	<i>Smilax aspera</i>
<i>Carex japonica</i>	
<i>Centaurea ragusina</i>	
<i>Chamærops excelsa</i> (<i>Fan palm</i>)	

*In House absolutely Unheated.**In House with Winter Temperature not below 35°.*

Cineraria maritima
 Equisetum (Horse-tail) sylvaticus
 Eucalyptus globulus
 Eugenia buxifolia
 Eulalia japonica
 „ variegata
 Euonymus radicans variegatus
 Ivies, small variegated
 Myrtle, large-leaved
 Ribbon Grass
 Thalictrum adiantifolium

Miscellaneous Pot Plants

Aquilegia (Columbine) cœrulea
 Calceolaria violacea
 Campanula (Bell-flower) Allioni
 „ fragillis
 „ isophylla
 „ pyramidalis
 Carnations, Marguerite vars.
 Cheiranthus (Wallflower) alpinus
 „ Cheiri, Florists' vars.
 Dahlia glabrata
 Delphinium sinense
 Dianthus (Pink) Heddeggii
 Dielytra spectabilis (Lyre-flower)
 Francoa appendiculata
 „ ramosa
 Helleborus niger
 Heuchera sanguinea and vars.
 Linum monogynum
 „ narbonense
 Lobelia cardinalis vars.
 Megasea crassifolia
 Mimulus (Monkey-flower) maculosus
 „ moschatus
 Myosotis dissitiflora (Forget-me-not)
 „ palustris
 Ononis (Rest Harrow) rotundifolius
 Orobus vernus
 Pinks of all kinds
 Phlox amoena
 „ divaricata
 „ subulata vars.
 Primula auricula
 „ denticulata
 „ japonica
 „ Sieboldi
 „ verticillata, and many newer
 species
 Saxifraga Cotyledon
 „ Fortunei
 „ sarmentosa, and many others
 Stocks Intermediate
 Spiræa japonica
 Tiarella cordifolia (Foam-flower)
 Tricyrtis hirta
 Trollius asiaticus
 „ europæus

Arctotis aspera
 Calceolaria alba
 Celsia Arcturus
 Chrysanthemums
 Cinerarias
 Convolvulus Cneorum
 Diplacus glutinosus
 Fragaria (Strawberry) indica
 Hypericum chinense
 Iberis (Candytuft) gibraltaria
 Kalosantes coccinea
 Lotus peliorynchus
 Lychnis grandiflora
 Mesembryanthemum aurea
 „ blanda
 „ rosea
 „ glaucum, &c.
 Pentstemon Cobæa
 „ Murrayanus
 „ speciosus
 Rochea falcata
 Salvia Bethelli
 „ Pitcheri
 „ rutilans
 Sedum carneum variegatum
 „ Sieboldi
 Swainsona galegifolia alba

CHRYSANTHEMUMS

SELECTIONS FOR VARIOUS PURPOSES

For cultural hints see pages 353-365

Twenty-four Japanese for Exhibition.—His Majesty, rich crimson; King George, mulberry red; Bob Pulling, rich yellow; Japan, deep orange yellow; Mrs. Gilbert Drabble, pure glistening white; H. E. Converse, reddish bronze, gold reverse; Fred Green, purple; Harry Wood, crimson, shaded scarlet; William Turner, pure white; Francis Jolliffe, canary yellow, each petal edged rose; Lady Edward Letchworth, golden yellow; Kara Dow, chestnut bronze; Mrs. A. T. Miller, pure white; Master James, chestnut red; F. S. Vallis, straw yellow; Pockett's Crimson, a very deep crimson; Mrs. L. Thorn, pure yellow; White Queen; Walter Jinks, rich rose pink; W. Mease, old rosy cerise; Sir Frank Crisp, chestnut red; Miss Annie Nicoll, pure white; Mrs. R. H. B. Marsham, white; Marie Loomes, chestnut terra-cotta.

The Best Japanese Varieties for Decorations.—Source d'Or, rich orange red; William Holmes, crimson; Western King, pure white; Crimson Source d'Or; La Triomphante, mauve lilac; Caprice de Printemps, rosy pink; Dr. Enguehard, rosy pink; Moneymaker, pure white; Mrs. J. W. Scott, pure white; Mrs. Greenfield, deep yellow; Madame R. Oberthur, pure white, late; Tuxedo, orange, late; Winter Cheer, pink, late.

Six Thread-Petalled and other Fantastic Flowers.—Mrs. James Carter, pale yellow; Alice Carter, reddish crimson, tipped gold; Golden Shower, golden yellow, passing to crimson at end of petals; Bouquetterre, white, tipped yellow and rose; Mrs. Wm. Filkins, yellow; and Mrs. W. Butters, white. The first four are thread-petalled varieties.

Eighteen Incurved Sorts for Exhibition.—Hanwell Glory, bright bronze; Mrs. H. J. Jones, white; Duchess of Fife, pure white; Charles H. Curtis, yellow; Mrs. W. Howe, golden amber; Lady Isabel, blush lavender; Mrs. W. C. Egan, light pink, shading to white; Madame Férlat, white; Topaze Oriental, straw yellow; Mrs. R. C. Kingston, soft lilac pink; C. Blick, rose violet on white ground; Miss Nellie Southam, deep rose purple; Mrs. F. Judson, pure white; Mrs. Barnard Hankey, deep bronze; Mildred Lyne, fawn, shaded bronze; Clara Wells, rich cream; Buttercup, rich yellow; Frank Trestian, amber, shaded bright orange.

Four Incurved Sorts for Decorations.—Mrs. George Rundle, white; George Glenny, pale canary yellow; Golden George Glenny, golden yellow; and Mr. Bunn, bright deep yellow.

Six Reflexed.—Cullingfordi, bright crimson; Pink Christine, light pink; King of Crimsons, deep crimson; Peach Christine, peach pink; White Christine, white; and Golden Christine, golden bronze.

Six Large Anemones.—Descartes, rich reddish chestnut; Cincinnati, blush pink, lighter centre; Mrs. Judge Benedict, sulphur, tinted blush; Madame Robt. Owen, pure white; Gluck, orange yellow; and Delaware, creamy white.

Twelve Large-Flowered Japanese Anemones.—John Bunyan, rich yellow; W. W. Astor, salmon blush, golden rose centre; Sir Walter Raleigh, pale blush, centre lilac, tipped yellow; Enterprise, rose, sulphur centre; Nelson, crimson purple; Mrs. Hugh H. Gardiner, deep rose, high disc, tipped gold; Marcia Jones, pure white; Mlle. Cabrol, rose pink, lilac disc; Queen Elisabeth, silvery blush, rose centre, tipped yellow; Robert Burns, blush, creamy yellow centre; Le Chalonais, citron yellow; and Fabian de Mediana, white, shaded purple, lilac centre.

Six Pompon Anemones.—Antonius, bright yellow; Emily Rowbottom, bluish white; Marie Stuart, blush, sulphur centre; Madame Chalonge, blush, tipped sulphur; Calliope, ruby red; Regulus, cinnamon brown; and Magenta King, magenta, centre yellow.

Six Pompons.—William Westlake, rich golden yellow; William Kennedy, crimson, amaranth; Mlle. Elise Dordan, silvery pink; Rosinante, blush rose; Comte de Morny, purple; and Osiris, rosy pink, tipped gold.

Six Miniature-Flowered Pompons.—Snowdrop, pure white; Primrose League, pale canary yellow; Miss Gertie Waterer, pale flesh pink; Katie Manning, rosy bronze; Model of Perfection, lilac, edged white; and Victorine, dark brown.

Eighteen Large-Flowered Singles.—Phyllis Bryant, sulphur yellow; Mrs. W. G. Patching, bronzy chestnut, white disc; Mrs. Tresham Gilby, deep yellow; Mrs. W. Buckingham, pink; Mensa, pure white; Edith Pagram, rich pink; Caledonia, rosy lilac; Sylvia Slade, garnet red; Roupell Beauty, wine red; Sandown Raidence, chest-

nut crimson; Sunset, bronze, with red tips; Pictor, blush pink; White Edith Pagram, Pegasus, white; Mrs. Hazelhurst, terra-cotta; Metta, deep magenta; Crown Jewel, bronzy yellow; Cannell's Yellow; and Altrincham Yellow.

Twelve Small-Flowered Singles.—Mary Anderson, pale blush; Mrs. D. B. Crane, cerise pink; Emily Wells, clear pink; Annie Tweed, bright crimson; Miss Annie Holden, straw yellow; Ladysmith, rose pink; Mary Richardson, rich terra-cotta; Crimson Mary Richardson; Lady Clinton, pure white; Jupiter, clear yellow; Emile, bright pink; and Marguerite Pink, golden buff.

EARLY-FLOWERING CHRYSANTHEMUMS

Twelve Pompons for Outdoor Culture.—Mr. Selly, rosy lilac; Little Bob, bright chestnut crimson; Yellow L'Ami Conderchet, rich golden yellow; Blushing Bride, rose lilac; Bronze Bride, bronzy rose; Alice Butcher, orange red; Lyon, rosy purple; Mrs. Cullingford, white; Miss Davis, blush pink; Madame Ed. Lefort, bright orange, tinted red; Veuve Cliquot, bronzy buff; and J. B. Duvoir, blush lilac.

Twenty-four Border Varieties.—Elstob Yellow, better than Horace Martin; Crimson Diana, deep crimson; Cecil Wells, buttercup yellow; Emily, pure white; Barbara Forbes, large pure white; Dolly Prince, a very early white; Gertie, salmon pink; Harrie, bronzy orange; Jack, reddish terra-cotta; Le Pactolé, bronzy yellow; Lillie, clear pink; Mrs. Roots, pure white; Tonkin, reddish orange; Venise, golden salmon; White Quintus; Robbie Burns, rosy cerise; Rosie, terra-cotta; Province, rose pink; Normandie, blush pink; Nina Blick, scarlet red; Pride of Keston, deep rose; Ralph Curtis, creamy white; Marvel, rich plum; Harvest Home, red, tipped gold.

STOVE PLANTS *

NAME.	SEASON OF FLOWERING.	REMARKS.
Allamanda . . .	Summer	Handsome climbing plants, bearing numerous large, showy, yellow flowers. Propagate by means of cuttings in spring. Succeed best when planted out, or in a very large pot. Compost, fibrous loam, with some coarse sand and cow manure added. Prune the shoots annually in early spring to within two joints of the old wood. Do not shade except from very hot sun. A. Schottii, A. nobilis, Chelsoni, and A. grandiflora are the best.
Anthurium crystallinum .	...	Has large velvety green leaves; the veins beautifully marked with white; a handsome foliage plant. Requires a compost of peat, sphagnum moss, and charcoal; preferably grown in pans, well drained. Plants must be so placed as to be on a slight mound when the potting is finished. Propagate by dividing the plants very carefully in early spring. Afford plenty of moisture.
A. scherzerianum . . .	Throughout many months	The chief beauty of this plant and its numerous varieties is centred in the brightly-coloured spathes. It grows about 1 foot high, and forms a charming object when the scarlet spathes are at their best. They remain bright for a long time.
Aralia	...	Several Aralias, notably A. Veitchii, A. Veitchii gracillima, and A. elegantissima, are very elegant foliage plants; most suitable for table decoration. Soil, loam and peat with silver sand. Usually propagated by grafting.
Aphelandra aurantiaca .	Winter	Evergreen, bearing very showy, orange-scarlet flowers. After the flowering season, diminish supply of water, give a lower temperature, and prune about March to two buds from the old wood. When shoots begin to appear, remove plants to the stove and repot in fibrous loam, peat, and silver sand.
Achimenes	Summer	Beautiful stove flowering plants; herbaceous perennials, having underground tubercles. These should be placed several in a 6-inch pot from January to March so as to provide a succession of bloom. Grow in peat and leaf soil with a little silver sand and manure incorporated, placing

* As beginners seldom start with stove plants, a brief list of only the most important kinds is given. For meaning of the word "stove," see p. 520.

NAME.	SEASON OF FLOWERING.	REMARKS.
Achimenes	Summer	the tubercles about $\frac{1}{2}$ inch below the soil. Tie the stems to neat stakes as they grow. After flowering, gradually decrease water supply, and finally withhold altogether during winter, placing the pots on their sides in a warm house.
Begonia	...	The varieties of Begonia Rex are well worth growing for their prettily marked, handsome leaves. Propagated by leaf cuttings obtained by inserting the leaves in a pan of sand, partially covering and making incisions across the principal ribs. Of easy culture in a soil composed of peat and loam with plenty of silver sand. Some of the best stove flowering Begonias are the following: B. Gloire de Lorraine, B. socotrana, B. nitida, B. manicata, B. metallica, B. hydrocotifolia, B. Winter Cheer, B. Ensign, B. Mrs. Heal, B. Gloire de Sceaux. B. socotrana forms a number of small bulbs at the base of its stems; it rests during summer, beginning to grow about September, flowering during winter. The others above mentioned may be propagated by division of the root or from seed, and, with the exception of B. metallica, are winter flowering. B. manicata is a very easily grown kind. It may be raised from cuttings in early April, and put singly into $2\frac{1}{2}$ -inch pots, or three in a 6-inch size. They will strike readily upon a hot-bed. When rooted place them in a frame, giving increased quantity of air, and in mid-June transfer them to pots $4\frac{1}{2}$ -inch and 6-inch in size. When three cuttings are put into one pot, these may be moved without separation from the 6-inch pot to an 8-inch one. During the summer keep the plants in a frame, and give air on all favourable occasions, moving the plants when colder days come to a house with a temperature of about 50 degrees. Water the plants when the pots are full of roots with weak liquid manure. Never injure the large fleshy leaves. The pretty pink-tinted flowers are produced in panicles, and a plant in full beauty is delightful.
Bougainvillea glabra .	Summer	Shrubby climber suitable for either stove or greenhouse, producing masses of rosy purple bracts. Does best when planted out. Prune to one or two buds in February. Give liberal treatment: loamy soil with silver sand mixed in.

NAME.	SEASON OF FLOWERING.	REMARKS.
<i>B. spectabilis</i> . . .	Early Summer	Bracts, warm brick red. Similar treatment as above.
<i>B. sanderiana</i> . . .	Summer	A handsome and valuable variety of <i>B. glabra</i> .
<i>Caladium</i>	...	Valuable ornamental leaved tuberous rooted perennials; remarkable for the varied beauty of their foliage. The tubers remain in their pots throughout the winter exactly as <i>Achimenes</i> ; they are started in March, placing one in a 4½-inch or 6-inch pot according to size; use rough, rich peaty soil, and plenty of silver sand. Towards July diminish the water supply, and gradually dry off. Shade from hot sun only.
<i>Clerodendron Thomsonæ</i>	Summer	Shrubby climber, bearing panicles of numerous showy scarlet flowers, with large, prominent white sepals. Prune after flowering, and keep somewhat dry during winter. Give a good loamy soil, and plant out if possible in preference to pot culture.
<i>Codiaeum (Croton)</i> . . .	...	Perhaps the most valuable decorative stove plants we have; remarkable for the fine markings of their leaves. Propagated best by rooting the tops; this is done by making an incision in the stem in spring, and covering this with moss. Roots will form in a few weeks, when the shoot may be removed and potted. Crotons like plenty of sun, moisture, and heat, and a fairly rich, sandy soil. Some of the best varieties are: <i>Queen Victoria</i> , golden yellow, mottled with green; <i>undulatum</i> , crisped margins to the leaves, claret colour, blotched crimson; <i>Reedi</i> , very fine, brick-red shade predominating; <i>chelsoni</i> , narrow, orange and crimson; <i>Baron Frank Sellière</i> , pretty green and white; <i>Aigburth Gem</i> ; <i>Van Oerstedii</i> , charming, very dwarf, green and yellow; <i>Flamingo</i> , handsome, dark red; <i>Mrs. Icton</i> , light yellow and carmine shades.
<i>Dipladenia amabilis</i> . .	Summer	A beautiful climber; flowers of a lovely rosy crimson.
<i>D. brearleyana</i> . . .	Summer	Climber; flowers pink, changing as they age to rich crimson. The <i>Dipladenias</i> mentioned are charming stove plants, although the flowers are not long lasting. Propagate by cuttings taken in the spring when the old plants begin to grow. Give them plenty of heat and moisture, and finally plenty of light to mature the wood well. Prune after flowering, and keep somewhat dry during winter.

NAME.	SEASON OF FLOWERING.	REMARKS.
<i>Dracaena</i>	...	Ornamental foliage plants, of value for house decoration. Propagate by "ringing," that is, mossing the tops, and removing them when rooted, as with Crotons. Similar culture to that advised for the latter. <i>D. amabilis</i> , <i>D. Baptistii</i> , <i>D. sanderiana</i> , <i>D. goldiana</i> , <i>D. Lord Wolseley</i> , <i>D. ignea</i> , <i>D. The Sirdar</i> , <i>D. Eckhautei</i> , &c.
<i>Eranthemum</i> <i>neivosum</i> (<i>pulchellum</i>)	Winter	A valuable winter-flowering plant; flowers bright blue, and freely produced over a long period. Easily propagated from cuttings in spring; loamy soil.
<i>Eucharis amazonica</i> . .	Various	Charming bulbous plant, bearing racemes of pure white pendulous flowers often two and three times in one year. Several bulbs (four or five) should be placed in a 10-inch pot, and, until the pot becomes full of roots, water sparingly. When well rooted they enjoy plenty of manure water, and must be well shaded to preserve the dark green of the leaves.
<i>Fittonia</i>	...	Dwarf, semi-creeping plants, with beautifully marked leaves; very useful for furnishing an edging to the stove staging. <i>F. argyoneura</i> (silver leaved) and <i>F. Verschaffeltii</i> (red veined leaves) are the two best.
<i>Gardenia florida</i> and var. <i>radicans</i>	Early Spring and Summer	Shrubs bearing deliciously-scented pure white flowers. Propagate by cuttings taken with a heel of the old wood attached, in January. Succeed best when planted in a well-drained bed of loam containing plenty of coarse sand. A lower temperature is essential when growth is finished. Young plants flower more freely than old ones.
<i>Gloriosa superba</i> . . .	Summer	A tuberous climber, producing curious showy flowers of a rich orange and red, and prettily crisped. Little water is required until the annual growths are fairly vigorous. After the flowers fade, gradually withhold water, and keep the soil quite dry in winter.
<i>Gloxinia</i>	Early Summer	Indispensable tuberous flowering plants. The tubers are placed singly in well-drained $4\frac{1}{2}$ or 6-inch pots, according to their size, in a rich, leafy soil, in January and February. Plenty of water is necessary when the plants are well rooted. Gradually dry off when the flowers are over, and winter in a warm house, turning the pots on their sides. Handle very carefully, as the leaves break easily.
<i>Maranta arundinacea</i> . .	...	This plant has beautifully variegated leaves, pale green and creamy white. Likes a soil not too rich, and must

NAME.	SEASON OF FLOWERING.	REMARKS.
Maranta arundinacea .	...	be carefully watered. Give a light position. Propagated by offshoots.
Nepenthes	...	This is the Pitcher plant, of which there are many species and varieties. They are more quaintly curious than beautiful. Give them a position near the glass. Basket culture is necessary, and a compost of sphagnum moss and peat and plenty of drainage. <i>N. dicksoniana</i> , <i>N. mastersiana</i> , <i>N. mixta</i> , <i>N. Curtisii</i> <i>superba</i> , <i>N. Morganiae</i> , are some of the best.
Pancratium fragrans .	Summer	A bulbous plant, producing sweetly-scented, beautiful white flowers, which, however, do not last long. Of easy culture in good loam made porous by the addition of silver sand. Do not re-pot more than is absolutely necessary; rather give stimulants in the way of farmyard or artificial manures.
Pandanus Veitchi . .	...	This is a useful, ornamental-leaved plant, and very suitable for house decoration. Propagated by offsets, produced naturally. Use soil composed of half peat and half loam.
Poinsettia pulcherrima .	Early Winter	Valuable for its brilliant scarlet bracts during winter; these remain in full beauty for many weeks. Propagated by cuttings inserted in early spring; place in small pots plunged in a mild hot-bed. Water very carefully throughout, or the bottom leaves will be lost. After the bracts are over, gradually withhold water, keeping quite dry in winter. Plenty of cuttings may be had when the old plants break into growth in the spring.
Solanum Wendlandi .	Summer	A shrubby climber, producing bunches of lovely lilac-blue flowers in great profusion. Prune after flowering, and keep rather dry in winter.
Stephanotis floribunda .	Early Summer	A climber that should be in every collection of stove plants, producing numerous clusters of beautiful, waxy-white, sweetly-scented flowers. Propagate by cuttings of previous year's wood, inserted in spring. It succeeds best planted out in a well-drained bed of loam.
Torenia Fournieri and <i>T. asiatica</i>	Summer	Charming summer-flowering plants. <i>T. Fournieri</i> has hooded flowers, pale violet and yellow; <i>T. asiatica</i> similar shaped blooms of blue and violet. There is also a light-coloured variety of <i>T. Fournieri</i> . They are easily raised from seed sown in spring. The seedlings should be pricked out into 6-inch pots, placing them about an inch apart. Give them a light, sandy soil, consisting of loam and leaf mould.

FRUIT

DESSERT APPLES

For cultural hints see pages 420-427

VARIETY.	SEASON.	STOCK.	REMARKS.
Irish Peach	August	Paradise	A beautiful fruit; one of the best early apples; must be eaten soon after it is gathered.
Devonshire Quarrenden . .	August	Paradise or Crab	A very hardy variety; fruit rather small, dark red; the tree bears well either as a pyramid or as a standard.
Beauty of Bath	August	Paradise	A fine dessert variety; good quality; free cropper.
Worcester Pearmain . . .	September	Paradise or Crab	Handsome fruit of fair quality; a heavy cropper; succeeds well in orchards.
James Grieve	September and October	Paradise	Medium size; fine flavour; good bearer.
Margil	November to January	Paradise	A finely-flavoured dessert apple, somewhat small; does not grow vigorously, therefore suitable for espaliers and dwarf bushes.
Ribston Pippin	November to January	Paradise	A splendid dessert apple; somewhat liable to canker, however, in soil that is wet.
King of the Pippins . . .	November to January	Paradise	An excellent fruit, with rather an acid flavour; a prolific bearer.
Adam's Pearmain	December and January	Paradise	Medium-sized fruit, well flavoured; the tree is a good bearer.
Cox's Orange Pippin . . .	November to January	Paradise	Generally recognised as the best-flavoured apple in cultivation; bears well either as a standard or pyramid.
Blenheim Orange	November to January	Paradise	A valuable apple, suitable either for dessert or cooking; forms a fine standard tree on the Crab stock, but does not then bear well when young; on the Paradise it bears earlier.
Allington Pippin	November to February	Paradise or Crab	A splendid dessert apple; delicious flavour; bears well.
Cockle Pippin	February to April	Paradise or Crab	A valuable late apple of excellent flavour.
Sturmer Pippin	March to May	Paradise or Crab	Another very valuable late apple; delicious flavour; prolific bearer.
Scarlet Nonpareil	December to March	Paradise	Medium; round; greenish-yellow; rich and juicy; a free bearer.
Newtown Pippin	December to April	Paradise	Medium sized; round; green; juicy; requires a warm position.
Lord Burghley	February to May	Paradise	Medium to large; green; russet-bronze; juicy, rich pine flavour.

COOKING APPLES

VARIETY.	SEASON.	STOCK.	REMARKS.
Frogmore Prolific . . .	September and October	Crab or Paradise	An excellent cooking apple; bears well as a standard or pyramid; white juicy flesh; large.
Lord Grosvenor . . .	August and September	Crab or Paradise	Large; a splendid early apple, very prolific.
Ecklinville	September and October	Crab or Paradise	A very good apple; heavy bearer; does well in any form, particularly as a pyramid.
Peasgood's Nonsuch . .	October and November	Paradise or Crab	Very large and extremely handsome; good flavour, and fairly prolific.
Warner's King	October to December	Paradise	A hardy and prolific variety; large, excellent kitchen apple.
Cox's Pomona	October and November	Paradise	Large, handsome fruit; a valuable kitchen variety.
Lane's Prince Albert . .	October to February	Paradise	A valuable, large pale-coloured apple; as a bush bears particularly well.
Sandringham	December to March	Paradise or Crab	One of the best kitchen apples; large and handsome; bears well in either stock.
Wellington (Dumelow's Seedling)	November to March	Paradise or Crab	A very valuable cooking apple; keeps well, and is an abundant bearer.
Bramley's Seedling . . .	January to March	Paradise	Large and excellent late cooking apple.
Mère de Ménage	December to March	Paradise	Finely coloured fruit; bears well as a small bush.
Cellini	October to November	Paradise or Crab	Large, even; green - yellow, streaked; good flavour; free bearer.
Grenadier	October to November	Paradise or Crab	Large, flat; green - yellow; very juicy; free bearer.
Annie Elizabeth	December to January	Paradise or Crab	Large, conical, angular; green, bronze-flushed; crisp, brisk flavour; very reliable.
Bismarck	October to December	Paradise or Crab	Very large; green, rose markings; vigorous and free bearing.
Alfriston	December to April	Paradise or Crab	Large, angular; green streaked with russet; sugary, crisp; free bearing; a grand late variety.

DESSERT PEARS

For cultural hints see pages 429-437

VARIETY.	SEASON.	STOCK.	REMARKS.
Doyenné d'Été	July and August	Quince	Small, very good early pear; must be eaten as soon as ripe; will not keep.

VARIETY.	SEASON.	STOCK.	REMARKS.
Citron des Carmes	July and August	Quince	A small, juicy, and well-flavoured early pear that will not keep when ripe.
Beurré Giffard	August	Quince	Medium size; an excellent late summer fruit.
Jargonelle	August	Quince	Large; of rich flavour; succeeds well as a standard; does not keep.
William's Bon Chrétien . .	September	Quince	A delicious pear, but will not keep long when ripe.
Fondante d'Automne . . .	September and October	Quince or Pear	A deliciously-flavoured pear, with white, tender, juicy flesh.
Louise Bonne of Jersey . .	September and October	Quince	A very fine fruit of excellent flavour; bears well in any form.
Marie Louise	October and November	Should be double grafted	Richly flavoured, though somewhat uncertain bearer; does well against a wall.
Doyenné du Comice	November and December	Quince	By many considered to be the best pear in cultivation; fruit large, pale yellow; flesh very rich and sweet.
Glou Morceau	December	Quince	A late pear of excellent flavour; grows well on the Quince; should have wall protection if possible, or a sheltered situation.
Winter Nelis	December and January	Quince	A somewhat small fruit, but finely flavoured; a very valuable late variety.
Thompson's	November	Pear	Generally considered to be the best-flavoured pear in cultivation; medium size, of rather uneven shape; exquisite flavour.
Ne Plus Meuris	January and February	Quince	A valuable late variety; medium-sized fruit of first-rate quality.
Olivier de Serres	February and March	Quince	An excellent late pear; medium sized; delicious fruit; bears well.
Easter Beurré	January to March	Pear or Quince	Large, juicy fruit, rich flavour; the tree is hardy and bears well on either stock.
Souvenir du Congrès	August to September	Quince	Very large, obovate; juicy, melting, free.
Devondean	October to November	Quince	Large, long pyriform; melting, sweet; very handsome, reliable.
Emile d'Heyst	October to November	Quince	Medium size, pyriform; melting, sugary; a great bearer.
Charles Ernest	October to November	Quince	Very large; pale yellow; handsome, rich flavour.
Beurré Diel	October to December	Quince	Large, obovate; sugary and aromatic. A free-bearing variety.

COOKING PEARS

VARIETY.	SEASON.	STOCK.	REMARKS.
Catillac	December to April	Quince	Very large fruit, therefore should be grown as a dwarf, and in a somewhat sheltered position; the best for culinary purposes.
Uvedale's St. Germain .	January to April	Quince	Exceedingly large fruit; this variety succeeds particularly well as a cordon; a good stewing pear.
Vicar of Winkfield . .	November to January	Pear or Quince	Fruit long, narrow; does well as a pyramid; of good flavour.
Verulam	January to March	Quince	Large, obovate; very prolific.
Bellissime d'Hiver . .	November to April	Quince or Pear	Large, sweet, free from grittiness; makes a fine tree as a pyramid.

DESSERT PLUMS

For cultural hints see page 428

VARIETY.	SEASON.	STOCK.	REMARKS.
River's Early	July	Common Plum	A valuable early purple plum.
Denniston's Superb . .	August	Common Plum	Yellowish green fruit; over medium size; of splendid flavour; one of the best.
Green Gage	August	Mussel	Preferred by many to any other plum; medium size; rich flavour.
Jefferson	September	Common Plum	Prolific bearer; a most delicious plum; large, oval; rich golden yellow, with red dots.
Kirke's	September	St. Julian	Dark purple; medium size; of excellent flavour; the tree bears well.
Lawson's Golden Gage .	September	Mussel	A highly-flavoured fruit; oval, medium size; deep yellow, speckled with crimson.
Reine Claude de Bavay .	September	Mussel	A deliciously-flavoured plum; roundish; greenish yellow; large.
Transparent Gage . . .	September	Common Plum	Rather large; greenish yellow, marked with red; one of the best.
Coe's Golden Drop . . .	Late September	Mussel	Large fruit of splendid flavour; should be allowed to hang late.
Ickworth Imperatrice .	October	Common Plum	Purple; rich flavour; must hang late to develop its full flavour.
Nouvelle de Dorelle . .	October	Mussel	Dark purple; a very sweet, late plum.
Huling's Superb . . .	August	Common Plum	Large; greenish yellow; good flavour.
Bryanston Gage . . .	September to October	Common Plum	Large; green, blotched red; rich flavour.

COOKING PLUMS

VARIETY.	SEASON.	STOCK.	REMARKS.
Duke of Edinburgh . . .	August	Mussel	Good bearer; large fruit; light purple colour.
Pond's Seedling . . .	September	Common Plum	A large dark red plum, valuable for cooking purposes.
Washington . . .	September	Common Plum	An excellent culinary plum, vigorous grower, and good bearer; large, handsome fruits; yellow, with red markings.
Magnum Bonum (red and white)	September	Common Plum	Large and very useful cooking varieties.
Victoria	September	Common Plum	Very heavy bearer; bright red; one of the best culinary plums.
Early Prolific	July to August	Common Plum	Medium size; deep purple; sweet; a great bearer.
Pershire	August	Common Plum	Medium size; juicy; free bearing.
The Czar	August	Common Plum	Very large; purple; free bearer; does not crack, and succeeds well on a north wall.

PEACHES

For cultural hints see page 474

VARIETY.	SEASON.	REMARKS.
Waterloo	July	A valuable early variety, well flavoured.
Hale's Early	Early August	A handsome early peach.
Dymond	August	An excellent fruit, large, and of fine flavour.
Grosse Mignonne . . .	Early September	Large; one of the best peaches.
Stirling Castle	September	By many considered to be the sweetest of all peaches; richly flavoured; forces well.
Princess of Wales . . .	Late September	A handsome fruit; one of the best.
Violette Hative	September	A rather large fruit; finely flavoured; prolific bearer.
Walburton Admirable .	October	Very large, pale colour; a good late peach.
Sea Eagle	Late September	A finely-flavoured large late peach.
Salwey	October	An excellent late peach, with yellow flesh.
Royal George	August to September	Large; highly coloured; first-class in every way.
Lord Palmerston . . .	September	Large; pale yellow flesh; melting and sweet.
Exquisite	September	Very large; sweet, juicy, vinous.

NECTARINES

VARIETY.	SEASON.	REMARKS.
Early Rivers . . .	Early August	A splendid early nectarine of first-class flavour; forces very well.
Elruge	Late August	Rather small; handsome fruit; the tree is a prolific bearer.
Lord Napier . . .	Early August	Large, delicious nectarine; forces well.
Pine Apple	Early September	A very handsome fruit, with yellow flesh, and of good flavour.
Victoria	Late September	A fine late variety; large; pale coloured; bears remarkably well.
Balgowan	End of August	Very large; high flavour; hardy.
Humboldt	Early in September	Large, sweet, free; very reliable.
Spenser	September	Very large; richly flavoured; handsome appearance.

All the above peaches and nectarines are of good constitution and standard varieties.

CHERRIES

For cultural hints see page 427

VARIETY.	SEASON.	REMARKS.
Early Rivers . . .	June	A sweet and early cherry; black.
Belle d'Orleans . . .	June	Rich flavour; of a pale yellow colour.
May Duke	July	One of the best cherries; rather acid flavour; dark red colour; an abundant bearer.
Frogmore Early Bigarreau .	Early July	A large, juicy fruit; yellow, marked with red; prolific.
Knight's Early Black. .	Late June	A large, black, juicy fruit; grows and bears well.
Governor Wood . . .	July	One of the most delicious cherries; pale colour.
Late Duke	Late August	A good late variety; somewhat acid flavour.
Black Heart	July	Medium size; black-purple; juicy, sweet, free.
Noble	September	Large; flesh firm; rich flavour.
Morello	August	Large; very dark red; the best cherry for cooking; does particularly well against a north wall.

STRAWBERRIES

For cultural hints see pages 455-462

VARIETY.	SEASON.	REMARKS.
Keen's Seedling . . .	Early	Dark colour; medium size; prolific; sweet.
La Grosse Sucrée . . .	Early	An excellent variety; dark, shining red; splendid flavour; one of the best.

STRAWBERRIES

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VARIETY.	SEASON.	REMARKS.
Royal Sovereign . . .	Early	A large, handsome, scarlet fruit, of good flavour; the best for pot culture.
Laxton's Latest . . .	Late	Large, dark fruits of excellent quality.
The Laxton . . .	Mid-season	A free-fruited variety of high merit.
Sir Joseph Paxton . . .	Early	A variety of high merit; the fruits are good for packing, being very firm.
The Bedford . . .	Mid-season	Very heavy cropper of good quality.
British Queen . . .	Mid-season	Generally considered to be the best-flavoured strawberry in cultivation; somewhat tender constitution and shy-fruited.
Countess . . .	Mid-season	A large conical-shaped fruit; crimson; rich flavour.
Veitch's Perfection . . .	Late	Large; very sweet; of good constitution.
Waterloo . . .	Late	An excellent late variety; very dark, almost black when fully ripe; rich flavour.
Dr. Hogg . . .	Late	Large; of as delicious a flavour as British Queen, and of more vigorous constitution.

GOOSEBERRIES

For cultural hints see pages 462-467

VARIETY.	SEASON.	REMARKS.
Whinham's Industry . . .	Mid-season	Large; of fair flavour; good for picking green.
Speedwell . . .	Early	Fine flavour; large; a good exhibition variety.
Warrington . . .	Late	Above medium size; very fine flavour; good cropper; and valuable for its long-keeping properties.
Red Champagne . . .	Mid-season	Medium size; good colour; upright habit; an excellent bearer; of first-rate flavour.
Langley Beauty . . .	Mid-season	A variety of great excellence; fruit large, of fine flavour and appearance; free habit.
Pretty Boy . . .	Late	A rounded variety; bears well; is of good flavour; and hangs until late in the season.
Keepsake . . .	Early	Large; of fine flavour; very useful, as the fruit is large enough to thin for tarts early in the season.
Telegraph . . .	Late	Very large; well flavoured; good bearer; an exhibition variety.
Whitesmith . . .	Late	Medium size; a very free bearer; fine flavour.
Berry's Early Kent . . .	Early	A first-rate variety; large berries.
Langley Green . . .	Medium Early	Very sweet; hairy; crops freely.
Crown Bob . . .	Early	Bright red; hairy; good flavour.
Hedgehog . . .	Mid-season	Rich flavour; hairy; thin skin.

RASPBERRIES

For cultural hints see page 477

VARIETY.	REMARKS.
Superlative	Very large; of excellent flavour; a strong grower, succeeding in soils where other varieties often fail; valuable from its often producing a second crop late in summer and early autumn.
Hornet	Large; of very fine flavour; a good variety in rich soil.
Northumberland Fillbasket .	Large; well flavoured; free growing; suitable for preserving.
Baumforth's Seedling . . .	Large; good flavour; bears well, but requires a good soil.
Yellow Antwerp	Generally considered to be the best yellow; large; fine flavour.
November Abundance . . .	Deep red; large; good flavour; ripens in November.

AUTUMN FRUITING RASPBERRIES

VARIETY.	REMARKS.
Belle de Fontenay	Late; dark red; very free; bears well.
October Yellow	Excellent flavour; but requires a fine autumn to ripen well.

BLACK CURRANTS

For cultural hints see page 467

VARIETY.	SEASON.	REMARKS.
Lee's Prolific	Rather early	Large; very sweet and good; one of the best.
Black Naples	Rather early	Very large and sweet; a good bearer.
Carter's Champion	Maincrop	Very large; good flavour; and keeps well.
Ogden's	Maincrop	Very large and good; succeeds where others fail.
Boskoop Giant	Early	Very large; free cropping; free from bud-mite.

WHITE CURRANTS

VARIETY.	SEASON.	REMARKS.
White Dutch	Maincrop	Berries and bunches long; good flavour; good bearer.
Transparent Versailles . .	Late	Very fine flavour; large and good.

RED CURRANTS

VARIETY.	SEASON.	REMARKS.
Cherry	Early	Very large; extra fine.
Red Dutch	Mid-season	Large; very heavy bearer.
Mammoth	Late	Very large and good.
La Constante	Late	Large; good flavour; bears freely; the fruits will hang on the bushes until late autumn.
Raby Castle	Mid-season to late	Large berries; large trusses or bunches; hangs well.

VEGETABLES

WHAT TO SOW.	DATES FOR SOWING.	VARIETIES.	SEASON.
Asparagus	April	Giant	April to July
" to plant	March or April	Conover's Colossal	"
Artichoke	"	Globe	June to October
" to plant	May	White (Sutton) Old Red	October to April
" Jerusalem	March or April	Progress or Ne Plus Ultra	June
Beans, dwarf	April	Monster Negro	End June & July
"	May, early	Magnum Bonum	July
"	May	Canadian Wonder	August
"	June	Syon House	September
"	July	{ Scarlet Emperor, Tender and True, Hackwood, Park Success. }	July to October
Beans, runner	May or June	Early Green Longpod	June
Beans, broad	February	Beck's Green Gem	July
"	"	Monarch	August
"	March	Windsor	October
"	April	Self-Protecting	November
Broccoli	March	Michaelmas White	Jan. and Feb.
"	"	Maincrop	March and April
"	April	Model or Late Queen	May
"	May	June Monarch	May and June
"	"	June King	Oct. to Dec.
Brussels Sprouts	March or April	Paragon	Dec. to March
"	"	Exhibition	Nov. to March
"	April	Scrymger's Giant	June to October
Beet	"	Crimson Ball or Globe	Oct. to Dec.
"	May	Nutting's Dwarf Red	Dec. to April
"	"	Cheltenham Green Top	Oct. to Dec.
Borecole or Kale	April	Dwarf Curled	Dec. to March
"	"	Cottager's, or Late Scotch	Dec. to April
"	"	Read's Hearting	July
Cabbage	February	Sutton's Maincrop	

WHAT TO SOW.	DATES FOR SOWING.	VARIETIES.	SEASON.
Cabbage	March	Matchless	August
"	July	Harbinger	April
"	July or August	Rosette Colewort	Oct. to Jan.
Carrots	March	Early Nantes	June
"	"	Early Gem	July
"	April	Matchless or Model	July to October
"	"	Intermediate	Sept. to Jan.
"	July	Early Horn or Others	Spring
Cauliflowers . . .	Feb. (in frames)	Snowball or Forcing	June
"	March or April	Pearl or Favourite	July and August
"	April	Veitch's Autumn Giant	Oct. to March
"	August or Sept.	Walcheren or Early London	May and June
Celery	March	Early White or Red	October
"	April	Major Clarke's	December
"	"	Standard Bearer	March
"	"	Sulham Prize Pink	Nov. to April
Cucumber	February	Telegraph	April
" for framework	March	Matchless	May
" " " "	April	Market Favourite	Summer
" " " "	"	Long Ridge	"
Endive "	June	Stockwood Ridge	August to Sept.
"	July	Green Curled	October
Leeks	Feb. or March	Batavian	Winter
Lettuce Cos . . .	Feb. to Sept.	Lyon or Musselburgh	"
" Cabbage	"	In Variety	May to Dec.
Onions	March or earlier	In Variety ; see Notes	April to April
" winter varieties	Aug. to Sept.	In Variety	Aug. to April
Parsley	Mar., May, July	Giant Rocca or Spanish	May to July
Parsnip	Feb. to April	Garnishing	All year
Rhubarb	March or April	Student or Hollow Crowned	October to April
" to plant	Nov. to March	Early Albert	March
Radish	Feb. to April	Champagne	April to June
"	May or June	Early Sorts	"
Peas	February	Late Varieties	Summer
"	March	Chelsea Gem	May
"	April	Daisy or Stratagem	June
"	May	Bountiful or Gradus	July
"	"	Ne Plus Ultra	Aug. to Oct.
"	May or June	Centenary	"
"	July	Marrow Varieties	Aug. and Sept.
Savoy Cabbage . .	March	Early Kinds, Dwarf	October
"	April or May	Green Curled	September
Seakale	March or April	{ Drumhead or New Gem }	Winter
" to plant	April	Savoy	"
Spinach	March	Purple or White	"
"	April or May	"	May
"	August	Victoria	June
Tomatoes, under }	January	Longstanding	Spring
glass }	"	The Carter	"
"	Jan. to March	Conference or Ham Green	Summer
"	March	Sunrise	{ Summer and
" for open }	"	Duke of York	Autumn
ground }	"	Laxton's Early	Autumn
Turnips	February	"	July
"	March	Early Milan	May
"	June	Snowball	June
"	"	Veitch's Globe	Autumn

USEFUL TABLES

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WHAT TO SOW.	DATES FOR SOWING.	VARIETIES.	SEASON.
Turnips	August	Veitch's or Golden Globe	Winter
Vegetable Marrows .	April (in frames)	Early Albert	June
" "	May	Long White	July
" " " "	June	Bush or Custard	August
Herbs	March to May	In Variety	"
Potatoes	Feb. (probable)	Midlothian Early	May and June
"	March	King Edward	July to Nov.
"	"	The Factor	July to Spring
"	"	{ Ninety Fold or Ashleaf, }	May to June
"	"	{ in variety }	
"	April	{ Maincrop Varieties or }	July to October
"	"	{ Late Up to Date }	Winter to Spring
"	"	Dover Castle, Royalty	

USEFUL HINTS

Bulbs after Flowering.—Bulbs that have been forced or grown in water, methods of treatment that are somewhat against their nature, cannot be depended upon to flower again the following year. If it is thought worth while to keep them at all, they will have to be nursed into vigour by being planted in a warm aspect in well-drained soil, and left for a year to recover, after which they may be used again, though they may not be so good as properly-grown Dutch Bulbs, which are now so cheap that it is hardly worth while to practise the nursing plan.

Care of Old Trees.—Almost every garden contains one or more veterans which are for some reason precious to their owners. The two immediate causes of premature decay are starvation at the root and injury by storms and disease. Such trees as the Beech and the Horse Chestnut, that root close to the surface of the soil—quite differently to the Oak—may often be invigorated by covering the ground with a few inches of good soil or short manure. Artificial watering during long drought, provided that it is thoroughly done, is another great help. Trees with large crowns of branches are frequently seen thinly furnished with foliage, and altogether sickly in aspect, owing to unhealthy or insufficient roots. The balance between top and bottom has been destroyed. To restore it in some measure, the top growth may be reduced by pruning and shortening branches here and there, wherever it can be done without spoiling the appearance of the tree. This demands careful judgment, but some old trees in a sickly state can certainly be rejuvenated in this way. It is of no value in the case of trees with decayed trunks, nor with those, like our Common Oak, which will not break from old wood. But Elms, Robinias, and Red Oaks are amongst those that respond to this treatment. Old trees with insecure branches can often be preserved from mutilation by storms if the main branches are fastened together or to the trunk. The common practice of putting an iron collar round the branch should be abandoned. The iron prevents the natural expansion of the branch, and ultimately chokes it. A better way is to use a strong iron rod with a plate at the end, and instead of supporting the branch by encircling it, a hole is bored right through the centre of it, through which the rod is pushed from the outer side. In this way the weight is borne by the iron plate, which should, by removing sufficient bark, be allowed to fit close in to the wood. New bark will gradually close over and hide the plate, and instead of an ugly iron collar cutting into the wood, the only evidence of artificial help is in the rod coming from the inner side of the branch. It is important that branches or snags that have to be removed should always be sawn off quite close to the trunk or larger branch from which they spring. When a stump even no more than a few inches is left, the new bark and wood are unable to close over it, and the wood ultimately decays and acts as a conduit for moisture and fungoid diseases. A coating of liquid tar over the wound, renewed once or twice until the new bark has closed over, is a perfect protection against these evils. Trees decayed in the centre, with only an outer layer of healthy wood, are, of course, doomed; but by filling up the holes in the early stages of decay, and thus keeping out moisture, their term of life can often be lengthened by many years. Holes made by woodpeckers can sometimes be plugged up with a piece of oak. This, if left on a level with the bark, will often enable the latter to close over the hole. Large holes may be filled with cement, or even built up with bricks, the surface being made water-tight and tarred over.

Cleansing Plants.—Whilst every one recognises that as soon as plants of any description become infested with insects they must be made clean, it is not so generally understood that cleanliness is indispensable to the health and growth of all plants even when no insects are present. The larger the leafage, especially of plants grown under glass, the greater their breathing area, and as leaves are like lungs, constantly giving off gases and absorbing others, it is of the first importance to keep them clean. Outdoors, rains or heavy syringings will generally do that. Indoors, because the culture is somewhat artificial, there is greater need for cleanliness. Leaves should therefore be often sponged or syringed to free them from dust and soot or other dirt. This is specially necessary with thick leathery leaves.

Coops for Winter Protection.—The late Mr. G. F. Wilson, of Weybridge, had a most useful coop for protecting winter flowers, especially the Christmas Rose. He used to mention that he had at Wisley a place which suits both the winter and Lent Hellebores:—"Ours are planted in a bank at the side of a ditch facing north, shaded by a high hedge at the south side of the ditch. The soil is light loam, and in ordinary years rather moist. Some good authorities advocate planting in the full sun. Our experiments have gone the other way. Perhaps it is a question of stiffness of soil. As the flowers when out have often hard frosts and heavy rain to contend with, glazed lights are frequently recommended to protect them. My object in this note is to recommend coops, as being much lighter and as covering larger plants. We began by using common wicker hen-coops covered with green scrim, but after a time the wood got out of shape and decayed, so iron wire was substituted for the skeleton. If these coops are put by in the summer, if not in use, in a dry place, they will last for many years. After the Hellebores they are useful for *Anemone fulgens*."

Covering for Close North Fence.—Many beginners regard the north aspect as unsuitable for plants in general, but it is as easy to plant a fence with a north exposure, and to make it beautiful with a flowering covering, as one with any other position; indeed some plants, by no means the hardiest, such as *Escallonia* and *Ceanothus*, will often on a north wall or fence escape that vernal danger of sun on frosty stems or foliage that so often kills these plants, or at any rate cuts them to the ground in any sunny aspect other than westerly. Any of the Ayrshire Roses would do well, and the common pink China, also the beautiful and long blooming hybrids of China and such fine rambling sorts as Penzance Briars, Mme. Alfred Carrieré, and Reine Olga de Wurtemberg, the grandest of roses for winter foliage. *Wistaria* would also do, and the Clematis species, such as *montana*, *Flammula*, *graveolens*, and *paniculata*. *Jasminum nudiflorum* is naturally at home in such a place. The Guelder Rose, trained as a wall or fence covering, is admirable; and another handsome shrub that is excellent for the same use is *Spiræa lindleyana*, all the prettier if *Clematis Flammula* runs into it. The Roses named are—all but the China and hybrids—strong and even rampant growers. Reine Olga will throw out shoots 15 feet long in the year, therefore these should be planted a good distance apart. When the fence is not high, say about 5 feet, the Roses must be trained down and are all the better for it.

Destroying Wasps' Nests.—The simplest and most certain material with which to destroy wasps' nests is cyanide of potassium. A very small quantity of this may be dropped a little way in the hole of the nest, the entrance being at once closed with a piece of turf. Cartridges of gun cotton, dynamite, or other similar explosive, with lighted fuse attached, then placed in the hole, will generally blow the nests to atoms. One may use with almost equal effect ordinary squibs of gunpowder, brimstone, or saltpetre, as the smoke being enclosed the wasps are quickly destroyed. These measures should be taken at night when the wasps are in the nest. Rag soaked in tar and put on the end of the stick which must be lighted, thrust into the hole, and a thick piece of turf to stop the entrance, will kill the marauders.

Flowering Trees and Shrubs for Windy Places.—Only vigorous trees and shrubs should be planted in very windy places. Where Rhododendrons and Azaleas succeed they may be planted freely for their spring beauty, and, in the case of the former shrub, evergreen foliage too. Barberries may be tried, and they bear beautiful flowers in spring and summer, followed by showy fruit in autumn. The purple-leaved Barberry (*B. vulgaris purpurea*) is an effective, dark-leaved shrub, and will flourish in quite barren ground. The Phillyreas form a small group of compact, evergreen shrubs, and, with the exception of *P. decora*, also known as *P. vilmoriniana*, all have graceful deep green leaves, and are quite hardy. The Spanish Broom (*Spartium junceum*) is another good shrub for the purpose. One may also choose from the Thorn, Laburnum, stronger growing forms of Deutzia, Bush Honeysuckles (Weigela), Snowdrop Tree (Halesia), Lilacs, Flowering Currants (Ribes).

Garden Plants that will bear Flooding.—Many of my readers are placed by riversides, and some part of the garden is flooded occasionally in winter. A correspondent in the *Garden*, "A. B.," in response to a question about the plants likely to succeed under such conditions, gave a list from his experience that will succeed:—"Several forms of *Lychnis*, *Spiræa*, *Myosotis* (Forget-me-not) in various perennial forms; *Lupinus*, *Leucojum* (Snowflakes), Flag or German Iris, *Trollius* (Globe-flowers), *Caltha* (Marsh Marigolds), in variety; *Chrysanthemum latifolium* and *C. maximum*, with their hybrids; Bunch Primroses, *Polyanthus*, *Primula japonica* (plant this on the water edge of the river), Daffodils, Snowdrops, *Fritillaria*, double form of Meadow Saxifrage, *Anemone japonica*, *Hemerocallis* (Day Lilies), these will revel in a damp root-run; *Aconitum*, *Pæony*, *Helianthus* (Perennial Sunflower), *Delphiniums* (to see these at their best add peat to the soil), *Starworts*, *Phlox* (must have very rich soil), *Doronicums*, *Campanulas* (to get best effect add peat and leaf-mould), Oriental Poppies, *Achillea Ptarmica*, the Pearl,

Linum catharticum (Goldilocks), Columbine, Rudbeckia, *Erigeron speciosus*, *Eryngium alpinum*, Galega (Goat's Rue), Geranium (Cranes-bill), *Tradescantia virginica*, Pole-

FIG. 68.—Useful Garden Tools.

Dibble, Dutch or push hoe, common or draw hoe, and rake.

Nasturtiums, annual Larkspurs, and annual Monkshoods, with Godetias, Shirley Poppies; and Cornflower will do sown the previous September for transplanting; Paris Daisies, Salvias, Ivy-leaved Geraniums, Heliotrope, Fuchsias, Geraniums, and Pentstemons, to be struck from cuttings and wintered in a cool frame. *Trees:* Copper Beech, Silver Maple, Golden Elder, Weeping Ash, red and pink Hawthorns, Japanese flowering Apples, double white and pink Cherries, red Horse-Chestnut, and Laburnums.

"As *Creepers*, cut-leaf and other Blackberries, type Clematises, on their own roots, white Everlasting Peas, Kentish Hops, Virginian Creepers, Honeysuckle of kinds, and hardy single Roses and Ivy; Pampas Grass, Guelder Roses, Weigelas, Rugosa, or other single hardy Roses on their own roots. Sweet Briars all do as bushes. Mock Oranges, Ribes of kinds, Forsythia, Lilacs, all these will do."

Garden Tools.—These must be of various descriptions. Spades, forks, hoes, rakes, picks, knives, saws, shears, scythes, rollers, wheelbarrows, water-pots, and many other things. But once purchased they should always have a place to themselves, where, having been well cleaned after being used, they can be hung up or otherwise stored. It is surprising how little space tools need. When on hooks, or large nails, they can be hung up round a shed. A shed made with a wood frame, and coated with corrugated iron, does not cost much, and is very enduring. It may even be large enough, if near the greenhouse or frames, to be used as a potting shed also. All tools should be kept quite clean, as then they work more freely and last longer. Always leave water-cans upside down after use. Give barrows, pots, &c., a coat of paint occasionally, as it pays in the end. Keep one large pruning knife for rough work, and a small one in the pocket for common use.

Greenhouse Fires.—Where there is a greenhouse, some means of heating it to exclude frost in winter is essential. Gas or oil lamps are temporary and poor means for warming a greenhouse, often failing, and the foul gases emitted are most harmful to the plants. The best provision is found in a small boiler fixed in the wall of the greenhouse at one end, the furnace door by which it is fed being outside, and protected with a small corrugated iron sheet to ward off wind and rain from the fuel. If to this boiler be attached inside sufficient length of 4-inch piping, it is easy then to get up a nice warmth, and with proper attention to maintain it through the night, especially in hard weather. All these boilers are best fed with fuel of one-third small coal, the rest being finely broken coke and house cinders. Always loosen the mass of fire, perhaps once in two hours during the daytime, adding fresh fuel, especially before going to bed, when the fire should be well banked up.

FIG. 69.—Rake and draw hoe with long handles. Also digging spade and narrow tined fork.

Gumming.—Gumming on fruit trees is practically confined to those producing stone fruit. Peaches, Nectarines, Plums, Apricots, Cherries, and Almonds are all prone to it, and the intelligent cultivator dreads its appearance on the trees named almost as much as an outbreak of canker in the Apple orchard. Fortunately, however, it does not spread rapidly from tree to tree as canker does, though it is equally difficult to eradicate when once it puts in an appearance.

Its appearance at times is most puzzling, even to experienced growers, as, knowing what conditions are likely to produce gumming, measures are taken to arrest it. This is not so, however, with the amateur or young gardener. The latter especially often undertakes the management of a valuable lot of trees either growing against walls in the open or under glass. A few errors on his part in the cultural details may lead to much trouble, if not the total loss of valuable trees, through the excessive exudation of gum from the main stem or branches.

One of the most fruitful sources is the too free use of the knife. Trees which produce

FIG. 70.—Evil effects of wire and tight shreds.

FIG. 71.—Gumming.

stone fruit resent hard pruning more than either the Apple or Pear. Under proper treatment pruning can and should be reduced to a minimum. This in the first instance is accomplished by properly disbudding the branches in summer, and secondly by preventing the formation of gross shoots. Rank-growing trees are more subject to gumming than those which make medium growth and carry full crops of fruit annually. To severely prune the former only makes matters worse. The fault can generally be traced to the border, unless through some mishap the crop fails, and there is not the strain of fruit production to balance growth. It is the roots, therefore, and not the branches that must be dealt with. A firm and rather shallow rooting medium favours the formation of short-jointed, healthy fruiting wood, support being afforded as the trees require it. Deep rich borders of loose formation and overcharged with manure encourage soft strong shoots which seldom become matured by autumn. With outdoor trees such unmatured wood is easily injured by frost, and its effect is readily noticed the following spring, first of all by the discoloration of the bark, forming patches of red here and there. These eventually turn

black, the bark dies, and this is generally followed by the exudation of gum. From this it would appear that the sap vessels having been ruptured, strangulation at that point results, and the growth above, being cut off from further support, perishes. In the case of strong growing trees lift them and rearrange the roots, bringing the latter nearer the surface. Place fresh strong loam about them, the only addition required being old mortar, and then ram the whole firm.

Although, as pointed out, gumming may be the result in the first instance of indifferent root action, coupled with what may be termed frost-bite, it generally follows wounds or abrasions of the bark. How do these abrasions occur? Seeing the evil which follows, how careful one should be in avoiding them.

A wound to the bark is easily produced by the use of shreds that are too short, and which will not allow for the free swelling of the various shoots for at least a year. No part of the tree should ever be allowed to press hard against the brickwork. Look over the trees frequently during the growing season to free any shoot that is likely to become too closely encircled by the shreds or matting.

Hedges of Flowering Shrubs.—It often happens that some kind of hedge is wanted in a garden, either as a screen to hide vegetable ground, or as a wind break or some kind of partition. When this is the case it is a good plan to plant hardy flowering shrubs about 4 feet apart, and to so train them that they grow into a compact hedge, and yet have enough lateral play to allow them to flower. Such a hedge is not only ornamental, but it yields endless material for cutting. It should be allowed to grow quite 4 feet thick, and is best formed with a backbone of stiff woody shrubs, such as Guelder Roses, Ribes, and Lilac, while between the stiffer shrubs might be some that are weaker, such as Kerria, Rhodotypos, and Leycesteria. Plants of rank, rambling growth, such as the free Roses or double-flowered Brambles, Aristolochia, Wistaria, Virginian Creeper, and the rambling Honeysuckles, are not in place in such a hedge; they are more suitable for rough hedge banks, walls, or for arbour and pergola; the flower hedge wants true shrubs. The bush Honeysuckles, such as *Lonicera fragrantissima* and *L. tatarica*, are just right, or any woody, twiggy bushes either of moderate growth, or such as are amenable to pruning or thinning, such as Deutzia and Snowberry, shrubs that so often get overgrown in a shrubbery. In the hedge these would do well, as they could be easily watched and thinned, also any of the many true shrubs that flower all the better for reasonable pruning. Any one would be surprised to see what a quantity of useful flowers such a hedge will yield, while if there is another of foliage for winter use it will be invaluable to the indoor decorator, using such shrubs as the Scotch Golden Holly, Golden Euonymus, Golden Privet, the variegated *Eurya latifolia*, yellow variegated Box, *Cassinia fulvida*, and Golden Tree Ivy, all shrubs of the utmost value for winter cuttings. Other flower hedges are delightful possessions. Hedges of China Rose, of Sweet-briar, of old garden Roses, or of climbing and rambling Roses trained down, of Honeysuckle, of Jasmine—some of these are occasionally seen; but a good selection of true hedge shrubs is rarely, if ever, made. Any of the shrubs recommended for the mixed flowering hedge could, of course, be used alone, and excellent would it be to have a hedge of Guelder Rose, or of flowering Currant or Japanese Quince, and how much more interesting than the plain hedge of Quick or Privet or Holly. Both sides of the hedge should be easily accessible; not necessarily by a hard path, but by a space just wide enough to go along comfortably. An additional advantage well worth considering would be that, supposing the direction of the hedge was east and west, the south side would flower in advance of the north, and so prolong the supply of bloom.

Sweet Briars as Exposed Hedges.—The Common Briar makes an excellent hedge. It is very hardy, and as the plants are raised from seed there is no trouble from wild suckers, such as one experiences now and then with budded plants of Lord Penzance's hybrid Sweet Briars, which make delightful hedges. The most brilliant crimson is Anne of Gierstein. Other good kinds are Amy Robsart (pink), and Lady Penzance (coppery yellow); the last mentioned is not quite so free as the others. All have fragrant foliage, and produce showy fruits in autumn. The Sweet Briar revels in a good, deep loamy soil, inclined to clay, but before planting the ground must be trenched, incorporating with the soil well-decayed farmyard manure, and a little old mortar and burnt garden refuse if procurable. Plant between October and April. Do not plant very large bushes of the Sweet Briar. Those from 2 feet to 3 feet in height are strong enough. One year after planting cut them down to within 12 inches or 15 inches of the ground; the subsequent treatment consists in removing dead and crowded growths in autumn, and pruning rather severely three or four years to induce strong, new growth. A good watering now and then during the summer with diluted stable or cowyard drainings forms an excellent stimulant for these and other Roses used as hedge plants.

Hot-bed.—In making a hot-bed, either for forcing vegetables, growing Melons or Cucumbers, or raising annual flowers, the first thing to be considered is the preparation of the materials. These should consist of leaves and stable litter in equal

quantities, and be thrown into a heap and turned over several times at intervals of three or four days to allow the steam to escape. If the leaves or litter are too dry, make them thoroughly moist by sprinkling water over them. Thus prepared the material will retain the heat for an indefinite period. Secondly, the dimensions of the bed should be marked out, and allowance made for a 2½-foot pathway all round, after the frame is placed on. Stout stakes should then be driven in at the four corners to serve as guides when the bed is being made, after which place a layer of the material along the sides and ends of the bed, in a direct line with the stakes, and then proceed with the interior of the bed. As each moderate layer of leaves and litter is added, let it be trodden very firmly, as if left in a loose condition the bed will soon lose its heat, and also be liable to tilt on one side when the frame is placed on. The sides and ends must be well trodden and beaten with a fork, or they will collapse when walked upon later. Beds which are made very early in the year should be 4 feet high at the back, and 3 feet 6 inches in front, while those made later may be 6 inches less in depth. A good fall from back to front must be allowed, so that a maximum amount of sun heat may reach the interior of the frame. As soon as the bed is finished the frame may be placed on and the soil thrown in, after which some clean straw litter should be laid round the frame on the bed to give a neat appearance.

Labels.—Everything sown or planted in a garden should be labelled, such as all varieties of Apples or other fruits, of Dahlias, Roses, Carnations, and other things individually, and Peas, Potatoes, Cabbages, &c., in the bulk. Labels may be made easily from stout laths rent for plastering, as these need little preparation. A bundle of laths 3 feet long will make hundreds of labels, from 4 inches, wired on to trees or roses, up to 8 inches, for vegetables. First cut them into proper lengths, then pointed one end, if to be put in the ground, doing that with a sharp knife, and facing off both sides flatwise quite smooth. A little thin white paint may be well rubbed over a few inches of the top of one side, and the name be written with pencil whilst the paint is wet. It then soon dries, and the writing will remain clear as long as the label endures. These wood labels should be prepared by the fireside in the winter. If metal labels are desired, the best we know are the "Acme."

Mulching.—This is a term understood by practical gardeners as a dressing of some other material placed on the surface of the soil about plants, trees, and similar things to check waste of moisture when, either after watering or after rain, or at any time hot sun beats fiercely on the soil, and makes it hot so that it dries rapidly. To prevent this the gardener, whenever he can, places about the things he has to water, or between and about garden crops or fruit trees or other things, a layer of manure containing a good portion of straw; or failing that, cocoa-nut fibre refuse or decayed leaves, as these catch the sun's rays and protect the soil, thus keeping moisture in it. Under waterings or rains the manurial properties in the mulch also will wash in and assist to feed the crops or trees. Fruit trees on walls and Vines specially benefit by mulches of manure.

Nails and Shreds.—Every gardener (the term is used in its broadest sense) has occasion to nail fruit trees or climbers to walls or fences. The best nails for brick or stonework are those of the ordinary cast-iron form, as these do not bend, and can be driven into very hard material. When old ones are drawn from a wall they should have a partial turn or twist given to them with the hammer claw or pincers first, as that preserves the point and frees them from mortar. Nails that have lost their points are of little use, and should be thrown away. Old nails with hard mortar still adhering are best cleaned by putting them on an old shovel and burning them in a fire, as then they are quite fit for use. Shreds should always be made of clean, even if old cloth. They may, according to the size of the shoots they are to secure, range from half an inch to an inch in width, and be from three to even six inches in length. Old shreds may be full of insect eggs or fungoid spores, and should be burned at once.

Packing Flowers.—The best way to pack flowers is to wet some moss and wring it out in the hand, and either tie it on to, or lay it loosely but firmly among the stalks, and envelop the whole in some large fresh leaf like Cabbage, Rhubarb, Spinach, Lettuce, Dock, or even Ivy. If the box is larger than the space the specimens actually occupy, it is well to fold the green leaf over the flowers, and to fill the rest of the space with crinkled paper of any kind, wood or paper shavings, or any such material, in order to keep the flowers quite firm, and not allow any movement whatever. It is much better to pack very tight, only short of crushing, than to leave any space which would allow them to move. It should be remembered that a postal journey is a train journey, and that the unceasing vibration means a constant grinding of any surfaces which may be in contact with each other. Only tight packing prevents injury from this cause. In all such packing exclusion of air is also of the utmost importance, and therefore tins are the best kind of receptacle. There is generally a Cabbage leaf in the kitchen, and there is often only too much ivy on the house.

Pergola.—The pergola, or covered way of green growths, has come to us from Italy, and is frequently seen in English gardens. In Italy it answers the two purposes

of the best way of growing Vines for fruit, and of affording pleasant shade over paths. Even in England, though Grapes will only ripen against a wall, the Vine is still the best and most beautiful covering for these pleasant, shady ways, and with other quick-growing climbing plants, such as *Aristolochia* and *Roses*, will soon cover the skeleton of the structure, and give the cool shade that is so pleasant in the heat of full summer. The pergola may be entirely of wood, preferably of oak, stems about 9 inches in diameter, and left quite rough. The bark must not be stripped off. Where expense is no object it is better that the supports should be of something more durable than wood. Nothing is better than piers of 14-inch brickwork, standing 7 feet 2 inches out of the ground, with sound beams of oak coupling them across the walk, and larch poles or branching tops of oak laid along overhead. There are also some small trees that will soon cover a pergola, such as *Laburnum* and *Weeping Ash*. These two, if grown together over a temporary larch support, would in time take its place altogether. In quite small gardens rough arches of oak across a path are pretty, and provide opportunities for the growth of climbers; but never use galvanised iron frameworks or anything of a cheap "rustic" character. Simplicity should be the watchword.

Plants for Rooms.—No book upon gardening intended for the beginner would be in any sense complete without some particulars about Window and Room Plants. Many lovers of flowers have no greenhouse or even garden to pursue their pleasurable inclinations, and it is then the room becomes the indoor garden, where those things that will succeed in this atmosphere are grown in as great a variety as possible. Dwellers in "flats" usually lighted by electricity, not by health-destroying gas, may brighten their apartments considerably by judiciously selecting a few good things. At present room gardening is not always successful. There are more failures than successes, and unless certain golden rules are unflinchingly observed, it is hopeless to expect plants to live for more than a few weeks, whereas with correct treatment their lives would have been of considerable duration. It is very easy to deal with insect pests, as the plants are under close and constant observation, but the failures may be attributed to injudicious watering, draughts, foolish applications of violent fertilisers, and dust. There are others, and one of them is not purchasing the right sort of plant. Things forced in heat merely to sell, glistening green-leaved india-rubber plants, glossy palms, and so forth, are invariably a failure. We have no wish to say hard things about the hawker, but he buys from the marketman, who puts things in the market that have been produced by unnatural forcing in heat. So go to a good nurseryman who has grown the plants in about the same temperature as the room, then, success, with correct after-treatment, may be expected. It is a mistake to buy at all in the winter, unless, of course, for temporary decoration.

Draught is a fruitful source of failure. The plants are stood about the floor in the draught from doors when cleansing operations are going on in the early morning, or the windows are left open, and the foliage flutters in the keen early wind. All this means that in time (not very long) the deep green of the leaf changes to brown, and plant growing is given up in disgust. Then in the winter frost attacks the plants. The temperature drops far below freezing point in an unwarmed room, and the plants in the window have an unhappy time, even in a room used during the day. Never fail to bring the plants into the centre of the room when a sharp frost is expected, and this may be easily managed with an iron or strong wire stand. Never leave the door and window open at the same time or allow cold draughts to blow upon the plants.

In large towns constant attention is needful. Dust accumulates on the foliage, especially in the case of thick-leaved plants, such as the *Aspidistra* or *Parlour Palm*, *Aralia Sieboldi*, Palms, and similar things. Free the leaf surfaces from dust with a bit of sponge moistened in tepid water. Unless this important duty is frequently attended to it is hopeless to expect healthy plants. Dust chokes up the pores and suffocation ensues.

Water should always be tepid. A fruitful cause of failure is cold water, which chills the roots, hinders growth, and eventually kills the plants. This may seem a trivial matter; it is not so. Good room and window gardeners use water of the same temperature as the apartment. It is also wise to let the water intended for the plants remain in a vessel in the open air to soften, and where rain water can be used this is better than that from tap or well. Never over or under water. The soil should be kept in an equal condition of moisture, and when watering give a good dose at each application, so that it runs through the drainage and out of the hole in the bottom of the pot. In summer and warm spring days the plants receive considerable benefit from pleasant showers, soft, gently falling rain, not violent downpours.

Of course a greenhouse is an immense help to the room plants and flowers. When the latter become out of health, take them to the purer air of the greenhouse, and under more natural conditions, and especially after they have been repotted. The greenhouse is also a nursery for bulbous flowers and other things as pointed out in the chapter about greenhouse plants.

When potting room plants, remember it is most important to restrict the size of the pots as much as possible. Palms are frequently happier with their roots cramped in a pot than when allowed greater freedom, and disturbance at all is seldom necessary. We have Palms that have been in the same pots for years. The soil is top-dressed once a year, and during the growing time a little weak liquid manure is given. With regard to soil the information given in the chapter upon greenhouse plants applies here.

There is one point often forgotten, and that is of giving during the growing season a little stimulant or "artificial manure," such as Clay's. Use this manure strictly according to directions, not a least bit over, as it is powerful, and, like medicine given in excessive doses, inflicts considerable injury. We have known plants killed by the excessive use of artificial fertilisers. Soot water is excellent, and is easily made by putting soot in a small sack and letting it soak through in a tub of water. Soot is useful to give in the spring, and makes the foliage of deeper colour.

The majority of insect pests may be removed with a tiny brush or with the hand.

Planting and Sheltering an Exposed Flower Border.—In dealing with a border of this kind, and there are many similar positions in English gardens, we should advise, in the first place, a careful planting of one of the best of our native evergreens, either Yew or Holly. Which of these two it would be wiser to use should be decided by observing which appears to be more vigorous in the neighbourhood. Both are slow of growth at first, but grow fast when well established. In an exposed place no pains should be spared to make this shelter planting effectual. Then you must have shelter shrubs. *Pyrus Malus floribunda* is very hardy, flowering when quite young. Lilacs are amongst our hardiest shrubs, flourishing even within the Arctic circle. Double Thorns would also do, the double white being far the best. Laburnums also do well. Wistaria is hardy, and is beautiful grown as a Standard, as is also Philadelphus (Mock Orange). It should be remembered that all shrubs that are amenable to the standard form give much more bloom. Brooms are hardy and beautiful, and there are many kinds to choose from. With these, or even a smaller selection of them as a sheltering background, nearly all the best known border plants would succeed.

Planting a Steep, Sunny Bank of Poor Soil.—Amateur gardeners are often at a loss to know how to deal with such banks as this, and the following hints may prove helpful. In the latitude of London and the large portion of England that is to the south of it, many of the shrubs and plants of the Mediterranean district succeed well on banks in poor, warm soils that are naturally well drained, and receive the full heat of the sun. Conspicuous amongst these are the hardier of the Cistuses, Rosemary, Lavender, Santolina, and Phlomis, all the Brooms, the sand-loving, bluish grass (*Elymus arenarius*), the Eryngiums or Sea Hollies, a large range of aromatic herbs such as Thyme, Marjoram, Catmint, Furse of kinds, Broom, Lycium (Boxthorn), Brambles, not forgetting the pretty cut-leaved *Rubus laciniatus*, the Japanese Wineberry (*Rubus phanicolasius*), picturesque in growth and in fruit, and with slight preparation, the Japanese Rose (*Rosa rugosa*), and the Scotch Briars. The situation is also favourable to the hardy Opuntias of recent introduction. Such a place also shows to great advantage several plants that are commonly grown as climbers up walls or other supports, and that are quite as beautiful rambling at will over the ground. Amongst these would be *Clematis montana*, which is of extreme vigour, and bears a wealth of white flowers in spring, *C. Flammula*, *paniculata*, *graveolens*, and the Old Man's Beard or Travellers' Joy (*C. Vitalba*). Many of these Clematises are as beautiful when in seed as in flower. Every lover of the open knows how charming is the hedgerow in autumn when the Travellers' Joy covers it with its foamy seed tassels. Upon this bank could also be placed Everlasting Peas if the soil is prepared deep enough for their great roots. Othonnopsis and *Arnebia echioides* (Prophet Flower), the native and other heaths. These plants would give an ample list for a very large space of ground.

Planting Sloping Banks in Garden Ground.—No feature is more frequent in gardens, whether large or small, than a change of level necessitating a flight of steps. The change of level, if not retained by a wall, usually has for its fate the steep turf bank, unbeautiful, awkward to mow, and in all ways a very "bad second" to the better way of treating it as a slope planted with suitable bushy growths. *Cotoneaster microphylla* is a most suitable dwarf shrub for this purpose, but only one of many that can be used in like manner. Such a bank planted with Savin (*Juniperus Sabina*), an evergreen of deep, low-toned colour, that accords with the most dignified of masonry, would always, winter or summer, clothe it well, and be pleasant to see. The late Dutch Honeysuckle, though not evergreen, is also a capital thing, for its masses of growth, interlacing in a kind of orderly tangle, are by no means unsightly in winter. For banks of large size there is *Pyrus japonica*, the free-growing Roses, or the double Brambles. For hottest exposures there are the Cistineæ (*Cistus* and *Helianthemum*); while some of these and other sun-loving plants, such as Phlomis, Rosemary, and Lavender, can be used in mixtures. A beautiful combination is of the common evergreen Berberis (*B. Aquifolium*).

folium), and *Forsythia suspensa*, the yellow bloom of the free-arching Forsythia coming while the Berberis is showing its own yellow bloom, and still holds its leaves of winter red-bronze colouring. Ivy and St. John's Wort are obvious plants for such use, but their monotony makes them less desirable than the more interesting treatment of shrubs with low or spreading growth. Scotch Briars are also excellent for this kind of planting, while if the bank occurs in a shady spot, or has a cool exposure, it will be a good place for hardy ferns.

Pots and Potting.—Flower pots or pans used for growing plants of any description in should always be cleaned before being employed. If they are new, and have not been exposed to the weather, dip them in water twenty hours before they are used, as quite new pots, not so treated, often absorb much moisture from the soil. All that have been used should be thoroughly washed, and, if green, scrubbed clean in strong hot soda water and well dried before they are again used. What are called crocks or drainage usually consists of such split or broken pots as are invariably found where flower-pots are used. If there are, however, few of these, some soft red bricks broken up, not too finely, make good drainage. One rather flat piece of crock or potsherd should always be placed over the pot hole, and on that from half to one inch of broken rubble, large or small, according to the size of the pot. Still it should not be overdone. In filling with soil put on to the crocks a few of the coarser pieces of the soil first, as the finer soil is then prevented

FIG. 72.—Potting a Plant.

from washing into and choking the rubble. Always use a proportion of one part in ten or so of sharp white sand with potting soil.

Repotting means the changing of a plant from a small pot into a larger one. The larger pot should not, as a rule, for all ordinary pot plants, exceed the smaller sizes by more than one size or two at the most, that is to say, if the smaller pot be a 48—that is, selling at 48 to the cast—it will be 5 inches across the top inside measurement. A good shift is into a 6-inch pot or 32, or it may be needful to transfer the plant to an 8-inch pot or 24 size. The plant is easily removed from the small pot by turning it upside down, resting on the left hand, and with the right hand taking hold of the inverted pot. Give the edge a sharp tap on a table or potting bench. The plant then slips out from the pot at once. In refilling, first remove from the ball of roots all drainage, as the new pot should be provided with fresh drainage before the plant is put into it. In the case of a very hard ball, some of the soil may be removed with a pointed stick first. Then repot, not deep, but firmly.

Rabbit Proof Plants.—It is not easy to compile a list of plants that rabbits refuse to touch, for these pests to the gardener will consume almost anything. Plants, too, that rabbits refuse to touch in one neighbourhood, because doubtless of an abundance of more appetising food, are devoured wholesale elsewhere; and whether the winter be mild or severe is another point, in truth during a very hard winter everything practically is consumed. The following plants, however, are not favourite food for the rabbit:—Azaleas, Rhododendrons, Spurge Laurel, the Sabine or Juniper, Furze, the Forsythias, *Jasminum nudiflorum*, Tree Pæonies, the Snowberry (*Symphoricarpos*), Butcher's Brooms (*Ruscus aculeatus* and *R. racemosus*), Boxthorn (*Lycium barbarum*), Spindle Tree (*Euonymus europæus*), Privet, Yuccas, Hydrangea Hortensia, Wig or Smoke tree (*Rhus Cotinus*), Box, and the Hibiscus (*H. syriacus*); hardy herbaceous plants, Flame-flowers (*Kniphofias*, better known as Tritomas), Irises, Winter Aconite, Daffodils, Solomon's Seal, Lily of the Valley, Periwinkle, Aquilegias (in variety), Dog-tooth violets (*Erythroniums*), Scillas, Delphiniums (Perennial Larkspurs), Primroses, Anemones, Aubrietias, Violets, Canterbury Bells, Foxgloves, Poppies, *Cineraria maritima*, *Stachys lanata* Muscari (Grape Hyacinth), and Arabis.

Seed Sowing.—How few persons, even those who have long been gardening, seem to understand the proper way to sow seeds. Almost every one, and amateurs especially, sow seeds far too thickly, with the result that they commit a double fault, for not only are seeds wasted, but much extra labour is created in thinning the seedlings. Such seeds as vegetables and annual flowers are generally sown fully three times too thick, as the great thinning needful shows. Plants in their seedling stage are so crowded that they are often strangled in their birth as it were. Seeds sown in pots, pans, or boxes under glass need the same care in not sowing too densely. It is much better when plants have to be transplanted to give them the chance of becoming strong before the change is made. Heavy seed sowing benefits the seedsman at the expense of the gardener.

Seeds, Ordering.—All seedsmen issue lists of their seeds, and one of these lists can always be had on application to the trader. It is good policy to obtain two or three lists, one especially being from some first-class firm, because new things are more likely to be found in such a catalogue. Of these novelties purchase a few yearly to try them. Some will give great pleasure, some will be disappointing. Always look carefully over the lists,

write out clearly on paper what is required, and order in good time, that is, several weeks before sowing, as it is so useful to have the seeds at hand when wanted. Do not order more than sufficient, as too liberal a quantity tends to encourage thick sowing. Potatoes may not be sent out in hard weather, but seeds may be got in at any time. Be careful to keep them dry.

Shelters.—A very useful hint was given by the late Mr. G. F. Wilson of Weybridge in the *Garden*, when he wrote that: "Part of the garden at Oakwood, Wisley, before some Poplars grew up, was much exposed to high winds, and for some plants we wanted shade, so the question of shelter from wind and sun had to be considered." After describing some methods which were scarcely satisfactory, Mr. Wilson says: "We at last arrived at a shelter which, we think, practically answers every purpose, and is easily portable. We have a great many of these sort in use and have thoroughly proved them. The iron hurdle is five barred; it stands 3 feet 6 inches out of the ground, and is 6 feet wide; 3-foot common laths are tied by tarred string to the hurdles, two sets, one above the other, overlapping about 9 inches. This gives stability and a height of shelter of 5 feet 3 inches, which is enough for most purposes. One cross piece is put above the hurdle to stiffen the laths. The laths do not touch each other, so air passes through them. The whole shelter, iron, laths, and twine is well painted over with varnish."

Sowing Seeds in Concrete Walls.—A rough concrete wall is naturally not the best place for sowing seeds in. As much loamy soil as possible must be got into the crevices, and it would be well to mix the seed and soil and work them into together. Autumn is a good time for this work, so that the young plants would be getting a good hold in making that slow but strong winter growth that seems so good a preparation for vigour in the coming year. The following would be advisable:—

<i>Alyssum saxatile</i>	<i>Iberis gibraltarica</i>
" <i>serpyllifolium</i>	<i>Sedum Aizoon</i>
<i>Antirrhinum</i> (Snapdragon), <i>asarina</i>	" <i>anglicum</i>
and <i>majus</i> , vars.	" <i>glaucum</i>
<i>Arabis alpina</i>	<i>Tunica Saxifraga</i>
<i>Armeria vulgaris</i> (Thrift)	<i>Aubrietia græca</i>
<i>Centranthus ruber</i> (Red Valerian)	<i>Campanula rotundifolia</i>
<i>Dianthus cæsius</i> (Rock Pink)	<i>Cerastium tomentosum</i>
" <i>deltoides</i>	<i>Corydalis aurea</i>
<i>Draba aizoides</i>	<i>Saponaria calabrica</i>
<i>Iberis sempervirens</i>	<i>Wallflower</i>
" <i>corræefolia</i>	

Spraying.—There is considerable difference between syringing and spraying plants. Syringing cleanses and refreshes the foliage, and the instrument used is a large force squirt. This drives the water either in one stream from a nozzle, or breaks it up into many tiny streams through a broad perforated nozzle called a rose; the smaller and more numerous these holes the finer the tiny streams. When it is desired to refresh foliage, the latter nozzle should be used to allow the water to fall on the plants like gentle rain. When plants are dirty and need washing, then the other nozzle must be used, and the water driven on to them with great force. Spraying means the casting of moisture on to plants like dew, and is advised when, because of mildew or insect attacks, it is needful to suffuse the leaves with some liquid remedy of a chemical nature. A proper spraying syringe, such as the Abol, with its curved nozzle, sends the liquid over the plants practically like vapour, and it does not run off them.

Tying Up.—It is impossible to garden long without realising that much tying up is needful. Thus, *Cos Lettuces* may be all the better if loosely tied round to help them to form hearts; broad-leaved *Endives* tied up to cause them to blanch; *Celery* just before it is earthed, loosely tied up to enable the earthing to be neatly done; *Carnations*; all tall growing flowers; *Dahlias*, *Chrysanthemums*, and many similar things, with climbers, or sticks or tree stems, or trellises, &c., and especially of plants of various descriptions in pots in the greenhouse. Neat sticks or stakes or bamboo rods are admirable for these, but the best tying material is soft, tough raffia grass, which in a dry prepared state may be purchased cheaply from seedsmen. This should not be used wastefully, but with care, and when tied leave the ends short and neat. In many cases worsted or wool or twine may be used, and sometimes coarse, soft tar cord. But for all soft wooded plants the raffia is much the best.

Winter Protection for Outdoor Flowers.—It is well worth while to provide suitable shelters for the few outdoor flowers that we have in midwinter. Of these one of the most important is the *Yellow Jasmine*, so usually grown against walls, palings, or sheds. Either the rot-proof Willesden canvas or a stout quality of the same scrim are excellent materials for protective coverings. It is easy to have a sheet of this for each section of

wall or space where it is likely to be wanted, and well worth the trouble of the slight preparation needed for taking on or off quickly. If the sheet has a strong tape or webbing sewn to the top and a few stout rings, and the wall is provided with corresponding hooks, it is soon put up and taken down, and is easily folded up when out of use. If several of the sheets are in use, it saves much trouble to have them numbered; best by painting in white or grey a 3-inch square patch in one top corner, on which, when dry, a number in darker colour is painted, also painting the same mark on the wall; then there is no fumbling about or loss of time in finding out which sheet is for which place. Contrivances for keeping the sheets down in windy weather will suggest themselves to intelligent persons, but the great thing is to have the protection at hand. A number of hurdles thatched with straw, or reeds, or heath are always of use to be put over Christmas Roses, Violets, or *Iris stylosa*. The sweet bloom of any *Chimonanthus* trained to a wall shrivels and is spoilt in severe frost, but may be saved by hanging over the bush some boughs of Spruce or Scotch Fir. If the protecting boughs are hung up by their stem ends they are easily lifted or moved aside so that the flowers may be picked.

Watering.—Much judgment is needed in learning how to water plants or crops properly. Plants in pots are best when occasionally allowed to become root-dry, but only just for the moment, as the drying of the soil sweetens it. But if dry long the plant flags and suffers, and that should not be the case. Then the soil should be well saturated, giving sufficient water to fill the pot to the top and even twice filled if needed. Where, however, soil seems moderately damp then do not water but miss that pot. Too many people water all alike and seldom stop to consider whether it is proper or not. Outdoors remember that as a rule roots go deep, and that in dry weather it is better to give a thorough soaking once a week rather than a moderate watering, which only moistens a few inches deep. After such good watering either cast some dry soil over it to prevent rapid evaporation by sun heat, or put on a mulch of long manure or cocoa-nut fibre refuse.

Window Boxes.—This is a familiar form of window gardening. At one time the Warden case was very popular. When the "box" is merely a strip of board tiled or coloured in some way, pot plants are intended to be used; that means, of course, shrubs or flowering things purchased or grown in the greenhouse for the purpose. But well-drained boxes of soil, such as one would put a Geranium in, are suitable for the growth of many plants and bulbs. Daffodils, Tulips, Scillas, Chionodoxes, Snowdrops, &c., are pretty for the spring, planting them the previous autumn. We have seen, too, the exquisite early-flowering Irises grown in this way by an enthusiast who had no suitable place in the garden, but would not be without his cherished bulbs. The Netted Iris (*I. reticulata*), a full violet purple and filled with strong violet scent; *I. bakeriana*, and the little yellow *I. Danfordia* may be grown in this way. Of course, this form of gardening is not for the usual run of flower lovers. They must place their faith in the Musk, the Periwinkle, Creeping Jenny; and for temporary effect the Zonal Pelargonium or "Geranium," Fuchsias, Petunias (very free-blooming and bright flowers, even in quite hot positions). We must point out the importance of the quite dwarf things, the Mossy Saxifrage (*Saxifraga hypnoides*), the large, white-flowered *S. Wallacei*, or Stonecrops, which look well with bulbs planted between.

During winter make good use of quite dwarf evergreen shrubs, such as *Cryptomeria japonica* (a Conifer), but better still Aucuba, Box, or Laurel, as Conifers, in places near towns, often fail.

When the position is very sunny the soil dries in the pots quickly, and constant attention will be needful, not forgetting also the importance of stimulants occasionally.

Wood Frames.—Frames of moderate size and having glass lights for tops are most useful in gardens. Although not generally available for forcing except on dung beds, they are excellent to raise seeds in, to winter many fairly hardy plants, such as Lettuces, Cauliflowers, Cabbage, Radishes, &c., and to plant out Potatoes in March for early cropping. Also may be wintered in them many fairly hardy plants, especially if covered up with mats or sacks, during hard frosty weather. Where stable manure can be obtained and hot-beds made up in the spring tender seeds may be raised in a frame, cuttings rooted, or Cucumbers grown on. Frames of this kind should be kept very clean, and especially the glass, and all the woodwork should receive a couple of coats of paint every two years at least.

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