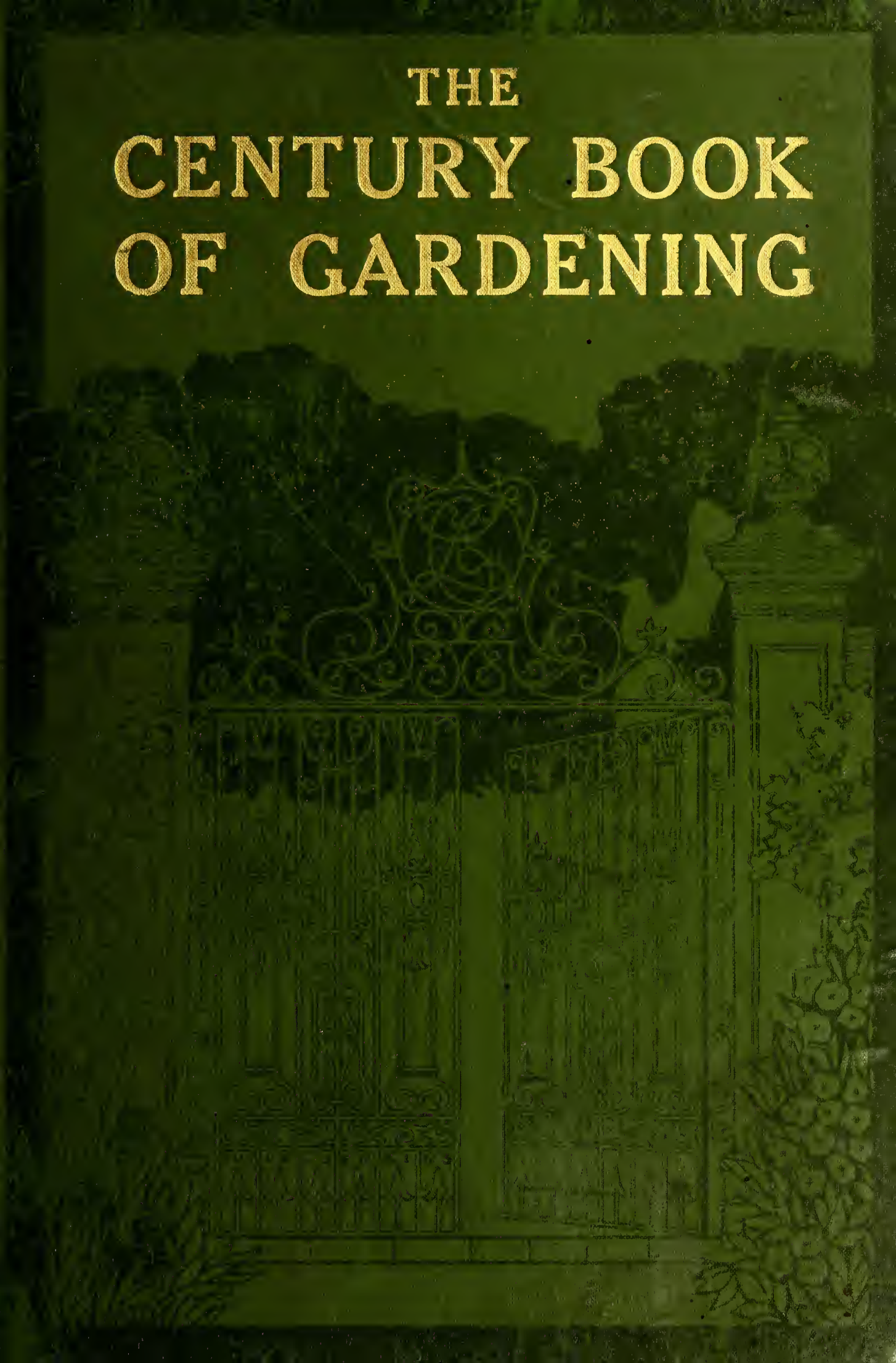
THE CENTURY BOOK OF GARDENING



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THE CENTURY BOOK OF GARDENING

A COMPREHENSIVE WORK FOR EVERY LOVER OF THE GARDEN

EDITED BY E. T. COOK

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A FORMAL GARDEN AT LONGFORD.

"COUNTRY LIFE."

IN THE ROSE GARDEN AT DOWNSIDE

INTRODUCTION.

THERE shall be no excuse for the issue of this CENTURY BOOK OF GARDENING. The reason for its appearance is evident and wholly gratifying. It is the greater fruition of that love of the garden which has long had deep roots in the English mind. Among the many transformations which the end of the century has brought us, there is none more encouraging than the truer interest we take in the affairs of the country, the greater exhilaration we have in outdoor existence, the keener zest we feel in the pursuits and enjoyments of rural life. Time has worked its revenges. After drawing up into the great centres of population much of the intelligence of the shires, it has ended by creating a stronger current of affection for the pleasures left behind. The denizen of the town, though he cannot always walk in scented woodland paths, or know the joy of flocks and herds, yet feels "the life of the sunlight upon the world," and has won for himself natural pleasures in greater degree than he ever enjoyed them before. Wherever we go, be it in country or town, we are conscious of the fact that men and women have learned more fully the enduring happiness that love of a garden can bestow. The country gentleman takes a greater delight and a more personal interest in the gardens that surround him; it is no longer with him a mere affair of estate management, and the hiring of so many men. The suburban garden is more intelligently tended, and the owner and his family are more often the actual gardeners, or at least are more closely concerned with the setting out and cultivation or beautifying of the land.

Here, indeed, is a healthful and beautiful kingdom to explore, where every step is a discovery, and every success a triumph. Yet difficulty will always beset the beginner, who is often at his wits' end to know what to do. Groping his way aimlessly in this realm of the garden and garden beauty, he is bewildered by the extent of the kingdom he surveys, knows

not what part of it to attach himself to, and is at a loss as to how to proceed. Even the experienced, in making efforts in new directions, often stand in need of a guide. It is to help the home-gardener that this book has been prepared. Here, whether his garden be large or small, it is confidently believed that he will discover what he requires. The arrangement is simple—alphabetical wherever possible—and information is given in the simplest way, and in a manner that everyone can understand. Our gardener loves his garden and its flowers and fruits with a pure enjoyment, for their own sake. He is a botanist, perhaps, though not one of those who

> "Love not the flower they pluck and know it not,
> And all their botany is but Latin names."

However, here the aim has been practical, and hard technical terms are avoided wherever that could be done. The illustrations are many and beautiful, and will be particularly helpful, though the book is far from being a picture-book. The whole work of the flower, fruit, and vegetable garden has been considered from the very beginning, and the laying-out and draining of the land, up to the gathering of the blossoms in the borders, of fruit from the orchard or the hothouses, and of kitchen products from the useful garden beyond. The steps that are to be taken to give variety, charm, and character to the garden, the means that conduce to success, and the dangers and pests that invade have all their place in this book. Again, every aspect and variety of gardening, it is believed, has been adequately treated according to its importance. The garden of general character, with its varied contents imported from every part of the world; the fruit garden and the orchard; water, rock, and bog gardens; the fernery and the wall garden; the broad lawns and paths; the garden trees and flowering bushes; the trim hedges, the gay parterres, and the radiant mixed

GROUPS OF HYBRID WATER-LILIES.

CLIPPED YEWS AT ELVASTON.

borders; the greenhouse and the hothouse; the window garden also—these, not less than the kitchen garden, which is as interesting as the others, are all treated in these pages. The flower gardener will find that great attention has been paid both to annuals and biennials, to hardy garden flowers, Roses, ornamental flowering shrubs, Orchids, and everything that he admires.

The varieties of gardening that have been alluded to suggest reflections. How has the horizon of the gardener been enlarged? The botanist and cultivator have ransacked for him the whole world for its charms, developed new possibilities, improved whole classes of flowers, given us new varieties and forms, and filled our gardens with new splendours. What a romance there is in the history of the Orchid! How much do we owe to France for Roses, Pæonies, and Gladioli, to Holland for Hyacinths and Tulips, to the East for many of the most gorgeous denizens of our garden? The Englishman of old always loved his garden, though it was a different garden from ours. Chaucer singing of the coming in of summer was thinking of blossom on the tangled hedges, of the kindling green of the oak and yew, pastures and woods by the racing brooks, lawns fresh with early dew, grassy hills looking out to the blue line of sea, and the crisp breeze whispering in the hollows. The garden he knew was won from the wild, an enclosed place enframed with well-shorn hedges of yew, with banks well tufted in its arbour, and quaint parterres filled with the simple flowers of the time. In illuminated manuscripts such places are disclosed to us. Therefore the formal arrangement which we discern so plainly in Tudor gardens was a natural development, and the still more rigid character imported later on from the Netherlands, was grafted upon indigenous stock. The Tudor Englishman dearly loved a pleached alley, or a sheltered spot shut in by great hedges of yew.

To those days we trace a certain formality, in conformity with architectural character, that still is noticeable in many gardens, and in particular the great thick hedges of yew. Evelyn, "without vainitie," claimed the credit of bringing the yew "into fashion, as well for a defence as for a succedaneum to cypress, whether in hedges or pyramids, conic spires, bowls, and what

other shapes. I do again name the yew, for hedges, preferable for beauty and a stiff defence, to any plant I have seen." This last remark is undoubtedly true, and still none can deny that a good yew hedge is an admirable background and protection for Hollyhocks, Dahlias, Lilies, and all tall-growing flowers. Although great destruction has been wrought amid the yew hedges of former times, many that are ancient, if not quite of Tudor age, still remain. At Albury is a hedge 10ft. high, and a quarter of a mile long, said to have been designed by Evelyn for the Earl of Arundel. At the Palace, Hadham, Hertfordshire, which once belonged to the Bishops of London, is a garden said to date back to Tudor times, enclosed on two sides by a high wall, while the other side is protected by a yew hedge 3yds. thick. There are yew hedges at Bishopsbourne, near Canterbury, said to have been planted by Richard Hooker about 1595, and now about 14ft. high and 10ft. thick. The yew was, indeed, a great feature of old English gardens, and men loved it with a certain reverence for the service it rendered them. Thus appropriately does Dr. Conan Doyle, in his "Song of the Bow," speak of its making—

> "Of true wood, of yew wood,
> The wood of English bows;
> So men who are free
> Love the old yew tree,
> And the land where the yew tree grows."

But it is worthy of remark that the yew tree was answerable for very important changes that passed over our gardens. The "ductile" yew lent itself readily to the topiary gardener. Now the "topiarius" had been a familiar figure even in Virgil's days, and it was only his extravagancies that made him ridiculous. Bacon did not like "images cut out of juniper and other garden stuff; they be for children." But the taste grew, and the extreme of absurdity was reached about the time of William and Mary, when the yew was cut, not only into hedges, cones, and pyramids, but into the shapes of men, beasts, birds, fish, ships, and the like. There are early examples of cut trees, without this extravagance, which command our respect, as in the remarkable example in the gardens of Levens Hall, Kendal, others at Heslington, near York, in a garden laid out about 1687 by Beaumont, the gardener of Hampton Court, and the strange Four Evangelists and Twelve Apostles at Cleeve Prior.

But such a style, carried to an extreme of folly, worked its own remedy. It attracted the satire of Addison and Pope. The latter was bitter in his deriding of the fashion in his descriptions of examples for sale: "Adam and Eve in yew, Adam a little shattered by the fall of the tree of knowledge in the great storm; Eve and the serpent, very flourishing; St. George, in box, his arm scarce long enough, but will be in a condition to stick the dragon by next April; divers eminent modern poets, in bays, somewhat blighted, to be disposed of a pennyworth; a quickset hog, shot up into a porcupine, by its being forgot a week in rainy weather." Out of this satire came destruction. We still may think with delight of the old Scotch garden depicted so delightfully by Scott at Tully Veolan, beloved of Waverley and Rose Bradwardine. But, though some places escaped, a new spirit had been evoked, and Kent and Brown, and their successors and imitators, swept away many a garden of the olden time.

The landscape school sought to import the qualities of wild nature into the garden, to extend great sweeps of lawn, broken by clumps of trees, with lakes, creating simple landscape effects. Where features were necessary, they introduced objects not always more rational than those they had derided—grottoes, classic temples, hermits' cells, broken columns, Gothic ruins, and other like artificialities. Into the poor landscape style was imported the more grandiose fashion of Le Notre, to which we owe the great fountains and splendid avenues which are truly a glory of the land.

Then came a reaction from the attempt to create the purely natural, and many broken styles, or fashions wanting styles, arose. These shall not be described here. They were all striving upward to the kind of gardening we are accustomed to to-day. There are still no settled principles, and it may be desirable that there should be none. What we look for is natural delight in the garden, and a development of its possibilities. We are living now

in what is practically a new flower world, and this it is that gives modern gardening its character. We feel that a pleasure garden is primarily a place for flowers, and it is to the cultivation of these that a considerable part of this volume is directed. Intelligent understanding of flowers and plants has led to the expansion of gardening efforts into new directions, already suggested, for neither the formal gardeners with restricted possibilities, nor their early successors, ever could attain distinction in pure flower gardening, or water, rock, or any other special feature of gardening, outside the large effects they aimed to produce.

But if the garden has a relation to time and the changing ideals of centuries, it has necessarily its place in art, and therefore its function as a teacher and a sweetener of life. Its office in the world is to give man the opportunity of winning Nature to himself, of expressing himself in Nature, of developing his ideals in natural beauty. In the garden Nature responds to his overtures. Behind its green denizens primal Nature lies, but the gardener gives us Nature selected, harmonised, invested with new qualities, and led to new conclusions. The things we cherish in our gardens have their originals and kindred somewhere in wood, field, swamp, or mountain-side; but how has the gardener changed and glorified them, how from general qualities developed particular beauties, how tamed the rugged, strengthened the weak, made durable the fleeting! These thoughts may serve to suggest how reasonable and natural is the love of the garden, how ennobling is our love for it, how healthy, happy, and enduring are gardening pursuits.

WISTARIA SINENSIS.

"Not wholly in the busy world, nor quite
Beyond it, blooms the garden that I love,"

writes the Poet Laureate; but, wherever the garden may be, it will have some atmosphere or character of its own. It may be large or small, it may lie in the hollows of the hills, on the steep slope, or on the wind-blown crest; it may possess wood, water, or heath; it may have soil that is light and friable, or that is dense, heavy, and tenacious. If it be only a suburban plot, and have neither hedgerow nor coppice, there are yet particular qualities in it which it is the gardener's work to develop and unfold. Let him not be discouraged if the garden be small. It may still be a kingdom all-sufficient in itself, where he may express judgment in selection and combination, and use to excellent purpose the impressions and experience he has been alert to receive. Better that it should be small than too large for his mastery, where effort would be wasted and distinction never attained. A large, varied,

A CLEMATIS-COVERED ARCH

and well-kept garden may certainly afford greater pleasure than a small one, but it is useful to remember that most lovely effects are often attained even in the little cottage gardens of our country roadsides.

We may suppose, however, that the gardener will have one or more of several possibilities open to him. He will, in the first place, probably have what may be called a general garden, where he delights to collect many varieties of plants from all sources. The choice before him is, of course, endless. His greater difficulty is that of selection, so that he may possess the things he can grow to the greatest advantage. In this book he will find many hints for his guidance. He may be led to discern, for example, what are the better directions of flower gardening, to recognise the high value of hardy and half-hardy border plants, to seize what may be good of the once-fashionable bedding, and make use of new opportunities of new beauty. He will turn his attention first of all to the queen of flowers, the Rose. Lilies, Dahlias, Cannas, Chrysanthemums, Phloxes, Lychnis, Poppies, Pæonies, Hydrangeas, Irises, Delphiniums, Gladioli, Hollyhocks, Honeysuckles, Clematis, Marigolds, Zinnias, Stocks, Asters, and a whole world of other beautiful things will attract him. There will be ornamental flowering shrubs—Rhododendrons, Azaleas, Weigelas, Lilacs, Mock-oranges, and many more—and climbing plants in great variety; conifers and evergreens, too, to be well planted for harmonious effect in the winter, and as the background for the gay flowers of summer-time. Touching all these things, it is believed that these pages will be found very helpful. Our gardener will certainly have a lawn, or a space of grass, and we have endeavoured to tell him how to arrange and manage it. He will, perhaps, have hedges to shelter his various growths from the cold blasts of the north or east, or to separate his flower garden from his orchard and kitchen garden, or, at least, to delimit his modest patch from that of his neighbour. It may be that he will have a terrace to adorn with clustering growths of Ivy, Ampelopsis, or some Rose or flowering climber. Happy he who can pursue his stream to where a lake quivers as the wind kisses it, or sparkles as the swallows dip. Then a whole realm of beauty drawn from the sweet ranks of Water-lilies will claim his attention. The sedgy border or the oozy bank demands his care, and he will seek the Irises and water-loving plants to fringe and glorify the margin of the mere.

Near the lake, if not near the flower garden, we may expect to find a rock garden, formed, it may be, upon some old hedge-bank. The formation of this rock garden and its

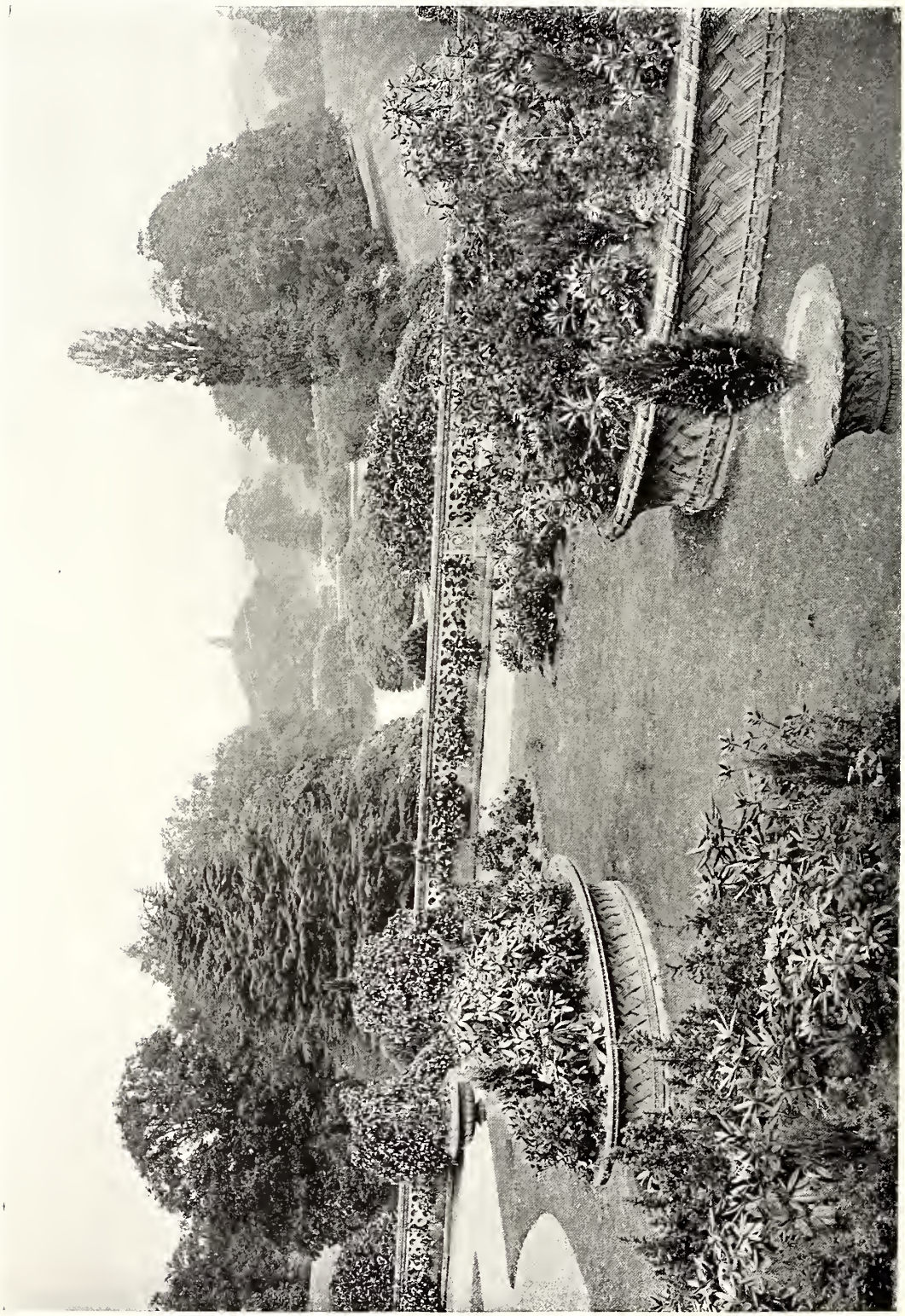
maintenance in full charm, vested with those lovely starry growths which are a lesson in cheerfulness, so glorious is their beauty won from the crannies of sterile rock, must be a matter of thought. Here will be ferns—Blechnum, Adiantum, Polypody, Hartstongue, and others. Perhaps the "rockery" will be nothing more than a rugged old wall, and nothing in a garden is more delightful than picturesque stone or brickwork, with many a "flower in the crannied wall." The delights to be won from wall gardening are indeed very many, as is the case with several special branches of our art, such as water and bog gardening.

Perhaps this book may be consulted again by those who possess or would have a wild garden with a fir wood. Here discrimination and thought may create perfectly delightful resorts, informed with all the beauty and glorious colour of Nature itself, and strengthened and enriched by the imperceptible hand of art. The pitfalls are many, but the successful gardener will have his stretches of nodding Daffodils in one part of the copse, other places carpeted with Primroses and Violets, or with Lily of the Valley, or again decked with Foxgloves and Mulleins. What can surpass a woodland vista, its foreground brightened by these patches of colour, carrying their influence into the green gloom of the conifers or sun-flecked shade of the deciduous trees beyond.

These thoughts may serve to suggest how very rich and varied are the aspects and possibilities of gardening. Concerning each and all of them much information will be found in these pages. The orchard and fruit garden have been fully considered, and the various requirements necessary for success in indoor gardening are all given here. The kitchen garden receives the same attention. Greenhouse and hothouse plants, with the management of houses, Orchids, flowers of all classes, and trees and shrubs, have their places in the book.

Many hints will also be found here as to how the gardener shall surmount his difficulties, and destroy the pests that invade his sanctuary. The best methods of eradicating blight and banishing insect pests are carefully indicated. In short, it is hoped that this Dictionary may be found a sufficient guide in any difficulty or doubt, not less in regard to the cultivation of any particular plant than to the general conditions of gardening, and such matters as the laying out and management of gardens.

WYCH ELMS BY HEDGEROW.



THE TERRACE GARDEN, HECKFIELD PLACE.

THE MONKS' WALK, ASHRIDGE.

THE CENTURY BOOK OF GARDENING.

SHRUB BORDERS AND HARDY FLOWERS.

By Mrs. Earle, Author of "Pot-Pourri from a Surrey Garden."

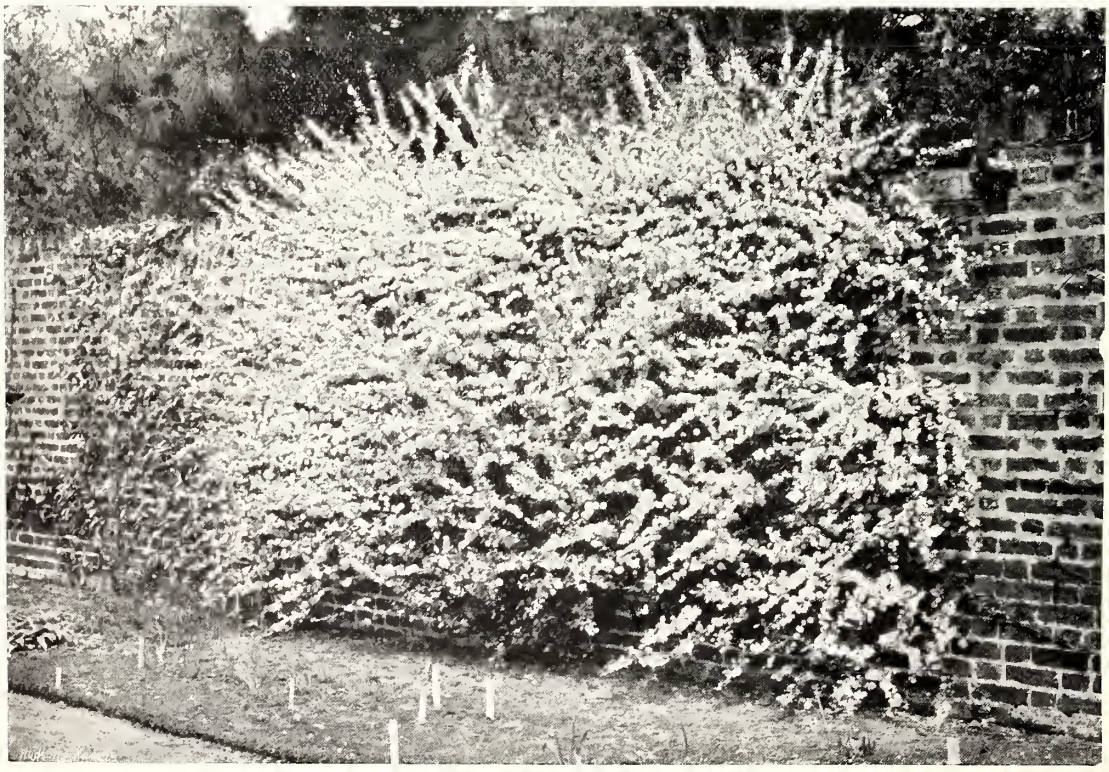
In England we are always copying from our neighbours, the French; but I think it is somewhat rare for the compliment to be returned. Lately a young architect friend of mine has had the great pleasure of building an English house for real French people in Normandy. I hear the approach is up a straight drive flanked on each side by white rough-cast walls. On these it is proposed to grow creepers, and to have at a short distance from the wall two broad borders. Now the question is, how shall they be planted? The first idea was to make them herbaceous. I cannot believe this could be satisfactory on each side of a road along which there might be traffic at any time of the year.

For such herbaceous borders to be beautiful, they would have to be planted in a very bold manner, with large masses of colour, and this means broad bands of earth more or less covered with manure for six or eight months in the year. This would be anything but attractive. A wide mixed border, if not entirely on the simple dotted cottage system, should be intersected with plants which are good in form and restful in

colour and are much the same all the year round; besides, many flowers and plants do so badly in full sun.

Had I the planting of such an approach I would plant it in bold masses of low-growing, restrained flowering shrubs—no Lilacs, Laburnums, Rhododendrons, or Laurels—and I think an effect might be gained that, with a little care and judicious pruning, would be comparatively original and satisfactory the whole year round. As a border of this kind would take several years to come to perfection, while the choice shrubs were still young the coarser and quickergrowing ones might be used in between, to give point and accentuate the groups of colour.

For early spring flowering I would plant the different kinds of Pyrus, and especially the Pyrus Malus floribunda, and the three different coloured varieties of Pyrus japonica; the pink Almond tree; also Amygdalus macrocarpa, which has larger flowers and is earlier in bloom, the double Almond, and the very early-flowering Chinese shrub, Amygdalus Davidiana, Prunus divaricata, which blossoms in March, and the Chinese Prunus triloba, which is of a graceful growth and wreathed with clusters of double flowers. The other variety, Prunus sinensis fl.-pleno, and the double Peach tree are very beautiful, and so is the lovely double-flowered Cherry, Cerasus serrulata. Prunus Pissardi, with its rich purple foliage, makes a good contrast with low-growing and well-pruned variegated Maples. The Kerrias, which require constant thinning out, Kerria japonica and its delicate single variety; the different kinds of Broom, particularly Genista præcox and G. alba (these only last in their prime for three or four years, and it is well to keep a constant supply of each kind, grown from seed every year, as a cold winter kills the old plants; this is especially the case with G. ætnensis). Genista tinctoria, though a wild plant, is useful because it flowers in July; so does G. ætnensis, and the small tufted G. hispanica covers the ground under the larger kinds. Genistas group well together, as their flowering-time can



PRUNUS TRILOBA AGAINST SUNNY WALL AT KEW.

A YUCCA GROUP.

be a good deal retarded by the pruning in the preceding year, and even when left alone the varieties in bloom extend over three or four months.

On warm soils the Cistus, or Rock Rose, in all its varieties is a beautiful plant; the hardiest are Cistus laurifolius, C. florentinus, C. crispus, and the Gum Cistus, C. ladaniferus; also the smaller Helianthemums, which are best grown from seed. The yellow and white tree Lupins (Lupinus arboreus), the Maidenhair tree (Salisburia adiantifolia), the Fringe tree (Chionanthus virginica), which in early summer bears long clusters of white flowers with petals long and narrow; the Snowdrop tree (Halesia tetraptera), though it grows too large for a border; the beautiful Japanese Guelder Rose (Viburnum plicatum), the shrubby Veronicas, the Angelica tree (Aralia spinosa), and Eulalia japonica, the feathery panicles of which will expand indoors if the branches are cut late in the autumn and stuck into a dry vase. In a damp corner the grey-leaved Sea Buckthorn (Hippophæ rhamnoides), both male and female kinds; Buddleia globosa; all the shrubby Spiræas, but especially and without fail Spiræa Thunbergi, the most useful of garden plants, from the time when in early spring, almost before a leaf appears, its bare branches are covered with little starry white flowers, and its refined feathery light green is a delight the whole summer, to the time when its leaves die in autumn a golden yellow. Spiræa Lindleyana, which flowers in July, is a taller-growing and most effective deciduous shrub To mention only two of a most useful family, the dwarf evergreen shrub, Skimmia fragrans, would look well all the winter, and so would pruned clumps of the large-leaved Ivy (Hedera) with yellow berries.

In the south-east border the hardy Eucalyptus Gunni, with its silvery foliage, the dark green Arbutus, and the handsome shrub Desfontainea spinosa; large masses of Yucca filamentosa and Y. gloriosa would vary the shrub growth, and until these grow old, clumps of the common Seakale plants, with their handsome grey leaves, could be put in front of them. In favourable localities, groups of the New Zealand Flax (Phormium tenax) might be tried, although it is not quite hardy, and would need protection in the winter. A selection of the various Andromedas is always beautiful, and the hardy Hibiscus could be grown either as shrubs or

on the wall; also the Mediterranean Heath (Erica mediterranea), which flowers in April, and several other hardy flowering Heaths. Cotoneaster horizontalis is an evergreen shrub, very pretty in growth, and covered in early spring with miniature yellow flowers; Leycesteria formosa likes damp places in half shade, and flowers late in the summer; Comptonia asplenifolia is a quaint Japanese deciduous shrub well worth growing—it is in no dread of dryness, but requires to be planted near some other shrubs for protection in the winter; the low-growing Othonna cheirifolia has grey leaves the whole year round, and yellow flowers in spring; this plant forms a good protection in winter and support in summer for the lovely perennial Convolvulus mauritanicus. Lithospermum prostratum, Daphne Cneorum, Acæna millefolia, A. sarmentosa microphylla and A. pulchella, all cover the ground satisfactorily in front of deciduous shrubs, and exclude weeds. Cotoneaster microphylla would flourish and berry in the dryest corner All the Berberis are worth growing, and Berberis nepalensis, though rather tender, has very handsome foliage.

BAMBOOS AT GUNNERSBURY.

In the north-west border a large patch of the different Bamboos, especially Arundinaria japonica, Phyllostachys nigra and Bambusa palmata; Philadelphus grandiflorus, or Mock Orange, with a group below of the dwarfer kinds, especially the single-flowering P. microphyllus; Clethra, or Sweet Pepper-bush, which flowers in July; Kalmias; also the different Azaleas (Ghent and Mollis); Magnolia stellata and various deciduous Japanese kinds; large clumps with specimen plants of the modern Weigela, which vary in tint from white to dark red (to look well after a year or two the old wood must be cut out annually).

Tree Pæonies (Pæonia moutan), which are slow growers, should be planted with plenty of room between them.

The first year many of the commoner and quickly growing shrubs would help to fill the bare spaces; for instance, Ribes sanguineum and R. aureum, the ordinary Lavender, and the dwarfer variety which flowers earlier, Hydrangea paniculata grandiflora, Rosemary, and the French Cotton Lavender (Santolina), which quickly fills a large space, whilst the common Rue (Ruta graveolens), and its finer variety R. albiflora, seen against Golden Privet produces a flower-like effect of colour in late autumn

A GRASS WALK AT BULWICK.

The shrubs for these borders would have to be selected with great care, as the walls in summer would scarcely cast any shade, and many shrubs do not succeed well at all without the half-shade of wood or copse. After making the border, which must be deeply trenched, each plant would require setting in a soil suitable to its best growth and well-being. The fashion of the day is to be very impatient as regards the making of a garden; so much can be bought, that those who can afford to buy are under the impression that money will procure everything. This is no more the case in a garden than it is in lifetime; patience and labour are essentials to success, even where knowledge be ever so great. A bright flowery covering to the earth is quite easy to attain even in the first year, but to produce a really beautiful garden of specimen shrubs is hardly to be arrived at under six or seven years.

As in the bordering of a straight road with a wall on each side any picturesqueness

AN ARCH OF ROSES.

of effect is impossible, the beauty must depend on the graceful grouping of the rarer plants. This, were I planting it, would make me eliminate very quickly all coarse-growing and weedy plants. And in these borders I should have no Roses of any kind, and on the walls only a few of rampant strong growth, and I would drape the walls not only with creepers, but with Southern fruit, such as figs and vines, not forgetting the claret-coloured vine and the quick-growing American vine (Vitis Coignetiæ).

On the south-east wall must also be a Clematis montana, which, when properly pruned, flowers profusely every May,-and some of the later-flowering Clematis; a Wistaria, which, after it has flowered, should be pruned like a vine, so as to show patches of bare wall and the growth of its branches against it. The common Laburnum, the New Zealand Laburnum (Edwardsia grandiflora), the Judas tree (Cercis Siliquastrum), and the pink false

Acacia (Robinia hispida) look beautiful trained against a wall; and so do Desmodium penduliflorum with its purple blossoms in September, and the Gum Cistus (Cistus ladaniferus) and other Cistuses. Both the common white Jasmine (Jasminum officinale) and the winter-flowering one (Jasminum nudiflorum) must have a place, also the large yellow Jasminum revolutum, which is hardy in many localities. Garrya elliptica is another beautiful winter-flowering wall shrub and an evergreen as well; so are the common Pyracantha (Cratægus Pyracantha) with its scarlet berries, the Escallonia Philippiana and the less hardy E. macrantha, the Choisya ternata and the Loquat (Eriobotrya japonica), Myrtle and Rosemary, the Magnolia grandiflora with its beautiful glossy leaves, a slow grower at first but greatly benefited by forking the soil and manuring the roots in autumn. It would be well to plant Magnolia grandiflora at the back of a group of the deciduous Magnolias. The winter-flowering Chimonanthus (Calycanthaceæ) fragrans, with its variety grandiflora, would do well, and so would Bignonia radicans (which covers the wall more quickly if many of the shoots are taken off in spring), also the bright golden blossoms of Forsythia suspensa. The Japanese Hawthorne (Raphiolepis ovata) and the Mountain Sweet (Ceanothus azureus) need winter protection, but the blue Passion-flower (Passiflora cærulea) is quite hardy.

For those who cling to Roses, the best for the south wall would be Lamarque, with its fine foliage, Rêve d'Or, the Banksian Roses, and a strong grower such as Paul's Single White or Aimée Vibert, with a Solanum jasminoides planted close to it. It is well to note that climbing Roses flower much better in light soils if the old wood is cut out rather in the late autumn than spring, and some of the new shoots should be trained horizontally.

The north-west wall must have the numerous varieties of Honeysuckle, especially the late Dutch Lonicera Periclymenum, and its earlier variety L. belgica, also the Japanese Lonicera japonica and its variegated form. The Austrian Copper Brier, the white Jasmine, Jasminum nudiflorum, Choisya ternata, and Lamarque Rose would all do as well on the shadier wall. So would the double and single varieties of Kerria japonica, the summer Clematis of the Jackmanni type, and the sweet-scented C. Vitalba, which only does well if much pruned directly after flowering. Eccremocarpus scaber could be used to fill up spaces until the other plants have grown large, and half-hardy climbers, such as the flame-coloured Nasturtium, the blue Plumbago capensis, and the purple Maurandia Barclayana, with its delicate foliage, could be planted for the summer.

In making new places, by far the most important thing to attend to is that the natural beauties—be they only inequalities of the ground, growth of trees, shrubwood, or hedgerow—should not in any way be destroyed, but used, on the contrary, in every conceivable way to improve the garden. No artificial arrangements of planting or laying out of ground can ever replace the beautiful effects which Nature herself has made. In "Wood and Garden" Miss Jekyll has an admirable description of a piece of ground which is close to her house, a few sentences of which I quote, as they teach the lesson so clearly, and would apply to the indigenous growth of any other soil as well as to her own Surrey sand:

> "Near my house is a little valley whose planting, wholly done by Nature, I have all my life regarded with the most reverent admiration. . . . On the steeply-rising banks are large groups of Juniper, some tall, some spreading, some laced and wreathed about with tangles of Honeysuckle. . . . Some of the groups of Thorn and Holly are intermingled, and all show beautiful arrangements of form and colour, such as are never seen in planted places. . . . Throughout the walk . . . only these few kinds of trees have been seen—Juniper, Holly, Thorn, Scotch Fir, and Birch and yet there has not been once the least feeling of monotony, nor . . . could one wish anything to be altered or suppressed or differently grouped. And I have always had the same feeling about any quite wild stretch of forest land. Such a bit of wild forest as this small valley, and the hilly land beyond, are precious lessons in the best kind of tree and shrub planting. No artificial planting can ever equal that of Nature; but one may learn from it the great lesson of the importance of moderation and reserve, of simplicity of intention and directness of purpose, and the inestimable value of the quality called 'breadth' in painting. For planting ground is painting a landscape with living things; and as I hold that good gardening takes rank within the bounds of the fine arts, so I hold that to plant well,

needs an artist of no mean capacity. And his difficulties are not slight ones, for his living picture must be right from all points and lights. No doubt the planting of a large place, with a limited number of kinds of trees, cannot be trusted to all hands, for in those of a person without taste or the more finely-trained perceptions, the result would be very likely dull, or even absurd. It is not the paint that makes the picture, but the brain and heart and hand of the man who uses it."

This extract should be a warning to those who think that clearing, in the gardener's sense, is a necessary part of making a garden.

We hear much, in these days, of herbaceous borders, often described in poetical language, and which are supposed to grow all the flowers of the year in the utmost perfection, mentioning in a light and airy way that the Christmas Rose may be picked in the depth of winter, and the Violet may flourish from November till April. All this is really book gardening or newspaper gardening. There is nothing so difficult as keeping the same borders in perfection during eight or nine months in the year. To obtain that result, the herbaceous border can only be the enlargement of the English cottage garden, which needs nothing but loving care—filling up bare places as they occur by the constant introduction of fresh plants, whether perennial, annual, or half-hardy; watering plants as they come into bud, thinning out vigorously when necessary, mulching during the hot summer days, and covering with manure the bare earth in winter. But there is no gardening so difficult as borders in which things are to grow and look well—that is to say, have some distinct and marked feature—nearly the whole year round. Some of the best gardeners I know are very much disposed to say, in these understanding days of gardening, that the herbaceous border in the old cottage sense is impossible, and even not desirable, for a mere mixture in full sun of a mass of every kind of flower is not beautiful; there is no repose, no form, no drawing, no colour even, as one plant is apt to kill another in more senses than one. I think a feeling is growing among the best gardeners that even in moderate-sized gardens certain portions must be more or less devoted to the growths of different plants flowering at different seasons, spring-flowering things doing best if they face east or south-east, autumn-flowering plants doing well facing north or north-west, some plants at all seasons doing best in full sun, and others in shade or half-shade.

Mystery being one of the great beauties of a fair-sized garden, there is no reason why special spaces should not be concealed in such a way that their period of rest should not offend the eye. Miss Jekyll's description of her herbaceous border is most interesting, as it is planted with the idea of good effects both of form and colour; but this is only for a comparatively limited time in the year, her spring flowers and many of her autumn ones being kept entirely apart and grown in appropriate places. A very perfect herbaceous border may be had in the spring, when most things are more or less low-growing, the beautiful Crown Imperials being the great exception; but to my mind the spring garden, with its numerous interesting bulbs, should more or less be a garden of its own, fading off into a wood. Pæonies, Roses, Carnations, and many annuals are better grown in beds apart. Therefore the real herbaceous border, with its formless mass of colour and its endless picking capabilities, is, I am sure, more in place in the kitchen garden, where the object could be to grow as many plants as possible in a healthy state. In that case the beauty of occasional effects must come greatly by accident, although one year always suggests some beautiful combinations to be carried out with more or less success the following year; and in the same way the glaring defects may be avoided. The great secret is to know the plants which must be either thinned or divided every year, or in some soils every other year—for instance, the various single Dianthuses and old-fashioned Pinks, Pyrethrum uliginosum, the various perennial Sunflowers, etc.—and those—such as Delphiniums, Spiræa Aruncus, Bocconia cordata, and many others—which never reach their full size and perfection without being left many years undisturbed. If such plants grow too large, they can be thinned in spring, or have a piece cut out of them in the autumn and the hole filled in with manure well pressed down.

To get the border to look bright in May, June, and September is easy enough; the great difficulty is to keep it beautiful through July and August. Some of the plants which help to maintain this brightness are Anthemis tinctoria, the blue Erigeron speciosus, the strong-growing Achillea Eupatorium and Centaurea macrophylla, Felekia speciosa and the hardy Alstrœmerias, which grow strongest from seed, and when well established flower best if a little thinned out in the spring. Dictamnus Fraxinella, and its lovely white variety, flowers in a sunny place at the end of May; but it can be made to flower later by putting it in a half-shady position. The tall mauve and white Galega officinalis are invaluable, also the blue Anchusa italica, which flowers best in very dry poor soil, and Malva moschata alba, which does best in the shade. All these do fairly well in borders which cannot be watered.

A BORDER OF HARDY FLOWERS.

Everyone knows that the handsomest and most effective of July plants are the beautiful white Madonna Lilies (Lilium candidum). These are unfortunately often disfigured by a fungus which attacks their leaves, and, when allowed to spread, even prevents their flowering; if taken in time this disease can be arrested by spraying the plants with Bordeaux mixture early in spring. The coarse-growing but handsome Trumpet weed (Eupatorium purpureum) is useful, and so are Echinops Ritro and E. ruthenicus with their thistle-like heads, a group of which would contrast well with the tall Mulleins, the best of which are Verbascum phlomoides and the taller V. Chaixii, and in front of this group might be a mass of the different Eryngiums, especially Eryngium amethystinum. The earlier flowering and dwarfer Verbascum phœniceum is also worth growing. The scarlet Lychnis chalcedonica, with its larger flowered variety L. Haageana, and the bright red flowers of the scarlet Bergamot (Monarda didyma), give a brilliant touch of colour when it is so much wanted. The scarlet Bergamot flowers much better if it is kept well watered, and its scented leaves and bright colour amply repay for a little extra care. The cool blues and whites of the different Campanulas look well in the half-shade; of these the best are the well-known C. persicifolia grandiflora, C. grandis, the tall mauve C. latifolia, which is not often grown enough, C. macrantha, and C. Van Houttei, which has long pendant dark blue bells. The Japanese perennial Platycodon

MARGUERITES AND SUMMER FLOWERS.

grandiflorum, which is generally mistaken for a Campanula, is very beautiful with its quaint balloon-like buds, and shades from white through delicate grey to a full blue. Michauxia campanuloides is a biennial seldom well managed, but very beautiful under favourable circumstances. The mauve Scabiosa caucasica is supposed to be a perennial, but seed should be sown afresh every alternate year; so ought the slender Gaura Lindheimeri, which is so useful as a cut flower, lasting well in water.

The dwarf Linum flavum, Linaria dalmatica, and Rudbeckia (Echinacea) purpurea should be always grown, also Inula japonica, which flowers in June when yellow flowers are scarce. No border can be complete without the old double white Rocket (Hesperis matronalis), which in light soils dies away unless it is divided and replanted every year immediately after flowering.

Chelone barbata and the different Pentstemons prefer a light but moist soil, and must be watered in dry weather; as they rarely do well after the third year it is advisable to sow seed every other year. The blue Catananche cærulea and its white variety are very useful for picking, and easily raised from seed. I cannot say too much in favour of the white willow herb, Epilobium album; it flowers best if grown in full sun and in poor soil, and it looks very well behind a group of the wild blue Geranium. Some other beautiful combinations for borders that can be watered in dry weather are a group of Lilium candidum in front of a broad mass of blue Delphiniums; the orange Lilium Croceum seen against the blue mist of the wild Salvia or annual Nigella; purple Pentstemon planted near Coreopsis grandiflora; and Lobelia cardinalis standing out against a mass of white Anemone japonica. Gypsophila paniculata planted in front of, and between, Tulipa Gesneriana or Crown Imperial will hide their withering stems with its cloud of white, and Monarda didyma will screen off the dying foliage of Papaver orientalis. The grey foliage of Artemesia Stelleriana is very useful, and harmonises well with purple and blue flowers; it is hardier than Cineraria maritima, though this will survive if it is given some protection in the winter.

For those who have room, Funkias should have a place, and for August flowering no

garden should be without F. Sieboldi. Acanthus Mollis should be grown either for the sake of foliage, when it is a very handsome covering to the ground, or in large solitary groups where its great flower spikes make it complete in itself. Few know that the perennial Phloxes do a great deal better in crowded borders if grown in a reserve garden, put in place in July and well watered, than when left in the beds, even if divided in the autumn.

All the early Chrysanthemums, of which there are now so many improved varieties, can also be moved in July, and the low-growing Asters, though not quite as fine as those divided in autumn, move quite well. To obtain a bright and full border in July, it is a great help to scatter some mixed Poppy seed in March, pulling up later on all that are not wanted.

The annual Purple Orach (Atriplex hortensis atro-sanguinea), which is really a kind of spinach, has beautiful claret-coloured foliage, which contrasts well with white or yellow flowers; seed can be sown in March and the seedlings thinned out or even transplanted.

It has been impossible in the space of a short article to do more than name a few of the less well-known herbaceous plants, including neither annuals nor bulbs. The real thing for everyone to remember in making a garden of any kind is that the right cultivation of all plants has been amply written about. All details can be learnt from books, but the discretion and judgment necessary in the matter of selection and adaptation to the particular soil or situation must ever rest with the reader, and can never be expected from a working gardener, however intelligent or even well educated. Considerable imagination and a dash of artistic feeling, not unmixed with poetry, are absolutely necessary for the success of any garden that is the least out of the common. It is far more a matter of temperament than of sex or age; but, as with the other arts, gardening is a jealous mistress, and no success can come to those who take it up violently one month and drop it the next.

To those who really love it, it becomes too quickly an all-absorbing occupation. Many will say, "Is it worth while?" Who can answer?

SHRUBS AGAINST WALLS (Tan-y-bwlch, North Wales.

AN OLD WALNUT TREE AT VEN HOUSE.

ST. CATHERINE'S COURT, BATH.

ANNUAL FLOWERS—HARDY KINDS.

ANNUAL flowers are those that bloom in the year in which the seed is sown. Some are hardy, others half-hardy, but all form a brilliant race, which attains greater perfection in the cool, bracing air of the North than in the milder climate of the South. The hardy varieties require the seed to be sown in spring between March and late April, except in the case of some kinds, for which the autumn is more suitable, especially in the South of England. Break up the surface soil well, and sow thinly—an important point in their culture—and cover the seed lightly with fine soil. If the seeds are very small, a mere dusting suffices. Never overcrowd the seedlings, but thin out vigorously, as each plant must have a space of about 6in.; otherwise it becomes weakly and the flowers are poor. Avoid sowing too early in spring, for, when cold wet weather follows, the seeds frequently perish. Annuals must not be regarded as plants that will live anywhere and anyhow. Strong growth and abundance of flowers must be the object. Give them, therefore, well-prepared soil, but not too rich, thin out freely, and keep seed-pods picked off. When seed is allowed to mature the powers of the plant are lessened. The annual flower, whether hardy or half-hardy, well deserves to increase in popularity. Our gardens are less interesting and beautiful when the annuals, so easily raised and often so brilliant in colour for months together, are absent. They are flowers that seem adapted in a special way for those who cannot always command tender exotics, or winter gardens and similar charming attributes of many an English home. The seed, moreover, is reasonable in price, and of recent years beautiful novelties have been raised, not, indeed, always improvements upon existing types, but generally sufficiently distinct and effective to be used liberally. All will enjoy annual flowers in bold breadths, the more fragrant kinds especially, such as the Mignonette, growing near the house, into which, in the warm summer evenings

its grateful perfume floats, mingled, it may be, with the scent of Roses, Jasmine, and Honeysuckle. For this reason a line of Virginian Stock near the house is delightful. It is well to grow in a reserve part of the garden many of the more useful varieties for cutting, and thus to avoid interference with the plants in conspicuous beds. In many households flowers are used largely for the table and vases in the rooms, and this reserve garden will supply the wants without marring effective outdoor displays. We have given few cultural notes in describing each group, for the reason that annual flowers are very easily grown. The rule in the case of the hardy kinds which we are now considering may be applied generally, and if our readers will follow the instructions already laid down they will not complain that annuals are weedy, possess but a short life, and collapse when the garden should be clothed in richest raiment. It is a wise plan to grow a few kinds only, not to get together a mere collection. The judicious gardener would rather grow three good Sweet Peas than twenty varieties where space is limited, and he would remember that some seeds are happier in one spot than in another. The "Nasturtium," or Tropæolum, as it is properly called, loves a dry, even a poor soil, and sunshine, whilst another needs richer diet. Generally, however, few hardy or half-hardy annuals enjoy shade. An open sunny spot will alone promote strong, sturdy growth, without which flowers are few and of poor colour. A new world of flowers is revealed when this race of plants is well selected and grown with reasonable attention. The alphabetical list will show that annual flowers are wonderfully varied, some quite dwarf, others tall, as the Sweet Pea, the most delightful of the whole tribe. The most important annuals are:

Acroclinium.—*See* "Everlasting Flowers."

Alyssum, Sweet.—This has white flowers and is pretty for edgings. Keep the seed-pods picked off. Height, 9in.

Bartonia aurea.—A yellow-flowered kind, about 18in. in height. Showy and effective.

Brachycome iberidifolia (*Swan River Daisy*).—A pretty kind, with either blue or white flowers. It may be used in groups in borders, and grows about 9in. high.

Cacalia coccinea.—A scarlet-flowered annual, 18in. high, and less attractive than many kinds.

Calandrinia grandiflora and C. speciosa are two hardy flowers of much interest. The former should have a very sunny position, when the full effect of its rose colouring is gained. C. speciosa requires similar treatment, and has purplish flowers. Many prefer the first-named. Sow seed out of doors in spring, and the seedlings enjoy warm soils.

Calendula.—*See* Marigold.

Calliopsis.—Described under the more familiar name of Coreopsis.

Campanula (*Bellflower*).—The Bellflowers are for the most part perennials, and C. macrostyla is a half-hardy annual, but C. attica and its variety alba are hardy annuals. The first of the two has a violet flower and the other a white, a pretty association of colour, and they are only 6in. high.

Canary Creeper (*Tropæolum canariense*).—*See* note upon Climbing Annual Flowers.

Candytuft.—Very easily-grown annual of many colours, white, crimson, and intermediate shades. Many care most for the pure white forms. (*See* Iberis.)

Centaurea Cyanus (*Cornflower*).—Few annual flowers are more beautiful than this, and the ordinary blue kind is as charming as anything raised of recent years. The white is pretty, but some of the other colours are the reverse of pleasing, though, perhaps, that is a matter of taste. Always sow plenty of the blue form for cutting. Grow the plants as recommended above.

Chrysanthemums, Annual.—These are showy annual flowers, very easily grown from seed sown out of doors in April or early May. The seedlings should be thinned freely, as each plant requires ample space for development. The flowers are very decided in colour, in C. Burridgeanum, for example, yellow, deep crimson, and white being strongly shown, and both Carnatum and its variety Atrococcineum are of rich hues, especially the last-named, which is scarlet. Dunnetti, double white and double golden, are very handsome, and the flowers bold and showy, whilst another useful kind is the Crown Daisy, C. coronarium, of which there are also double forms, one with white and another with yellow flowers. Seed of these should also be sown early in the year under glass, as in the case of half-hardy annuals. C. segetum is the corn Marigold, a plague to the British farmer, but a bright garden flower. There is a larger form than the parent one, named grandiflorum, having rich yellow flowers, showy in the garden and useful for cutting. Stronger plants of this are obtained by sowing seeds in the autumn.

CENTAUREA CYANUS (Cornflower).

Clarkias.—These are very strong-growing annuals, the flowers semi-double, but borne freely, and as a rule of good colour. The varieties of C. elegans are effective, especially Salmon Queen, which is of a rosy tint, and White Queen, pure white, whilst of C. integripetala there are rose, pink, and other colours. The magenta purple shades are scarcely so good as the clear bright colours. C. integripetala grows only 18in. high, but C. elegans is taller, sometimes over 2ft.

Climbers.—The annual climbers are of great beauty and value, being so quick in growth, and covering in a short space screens, arbours, and the like. The most useful are Convolvulus major and minor; Japanese Hop (Humulus japonicus), remarkably quick in growth, and of a pretty green colour, its variegated variety with brightly-coloured leaves; Mina lobata (sow seeds in gentle heat in spring, warm soil); Tropæolum Lobbianum and the Canary Creeper (T. canariensis), Sweet Peas, and Thunbergia alata and varieties (warm soil and sunny position only; sow seeds in gentle heat in spring). Except when stated, all may be sown in the open ground in spring.

Collinsias.—Charming annuals, and seed may be sown in autumn and spring, as then a long succession of flowers is gained. The plants seem quite happy in town gardens, for which, as a rule, annual flowers are not well adapted. Make good groups of them. Bicolor is the best known, its flowers of a lilac and white colour. Candidissima is white, and there are grandiflora, purple, and its variety carminata, carmine, all the varieties varying from 9in. to 1ft. high.

CONVOLVULUS.

Convolvulus.—Of the hardy annual forms are the well-known major and minor, the former of climbing growth, and useful for beautifying trellises, arbours, pergolas, and the like. Sow the seed in May in rich soil, and get a good series of colours, which vary from white to deep purple. Minor is dwarf, only reaching 1ft. in height, and as varied in colour.

Coreopsis, also called Calliopsis, including also the beautiful C. grandiflora, which will flower from seed sown the same year, although many flower gardeners treat it as a biennial. Sow the seed in early April, and if the soil is fairly rich and the plants are not crowded together, a glorious display of flowers will result in the autumn. This is one of the brightest and most graceful flowers of the garden. Atrosanguinea is a very deep brilliant yellow. Other beautiful kinds are Drummondi, rich yellow, brown in the centre; Coronata, yellow; and the yellow and brown tinctoria, delightful for their unusual colouring.

Cornflower.—*See* Centaurea.

Datura.—There are two Daturas that may be treated as hardy annuals, one named Cornucopia and the double D. chlorantha. The first-named has conspicuous flowers, sweet scented, and white and purple in colour; it grows less than 2ft. in height, and in full bloom is very distinct and pleasing. When potted, the plants are useful for the greenhouse. D. chlorantha flore-pleno has yellow flowers of trumpet shape and sweet smelling. It is a few inches taller in growth.

Delphinium.—*See* Larkspur.

Erysimum.—Very bright annuals which may be sown in autumn are E. Arksanum, which reminds one of the Wallflower, and rich yellow, and the orange, E. Perowskianum, blooming in the spring when sown in autumn.

Eschscholtzia.—This group should be regarded as annual, as seeds sown in spring produce plants to flower the same year. There are several kinds, but none more pleasing than the old yellow Crocea, of which there are double and white varieties. California is pale yellow, Mandarin is orange and crimson, and Rose Cardinal is of a rosy shade, as its name suggests; but many think the self yellows the best. Sow seeds also in autumn. The Eschscholtzias are about 1ft. in height and gay flowers, varying a little in size, but always bright, the yellows in particular. Little groups on a sunny border are a distinct change from the other plants; the flowers open wide, and the greyish shoots tumble over the margin, breaking up hard lines, and scattering colour where one often least expects it.

Eutoca viscida.—Blue is a colour required in moderation, but rarely got amongst annuals. This, however, is bright blue, very free, and bees seek it. Height, 1ft.

Gilia.—This is a useful race, especially when boldly used. It should be sown freely near beehives, as bees appreciate the flowers. Tricolor, white and lavender, and nivalis, white, orange centre, are about 18in. in height, and minima cærulea, useful for edgings, is blue.

Glaucium luteum (*Horned Poppy*).—A group of this is showy, as the flowers are rich yellow, and the leaves glaucous. It should not be used too much. Height, 2ft.

Godetias.—Rather a large family, and very showy in summer. In poor land seedlings will stand the winter and flower much earlier than those from spring-sown seed. Godetias transplant well, better indeed than most annuals. Even when a few seeds have been sown in September, a further sowing should be made in March to provide a succession; but there will be no long continuance of flowers unless the plants are thinned to not less than 6in. apart as soon as they are large enough. When dry weather sets in, top-dress with a little rich compost, consisting of an admixture of old leaf-mould, charred rubbish, and old potting soil, all blended together and passed through a half-inch sieve. Among the best varieties are Bijou, white with dark red spots, very dwarf, being not more than 6in. high, and effective in a bold mass; Bridesmaid, white, striped with rose; Duchess of Albany nana, white, very dwarf, a good bedding plant; Lady Albemarle, carmine, edges of the petals suffused with lilac, very dwarf; Lady Austin Rose, glossy deep rose pink, a charming variety; Princess of Wales, ruby crimson; Rosea alba, white with rose centre, very dwarf; White Pearl, a fine white; Gloriosa, in the way of Lady Albemarle, but of a darker colour, indeed at present the darkest variety in the family. The white Godetia is the most popular, which is not surprising.

GODETIA.

Grasses, Annual.—Besides the perennial Grasses, there are others of delicate beauty which may be raised from seed sown in spring in the open ground. These are Agrostis pulchella, a delicate and beautiful small Grass; the taller-growing A. nebulosa; the fluffy Hair-tail Grass (Lagurus ovatus), one of the most popular of all; the Large Quaking Grass (Briza maxima), and the smaller B. minima; the late and graceful Eragrostis elegans; and the Barley Grass (Hordeum jubatum). Sow the seed early in April, and in the case of the finer kinds, such as Agrostis pulchella, mix the seed with a little fine soil or sand to distribute it more evenly. The seed should be sown where the plants are to remain, and perhaps a little thinning out will be advisable where too thick sowings have been made. Eragrostis elegans is pretty by water, and will frequently perpetuate itself. When the Grasses are required for winter use, gather them

before they are in any way spoilt by heavy rains, and choose a bright afternoon for the purpose. Tie them in small bundles and place in a dry room, away from the window, and in an upright position.

Humulus japonicus (*Annual Hop*).—A pretty light green annual climber of wonderfully quick growth. It will soon cover a pillar, or run over an arbour or pergola. Its variegated variety is not very attractive, though some may like the creamy white markings. Sow in spring.

IBERIS (Annual Candytuft).

Iberis.—The annual Candytuft is an Iberis, called I. umbellata, and has given rise to many pretty garden flowers of various colours, the white forms being pure and handsome. There are also rose, lilac, crimson, and other shades, but many like the clear whites best. Some forms are dwarfer than others, the Tom Thumb strain being not more than 6in. in height, but the taller and Rocket kinds are about 12in. or 15in. The Candytufts are extremely hardy. Seed should be sown in autumn in rich soil. Thin out freely, as Candytufts look poor if at all drawn.

Immortelles.—*See* "Everlasting Flowers."

Kaulfussia amelloides.—A pretty annual for edging, only 6in. in height, and represented by several colours, of which white, crimson, and blue are the chief.

Larkspurs, Annual.—These are graceful flowers; so much so, that the taller kinds are effective amongst dwarf shrubs, or by the margins of shrubberies. Not only is the colouring of the flowers pleasingly diversified, but the growth of the plants also—some tall, others branching; hence such names as candelabra or rocket-flowered, which have resulted from the crossing of such species as Delphinium Ajacis and D. consolida. The dwarf rocket forms are about 18in. in height, but the tall branching forms are as much as 3ft. The colours are very varied, ranging from white to purple, but the deeper shades are the most effective. Seed may be had in separate colours, and is easily raised in spring out of doors. It would be well if flower gardeners were to seek out all the more beautiful forms in this race and grow them strongly, as under these conditions few annuals are more interesting or pleasing in colour than these Larkspurs. By shrubbery margins, or in single beds, with a dwarfer plant as a foil, the plants will be effective, and there are sufficient pure colours to obtain bright groups. The Larkspurs are amongst the most graceful of their class, very easily grown, and as varied in growth as in colour.

Lavatera trimestris (*Tree Mallow*).—Few annuals are gayer than this; the type is rose, and the variety alba white. A group of this in some rough spot in the garden, or in the border, is delightful; the plant is free in growth and bloom. Both grow to a height of 3ft. Rosea splendens, rose, and alba splendens, white, are very beautiful. The plants are about the same height as trimestris, and smothered with flowers for many weeks. Such flowers are precious for cutting, and those of this Mallow remain in beauty from July to September. Sow the seed in spring (late March or early April) where the plants are to grow, and thin out freely. The soil should be rich.

Layia elegans is a charming annual, rarely, however, seen, and makes a neat little edging 1ft. high. Its flowers are yellow, with a distinct, even white edge. In alba they are quite white. This may be used for edging.

Leptosiphon.—A charming group, dwarf, and for that reason suitable for edgings or the rock garden. Sow the seed in autumn in dry soils. It is important not to delay sowing until too late for the seedlings to develop into sturdy little plants before winter. When this cannot be done, delay sowing until spring, sowing in the usual way. When the soil is very light, autumn sowings always give the best results. Roseus is a very charming kind, bright and fresh in colour. Aureus, golden colour, roseus, rose, and the snow-white forms are very distinct and fresh in colour.

Leptosyne Stillmani.—Fortunately from time to time new annual flowers are introduced, and this is a novelty which we think will be grown considerably in the future. It flowers very early, so much so that within five weeks of sowing the seed the golden yellow blossoms appear, and continue to do so, if seed-pods are picked off regularly, for several weeks. This is also a good kind for cutting, as it grows 18in. in height, and the flowers have a considerable length of stem. L. maritima is really a half-hardy annual, and therefore the seed of this must be sown early in heat, but as soon as possible inured to the air to prevent the growth becoming drawn. This is no less than 3ft. high, and its pale yellow, daisy-like flowers are very charming when cut. But always remember that when an annual is recommended for cutting it is rendered valueless unless the plant is prevented from seeding. One can, of course, understand this, the double burden being too great, and the plant collapses.

Limnanthes Douglasi.—A well-known kind, with yellow and white flowers, which bees appreciate. Sow in autumn for an early display in the spring. It is only 6in. high.

Linaria (*Toadflax*).—A brilliant group of annual flowers, seeds of which should be sown in March, and successive sowings made to prolong the season of blossom. As a rule, a good sowing in early April suffices, unless the garden is large. Where the climate is unusually favourable, as in the South of England, autumn sowing may be practised. Sow in ordinary garden soil in a sunny place, thinning out the seedlings well, so that about 3½in. is the distance between the plants. Thin out freely, as Linarias are spoilt utterly when crowded; yet remember that it is only in free colonies that the plants are effective. They grow about 1ft. high, as a rule, and are amongst the most beautiful of annual flowers. L. bipartita is violet, with white and yellow spots (its varieties numbering a white one and the rich purple-coloured splendida), L. multipunctata, the violet-coloured L. Maroccana, and L. reticulata. The variety of the last-named called aureo-purpurea is one of the richest in colour of all annual flowers—purple with yellow spots, an effective colour. Broad patches of this bright kind are very effective.

Lupines, Annual.—A useful race of garden flowers, brightening shrubbery borders, and creating pretty, graceful groups in the wild garden. There are blue, white, yellow, rose, and other shades, all clear and pleasing. Of named kinds, Hartwegi, blue and white, and its white form; Hybridus atrococcineum, scarlet tipped with white; Mutabilis, white, and blue of various shades; the dwarf Nanus, blue, useful for bedding; Nanus albo-coccineus, crimson and white; and the rich blue Subcarnosus. They are all very easily raised from seed sown in April in any soil. It must be a poor garden that will not grow Lupines. The perennial species are described under the heading of "Hardy and Bulbous Flowers."

ANNUAL LUPINE.

Marigolds.—There are three distinct groups, the common, the French, and the African. The most familiar is the brilliant orange-yellow flower that seems happy anywhere. This is Calendula officinalis and its varieties, which are not made sufficient use of in gardens. They will grow freely in rough places, and beautify spots where few things will succeed. The flowers vary in colour and size. Orange King has immense flowers of handsome form and perfectly double, whilst there are soft, lemon-coloured kinds, known in various catalogues under distinctive names, as Lemon Queen, Prince of Orange, Meteor, and others. The Cape Marigold (C. pluvialis) is a charming flower of delicate white and purple colour, and is very pretty used near the margins of borders. The African Marigolds are tall, quite 3ft. high in good soils, and bear very large flowers like balls, in one case deep orange, in another soft lemon. When massed by themselves in beds, or clumps made of them in the border, they are very effective in autumn, when they attain full beauty; do not crowd them. As they are rather tender, do not sow seed until May, when fear of frost is over; but, if it is wished, sow early under glass, and transplant when early summer comes. The French Marigolds are quite dwarf as a rule, though some are taller, about 2ft. high. In this section the flowers are striped or blotched. Legion of Honour is a kind in great favour, but its yellow and brown flowers are not effective, being too striped. It is, however, very bright, only 9in. high, and good for edgings.

Malope grandiflora.—A well-known kind, with white, rose, and red flowers, of bold form. It grows to a height of 2ft.

Matthiola bicornis.—This is the well-known night-scented Stock. It is scarcely pretty in the full sun, as the lilac flowers close, but they open in the evening and exhale a grateful perfume. An annual to sow near the house, and as it is only 1ft. high, it may be well used as an edging.

Mignonette.—This fragrant annual, at least it is an annual in the open air in this country, has branched off into many varieties, but for ordinary use only two, or at the most three, need be grown, and the majority of flower gardeners are satisfied with one kind. Sow the seed in March, thinly, and the seedlings should be thinned to from 9in. to 1ft. apart. The soil should be good and well worked, but Mignonette is most happy in fine ground. The Giant Crimson or Pyramidal Miles' Spiral is an excellent variety for the garden, and bears long spikes for cutting. The common sweet-scented variety is best for scattering amongst Roses, shrubs, etc., to fill the garden with fragrance all the summer. For pot culture in the greenhouse the Red and Golden Machet are most suitable, and very useful, too, in 5in. and 6in. pots. The seed may be sown either thinly in the pots in which the plants are to flower, or in 3in. pots, and moved later. Sowings should be made at intervals from the end of June until February or March where a succession is required. The early sowings may be outside, but winter sowings should, of course, take place in a warm greenhouse near the glass. In no case should the plants be crowded, five good seedlings being sufficient for each 5in. or 6in. pot, or if well grown when started in small pots a single plant will suffice. The soil must be good, especially the loam which forms the bulk of the compost. Old cow-dung, leaf-mould, a little soot, and a small quantity of old plaster may constitute a third of the whole soil, the remainder being loam. Make the soil very fine before sowing the seed. This is important.

Nasturtium.—*See* Tropæolum.

Nemophila.—Who does not know the blue Nemophila, most precious of annuals, and quite dwarf. Insignis is the kind we know so well, but there are varieties of it, such as alba, rosea, and grandiflora, the names indicating their distinctive characters. Then one can have atomaria, white with black dots; the rich blue variety, atro-cærulea; discoidalis, intense purple, edged with white; and maculata grandiflora, white with violet spots.

Nigella (*Love-in-a-Mist*).—This gets its name from the flowers being hidden in a veil of green. N. hispanica is its botanical name, and the flowers of the type are light blue, those of the variety alba white. There is a double kind, but many prefer the single, which is less stiff. Many flowers are spoilt by doubling, although there are some striking exceptions, the Rose as an example.

Peas, Sweet.—Few words are necessary to introduce this charming annual, queen, indeed, of annual flowers, as sweet in colour as in fragrance, hardy, free, and invaluable to cut for the house. They may be used in many ways—to ramble over twiggy sticks and form a flowery screen to hide some unsightly object, as a hedge, or in rows to give flowers for cutting. Wherever they are placed, few flowers are more welcome for their fragrance and beauty. Of late years much good work has been accomplished in extending the list of varieties, and those we give the names of are certainly the finest of the race. Sweet Peas must, however, be well grown to give satisfaction. Prepare the soil by digging it thoroughly and incorporating plenty of well-decayed manure, and sow the seed either in the autumn, from late August to October, or even November in some years, and also in the spring. If Sweet Peas are in large demand, make more than one

SWEET PEA.

sowing, so as to secure a succession. Let the soil be moderately fine for the seed, and the drills 3in. deep, previously coating the seeds with red lead to keep mice and birds at bay, or soak them in paraffin oil for 20min. Do not make the row quite level with the surrounding soil, as the Sweet Pea likes moisture, and a little hollow helps to retain the water given. Make the soil fairly firm, and put stakes to the plants when an inch or so in height, otherwise the results will be unsatisfactory. Never wait until the growths sprawl over the ground. In early summer give a light mulch, such as well-decayed horse manure, or leaf-mould, or spent hops, and when this is done the growth is twice as strong as when no mulch is given, as it acts as a protection against dryness at the roots. Never allow the flowers to decay until seed-pods are formed, or an end will quickly come to the production of bloom; the plants cannot withstand this two-fold burden. If one desires to save seed, set apart a row, or part of one, according to the quantity required, for this purpose. Of varieties, the following may be selected, but the list of Sweet Peas is of great length. Many kinds are much like one another, too, but those named are quite distinct: *Apple Blossom*, soft rose; *Blanche Burpee*, white; *Boreatton*, maroon; *Captain of the blues*, *Captivation*, rose and purple; *Cardinal*, crimson scarlet; *Creole*, purple; *Countess of Radnor*, softest mauve, or heliotrope, a lovely flower for decoration; *Duke of Clarence*, deep purple; *Emily Eckford*, mauve and blue; *Emily Henderson*, white; *Ignea*, crimson scarlet; *Lady Penzance*, bright rose; *Meteor*, brilliant carmine rose and buff; *Mrs. Eckford*, primrose; *Orange Prince*, scarlet and orange; *Ovid*, light rose; *Peach Blossom*, salmon pink; *Primrose*, primrose tint; *Stanley*, deep self maroon; and *Venus*, rosy buff. It is always wise to see a collection of Sweet Peas in flower, as considerable diversity of taste exists in the matter of colour.

Phacelia campanularia.—A delightful annual flower, bright blue in colour, and shaped like a little bell. It grows scarcely 1ft. in height, and is very charming when used as a groundwork plant, but it must have a fairly light, warm soil and sunny position. It is one of the most decided blue flowers we have. P. tanacetifolia is also blue, the flowers being borne in compact heads, but it is not so valuable as the other.

Platystemon californicus.—This is a dwarf annual flower, bright lemon in colour.

Poppies.—These are described, both annual and perennial, in the chapter about perennials in general.

Sanvitalia procumbens.—This is a pretty yellow-flowered annual, 6in. high, and therefore suitable for edgings. There is a double form of it, S. Mexicana.

Saponaria calabrica.—A pretty pink-flowered kind, suitable for autumn sowing. Six inches high. Alba has white flowers. Many prefer the pink form, as this is more effective in colour. Masses of it are wonderfully rich through the summer.

Scabious.—There are annual and perennial Scabious, and the former comprise flowers of varied and pretty colours, from pure white to black. We know of few classes in which so many shades are present, and the plants are very easily raised from seed by sowing it in gentle heat in March, and transplanting the seedlings to the open ground in May. Another method is to sow seed in April in the open ground, but the earlier sowing in heat is better. The flowers are pretty when cut for the house, and the plants are grown frequently in winter in pots for this purpose. Seed must be sown in summer if winter flowers are desired, keeping the plants strong.

SAPONARIA CALABRICA

Silene (*Catchfly*).—The annual members of this family are very brilliant garden flowers, and the compacta forms are useful as edgings. Sow seed both in spring and autumn. The flowers are of many colours, and the group called compacta shows many variations. S. pendula, white and rose-coloured, is 1ft. high, and the same colours are produced in S. p. compacta, only the plants are not more than 6in. high. There are double forms of both white and rose colours.

Sphenogyne speciosa.—This is a very bright and useful annual, about 1ft. high, with flowers not unlike those of the Marguerite, and of a yellow colour, varying in shade in individuals. A good group of this is distinctly attractive. This pretty kind was formerly called Ursinia pulchra, but Sphenogyne speciosa is the name under which it is now usually known. There is another Sphenogyne, S. anthemoides, but this is not so attractive as the other, hence it is seldom seen in English gardens.

Sunflowers, Annual.—These are invaluable for creating rich effects, and very easily raised, either by sowing in a close frame or upon a hotbed in April, using pans for the purpose, or in early May in the open. Put the seeds about 1in. deep, and in both cases the seedlings will quickly appear, making thinning-out essential. Never overcrowd Sunflowers, and let the soil be rich. There are many forms, some dwarf, others very tall, and with big double flowers, which differ, too, in colouring. A good kind is named Primrose Perfection, in which the flower is primrose-coloured, and the centre black. Sunflowers are excellent plants to grow in gardens newly-made, where striking colour is required at once to help through the summer months, or indeed in any rough, wild spot, these vigorous plants are well placed. Use the smaller forms for gardens of medium size, not those giant types which require a woodland or wild garden to tone down their oppressive colour. It is not always wise to grow the largest type of Sunflower, unless one wishes to obtain huge heads, more interesting for their dimensions than for colour or form. Regard the Sunflower as a plant of some sterling value in the garden, and, well used, it should play an important part in adorning the pleasure grounds. Many fine effects are obtained by associating it with evergreen shrubs, by woodland walks, and hiding unsightly corners. Of course, the daintier varieties, Primrose Perfection for example, may be sown in the mixed border, as they are as welcome there as any other annual. Too many Sunflowers means that a strong colour is overdone, so be moderate in their use. Cucumerifolius, a species from Texas, is very pretty, with yellow flowers and dark centre.

Sweet Sultan.—This charming annual, dear to our ancestors, deserves to become more popular. The variety in the flower colouring is pleasing, some being white, others yellow, and there are even shades of blue and purple. This race has been much improved of late years, the flowers being larger, and their fragrance

is precious too. Treat as previously recommended, and grow a stock in the reserve ground for cutting from. The flowers are quaint in colour, and their perfume is distinct.

Tropæolums (*Nasturtiums*).—These are amongst the brightest of annual flowers, and may be had in separate colours. If the seeds are grown in distinct batches, the seedlings come true to colour. Of the dwarf or Tom Thumb varieties, the following are effective when massed, either in separate beds, or in bold irregular groups in front of shrubbery borders: Empress of India, excellent for its effective dark leaves and crimson flowers; Golden King, bright golden yellow, dark foliage; King Theodore, glaucous foliage and velvety crimson flowers, a good bedder; Pearl, creamy white; Tom Thumb Beauty, orange spotted; King of Tom Thumbs, very dwarf, with dark foliage and scarlet flowers; and Vesuvius, a compact dark-leaved variety, with crimson flowers borne well above the foliage. Liliput is the name given to a new class of dwarf Nasturtiums, smaller than the Tom Thumb, both leaves and flowers being diminutive, but the latter are produced in profusion. They make charming plants for beds. The climbing annual Nasturtiums are very useful for running over trellises and arches, and for training over the front of window boxes. T. Lobbi may be obtained in several shades. It will flower all the winter in the conservatory, if planted in the border early in summer, and trained up under the roof to make festoons of growth and flower; but never use it in foggy towns. London fog is fatal. For the garden, the more familiar T. major should be used, and it gives greater variety of colours. The seeds of all the Tropæolums may be sown in March, and the seedlings transplanted anywhere in May. Although the seeds are quite hardy—as when self sown they remain safe in the ground all the winter—the plants will not bear exposure to frost. Cuttings may be struck, but seed is the quickest and easiest way to raise the plants.

TROPÆOLUM (Nasturtium).

Virginian Stock.—There are many forms of this, the colours comprising crimson, yellow, red, and white, and there is a freshness about them which is distinctly charming. Crimson King is a good crimson form. As the plants are only 6in. in height, they may be used as edgings. Sow the seed quite early in March.

Viscaria.—A brilliant group of annual flowers, 18in. in height, sometimes less, and very effective in masses or clumps in the border. The most showy is Cardinalis, which has crimson scarlet flowers of a wonderfully rich shade. Oculata and its blush variety, cærulea, are pretty, and there is a striped kind, scarlet with white streaks, but many care less for these striped flowers than for the self hues.

Whitlavia grandiflora.—This is pleasing in the border, and seed may be sown either in the spring or autumn. The flowers remind one in shape of those of the Gloxinia, and a kind named Gloxinioides is so called for this reason. The flower is lavender, with white throat. The type is violet-coloured; alba is white, and fragrant.

Annuals for Autumn Sowing (late August and September). Many annual flowers may be sown in the autumn, and bloom earlier in the year, of course, than when sown in spring. All kinds, however, cannot be thus treated, but the following are available: Alyssum, Bartonia aurea, Cacalia coccinea, Calendula or Marigold, Candytufts, Collinsia verna, Cornflowers, Erysimum, Eschscholtzia, Gilia tricolor, Kaulfussia, Layia elegans, Limnanthes Douglasi, Linum grandiflorum, Nemophila, Nigella damascena, Platystemon californicus, Sanvitalia procumbens, Saponaria calabrica, Silene pendula, Sweet Peas, Sweet Sultan, Virginian Stock, and other Stocks, save the ten weeks kinds.

A WALK AT PENSHURST.

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THE TERRACES, STREATHAM HALL.

"COUNTRY LIFE."

THE TERRACE, LONGFORD CASTLE.

EVERLASTING FLOWERS.

WHEN we use the word "Everlasting," in allusion to a certain class of flowers, several besides the Immortelles are included. The "Immortelles" are gathered from Xeranthemums, Rhodanthes, and Helichrysum arenarium. Helichrysum bracteatum affords a very large variety of colours and forms, and is the best and easiest to grow of all. Then there are the Acroclinium, Ammobium, Waitzia, Helipterum, Gnaphalium, Catananche, Antennaria, Statice, Gomphrena, and others, all deservedly coming under the head of "Everlasting Flowers." Stove and warm greenhouse plants will be omitted from the list. As a rule, all the Everlastings enjoy a rich and sandy loam, and very few indeed will thrive unless they can have good drainage. Some, such as the Rhodanthes, are far too impatient of superfluous moisture to thrive well in the open unless the season is exceptionally dry and warm. As their wants vary somewhat, each species will be considered separately.

The Helichrysums form a large family, containing over 250 species. Two of these are all one need deal with here, viz., H. arenarium and H. bracteatum. The first is a hardy herbaceous perennial, about a foot in height, and bearing bright golden-yellow flowers. It is a sand-loving plant, and yet needs a fair share of manure worked in the soil, propagated by division in spring, and cuttings of young shoots in summer. This is very useful as supplying a good yellow among the "Immortelles." Helichrysum bracteatum and its varieties give us the more double and globular forms of Everlastings. They enjoy a very rich and deep loam, but it must have no suspicion of stagnant moisture if the best results are to be secured. This is an annual. Sow in April if to remain in the open ground where sown, or early in March if a little heat can be afforded, pricking the seedlings out by the middle of May. If some of the dwarfer growers are sown in pots in May, and grown on plunged in a pit, they will make very pretty plants for the cool greenhouse during early winter. One can have yellow, bronze,

white, deep scarlet, purple, red, orange, orange-brown, and several other shades among these. When being cut to dry for winter use, they should be taken about three-parts open, as near mid-day as possible, and hung up in a cool shed, head downwards, until dry. If left until the flowers are fully expanded, the centres are apt to dry a dull and dirty colour.

HELICHRYSUM.

Ammobium alatum has much the same globular formed flowers as H. bracteatum, but smaller, and of the purest white. Sow in the open, during March or April, according to the season, give a rich loam, and thin to 18in. between each plant. The flowers can be cut and dried at almost any stage. A yellow counterpart of this is found in Gnaphalium fœtidum, which may be treated the same. Both are annuals.

Rhodanthes, Acrocliniums, and Helipterums may be classed together as regards culture These have a great objection to root disturbance, and should be sown where they are to flower, whether in the open or in pots. If in the open, they must have a sandy soil and a warm border. It is only in exceptional seasons that these are at their best outdoors. Their average height is from 1ft. to 1½ft., and being of slight growth it is better to sow the seed rather thickly. They are most useful for pot culture, especially the rose and white forms of Rhodanthe Manglesi, which may be had in flower for many months of the year. R. Manglesi atrosanguinea is a deep red, while for a yellow of the same form we must turn to Helipterum Humboltianum. All are good for cutting, and last well. The last-named, although a bright yellow when fresh upon the plant, turns a metallic green when dried. When cultivated in pots, they need a much richer soil, and an excellent compost is made of sandy loam one half, the remainder being cow and stable manure mixed, with a dash of sharp sand and plenty of bottom drainage. Care must be taken not to over-water while the seedlings are young, or they will damp off close to the soil.

ACROCLINIUM.

Xeranthemum annuum and its varieties give us the "Immortelles" so freely used in crosses, wreaths, etc. White and various shades of violet-purple are the main colours. They are good summer flowers in the open, and as easily grown as most annuals. Sow in boxes or pans in April, and prick out in any rich and fairly well-drained soil by the middle of May. It is an annual, and one of the best for the flower garden. The flowers must be cut dry and when just bursting if they are to be bright and clean.

Waitzias are peculiar and showy, but a little heat is needed to raise the seeds, and a dry summer is necessary for them out of doors. They make excellent pot plants when treated in a similar way to the Rhodanthes. Waitzia grandiflora and W. nivea are the two best.

Gomphrena globosa is a pretty annual that may be treated in the same way, growing from

1½ft. to 2ft., and carrying globular flowers of white, rose, flesh, purple, and dark red shades. Statice tatarica is a perennial, and quite hardy, rather more than a foot high, and producing large spikelets of small ruby-red flowers. It is very light and graceful, and does well in any light loam.

Everlasting flowers have, since in rich abundance the simple and beautiful hardy perennials have altered the face of English gardens, received little attention. Late Chrysanthemums, early bulbous flowers, and exotics of the greenhouse and stove contribute to the indoor decorations, but where the garden is innocent of any glass structure, then the flowers of the Everlastings are welcome. Many of them are very bright in colouring, and, rightfully used, are effective in the border. It is a mistake to neglect this interesting race, especially if winter decorations are desired either in the church or house, although we care little for them when used upon the table. In forming letters and designs for the Christmas festival they are invaluable, being bright, and, of course, only losing their colouring when coated with dust.

The Rhodanthes are, it must not be forgotten, amongst the most charming of all the Everlastings. In gardens of any size, or in which plants in variety are grown in the greenhouse, these delightful flowers are planted freely, so much so that in many market gardens their culture is of considerable importance. The seeds are also so easily raised that an amateur with little convenience may grow a large number of plants.

One must also include amongst the Everlastings the pearly Everlasting (Antennaria margaritacea), which is, apart from the chaffy character of its white flowers, a pleasing rock or border plant. The annual Australian Waitzias and the famous Edelweiss (Gnaphalium Leontopodium) may also be classed amongst the Everlasting flowers, and their dried blossoms used in a similar way to those of the more widely-known "Everlastings." The woolly flower-heads of the Edelweiss could be used in little decorations, partly for their greyish colour and partly for their pleasant associations. It is an Alpine very easily grown, yet so many fail with it, generally because the roots are taken from their mountain heights to the rock garden at home. Under such circumstances they are certain to fail, but raised from seed, or each year divided, the results are gratifying. Some variation occurs amongst the seedlings, the flower-heads being bolder in some forms than in others.

The finer Everlastings should be planted in the reserve garden, that portion devoted simply to the culture of flowers for cutting, or they may be grouped in the mixed border. Notes of culture are given in the following list of a few of the principal families, these being the Helichrysums, Rhodanthes, and Xeranthemums:

Catananche cærulea.—This is an Everlasting, for the reason that its flowers may be preserved during the winter in their natural colours. It is a hardy perennial from Southern Europe, and seems to prefer a warm, fairly rich soil, whilst it is easily raised from seed in the spring. When in vigour this is a very pretty plant, the flowers large and clear blue, as their specific name indicates. The variety bicolor is blue and white, and there is a white form also, but the clear self blue is more charming than either.

Helichrysums.—These are the most valuable of all the Everlastings grown usually in the open garden. They possess decorative value out of doors, and when carefully gathered and dried the flowers retain their beauty throughout the winter. The Helichrysums are for the most part natives of the Cape, and the species of greatest importance is H. bracteatum, which is, however, an Australian flower, with a number of varieties. One may obtain several colours, either in mixture or separately, as mentioned above, and named kinds too, whilst there is a dwarf-growing race. When the Helichrysums are grown for winter vases and bouquets, obtain the finest named varieties, such as Orange and Silver Globe and the crimson-coloured Fireball. These are bolder and handsomer than those obtained from an ordinary packet of seed.

Rhodanthes.—If everlasting flowers must be restricted to one kind only, then choice should be made of Rhodanthe Manglesi. One may well supplement the introductory notes to this group by giving the culture of this delightful half-hardy annual Everlasting and its variety in detail. When the plants are to be grown for the open garden the seed should be sown in March, and the seedlings thinned out until about half-a-dozen plants remain in the pot, which should be 5in., or "forty-eight," in size. Harden off the seedlings thoroughly before transferring to the open, which should take place in May. When, however, to be grown in pots, fill a shallow pan or pans with light soil in September, and give a temperature of about 55deg., not less. In the following March prick out the seedlings 1in. apart in 5in. pots, and when thoroughly established give a little weak liquid manure. When thus grown a profusion of bloom is the reward in spring. Throughout their season of growth a light position is essential.

Xeranthemums are frequently used in winter decorations. Their culture has been considered. It only remains to mention that they come from Southern Europe, and X. annuum is the species in greatest favour, whilst the variety superbissimum is an improvement upon the parent.

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A CONTRAST—UGLINESS OF "CLIPPING."

ANNUALS—HALF-HARDY.

THIS group of annual flowers represents many beautiful kinds, but the seed must be sown under glass, not in the open. For sowing the seed a hot-bed is of great service, but any warm house, if the temperature is not unduly high, is suitable, and nothing is better for sowing the seeds in than a shallow pan or even a box. The great secret is not to hurry the plants, but to provide a proper season of growth by sowing in late February, in March, or even in April. It is of little use to sow largely before the warm days. For soil mix up loam, decayed manure, leaf-mould, and sufficient sharp silver sand to lighten it well, and always remember to sow thinly, and give water by immersing the pan or pot, as the case may be, almost to the rim, letting the water soak up through the hole in the bottom. If watered from the top, the seed will be probably washed out. After sowing the seed very thinly, and dusting lightly with soil, cover over with glasses, which must be removed directly the seedlings appear above the surface, and give air judiciously. Remember that a stocky, sturdy growth is essential, and this is not obtained in a very hot temperature. Watch for slugs or wood-lice, which are partial to young seedlings. When the seedlings are beginning to crowd each other, prick out into other pans, and in the majority of cases this will suffice if they are not put too close together. In the case of choice things, of course it may be wise to pot them up separately. Where artificial heat is not available, delay sowing until early April, and place the pans or pots in a frame, choosing a sunny position, or use a hot-bed, which should be made up in every garden. As a last resource, sowings may be made in the open ground in May, but of course the results will not be so satisfactory. Let the soil be rich and thoroughly well prepared for these outdoor sowings. Plant out in late May or early June, when frosts are over, and before doing so expose the plants to the air, except at night if frost is apprehended, as unless the growth is vigorous the flowers will be few and poor. As in the case of the hardy annuals, an alphabetical list is given of the most beautiful tender kinds. It may be remarked that some plants described as annual are

really perennial, but those named are generally placed under the present heading. Many bedding plants are tender annuals, and these are described in the chapter upon "Tender Plants for the Summer Garden."

Alonsoa.—These delightful flowers are becoming more popular, and they are welcome also for pots as well as the open garden. They can be used with other things, or in small beds by themselves even. A. Warscewiczi is very bright in colour, the flowers of quite a crimson-scarlet shade, and those of A. linifolia and its variety gracilis are scarlet, the growth very slender and graceful. In both cases the plants are about 18in. in height.

Amaranthus (*Love-lies-bleeding*).—These are quaint but somewhat melancholy-looking plants. Always use them with extreme discretion and moderation, as if too freely planted the garden would have a very spotted appearance. A. caudatus, the true Love-lies-bleeding, is really a hardy annual, and easily known by its long, drooping, deep crimson flower spikes, which have a strange appearance in the border or in front of the shrubbery. The following have distinctive foliage: In the well-known A. melancholicus the leaves are of a rich red colour; in A. salicifolius, touched with an orange shade; and in A. tricolor splendens, usually called Joseph's Coat, crimson, green, and yello combine to make an effective group. Let the plants always be fully 8in. apart.

Anagallis (*Pimpernel*). — The pretty A. linifolia and its varieties cærulea, blue, and sanguinea, deep red, are very dwarf, only 6in. high, and may be used as edgings, or in the rock garden and pots.

Arctotis.—A. calendulacea is a brilliant flower of an orange colour, reminding one of the gazania, and dwarf, useful, therefore, for the margin of the border. The growth is spreading. In sulphurea the flowers are more of a lemon colour.

Argemone (*Prickly Poppy*).—This is a very tender race, and may be regarded as annual, as seed sown in heat early in the year will give seedlings that will flower in the ensuing summer. Select for them a warm, sunny place, rather dry soil, and let each plant stand apart from its neighbour to display its poppy-like character. The flowers are large and white, relieved by golden-coloured stamens. A. Mexicana is as pleasing as any, but a strong family likeness is conspicuous, so that one scarcely desires other kinds.

Asters, China.—These are not Asters, but belong to the family called Callistephus; but whatever their name, they constitute a brilliant race of garden flowers, making strong masses of colour in the early autumn, and being raised with ease in the spring from seed. Flower gardeners, however, are puzzled generally to know the types to select from the bewildering lists in catalogues. Many of the kinds are much alike, and all are tender, as might be supposed, from the native country of the species—China. Callistephus chinensis is the botanical name of this useful flower. The seed is very reasonable in price, but it should be good. Poor seed will produce poor flowers. Sow in the middle of April, in frame or greenhouse, using a shallow box, pan, or pot, and give a little heat. The seed quickly germinates, and in less than a month the seedlings are ready to prick off either into other boxes, or into a frame, preparatory to their removal to the open air. They may even be put out into a warm border at once—indeed, in about six weeks from the time of sowing the seed the plants, if well grown, are fit for the open ground, and before they come into flower, or even when in bloom, they may be potted up for the greenhouse and conservatory. If no artificial heat is available, sow the seed earlier in the month of April, as, of course, the progress of the seedlings will not be so rapid. Seed may also be sown in shallow boxes, over which a sheet of glass should be put, and placed under a sunny fence out of doors. When the seedlings appear, remove the glass covering, and transplant the Asters to the positions they are to adorn. Plant in groups or clumps of one distinct colour, and the effect will be richer than when several colours are mixed together. It is wise, where space is available, to sow seed to give flowers merely for cutting, setting apart a bit of the kitchen garden, or a bed in the reserve garden, for this purpose. China Asters are useful flowers to cut for the house. A rich soil is necessary, and plenty of water whilst growth is being made, not afterwards, as the flowers are apt to damp when the ground is unduly wet. The flowers are of wonderful colours, and display great diversity of form, some quilled, reminding one of a Chrysanthemum, others with flat florets, whilst of most of the types there are tall and dwarf kinds. There are the reflexed Victoria, Chrysanthemum-flowered, Comet, Mignon, Pæony-flowered, Truffauts, Hedgehog, Pompon, Bedding, Bouquet, and others; but for cutting, the taller branching kinds are the most suitable, reserving the dwarf, large-flowered, and stiffer kinds for massing.

CHINA ASTER, PYRAMIDAL.

Celosias are useful for bedding or for pots. They belong to the same race as the Cockscomb, and bear tall, feathery plumes, so to say, of effective colours. Sow seed thinly in a pan or shallow box about the end of February. Cover with a square of glass, and place in a warm greenhouse or upon a gentle hot-bed. When the seedlings appear, remove the glass and place the pan or whatever the receptacle may be close to the light, otherwise the seedlings will become drawn. When a few rough leaves have been made, pot the seedlings into 3in. or 4in. pots, using for soil a compost made up of loam three parts mixed with about two parts leaf-mould. Add sharp silver sand to lighten it. For future repottings use rougher soil, adding also well-decayed manure. Always keep the plants near the light, and when young a temperature of about 55deg. will suffice. Before they get root-bound shift into 5in. pots. Cease giving artificial warmth as soon as possible. The plants will flower well in the 5in. pots, but liquid manure is necessary to sustain growth. In June they may be planted out in the flower garden and used as relief plants in beds filled with dwarf bedders.

Cockscomb. *See* Celosia for culture.

Cosmos bipinnatus.—This is a very graceful and beautiful annual, which, like many other annuals, may be treated as half-hardy or hardy, this depending upon the time the seed is sown. In quite the South of England, sowing in April will suffice as a rule, but the better plan is to sow under glass in March, and treat the plants in the usual way, namely, planting out in late May when frosts are over. Always harden them off

well, otherwise the growth will be weak and unable to resist changed conditions. This Cosmos grows between 2ft. and 4ft. in height, and has dainty foliage, and in this respect it is one of the most beautiful of all annual flowers. But the flowers are charming also, and varied in colour, some reddish - purple, others white, and so forth. A group of this annual should be in all good gardens, and a succession of flowers may be secured by sowing seed between the tufts planted out. Choose a warm, light soil for the Cosmos. In cold ground or shade it is an absolute failure. The flowers with their fine foliage may be cut for the house. When seed is sown in the open the seedlings must not be transplanted. Sow where they are to remain.

DOUBLE OPIUM POPPY (see p. 18).

Jacobæa. — This is the common name for a set of half - hardy annuals which should be raised in heat in February, and there are both single and double forms. The most effective are the doubles, which may be had in many colours, purple, crimson, white, and rose, and the plants are dwarf or taller, according to the strain. There is, for example, a dwarf race called Dwarf Pompon, the plants less than 1ft. in height, whilst kinds may be obtained of double that stature. The flowers are very double, and useful for cutting. The botanical name of the Jacobæa is Senecio elegans. Although described here, it has been mentioned also amongst the hardy annuals, because by sowing the seed late in spring, especially in the southern counties, artificial heat may be dispensed with.

Nemesia strumosa Suttoni.—A very distinct and pretty annual, seed of which should be sown under glass early in the year, and the seedlings pricked out into boxes before being finally transferred to the open garden. It may be used in lines and groups with good effect. There are several colours—white, crimson, orange, pink, and soft yellow, a pleasing assortment, and none poor. It may be grown also in pots for the greenhouse.

Nycterinia selaginoides is a pretty half-hardy annual with white flowers of very sweet odour. The plant grows only 3in. high. Sow the seed in February or March, and transplant the seedlings to warm places in May.

Petunias are useful flowers, especially during hot summers, as they seem to revel in drought. Avoid the large dingy purple kinds; indeed, flowers of reasonable dimensions last longer, and they should be clear and effective in colour, especially if double. Sow seed in gentle warmth in March, prick off the seedlings when large enough, and either plant out or pot on for the greenhouse. If one has named kinds, strike cuttings at the same time in warmth, and they will soon root. Petunias are very easy to grow.

PETUNIA.

Phloxes, Annual.—These are amongst the most precious of all half-hardy annuals. The flowers are of varied colouring, and the plants remain in beauty over a long season, hence they may be used with advantage in conspicuous beds in the flower garden. More of the bright flowers are seen than formerly, and one need not confine the plants to single beds, but carpet the ground beneath Standard Roses and the like, or use them even in window boxes or large vases. Always, however, grow them in masses—broad, free groups — which alone display the colour, charm, and growth of the Phlox named Drummondi; indeed, the flowers are now so fine in form and colour that they are welcome for cutting for the house. Sow the seed under glass about the first week in March, and treat in the usual way, well hardening the seedlings off before transplanting to the garden. A rich soil is necessary, and, when growth begins, pinching back once does good, as it promotes laterals. There are a host of beautiful forms of all shades of colour, from white to violet with a white centre. A group of very dwarf plants is interesting, and they are only about 6in. in height, smothered with flowers of good colour in the summer. The quaint Star class will become popular. The flowers are of starry shape and very varied in colour—a pretty group.

Portulaca.—The brilliant Portulaca may be well included in this group, although the Messrs. Sutton sow their seed in shallow drills on a warm border at the end of April; but the usual way is to sow under glass and treat as in the case of the majority of half-hardy annuals. It is only in very warm summers and upon thoroughly well-drained soils that the Portulaca, with its wonderful depth of colouring, as brilliant as almost anything in the flower garden, succeeds. It is a child of the sun, as one may imagine when the parent, P. grandiflora, is a native of Chili. For an edging or carpet plant the Portulaca, in its great variety, some of the tints of dazzling brilliancy, is well adapted. One is surprised that it is not far more grown.

CHINESE PINK.

Pinks, Annual and Biennial.—The origin of this showy group of either annual or biennial flowers, as they may be regarded in either way, is D. sinensis, the China Pink; but we have separate groups, such as D. laciniatus, D. hybridus, and D. Heddewigi. As a rule, one regards them as annual flowers, sowing the seed early in February in pans or shallow boxes filled with light soil, and pricking out the seedlings in the usual way. Give gentle warmth, keep the seedlings near the glass to prevent them from becoming drawn, and make two or three sowings, a fortnight apart, to provide a succession. A good way is to sow four or five seeds in a 5in. pot, and keep the seedlings intact, planting them out without unnecessarily disturbing the roots. These beautiful flowers may be used in many ways, not only in masses in borders, but as a groundwork to taller things. The varieties of D. Heddewigi named Crimson Belle, the pure white Bride, or Eastern Queen, are as good as any. H. laciniatus has fringed flowers, as the name suggests, and of this group there are varied colours; in truth, the colouring is wonderfully diversified.

Salpiglossis sinuata.—This is one of the fairest of all annual flowers, which should be sown in gentle heat in February, and the plants pricked out or grown on until ready for the border or bed, or wherever they may go. It is well to make the soil fairly rich, as the Salpiglossis is as beautiful as almost any annual, graceful, and diversified in colour. Its colouring is wonderful—rich clear yellows, subtle velvety crimson, purples, and finely-varied and striped forms too. There is, however, some difference in the various races of seedlings, so that it is wise to sow seed got only from the finest flowers. The plants are fully 3ft. in height, and full of grace and charm.

Tobaccos (*Nicotiana*).—These are noble half-hardy annuals, and the taller, more massive kinds may be used with advantage in the sub-tropical garden. The plants are of extremely rapid growth, and of the large-leaved kinds none are handsomer than N. macrophylla and N. Tabacum, but the most popular, and deservedly so, is N. alba, better known as N. affinis, which should be planted freely in all gardens, large or small, in town or in country. It is very easily raised by sowing seed in heat in February, and treating the plants exactly as one would the Petunia, or any other half-hardy annual. Plant in rich soil, and use it in many ways, such as amongst evergreen shrubs, in the borders, and near the house, the fragrance from the ivory-white flowers floating into the rooms on warm summer evenings. During the day, when the sun is very hot, the flowers almost close up, but open out fresh and fair towards evening. A few seedlings may be potted on for the greenhouse. A new Tobacco which will probably be largely grown in the future is N. sylvestris. It has long tubular flowers, very sweet, and pure white, whilst they do not close during hot days, as in the case of N. affinis. The whole plant is very handsome, being fairly tall and with abundant light green leaves. Flowers are borne freely, and they are so unlike those of the ordinary sweet-scented Tobacco that the two plants may be used without introducing monotonous effects. A small bed of this upon the lawn would, we think, be acceptable, especially if near the house, for then the sweet fragrance would float into the rooms.

Verbenas.—These quaint flowers were almost annihilated by a fungus disease, the result in part no doubt of continually propagating from cuttings which were given strong heat to induce quick rooting. But Verbenas may now be classed amongst the half-hardy annuals. Seed can be obtained in separate colours, and the plants will come true, so that propagation by cuttings is needless, unless one wishes to perpetuate some fine kind. Seedlings are, however, so varied and beautiful that it is unnecessary to name individual kinds. One can obtain many colours, from white to intense sapphire blue, and the plants are vigorous and bushy in growth. Sow the seed in early March in a shallow box of light soil, give gentle bottom heat, and when large enough to handle comfortably pot off singly or prick them into another box. When well hardened off, which they should be at the end of May, plant out in the garden. This simple way of raising flowers is a thousand times preferable to keeping the plants over the winter in pots and getting vexed because disease attacks them.

Zinnias.—These gay half-hardy annuals have of late years been much used in parks and gardens, and this is not surprising when one considers that for many weeks the flowers remain in beauty, and their colours are varied and showy. Seed is now sown in separate colours, although, of course, the seedlings will vary occasionally, and there are endless varieties, as a rule, of Z. elegans, whilst Z. Haageana or Mexicana deserves notice. The double kinds are handsomer than the single Zinnias. The former remain longer in perfection, and the plants are more compact in growth. Groups in the border or masses in beds are welcome, and though few care for the scent of the Zinnia, its colour and solidity, so to say, are admired. Fireball is an especially vivid orange-scarlet double variety, but one can have orange, rose, white, scarlet, salmon, and allied shades, so that there is no poverty as regards tints. Never sow the seed so early as is often done, March or early April being quite soon enough. Sow thinly, as has been consistently advised, just cover the seed, and use 5in. pots. Give them a temperature of about 60deg., pot off when large enough singly into small pots, keep close for a time, then give air judiciously until by early June they are ready to plant out. Seed may even be sown out of doors in May, choosing a sunny spot, and avoid transplanting by thinning out all except the strongest.

SALPIGLOSSIS.

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A FLOWER-FRINGED PATH, TORTWORTH COURT.

"COUNTRY LIFE."

A CORNISH GARDEN.

BIENNIAL FLOWERS.

THE biennial flowers are the glory of the garden in the summer months, and beautify, too, the cottage plot, for in this precious group are the Sweet Williams, Canterbury Bells, Wallflowers, and many homely flowers we knew in childhood's days. It is strange, but nevertheless true, that this race, hardy, very easily grown, and brilliant in effect, should receive less attention than many plants that need far more care. They may be raised from first to last without any artificial heat whatever, the best times to sow the seed being May and early June, when the seedlings will be of sufficient size to plant out in the autumn to flower the following year. Choose a quiet corner for seed sowing, or reserve a portion of the garden for this purpose alone, making, indeed, a little nursery, as then they can receive more attention than would be possible if muddled up with other things. Make the surface of the soil fine, and beware of snails and slugs, which have a fondness for juicy seedlings. Sow thinly, and as the seedlings appear, if there is any risk of undue struggling for life, thin them out without thought of waste, as the thinnings if necessary may be planted elsewhere, in the reserve garden for example, as many biennial flowers are useful for cutting—the Stocks, Wallflowers, and Sweet Williams.

Antirrhinums.—These old-world flowers may be grouped with the biennials, although strictly they are perennial, but many plants, even so-called annuals, will survive more than one season. Seed may be sown under glass in spring, and the plants will bloom freely in the summer and far into the autumn, but the usual time for sowing is late June or July, treating the seedlings as advised in the case of the other biennials. Antirrhinums, or Snapdragons as the children call them, are splendid bedding plants, and if any special kind must be perpetuated, cuttings of fairly-ripened shoots strike freely under a handglass in the open in summer. Most enjoyable are a group of self-coloured varieties, the pure white, deep yellow, or crimson—three kinds which will gladden any garden. There are several named kinds, but these three colours should be obtained, as the striped forms, quixotic and distinctive, it is true, are far less effective. Avoid pigmy kinds, "squat," ugly little plants with spikes crushed upon the growth. These are called "Tom Thumb," and are an example of how utterly all natural beauty may be driven from a flower by artificial means. Antirrhinums are easily raised from seed sown as soon as ripe, or by cuttings out of doors or in a cold frame in August. Seedlings cannot be depended upon to come quite true from seed. It is wise to keep the plants in a frame during the winter and transfer to the open ground in spring. They suffer greatly in severe winters.

CANTERBURY BELL.

Canterbury Bells (*Campanula Medium*).—These are delightful biennials, thoroughly homely and quaint, the flowers like cups and saucers in shape, and painted with many colours, some self, others delicately tinted with mauve. This is a Campanula worth using freely in the garden and making a bold group of, especially of the pure white variety. Plant them not only in the border or in flower-beds, but on the fringes of shrubberies, anywhere, indeed, where their freedom and colour are seen to advantage. Some kinds are almost double, but are not as attractive as the singles, which are in every way bolder, and less coarse. Avoid, too, those forms in which the flowers are conspicuously cup and saucer shaped, as they are far from pretty. Blue, rose, mauve, lavender, and white are the leading tones, and some of the soft pink varieties are very delicate in colour, but one cannot always anticipate seedlings coming true, as they usually vary in colour somewhat, though this is, as a rule, no loss; nor can one expect double forms to retain their character as singles appear amongst them. If the seed is sown in June out of doors, strong plants will be obtained for planting out in the autumn, and these will flower gaily in the following summer. With such homely flowers as this Campanula one may obtain much colour at little cost, and in rich variety, with self hues of wonderful clearness and beauty. The pure white is very valuable.

Evening Primrose (*Œnothera Lamarckiana*).—Few biennial, or, indeed, any garden flowers are more beautiful than this Evening Primrose, which lasts many weeks in beauty, and its soft yellow flowers one never tires of. This is the kind of plant to naturalise, to make big masses of, and to plant amongst evergreen shrubs, as well as in the border. It is a mistake to put everything into the mixed border or rock garden. Such a plant as this is best seen in the woodland, shrubbery, or in quite the wilder parts of the garden. Seed sown in summer quickly germinates, and young plants may be put out in autumn.

Foxgloves (*Digitalis*).—Charming groups may be formed of these in gardens, lighting up, perhaps, some woodland walk, or relieving a monotonous mass of evergreen shrubs. It is in such places that the Foxglove reveals its true beauty, and if the best forms are obtained the effect is more pleasurable. Sow or plant them with a free hand—a group is full of colour and beauty, but solitary plants here and there are less imposing. It must be a poor soil in which the Foxglove will not flourish, and in half shade it is at home. The gloxiniæflora strain, so called from the form of the flowers, reminding one of the Gloxinia, is very charming, the flowers large, and often finely blotched, white relieved with deep chocolate blotches, or other colours. Seed may be sown where the seedlings are to remain, and in time Foxgloves sow themselves; but in the case of special kinds, raise them in a spare bed, and transfer to the position in which they are to bloom.

FOXGLOVES.

Honesty (*Lunaria biennis*).—A few patches of this are welcome in the border, and the silvery seed-pods are pretty in vases in winter. The flowers of the old purple kind and its white variety are pleasing, too, in late spring and summer. Sow the seed in May or June, and in time the Honesty will thoroughly establish itself in

gardens. The way to prepare Honesty for winter decorations is to take the pods between the forefinger and thumb; gently rub them, and the outer scales will fall off and disclose the silvery scale inside.

Michauxia campanuloides.—Few hardy plants are more distinct than this, which belongs to the Bellflower race, and grows usually about 4ft. in height. It is best treated as a biennial, sowing the seed in May or June, and planting out in a fairly sheltered sunny spot. Sow the seed in a pan, and place in a cold frame. The flowers are large, and white tinged with purple, several being borne on the branching stems. Beginners in gardening should not grow it unless they are prepared for possible disappointments. It is unhappily a rather uncertain plant.

Snapdragons.—*See* Antirrhinums.

STOCK, EMPEROR.

Stocks.—A garden is bereft of a beautiful and fragrant flower when the homely Stock is absent. No matter whether they are annual or biennial kinds, they possess distinct charm, and should be planted freely in large beds or grouped in borders to get their true effect in colour, whilst when massed a stronger fragrance pervades the garden. It must not be forgotten that the Stock is not very hardy, and in severe winters frequently succumbs. The garden Stocks are divided into several groups, and amongst biennials the tall Giant Brompton forms are as handsome as any, these being distinguished by woody stems and scarlet and white spikes of flowers, the scarlet form being the most frequent. When the seed is obtained from a thoroughly good strain about half the seedlings will be double flowered, but sometimes not a double variety will occur. This is, however, happily unusual. Sow the seed of the Brompton Stock in the open ground in the latter part of May, and then strong plants will be ready for putting out where they are to bloom in June. Another pleasing section is that known as the Queen, of which there are white, purple, and scarlet forms, branching in growth, which is no small consideration when cut flowers are in great demand. A popular section is that known as the Intermediate, which comprises the East Lothian Stock, the name Intermediate having been given because they appear to bridge over the annual and biennial, and may be regarded as belonging to either class. There are two periods for sowing the seed—quite early in August in pans or shallow boxes, or in March in gentle warmth, when the plants will be ready for the open ground in May and will flower freely, whilst they may be had in bloom in winter under glass by sowing the seed about midsummer and potting them into 5in. pots, three in each. A few potfuls of Stock in full bloom in January are delightful. Of special varieties for growing under glass choose such as Purity or All the Year Round. Then we have the Ten Week Stocks, of which a beautiful variety is Princess Alice, which is in every way a good garden Stock, branching in growth, useful for cutting, very pure white, and quite double. The Ten Week is recognised by its diversity of growth, some tall, others dwarf, and flowers of very varied colours, from white to rose, red, purple, and even a violet shade, varieties of distinct forms being named Superb Bedding, Giant Ten Week, and so forth, and the individual kinds may be obtained true to name. Pyramidal Stocks are very handsome, and these are strongly advised for the summer garden, As they grow into quite little bushes, put them not less than 1ft. apart, and carefully pick off decaying flowers. Many named varieties belong to this group, such as the Bouquet and Miniature and Mauve Beauty, the two former sections being very dwarf and useful, particularly for pots. When treating the Stock as an annual, remember that gentle heat must be used, and drain the boxes or shallow pans, whichever be used, thoroughly well.

WHITE BRANCHING STOCK.

Verbascum phlomoides (*Mullein*) is a beautiful biennial. V. phœniceum is much dwarfer.

Wallflowers.—These homely plants must be sown the year previous to flowering, but they will grow in time into large bushes, if not cut down by severe frosts. Wallflowers are, unfortunately, tender, especially when young, and frequently die off wholesale. The well-known Belvoir Yellow is as hardy as any, but the list of varieties is a long one, comprising the rich reddish-brown Harbinger, tall and dwarf German types, the primrose-tinted Primrose Dame, the old blood-red Wallflower, and even a purple kind. Wallflowers are easily raised in June in a prepared bed of ordinary soil, and the seedlings should be transplanted when 2in. or 3in. high in rows. In about a month's time transplant, or, better still, remove every other plant, which may be transferred to the bed or border, leaving those remaining in the reserve ground for cutting.

ROSES AND CLIMBERS AT SHIPLAKE COURT.

CLIMBERS—WALL PLANTS AND PERGOLAS.

A HOUSE or wall is seldom beautiful without climbers to add a touch of colour; not that a beautiful old house should be hidden with foliage, but here and there some charming flowering climber is welcome. There is a glorious list to select from: Roses, Clematises, and the handsome vines which bring rich colouring into the garden in autumn. Annual climbers have been considered in the chapter upon annual flowers in general, but there remain a host of perennial kinds which increase in beauty with age.

Ampelopsis.—This is the name of the popular Virginian Creeper which wearies one almost from its constant repetition, but it is valuable in every way, for covering walls in towns especially. A. Veitchi and muralis are the most suitable for this purpose, the last-mentioned not clinging quite so closely, and therefore more graceful. Both these die off resplendent hues in autumn, and are easily increased by striking cuttings of moderately ripened shoots, taken off any time from October to March, in a cold frame, or under a hand-light. By the following autumn these cuttings will have made good plants. Make the cuttings about 6in. long, not less. This is the best and quickest way to increase them. Seed may be sown in autumn, or very early in spring, in a prepared cold frame, or in the open ground. After sowing, put long straw litter, or other light material, on the bed to protect young growths. Sow the seed in drills, and if it is soaked in tepid water three hours before sowing it will germinate more readily.

Aristolochia Sipho, or the Dutchman's Pipe, so called from the curious shape of the flower and stem, is of more value for its foliage than its flowers. The leaves are very large and effective. It will grow freely almost anywhere, and though usually planted against a wall, it is a useful climber for arbours and the like.

Azara microphylla is a glossy-leaved, shrubby wall plant, with orange-red berries in autumn, but it is worth growing simply for its abundant leaves. This must have a warm position.

Calystegia pubescens fl.-pl., now grouped with the Convolvuluses, is a pretty climber for arbours, walls, pergolas, and similar structures, but it is not tall. It is of very quick growth, and a plant put in some time in spring will quickly make headway, and bear a succession of large double delicate rose flowers. If increase is desired, divide the roots. A warm soil suits it

Chimonanthus fragrans grandiflorus (*Winter Sweet*) is a precious plant for a wall, scarcely a climber, as it is almost too shrubby, but requiring a wall for support. The flowers are borne upon the leafless branches in winter, and are lemon yellow in colour, with crimson calyces, and delightfully fragrant; hence the

name Winter Sweet. A few twigs in a vase will perfume a large room with their spicy odour. In old gardens one sometimes sees glorious plants, perfuming the air on mild winter days. It may be propagated by cuttings, suckers, layers, and by seeds, the best method being by layers, as many find that cuttings are troublesome to strike, although gardeners occasionally strike them freely by putting them in under a wall in early spring. Suckers should soon become established when detached with a few roots from the parent, and when layering choose the strong shoots from the base of the plant. Put them down in the autumn, or after flowering, and cut each shoot half through on the under-side, pegging it firmly in the soil, and keeping the cut part open. Cover over with soil, and leave the layers thus for a year. Seeds will germinate readily, but they are many months in maturing. Of the various methods of propagation, choose layering. Prune the shrub carefully, and in spring, when the shoots may be cut back to within about 4in. of the main branches; and it is upon the new growth from these shoots that flowers appear in the following winter. The flowering twigs will be esteemed for indoor decorations, but wholesale hacking must not be indulged in. Grandiflorus is a variety with larger flowers than the type. Seedlings vary considerably as regards size and colour of the flowers.

Clematis.—This is a beautiful family of climbing plants, at least the majority of the kinds are of rambling growth, and the wonderful diversity of character distinguishing the various species and varieties enables a large number to be used in the same garden without monotonous effect. As there are between seventy and eighty species, some stove climbers, some happy only in the greenhouse, and some hardy, it follows that in all parts of the garden they may be present. For covering bare spaces of wall or trellis, garlanding archways and tree trunks, and for using, with other climbers, on such structures as summer-houses, arbours, and pergolas, they are of much value. To produce a good effect, however, the Clematis should be liberally treated. The soil in which it is planted should be rich and deep, while, during the period of growth, frequent waterings in dry weather and applications of liquid fertilisers will be found beneficial. For pots, the large-flowered varieties are very effective, when grown in large pots and trained over balloon-shaped wire trellises, as they almost cover their foliage with great star flowers. The usual method of propagation is by grafting on the roots of C. Flammula or some other strong-growing kind, but grafted plants have a way of dying off suddenly, and layering is the most satisfactory method of increasing the stock. To effect this a partially-ripened shoot should be cut with a sharp knife halfway through the stem, between two joints, and a cut made up the centre of the stem and carried through the joint above. This cut should be kept open with a piece of moss and the shoot bent down into a depression filled with porous soil, and pegged firmly in position, more soil of the same quality being added above it till the surface is brought up to the general level of the bed. Never allow the soil to become dry, and the wound will soon begin to emit roots; the rooted layer may eventually be divided from the parent plant and transferred to another position.

CLEMATIS, WILLIAM KENNETH.

The following list gives the majority of the hardy climbing species, some of which, however, are not in general cultivation:

C. balearica, from Minorca, bearing wide-mouthed, bell-shaped flowers, white, spotted with claret in the interior. This is quite hardy in the south-west of England, where it commences to bloom, during mild winters, in January. It is synonymous with C. calycina.

C. cærulea, from Japan, bearing large violet-coloured flowers during June and July. There are several named varieties of this Clematis.

C. campaniflora, a native of Spain and Portugal, flowers purplish-white.

C. cirrhosa, very similar to C. balearica, with which it is, by some, considered synonymous, but it is distinct.

C. coccinea is a very distinct bright red-flowered kind for a warm soil and wall.

C. Flammula (*Virgin's bower*).—A well-known hardy climber, much used in this country, bearing small white sweetly-perfumed flowers in great numbers during the latter part of the summer. It is one of our oldest exotic climbers, having been introduced from South Europe in 1596.

C. florida, from Japan, bearing large white flowers from June to August. There is a handsome double form of this Clematis.

C. Fortunei, a Japanese species. It bears fragrant double-white flowers about an inch in diameter. There are three named varieties.

C. graveolens, from Chinese Tartary, bearing scented yellow flowers in August, the seed-vessels of which, later on, become furnished with feathery tails as in the case of C. Vitalba.

C. lanuginosa, a native of China, bearing large light-blue flowers 7in. in diameter. The reverses of the leaves are woolly. The variety pallida produces even larger flowers.

C. montana, from Nepaul, is hardy in almost every locality in England. It bears numerous ivory-white flowers 1½in. to 2in. in diameter in May and June. It is a rapid climber, and is especially suitable for draping the branches of evergreen trees, such as Yews, Portugal Laurels, and old Hollies. In good soil it will attain a height of from 40ft. to 50ft. in a few years.

C. orientalis, from the Levant, produces yellowish-white flowers in August.

C. paniculata, from Japan, bearing white, sweet-scented flowers in July. It has a great resemblance to C. Flammula.

C. patens, from Japan, bearing large white flowers in June.

C. Pitcheri, a native of the United States, bearing dull purple, bell-shaped flowers in July and August.

C. songarica, from the East, bearing yellow flowers similar to those of C. graveolens, but smaller.

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C. Viorna, from North America, bearing drooping purple flowers with yellow interiors in June, which are followed by hairy seed-vessels.

C. virginiana, a North American plant, producing panicles of small white and fragrant blossoms from June to August.

C. Vitalba (*Old Man's Beard or Traveller's Joy*).—The well-known wild Clematis that garlands trees and hedges with its scented flowers during the summer, and with its smoke-grey seed-vessels, which have earned it its colloquial name, in the late autumn and winter.

C. Viticella, a species common over Southern Europe and Western Asia. There are several varieties of this Clematis, of which C. v. cærulea bears blue flowers; C. v. purpurea, purple; C. v. tenuifolia, crimson; and C. v. plena, double purple. The flowers are large and drooping, and produced from June to September.

The large-flowered Clematises, which are seen so frequently in our gardens to-day, belong to the Jackmani, Florida, Patens, Lanuginosa, and Viticella groups. Varieties belonging to the Jackmani and Viticella groups flower on the young wood, and at the end of the year should be cut down to within about a foot of the ground. Lanuginosa and its varieties should be very sparingly pruned, merely cutting out weak growths, while varieties of the Florida and Patens groups require no pruning except such as is necessary for the removal of dead wood. The following are some of the best varieties of the different groups. Of the Jackmani section, which takes its rise from the Clematis of that name, itself a hybrid between C. Viticella and one of the large-flowered Japanese species, Gipsy Queen, velvety purple; the type, which is the commonest purple Clematis in our gardens; its white variety, C. Jackmani alba; Madame Grange, crimson-violet; Mrs. Baron Viellard, lilac-rose; Mrs. Hope, satiny mauve, with darker bar running up the middle of the petals; and Rubro-violacea, a purple-maroon, are all good. Of the Lanuginosa group, some of the varieties of which produce flowers a foot in diameter, Alba Maxima, pure white; Daniel Deronda, violet-blue; Fairy Queen, pale flesh with pink bar; Grand Duchess, white, flushed rose; La France, violet-purple; Gloire de St. Julien, mauve-white; Marie Lefebvre, mauve with dark bar; and William Kenneth, lavender, are handsome flowers. Of the Patens group, fine varieties are: Aureliana, porcelain blue; Fair Rosamond, white with claret bar; Lady Londesborough, silver-grey with darker bar; Lord Londesborough, deep mauve; Miss Bateman, white with chocolate anthers; Mrs. Crawshay, pink with bronze bar; Mrs. George Jackman, satin white with cream bar; and Stella, light violet with deep red bar. Of the Florida section, all of which are double flowers, Duchess of Edinburgh and Lucy Lemoine, both white, sweetly scented; Countess of Lovelace, lilac-blue; Aurora, pink, shaded mauve; Elaine, light violet; Enchantress, white and rose; and John Gould Veitch, lavender-blue, are good representatives of the group. Of the Viticella section, four named varieties may be mentioned as worthy of notice: Ascotensis, azure blue; Earl of Beaconsfield, rich purple; Lady Bovill, blue-grey; and rubra grandiflora, cherry red.

LARGE WHITE CLEMATIS.

Amongst the shrubby and sub-shrubby species, the following are the most widely known: C. aromatica, or C. cærulea odorata, with scented violet-blue flowers 2in. in diameter, and growing to a height of 4ft.; C. æthusifolia, from China, flowers white and bell-shaped, height, 5ft.; C. crispa, an evergreen North American species, bearing pale lilac pendant flowers, and growing to a height of 6ft.; C. Davidiana, from China, bearing blue flowers, and growing from 2ft. to 4ft. high; C. integrifolia, from Hungary, drooping blue flowers 3in. to 4in. in diameter, and attaining a height of 2ft.; C. ochroleuca, a native of the United States, flowers yellowish-white, growing 1ft. to 2ft. high; C. recta, or erecta, bearing corymbs of scented white flowers, and growing to a height of 2ft. to 3ft.—this is an Hungarian species, of which there is a double variety; C. tubulosa, from China, bearing slender tubed blue flowers somewhat similar in shape to those of the Wood Hyacinth, and growing to a height of from 2ft. to 3ft.

Of course it would not be desirable to crowd all these forms into a single garden, unless a mere collection were desired. The varieties of the groups mentioned, particularly the Jackmani and others, are generally very handsome when fully established. If only one Clematis were required, C. Jackmani is as useful as any, the rich purple colour of the flowers showing to conspicuous

advantage in the autumn, when every shoot almost is hidden beneath this wonderful mass of blossom. The very strong-growing kinds, such as C. montana, must be kept within bounds. If not held in check this will overrun everything else, choking all neighbouring climbers in its effort to envelop the garden. Beautiful indeed it is in spring when the white flowers appear in bewildering profusion, but their beauty is not long-lived, and for the remainder of the year its aspect is rather ragged. For the greenhouse choose C. indivisa and its variety lobata; the white sprays of this are useful for cutting, and the climber when draping some pillar or rafter is very charming.

Climbing or Shrubby Wall Plants for the South of England and sheltered corners, because of somewhat tender growth, include the Abelias, Adlumia cirrhosa, Akebia quinata, Aloysia citriodora (the Sweet Verbena or Lemon Plant), Bignonia or Tecoma radicans, Ceanothus azureus, Gloire de Versailles, and other varieties, the flowers of charming blue shades, Choisya ternata (the Mexican Orange-flower), hardier than many suppose, and should be more grown as a bush, Eccremocarpus scaber, Indigofera floribunda, Maurandya Barclayana and varieties, and Solanum jasminoides and S. crispum. Passion-flowers may be included also, as in cold countries and climates they are far from happy.

Cratægus Pyracantha, usually known as "Pyracantha" or the "Fiery Thorn," is more often grown against a wall than as a bush. When the bricks harmonise with the deep green foliage and glorious bunches of scarlet berries all is well, but this is not always the case. The white flower clusters are pretty in spring. It is a shrubby climber of great value.

Eccremocarpus scaber.—A beautiful perennial evergreen creeper, but unfortunately it is tender, having come to us from Chili. In warm, sheltered positions, however, it is a success, and bears a wealth of bright orange and scarlet flowers. A dainty creeper for Southern Counties or warm spots in more northerly gardens. Sow the seed in gentle heat in March, and when the seedlings are strong enough plant them out, about the end of May being a good time. Cover over the roots with coal ashes during the winter, then if frost cuts down the stems new growth will be made when warmer weather comes again.

Garrya elliptica is a Californian shrub usually planted against a wall, because it is seldom happy as a bush in the open garden, unless in the extreme South of England. It is evergreen, very dense and handsome, and in winter the beautiful hazel-like catkins appear, which are produced in clusters, and vary from 3in. to 1ft. in length. Throughout the winter these remain to add interest to the garden, and when cut for the house they vary the indoor decorations. The male parent is the most valuable.

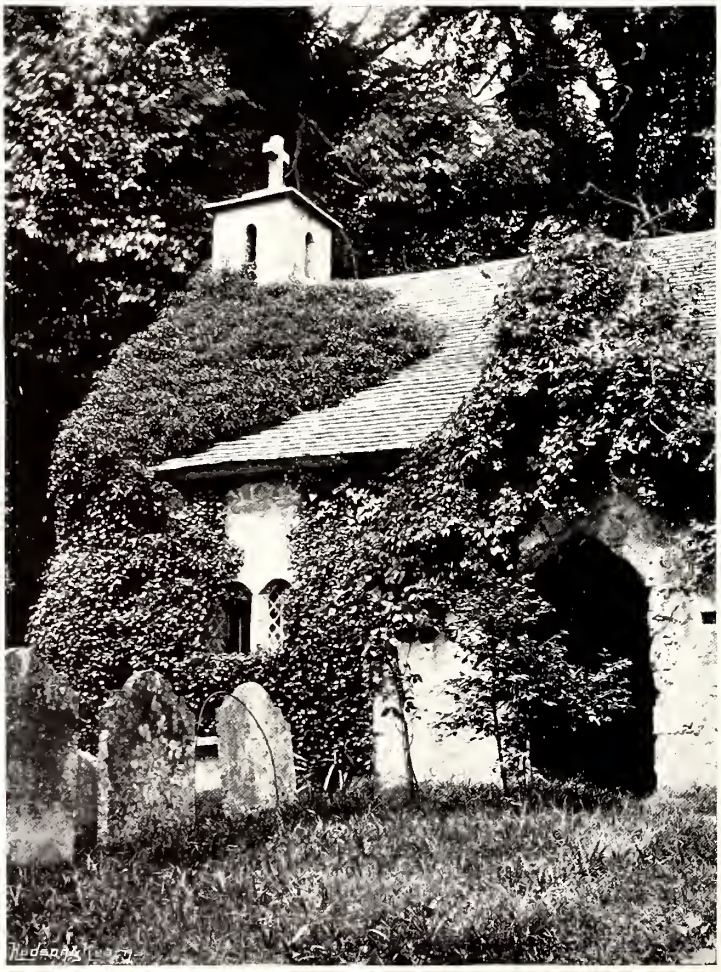
Honeysuckles.—Beautiful in growth and flower are the fragrant Honeysuckles or Loniceras, which perfume the wayside hedge with their precious blossom. They are amongst the most cherished of climbing plants, and must be used freely in the garden, against walls, trellises, fences, arbours, or to garland banks. Good kinds are the Dutch and late Dutch Honeysuckles, forms of the Woodbine or common Honeysuckle (L. Periclymenum), the late variety blooming far into the autumn, hence its name. L. japonica or Halleana, L. flexuosa, and L. sempervirens and the variety minor are all charming. L. sempervirens is very distinct, having quite scarlet flowers, and neat green leaves. It is one of the brightest of climbers, but must have a special place. A warm soil and position are essential. It is not happy elsewhere, but when it becomes established few climbers remain so long in beauty. It is neither rampant nor tall, but a Honeysuckle no one who can give the necessary soil and position should be without. L. Caprifolium and L. Xylosteum are native kinds.

SHRUBS AGAINST WALL AT BELVOIR CASTLE

Honeysuckles are rather slow in growth, and the flowers are not produced in profusion until the plants have become quite established. One need do no more than thin out old decayed shoots. The winter-flowering L. fragrantissima and L. Standishi are very sweet in winter.

HONEYSUCKLE.

Ivy. — This climber is too familiar to describe. Strike cuttings in late summer, and they will root freely if put in a shaded position out of doors, but the more tender variegated kinds should be struck under a bell-glass or in pots in a cold frame. Pot off these to thoroughly establish them before planting out. The best time to cut back Ivy upon houses is April, as then the new growth is not harmed by frost. Cut back quite close, and a fresh green surface will be the reward. Ivy may be used in many ways — as a climber, for edgings, and to run over low railings or fences, screens indeed of glossy evergreen growth. It is a useful and beautiful climbing plant, and enjoys best a rather moist shaded position, though it is in few spots that it is not a success. There are many varieties, such as the Irish Ivy, as much planted, perhaps, as any, Emerald Gem, which is remarkably quick in growth, the large-leaved dentata or Rægneriana, lucida, palmata, the pretty digitata, Glymi, pedata, angularis, and atro-purpurea. The last-named is very handsome in colour, the leaves almost purple, so dark is the tone, and when planted near the winter-flowering Jasmine the effect is distinct and bright. The variegated Ivies are tender. Madeirensis is as useful as any, and Lee's Silver is pretty also.



BONCHURCH: SHOWING BEAUTY OF IVY

Jasmines are well-known climbing plants, leafy and fragrant, especially the familiar J. officinale, which has white sweet-smelling flowers. Affine is a larger-flowered form of it. The Jasmine will succeed almost anywhere, requires very little pruning, and is as happy smothering an arbour as covering a house front. A pretty yellow species seldom seen is J. revolutum, which is evergreen and bears a wealth of golden-yellow flowers. Although a native of India, it is hardy in England. As precious as the white Jasminum officinale is J. nudiflorum, which flowers in winter, in mild seasons making clouds of colour when everything around is bare. It is deciduous, but every leafless shoot is lined with blossom, the trails of flowers lasting many weeks. If the shoots are gathered before the flowers are fully open, they may be used for table decorations, as the buds open perfectly in water, distilling a pleasant perfume. Very little pruning is necessary, merely cutting away worn-out shoots.

Kerria japonica.—Although this may be grown as a bush, and the plant is quite hardy, it must be included amongst shrubby wall plants, because so frequently planted in this position. The double variety is more commonly planted than the type, and its large orange-yellow flowers are as gay as anything in the garden during early spring. Many a cottage is almost wreathed with this bright, hardy climber. The type has smaller single flowers, yellow, and produced profusely. It is a very pretty shrub, and worth planting in a mass on the lawn outskirts. There is a variegated leaved variety of it.

Lathyrus. This family is chiefly known by the Everlasting Pea (L. latifolius), which may be increased by division, seeds, or cuttings. As simple as any way is by seeds, which germinate readily in early summer out of doors; but as the white variety does not always come true from seed, this should be propagated by cuttings taken from the base of the plant as new growth commences in spring. These growths at the base, if taken off with a heel, and put into pots and given a brisk bottom heat, will soon strike. Seeds, unfortunately, are not borne with much freedom. All the Everlasting Peas are useful for cutting, especially the pure white variety. Besides the familiar kind known as L. latifolius, which is the Everlasting Pea seen so frequently in cottage gardens, there are other kinds of much beauty. Grandiflorus is very handsome, with much larger flowers, and another beautiful kind is L. splendens, which, unfortunately, does not seem to be very hardy. It is a native of California, but perhaps it will prove hardier than many suppose. At any rate, it should have a warm sunny position. The flowers are very bright, a crimson-scarlet colour, and if the plant is found quite hardy it may be considered a good garden Pea. L. Sibthorpi and others are not for the general garden. The Orobus were at one time considered quite apart, but they are now grouped with the Lathyrus. A charming kind is O. vernus, of which there is a white variety named Alba. In a warm border it flowers well, and O. cyaneus is pretty also.

Passion-flowers are beautiful wall plants, as one need scarcely remark, but they must have a south aspect to be safe during the winter. No kind is more cherished than the blue Passiflora cærulea; its distinct colouring and graceful growth compel admiration. It grows quickly, flinging its slender shoots over anything near to it, and in the autumn the big yellow fruits hang like ripe apricots amongst the leafy shoots. It should be planted in the spring in a warm rich soil, but some gardeners plant it in autumn. Constance Elliot is a white variety, even more tender than the parent.

PASSION-FLOWER.

Roses.—The Rose is, of course, queen of climbing plants, but a chapter will be devoted especially to the flower.

Solanums.—Amongst climbing plants for the warmer Southern Counties of England must be named S. jasminoides and S. crispum. The former is a familiar sight in Devonshire, the white flower clusters wreathing many a house front and cottage in beauty, but it is only in favoured climes that such robust growth is obtained. It must have a light warm soil and sunshine. Where the climate is too cold for it out of doors, it is sufficiently beautiful for the greenhouse. It flowers over a long season. S. crispum, known by its handsome blue-purple flowers, is also tender, but when in vigour is very attractive. Grow it against a wall, and if in the event of a hard winter the shoots are cut back, the plant generally recovers.

Vines are beautiful climbers. One need not praise them, as the graceful growth and autumn tints of the Vine are familiar to almost everyone. China, Japan, and America have given us many handsome kinds. The following are the most valuable, and may be used in many ways—over pergolas, arbours, trellises, and against the house. Many know the charming picture produced by some greenhouse Grape against a cottage wall, a Black Hamburgh, Gros Colman, or other kind grown for the sake of its fruit only. The Vines add rich beauty to the autumn garden, the foliage changing to brilliant hues—crimson, yellow, and bronzy green—which are retained into November days.

Vitis Coignetiæ.—A noble Vine, which came to us from Japan a few years ago, and has added an additional note of colour to the autumn garden. It is fortunately very strong in growth, and has leaves no less than 1ft. across when fully developed, and of rich colouring, varying from crimson to bronzy crimson, all rich and effective. It should be planted freely against pergolas, over arches, anywhere indeed where colour and handsome growth are desired, even over tree stumps in the rougher, wilder parts. The Common Vine, V. vinifera, has yellowish leaves in autumn, which are welcome for their variety, but forms of this are very beautiful, such as the claret-coloured Teinturier, Miller's Burgundy, and the purple-leaved Purpurea. Vines of several varieties should be grown, as they are, in their rich autumn colouring, as beautiful as any flower.

V. Labrusca, or the Northern Fox Grape, is a brilliantly coloured kind, its leaves changing to crimson tints in autumn. Other good kinds are V. Thunbergi, which is rich red in autumn, a beautiful Vine, V. æstivalis, V. californica, V. cordifolia, and V. vulpina. Of course, colouring varies in depth according to the year; sometimes the leaves change little, but generally every shoot glows with colour. One kind, the Hop-leaved Vine (V. heterophylla humulifolia), bears beautiful turquoise-coloured berries. It deserves a warm wall for this reason, and if one desires a variegated variety, the leaves of a form of this are mottled with pink and white; but few care for these variegated-leaved climbers. They have an objectionable spotty look.

Wistarias.—The common Wistaria is W. sinensis, the lavender flower racemes hanging in profusion from the still leafless branches. A wall covered with Wistaria is a fair sight, as no climber is of more tender and beautiful colour. There are other kinds, one with white flowers named Alba, but there is none better and freer than the type. W. frutescens and W. multijuga are hardy kinds of considerable merit, but first plant the most charming of all, W. sinensis, which may be used to adorn arbours, summer-houses, pergolas, trellises, walls, and the like, giving it a warm soil and sunny position.

Pergolas.—A pergola is a charming feature in the garden, as our illustrations show, shady, cool retreats from the summer sun and made fragrant with the breath of Roses. In "The English Flower Garden" it is mentioned that adaptations of the Italian pergola are much to be recommended for English gardens, since, though our summer is short, there are a good three months when a bowery, shaded walk would be most enjoyable; and the numbers of free-growing, climbing plants at our disposal besides Vines, give an abundant choice of material. Aristolochia, Wistaria, Virginian Creeper, rambling Roses, Honeysuckles, Jasmines, and the free Clematises are all suitable, and look well and do well in such a position. The pergolas, like the stately fountains, are to Italy quite appropriate to the country and the climate. They are rarely necessities in our English climate, but simple adaptations would add to the delights of many an English garden. A creeper-clad trellis spanning a frequented walk is a good feature in a garden, as it gives a contrast to the open breezy parts, and serves for growing many beautiful hardy climbers which can only be seen at their best when rambling over trees, trellises, or along the tops of walls. It should lead to somewhere, and be over a frequented walk, and should not interrupt any line of view. The breadth, height, and length are points for individual taste to arrange, but if flowering creepers are desired to cover it, it must not be placed under or near the shade of big trees, especially such as the Elm, whose hungry roots would travel a long way to feed upon the good soil that the creepers must be planted in. The form of the structure must also be governed by circumstances and individual tastes. A simple structure is the best. The supports should be Oak tree stems, about 9in. in diameter, with the bark on, let into the ground about 2ft., if on a bed of concrete the better. The posts must be connected and firmly secured to each other by long pieces of similar width, and running along the sides, while the top may be formed of small pieces fixed transversely across. This will make a more firm and massive structure, and the simpler it is kept the better it will look. On no account let the "rustic" carpenter begin to adorn it with his fantastic branches, which he is so fond of doing. Around and over the pergola many interesting and beautiful shrubby and other climbers should entwine, here the Vine, there the fragrant Jasmine, or the Honeysuckles, their sweet breath filling the shaded walk with perfume in the summer. Of course in the winter the pergola will be little sought after, unless in quite the South of England and Ireland. It is a sun-shelter in summer, a grateful retreat amongst flowers, with a vision, too, of the garden beyond. Simplicity in design is essential, and in this country brick pillars are unnecessary, unless, of course, one wishes to create an elaborate feature, but the pergola formed of Oak stems is simpler and prettier. Of late years many charming pergolas have been formed in English gardens, sometimes almost like a covered way leading to the house, or by the margin of the lake. It is well to make the pergola lead somewhere, not a mere addition, as if a summer-house or "rustic" arbour to shelter one from hot sunshine. The creepers should be as varied as possible, and often against a sunny Oak tree stem delicate and beautiful kinds will luxuriate—Clematis coccinea, Lonicera sempervirens, Solanum jasminoides, the Pomegranate, and plants not seen in every garden. It should support, too, sweet-smelling flowers, and a large proportion of the climbers used should possess a delicate fragrance to perfume the walk. When the pergola is built by a walk or lake, an opportunity is provided of planting bright flowers in the grass to add colour to the picture. Plants against pergolas require attention in the winter and spring to prevent undue tangling of growth, as this will, of course, spoil the beauty of everything except the most vigorous kinds. The Japanese and North American Vines may be planted freely, for the sake of their glorious autumn colours.

AN ENGLISH PERGOLA.

BEDS OF SUB-TROPICAL PLANTS AT HECKFIELD.

TENDER PLANTS FOR THE SUMMER GARDEN.

By F. W. Burbidge, M.A., F.L.S., F.R.H.S., V.M.H.

TENDER plants are those that will not withstand a low winter temperature, but require at least greenhouse shelter during the coldest months of the year. Amongst them are many beautiful exotics, some remarkable for colour or perfume, others for grace of form; some for both or all of these qualities combined, and all more or less suitable for special use in the open air during our summer months, say from May until October. The line between hardy plants and tender ones is not easy to define. For example, Dahlias and Cannas are hardy in some localities, but not so in others. So also the exquisite blue Salvia patens, and many bulbs, such as Crinums, Ixias, and Gladioli; Cannas, Phormiums, Bamboos, Sikkim Rhododendrons, the white Azalea, Arum Lilies, Romneya Coulteri, Cordylines, some Yuccas, etc. On the West Coasts of England, Ireland, and Scotland, and in sunny seaside nooks in Wales, many plants are hardy and beautiful that are not hardy inland, or in exposed places, or on cold, heavy, or wet soils. Valentia, Oban, even Fota (Cork), and, of course, Cornwall and the Isles of Scilly and the Channel Islands are exceptional in the capabilities they afford for the open-air culture of what is elsewhere considered to be tender vegetation. Even on light, warm soils, position and shelter mean a great deal, many plants from the Canaries or the Cape, from New Zealand, Australia, from North China or North India, Chili, and Peru, being hardy under walls or close to hot-houses, that would die during our average winters in the open ground.

Aspect, again, is a very potent factor. Plants that are hardy under south-west, west, and even north walls or hedges, are often fatally injured by sudden sunshine succeeding hard frosts when facing east, south-east, and even south walls. Deep planting and ample drainage are also necessary for Cannas, Crinums, and many other bulbs and tubers of plants whose natural thermal limits are a little higher than those of our native vegetation.

Shade also is now and then essential, as well as shelter from winds. Some plants

like Fatsia japonica, and wood or forest underlings, rarely do well and attain their natural beauty if exposed to full sunshine. Moisture is a factor of importance, and we have a sliding scale from the pure aquatics to the sand and gravel or dry rock and wall plants, never so happy as when fully exposed high and dry in the sun. In mild localities near the sea even the Cape Fig Marigolds (Mesembryanthemums) are hardy and beautiful on dry rocks, mud banks, and old walls. There are fifty or sixty species of these, quite hardy, at Tresco, in the Scilly Isles. On the bastion walls of the garden at St. Michael's Mount they hang in gigantic festoons green and flowery all the summer and autumn-tide, though in winter and spring fully exposed to biting winds, rough gales, and clouds of salt spray from the sea. In gardens where bare, hot, dry, rocky banks exist, these may often be rendered most interesting by planting them with succulent plants of bold habit, such as Aloes, Opuntia, Cereus, Phyllocactus, Echeverias, etc., on a low carpet of Sedum, Kleinia, or Fig Marigolds.

Apart from sub-tropical plants proper, we have such hardy trees as Ailantus, Catalpa, Paulownia, and many others that may be used with very good effect in groups or masses of tender vegetation. It is a good plan to pollard or cut down such large-leaved plants every spring, partly to keep them in due bounds as to height and size, and partly to ensure the production of much larger leaves. Very good effects are to be obtained at a reasonable cost by focussing or grouping the real sub-tropical plants near the eye, and then continuing the effect with hardy things that look equally as well in the distance. The question of soil is important; and as a broad rule those sub-tropical plants whose beauty consists in their foliage do best in deep, moist, and well-manured soils. Flowering plants, such as Cannas, Pelargoniums, etc., do better in light sandy or gravelly soils, not too richly manured. Another practical point not to be overlooked is that while foliage plants often do best and look best in shady or half-shaded nooks; flowering plants, as a rule, bloom most freely in full sunshine. Moisture, during hot, dry weather, is of the utmost importance, and if possible a hose-pipe should be laid on to all the larger groups, so that they may be watered and sprayed whenever desirable. It has of late years been the fashion to decry "bedding out" in all its forms and phases; but in all things there is a happy medium. There are good and bad phases in gardens and in gardening of all kinds, and good "bedding out," as done at Heckfield by the late Mr. Wildsmith, gained the praise and admiration of some of the bitterest opponents of the system.

The late Mr. Gibson, an old traveller in the Eastern tropics, when at Battersea felt the flat tameness or sameness of the then outdoor flower gardening, and to him in the main was due the introduction of bold tropical vegetation in a picturesque manner. Wildsmith and others soon afterwards united the two systems, and flat beds were relieved and broken by graceful irregularity—beautiful form, in fact, was added to bright colour. In some few gardens of limited area, beds or the formal patterned flower gardens were done away with, or not formed, and velvety lawns swept away from the house or the terrace, the flowers being massed in front of sunny shrubbery borders, and so the colour was seen and intensified by a cool background of tree trunks and green or grey foliage or of purple and gold leaves. This kind of treatment, *i.e.*, the suppression of the flower-beds and massing of effective plants on borders across the smooth green lawn, is especially appropriate in small places, giving breadth and at the same time reducing the cost of after keeping.

Simplicity should be a guiding principle in sub-tropical as in other phases of gardening, and, above all, do not dot and speckle the lawn with beds, groups, or single plants. Even in our best public parks there is not a due proportion of smooth green lawn to contrast with and intensify the colour of the flowers employed. Just as bedding plants were decried thirty years or so ago, so to-day we find critics who object to sub-tropical plants in the outdoor summer garden. One who preaches tolerance in many other matters has recently written of sub-tropical plants, "Their room is better than their company, and there are hundreds of plants quite as beautiful, which are perfectly able to take care of themselves

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without coddling. . . . After all, what poor specimens these emigrants are, compared with their ancestors resident in their native land." This would be all very well if everybody took the same point of view, but, alas, it is not so, and human nature in the garden, as elsewhere, ever longs for variety, and there is ample room in the gardens of England for all tastes and all systems or methods of gardening, provided their owners are pleased; for, after all, this is the very reason to be of a garden—to please and satisfy human tastes and human needs.

One of the rarest of all natural gifts or senses is a good eye for colour. Even artists get into difficulties here; so we need not wonder at the garish effects often seen in gardens. Colour in the flower garden may be either mixed or massed in separate shades. The arrangement that pleases one may not please another, and there is room for all modes and methods. As a rule, occasional visitors appreciate brilliant effects that would soon pall and weary those who see them every day. The chatelaine is generally the best judge as to the most suitable colour scheme to employ; but whatever that is, one bright or telling colour should predominate and occupy the focus spot or centre of the whole arrangement. Nature gives us bold suggestions on the use of vivid colour, and but rarely uses her brightest hues and her brightest greens together. It is a safe rule to use plenty of grey foliage with the brightest colours, such as crimson or scarlet, or with vivid blue, and all the warm hues of yellow and orange show best with brown or purple foliage in contrast, this being a better contrast than the vulgar combination of yellow and purple flowers. Above all, take all care in the juxtaposition of reds, and keep orange reds and blue or purple reds and crimsons as far apart as is possible. As a rule, it is best to mass different shades of the same colour together, with a sufficiency of white flowers or of suitable foliage to act as a foil, but now and then a mixed or spangle bed or group may be made with good effect.

BEDS OF SUMMER FLOWERS.

But the most brilliant of colours, such as scarlet, yellow, and blue, may be used in close proximity only on one condition, and that is, that plenty of green or grey foliage be used along with them. Wherever the whole of a flower garden or parterre is seen at once, one colour should be dominant, be it red, yellow, orange, or blue; a few kinds in broad masses will give far more effect than any

mixtures can do. For masses of colour we have Zonal Pelargonia, Begonias of the tuberous-rooted section, yellow and crimson Calceolarias, Lobelia, both white and blue flowers, the fire-like scarlet of the Tropæolums, and many other plants having flowers or foliage of fine colour or form. Masses of colour may be either flat and neatly arranged, as in the case of mosaic culture or carpet bedding, or they may be loose and free, as when tall Pelargoniums, Cannas, Fuchsias, or Daturas are employed, or we can have the lightest and most ethereal of feathery arrangements by the due employment of the best of Sweet Peas, Humea elegans, Canary Creeper, and tall and feathery grasses, reeds, or bamboos of many kinds.

There is absolutely no limit to the distinct and beautiful effects obtainable by the use of tender or half-hardy annuals and exotics in the open-air garden during the summer months, and not unfrequently plants from the greenhouses or conservatory are actually improved by being so used. Large Palms, Bamboos, Musas, M. Ensete in particular,

A CORNER OF THE GARDEN AT HELMINGHAM.

Aralias, Dracænas or Cordylines, green and variegated varieties of Yuccas or Agaves, well grouped in sheltered positions on the lawn, enable us to obtain the most pleasing and varied sub-tropical effects in the garden. The old-fashioned way of placing Oranges, Lemons, Myrtles, Pomegranates, Sweet Verbena, Pelargoniums, Agapanthuses, Bay Laurels, and Oleanders on terrace walks is especially suitable near good buildings of the Elizabethan and Queen Anne eras. This was a special feature at Hampton Court, at Kensington Palace, and Holland House, and is still very happily carried out on the terrace walks at many of our fine old country houses. Well-filled pots or vases of good form may be employed with excellent effect on terrace walls or steps, as is done in Spain, South France, and Italy, where there is such a good variety of well-shaped pots or vases, made of terra-cotta or stone. The point is to use bowls or vases of good shape, and not the false classic or ugly concrete Marylebonese creations. Even old red Florence oil jars, sawn through at the right point, give very artistic receptacles, and have the advantage of

being reasonable in price at the same time. Old Seakale or Rhubarb pots make good receptacles for terrace wall plants, being good in form and colour.

Now there is such a desire for bright colour and sweet-scented blossoms near the house, I often wonder our best architects do not give us low, hollow-topped walls of brick or tiles, for Irises, Carnations, Pinks, Stocks, Wallflowers, and even dwarf Scotch and other Roses or other suitable flowers. These walls, beautifully tiled and thick-set with aromatic plants and flowers, are especially admired by most garden-loving visitors in Portugal and Spain, where some of the finest examples date from Moorish times. The pergola in all its forms is now a welcome feature in many of our best gardens, and we hope the old Moorish hollow-topped terrace walls will soon follow. Even the more homely window-box should be given to us in durable and suitable materials by the architect, instead of being left to the carpenter, thus becoming a permanent portion of the house, and not a mere temporary and often ugly makeshift as it is now.

As to the best use of tender plants in the open-air garden, real object-lessons are better than the best of written or printed advice. Go, if possible, or at least send your gardener to see the actual results obtained by their use in such places as Regent's Park, Hyde Park—notably the little watery dell at the head of the Serpentine. Much good work is also done at Battersea Park in the so-called "Sub-tropical Garden," and also at Hampton Court, while something to learn, something worth study for purposes of imitation, or rather improvement, may be seen in all the great public parks and gardens in or around London. But we must remember that even in our best public gardens the arrangement of fine-leaved plants is not invariably perfect, and we must all do our best to get clear of too many flower-beds, and of the inartistic dot and line method of arrangement. We should not dot our Palms or Musas or Indian Figs at regular intervals all over our shady banks and sunny glades alike. Not only is the dotting and spotting of the entire lawn space with sub-tropical plants inartistic, but it adds materially to the labour and cost of mowing and keeping in every way. One of the true tests of a garden scene is its picturesque character, or, in other words, would a Leader, a Parsons, or a Moon, or any other good landscape artist, care to paint it as it is, leaving nothing out?

A GARDEN IN SUMMER-TIME.

I know a garden in Ireland where the smooth green lawn ends at a rocky terrace overlooking the sea and in full sunshine. It is not, at first sight, a likely place for exotic vegetation; but a few large American Agaves grouped amongst the rocks, the soil amongst which is carpeted with Fig Marigolds (Mesembryanthemums), really make a picture of the scene, and give one a glimpse of the Riviera under our oft murky skies. A sheltered, mossy dell, down which a little trout stream tumbles from one shelving rock to another, is just the place in which to group a few large Dicksonias and other Tree Ferns, which look quite at home, surrounded as they are by natural conditions of flickering shade, coolness, and ample moisture, the damp rocks and soil at their feet being carpeted with cool, half-hardy Selaginellas, that sometimes even survive an ordinary winter, though the Ferns are removed

A SCOTTISH GARDEN.

indoors in October. In the same place Stag's Horn Ferns (Platycerium) and large Nephrolepis are grown specially on teak-wood rafts and on tough, fibrous sods of loam, so that they can be wired tightly to the gnarled and mossy trunks of the trees overhanging the stream, and the effect is quite unique and surprising, the plants seeming quite natural amid their leafy and rocky surroundings.

One of the most subtle of all the conditions concerned in plant arrangement is that known as "keeping," a word which here means "the right thing in the right place." There is a perfect sense of fitness, or keeping, if we associate Bamboos, or the Greater Reed (Arundo Donax), with the Giant Gunneras by a pondside or stream, because they are all naturally marsh-loving or bog plants; but if you plant Yuccas or Agaves in similar situations the sense of fitness is destroyed, seeing that they naturally love and grow best in dry, rocky, or stony places.

Those who really wish to excel in this effective phase of flower and foliage gardening should read Letter III. in Ruskin's "Elements of Drawing" on "Colour and Composition," in which the principles of form and of colour are clearly laid down. "The Sub-tropical Garden, or Beauty of Form in the Flower Garden" (Second Edition), by Mr. W. Robinson, is also a work on this subject that will repay the perusal of those interested.

Abutilons.—These beautiful plants may be used in many ways, *i.e.*, for clothing greenhouse or conservatory pillars and roofs, to grow in pots—though less attractive when thus used—and for planting out in the open, where they flower as freely as under glass. In the extreme South of England and Ireland they may in sheltered spots be even left out the whole year. A delightful kind for the summer garden is Boule de Neige, which is the most beautiful of the white kinds, very free both in bloom and growth. This may be grouped upon the outskirts of the lawn, or associated with other plants in large beds, and an easy way to manage it is to sink the pots above the rim, lifting again on the approach of frost. The plants will then continue to bloom under glass. They should be kept moderately at rest, however, to prepare them well again for the summer garden. Of yellow, choose Golden Fleece or Chrysostephanum; and of reds, Sanglant and Scarlet Gem. Anna Crozy, King of the Roses, and Premier are of a rose or rosy purple shade, whilst of striped kinds, which are always less effective than the selfs, striatum splendidum is as good as any. A. Thompsoni flore-pleno has double orange and crimson veined flowers and variegated leaves. The Abutilon is much valued for its foliage, as some kinds are conspicuously coloured, and of these the most important are Souvenir de Bonn, Thompsoni, which is, perhaps, the most popular of all, nævium marmoratum,

Darwini tesselatum, variegatum, and vexillarium variegatum, which is, however, prone to revert to the green form if the soil is too rich. One must not imitate planters in some parks and use them everywhere. Too much variegation produces a spotty effect. Thompsoni is probably the most popular, and if one kind is needed, select this. Propagate Abutilons by cuttings late in March, of moderately firm wood. Cut just under a joint and remove the lower pair of leaves, then put the cuttings round the sides of a 5in. pot, or, if of good size, singly in large sixties. Put them if possible in a close case, giving bottom heat, and only sufficient water to prevent flagging. When the cuttings are rooted more water may be given, and when becoming established pot on until they can be hardened off before planting out. Soil composed of loam and leaf-mould, mixed with plenty of sharp silver sand, suffices.

Agathæa cœlestis (*Blue Marguerite*).—This is a charming tender plant for bedding. A small bed filled with it is very pretty, as the growth is bushy and the daisy-like flowers of a clear blue colour. It can be used also as a groundwork, so to say, for taller things. A dry sunny position is necessary, and propagate by seeds and by cuttings; but the best way is to strike cuttings in spring; they quickly root with a little bottom heat, and may be potted and grown on either for the open or to flower in pots in winter. When the latter is the object, pick off the buds during the summer, ceasing to do so in early autumn.

Ageratums form a useful class of dwarf bedders, and are frequently used as a groundwork to other plants, the herbaceous Lobelia, for example. Cuttings strike freely in warmth in early spring. The best varieties are Cannell's Dwarf and Verte Bleu, both of a blue shade, Swanley Blue, Tapis Blanc, and the Zoo, which is perhaps the finest of all. Ageratums, because so dwarf, make good edgings, but this family should be planted with caution. A surfeit of Ageratums is not pleasant, and one frequently sees them put into positions for which they are entirely unfitted. The colours are somewhat monotonous, but the plants bloom so freely and regularly that they have value in the summer garden.

Alternantheras.—These were much used in the old carpet style of gardening, happily seldom seen now, a form of bedding which entails endless labour in keeping the plants clipped to make them conform to a set pattern. Alternantheras are of value for their leaf only, the colours ranging from yellow to reddish bronze, a few of the more important kinds being Amœna, paronychioides major, p. magnifica, and the variety Aurea. Certainly where carpet bedding is indulged in these plants are indispensable, and being natives of Brazil they are, of course, very tender. They are very easily propagated, striking the cuttings in a warm house with bottom heat. As a rule, of course, a considerable quantity of plants is necessary, and then they should be struck in a hot-bed. Before transferring them to the garden thorough hardening off is necessary, and planting must not commence before the first week in June. They are only of use in bedding.

Begonias.—One wishes every garden flower were as easily raised as the tuberous and fibrous rooted Begonias. They have in a large measure superseded the Pelargonium, and this is not surprising when one considers that seed may be obtained in distinct colours, which are faithfully reproduced in the seedlings. Seed sown in January will produce plants for flowering the same year, and another sowing in March ensures a still richer display. The tuberous kinds will be considered first. Sow in January and March, and get the best seed obtainable, as this is the most economical in the end. The flowers are either double or single, but of course seed can be obtained of either section, and it is very fine, so much so that great care must be taken not to sow too thickly. Just cover it with fine soil. Use for sowing very shallow pans, which must be thoroughly well drained, almost to the rim. Little soil is necessary for the seed, and this should be composed of sandy loam, leaf-mould, and sharp silver sand well mixed together. Moisten it before sowing, but disturb the surface as little as possible, as the soil must be quite even. The best way is to let the water percolate through the compost by holding the pan in a pail of water. When sowing is finished, cover the seed pan with a piece of glass. Place on a hot-bed, or keep the surroundings fairly moist. A bed filled with cocoa-nut fibre refuse, in a warm house and over hot-water pipes, is an excellent place for raising seedlings of Begonias and similar flowers. The temperature of the house should be not less than 65deg., and in about a fortnight the seedlings will be ready to prick off into a shallow pan or box, using a lead pencil or small pointed stick for this work. Give the same warmth, and when they touch each other pot into 3in. pots, gradually hardening them off until they can be placed in the cold frame in May, covering at night if frost is anticipated, ready for the open ground, in which they may be planted early in June. Begonias appreciate a rather moist soil, and a position not too much exposed to the sun. Always group the colours well, and a bed, for example, of a crimson variety is more effective than a medley of various hues. White and pink, bronzy orange and self orange, and associations of colours of this character create brilliant effects. A list of named varieties has not been given, for the reason that the colours in seedlings raised from good seed are wonderfully rich and varied, from white, through softer rose, pink, and peach tints, as subtle as in the Tea Rose itself, to bronzy orange, deep yellow, crimson of all shades, and vermilion. The same beautiful colouring is found amongst the double varieties. Propagation by division is easy, and useful when dealing with named varieties. Half bury the tubers in a sandy soil, and place the box in a warm house. When the eyes push out from the crown, lift the tuber, removing the soil, and cut clean through, taking care to have two eyes at least to each piece of corm. Pot up the divided portions, place in the warm house, and treat in the way advised for seedlings. The fibrous-rooted Begonias are very popular and more easily raised even than the tuberous varieties. They are scarcely so gay as the others, but useful and effective, especially in moist summers. Duchess of York, Crimson Gem, Fairy Queen, and Duchess of Edinburgh are delightful, and may be raised true from seed. B. Worthiana is an excellent bedding Begonia. The orange scarlet flowers have a drooping tendency, hence are less exposed to storms of rain and wind. It is an old but valued kind. The way to winter Begonias is to store the corms when lifted from the ground and thoroughly dry in silver sand, using shallow boxes for the purpose, and keep them in a cool place, quite free from frost. If already in pots when the foliage has died down, lay them on their sides under a stage, and when signs of growth appear in the spring bring them out. Remember that the foliage of Begonias is very succulent, and if exposed to the full sun, especially when water has settled upon it, the result is that it gets burnt and disfigured. Many fail to grow Begonias satisfactorily for the reason that the requirements of the plants are not studied. In very hot southern exposures it is hardly advisable to plant them, unless the soil is moist and gentle sprinklings in the evening can be given. So greatly has the habit of growth been improved of late years that the plants are available now for positions which they could not have occupied some time ago, for then the stems were "gawky" and the flowers comparatively few. The single kinds are generally a greater success in the open than the double Begonias, which expand less freely, and the plants are seldom so free.

Caladium esculentum.—This is a noble foliage plant for the summer garden to group with India-rubber plants, Eucalyptuses (Blue Gum), and plants of like character. It must not, however, be crowded up with things of unruly growth, as under such conditions one loses the massive aspect of the foliage. Plant it in rich soil, in a warm sheltered spot, lifting the tubers at the end of September, before frost has played pranks with the foliage, and storing them in a greenhouse much in the same way as one would the Canna.

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Calceolarias.—There are two groups of Calceolarias, the herbaceous and shrubby, and it is the latter that are here dealt with. These flowers are less used than formerly, partly from disease, and partly through the stercotyped bedders having lost favour. The plants have an unfortunate disposition to suddenly collapse; but by planting late in April in well-prepared ground, in which plenty of manure is put deep down, so that the roots as they develop can

CALCEOLARIA.

discover it, and watering in very dry weather, they will succeed. They fail in poor shallow soil. The best time to strike cuttings is October, when side shoots taken off with a heel, *i.e.*, a bit of the old wood, and the lower leaves removed, root readily in a cool frame. Drain the soil well by putting broken bricks, crocks, and similar things in the bottom, and over this fine loamy soil, which should be brought up to within a few inches of the glass. Put the cuttings about 2in. apart, and in each little hole sufficient sand for each to rest upon, and water with a fine-rosed watering pot. Shut the frame up, giving air occasionally to prevent damping off, and cover the lights with old sacks, mats, or similar articles to keep out frost in severe weather. Little water will be required until growth commences, but the soil must not be allowed to get dust dry. In spring, ventilate more freely, until the plants can be fully exposed before being planted out in late April in the beds or borders. A few plants may be potted up for the greenhouse if desired. Cuttings may be struck in spring in heat, following the same advice as given in the case of Fuchsias, but early October is the best time. Amplexicaulis, lemon colour, is one of the sturdiest and most free flowering. Other good kinds are Gaine's Yellow, Golden Gem, and Prince of Orange.

Canna (*Indian Shot*).—The Canna is welcome for its noble leafage as well as for its splendid flower spikes, which never attain full beauty, however, unless the summer is warm and dry, but it is always worth planting in bold groups on the lawn or some conspicuous spot in the flower garden. Of late years many beautiful varieties have been raised with flowers larger and finer in colour than the older kinds, whilst some are quite dwarf in growth, not more than 3ft., others reaching a height of 7ft. or even 8ft. Cannas are very easy to grow. Propagate them by placing the old roots in warmth in February, and if at command give bottom heat. The result will be young shoots, which when about 2in. in length take off with a heel attached, and insert singly in small pots. Plunge these in bottom heat in a house with a temperature of 65deg. If such means are not available give less warmth; but of course the cuttings will not root so quickly. When large plants in pots are required each year, propagation must be performed annually. A very simple way to propagate is by dividing the roots when growth commences, potting the divided portions in soil consisting of loam, well-decayed manure, and sharp silver sand, and affording a temperature of about 55deg. The roots may be stored in a frost-proof fairly dry cellar, or under the stage of a cool greenhouse. Lift them when frost has destroyed their beauty, and with a blunt stick remove as much soil from amongst them as possible, then lay them in the sun for a few hours to dry, and store. It is almost impossible to give a selection of varieties without introducing a bewildering list; there are so many noble kinds, and each year they increase, the flowers gaining breadth and colour, whilst the rich chocolate tone of some leaves is very attractive. Of the dark-leaved kinds, President Carnot, President Faure, Antonin Crozy, Geoffrey Saint Hilaire, and M. Andrè are noteworthy; and amongst those valued for their flowers the following are very effective: Alphonse Bouvier, deep crimson; Antoine Chantin, rosy salmon; Antonin Crozy, crimson, very rich against the dark-coloured leaves; Aurea, clear yellow; Duchess of York, yellow, spotted with red; Italia, red and yellow; Jules Chretien, crimson carmine; Mme. Crozy, orange red, with a margin of gold to the florets; Mme. Just, of a beautiful golden amber colour, red in the centre of the flower; Paul Lorenz, crimson flowers and very dark-coloured leaves; Progrès, vermilion spotted with a reddish colour and margined with yellow. To get flowers freely, plant in early June

CANNA.

strong crowns, and let the soil be very rich, and the position exposed to the full sun, but not wind-swept. Give water freely during the summer in dry weather.

Dahlias.—A sumptuous garden flower is the Dahlia, which is now divided into many classes. The plant is a native of Mexico, and the parent from which the present family has been derived is D. variabilis. It was first introduced into Spain in 1789, but was brought to our shores in the same year by Lord Bute, who was Ambassador to the Spanish Court at that time. There are

several classes, namely, Cactus, Decorative, fancy, Pompon, show, and single. A large garden is the place for the Dahlia, as the plant is too bushy and vigorous unless the beds or borders are bold; and when a variety of a good self colour can be freely grouped, the effect is excellent. Dahlias are not difficult to grow, and they are easily increased by cuttings, division of the roots, or by seeds. The usual way is by cuttings, and these are obtained by starting the old roots in cocoa-nut fibre refuse, boxes filled with light soil, or similar receptacles, placed over bottom heat to promote quick growth. Start the roots in February, and take the cuttings off close to the tuber, putting each cutting into a small pot, or they may be put round the sides of larger pots. When rooted pot them off separately, and transfer them to larger sizes as the pots become full of roots. Before planting them out at the end of May they must be thoroughly hardened off, and meanwhile prepare the sites by digging the soil thoroughly and putting a layer of manure in the bottom of the hole, not to come into actual contact with the roots, but for them to find it as growth progresses. Too rich soil will, however, promote excess of leafage, which is undesirable. Many growers believe more in watering with liquid manure in summer if the plant appears to need support, and the growths must be kept well thinned out. Before planting out, make the holes ready, and put in the stakes, for Dahlias require firm support, especially in wind-swept districts. Another way to propagate is by division of the crowns when growth commences, and this is simple, as it means taking off each tuber or two tubers with an eye or two, potting them into good soil, and starting in gentle warmth, or the old roots may be transferred bodily to the position they are to adorn; but striking cuttings is preferable. The Dahlia is not hardy, and except, perhaps, in quite the extreme South of England and Ireland, must be lifted when frost has destroyed the beauty of the plant. When this occurs, lift the roots carefully, remove as much soil as possible from them, and before placing in the store, dry in the sun, or if the weather is unkind, in a greenhouse, or even kitchen. Then put them close together in boxes filled with light soil, and transfer to a cellar, or under the plant stage, where they will be safe from frost, and not exposed to drip. Very little water will suffice in winter, merely sufficient to prevent the tubers shrivelling.

DAHLIAS.

Selection of Varieties.—This is an important point, and confusing to those who know little of the various races. If one desires new varieties, the collection must be constantly added to, and others weeded out. Such a course, however, is only necessary when one wishes to obtain prizes at the exhibitions. The Cactus class is the most handsome in the garden, and will be more valuable still when every variety throws its flowers well above the leaves, as the prevailing fault is that one sees more of the leaf than the blossom. Sometimes this is the fault of giving too rich soil, and of not thinning out the growths freely. The following are very beautiful in colour, and, for the most part, throw their flowers above the leaves: Bertha Mawley, crimson; Charles Woodbridge, also of a crimson shade; Countess of Gosford, a pretty colour association—yellow, touched with light brown; Cycle, rich ruby; Delicata, soft pink, a pretty shade; Fantasy, a coral colour (thin out the buds freely); Fusilier, salmon red; Gloriosa, very bright crimson, touched with scarlet; Harmony, red, shaded bronze; Henry Stredwick, maroon; Juarezi, scarlet, the variety upon which this group is founded, as it was brought from Mexico in 1872, and first shown by Messrs. Cannell and Sons, of Swanley, seven years after; Lady Penzance, yellow, a very clear and beautiful colour; Matchless, maroon; May Victor, yellow; Mrs. F. Fell and Mrs. A. Peart, pure white. There is a single Cactus class also in which the florets are twisted, as in the double variety. These are very useful for cutting, being graceful and pretty in colouring. This is a small group, the best varieties being Ivanhoe, rose, crimson at the base of the florets; Lady Rowena, sulphur yellow, with florets tipped with rose; Meg Merrilies, yellow; and the Abbess, white.

Fancy and Show Dahlias are grown chiefly for exhibition, and the fancy varieties differ only from the show in being either tipped or striped with colour. It is a very thin dividing line between the two groups. They are, however, far less effective in the garden than the Cactus, Pompon, and single Dahlias. Of the fancy and show kinds, the following have been selected as the most effective in colour: Crimson Gem; R. T. Rawlings, yellow; Rising Sun, a very dwarf plant, not more than 2ft. high at the most, with big scarlet flowers (this is very handsome when grouped); Prince of Denmark, maroon; Queen of the Belgians, very delicate pink; and Yellow Pet, rich yellow.

Decorative Dahlias are those which show a twofold character. They neither belong to the show class nor to the Cactus group. The following are handsome in the garden: Asia, a peach tint; Avalanche, very delicate, almost pure white, but with a faint pink tint; Cannell's Gem, orange red; Cannell's Scarlet; Constance, white; Countess of Pembroke, soft lilac; Glare of the Garden, scarlet, very brilliant in the garden, as the name suggests; Mrs. Hawkins, soft sulphur yellow, flushed with pink; and the yellow A. W. Tait.

Pompon Dahlias are delightful flowers, double, and beautifully shaped, and appear with great freedom. The following varieties are of great merit: Arthur West, crimson; Bacchus, also of a crimson shade; Darkness, almost black, so intense is the colour; E. F. Jungker, very soft yellow; Eurydice, pink, touched with purple; Fairy Tales, primrose; Isabel, orange scarlet; Janet, salmon; Nerissa, rose; Phœbe, orange; Whisper, yellow and bronze; Vivid, orange scarlet; and White Aster, pure white.

Single Dahlias need no description, and there are three divisions, so to say—the self, or shaded flowers; fancy, in which the colouring is distributed in stripes and blotches; and the Cactus. Of the selfs, choose Amos Perry, deep maroon, a pretty, velvety flower; Annie Hughes, rosy shade, with the base of the florets yellow; Demon, maroon, almost black; Kitty, white, touched with a pleasing mauve colour at the upper part of the florets; Marion Hood, pink, a clear, good colour; and Miss Roberts, yellow. Of the fancy,

most popular are Gulielma, white and cinnamon colour; Jack Sheppard, yellow, striped with red; M.C.C., yellow, with orange scarlet stripes, a very effective flower; Northern Star, red, edged with buff; Phyllis, white, with stripes of purplish hue; and Victoria, white, with crimson edge. This group is somewhat quixotic in colouring, and the colours are not always very fixed. Dahlias are of great value for giving cut flowers, especially for bold decorations, such as the church, for harvest festivals; and the Cactus, single, and Pompon classes are also most useful for this purpose.

Datura suaveolens is one of the most suitable flowering plants for the sub-tropical garden. It can be grown well in a large pot or tub, brought on under glass in the spring, and plunged, just as it is about to come into flower, in June or July. Its appearance is eminently tropical, and is well set off by its surroundings.

DATURA.

Fuchsias.—It is pleasant to know that this graceful group of flowers is becoming more popular, but for many years fashion placed them under a cloud. The hardy shrubby kinds will be described in the chapter concerning trees and shrubs, as here bedding plants only are being considered. They are very easily propagated by placing the old plants in heat early in the year and taking off the young shoots with a heel attached and potting them either singly in small pots filled with a soil similar to that in which one would strike a Pelargonium, or round the sides of a 48 (5in.) size. When rooted, pot them off, and the routine after this is very simple, consisting in merely potting them on as the pots become full of roots, and hardening off before trusting them in the open garden. Loam, leaf-mould, and silver sand make a good general compost, but it should be rather heavier for the later pottings. When one desires those fine specimens used in gardens and parks, either in beds or grouped upon the lawn, the old plants must be kept from year to year. This is very easy, as they may be kept in their pots in any shed, or even cellar, if the soil is not allowed to get dust dry and they are not exposed to severe frost. Green-fly is sometimes troublesome when the young growth appears through placing the plants in warmth to start them again, but sharp syringing with cold water before it gets established will settle this marauder. The double kinds are too lumpy to use freely out of doors. Such kinds as Mrs. Marshall, Earl of Beaconsfield, Tower of London, Harry Brooks, and Mme. Cornellissen should be obtained before any others.

Hedychium Gardnerianum (*Garland Flower*).—This is a tropical plant, a member of a beautiful family, and worth planting in a separate bed, if not grouped with other exotic flowers. In quite the Southern Counties the roots may remain out all the winter if coal ashes or cocoa-nut fibre refuse are heaped over them, but generally it is wise to lift them and store in the same way as one would Cannas or Dahlias. Plant out late in May in well-manured soil—loam and decayed manure are best—and water liberally in dry weather. The leaves are very handsome, not unlike those of the Canna, and the flowers, which are of a buff yellow tint, are very fragrant and borne freely in strong spikes.

Lobelias.—There seems little affinity between the tall scarlet Lobelia cardinalis and the bright blue Lobelia, gay and constant throughout the summer. The Lobelia is one of the most useful of bedding plants, but it must not be overdone. There are white varieties and those with flowers of varying shades of blue, also the taller kinds (L. ramosa), which grow about 9in. in height. Few plants, however, are more useful or better known than these, as they may be planted in vases, window-boxes, and in hanging baskets in the greenhouse. Where it is possible to keep the plants through the winter, propagate by cuttings, as these furnish stock of dwarfer and more compact growth than is possible by seeds. The way to get cuttings is to keep a few plants over the winter in pots, placing in an airy greenhouse free from frost, and in the spring to take little cuttings from the fresh growths. These will strike freely in 5in. pots, well drained, and give slight bottom heat. Pot off separately, grow on in a warm house, but harden them off well before transferring to the garden. Another way is by seeds, which should be sown in January, in heat of course, and in pans or boxes filled with light soil. Place them in a warm corner of a greenhouse with a sheet of glass over their receptacle, and when the seedlings are large enough prick off into other boxes, putting them about 1½in. apart. Give a little heat again and then pot off singly or prick out further apart into other boxes. If, however, the stock is very large, it is needful to merely thin them out in the boxes, and from these, when well hardened off, they may be transferred to the beds. Never use too much warmth. The seeds may be raised even in a warm room, placing the seed pans in a sunny window. Blue is a delightful colour used in moderation. But lines of Lobelia here, there, and everywhere are not pleasant. This is the abuse of it.

Pelargoniums (*Zonal*).—These are popularly called "Geraniums," but that term is botanically incorrect, as Geraniums are wild plants, whereas those so called in gardens have been raised by crossing species to produce new forms. Of course the Zonal Pelargonium is still one of the most useful of garden flowers, but is far less planted than formerly. The fine-leaved varieties, the tricolors, silver, and others, should not be planted in town gardens, but the usual run of "Geraniums" are a success anywhere, especially in the South, where they can remain out all the winter and grow into large shrubs. It is so easy to raise them from cuttings that advice seems almost unnecessary. Strike them in August or September. August is preferable, as the cuttings made from moderately-ripened shoots and cut just under a joint may be dibbled in a sunny, fairly open spot in early August. Gardeners root thousands in the narrow borders skirting fruit tree plantations. If the soil is poor, it must be improved by adding loam and leaf-mould, and in the case of any particular variety put a little sharp silver sand underneath each cutting for it to rest upon and prevent possible decay. Give a good watering, and in September, before there is any risk of frost, lift them and pot singly into 3in. pots, transferring them from these to a larger size. Plant out in late May. It is advisable to strike the tricolor and other variegated leaved kinds under glass. If no border is available or any spot in the garden, then strike the cuttings in shallow boxes or in pots, and put them in a cold frame, or in a window even. Cuttings may also be struck in March or April under glass

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Pelargoniums (*Ivy-leaved*).—This is a graceful group of flowers, useful for hanging baskets, window-boxes, or vases in the garden, and to peg down over the surface of a bed. Cuttings may be struck in spring or in autumn, as in the case of the zonal varieties, but they should not be trusted out of doors. Of double varieties choose from amongst the following: A. F. Barron, rosy lilac; Beauty of Castle Hill, rose; Galilee, soft rose; Jeanne d'Arc, white and lavender; Mme. Thibaut, pink; Ryecroft Surprise, salmon pink; and Souvenir de Charles Turner, pink touched with maroon. Of these Souvenir de Charles Turner is the freest and most vigorous.

Salvia patens and S. splendens (*the Blue and Scarlet Salvia*).—These are singled out from all the other Salvias because of their extreme beauty and usefulness in the summer garden. S. patens (the Blue Salvia) contributes a bit of true blue colouring to the border, and a group of it in a bed by itself on the lawn is charming, as the flowers are really blue. When placed against the white Phlox or rising from a bed surfaced with the bronzy-green Heuchera, the result is pleasing and distinct. The white variety is pretty, but we have plenty of white flowers, not so many, however, of the clear blue colour of S. patens. It has tuberous roots, and it is an easy matter to store them in sand or ashes in a cellar or some cool house where they will be safe from frost, planting out again in the spring. It is a mistake to dot this or any other plant about the border. Make a good group of it and get the full effect of the self blue flowers. It is a simple matter also to strike cuttings in spring from moderately-ripened shoots, treating them as one would the Fuchsia. The Salvias in general will be considered when greenhouse flowers are dealt with. The Scarlet S. splendens and the variety Bruanti are brilliant tender summer flowers also.

Sub-tropical Gardening.—The attractions of our gardens are mainly, if not entirely, dependent upon two factors, beauty of colour and beauty of form. The first comprises all effects that owe their being to artistic blending of tints, either in the way of contrasts, or colour gradations, where hues merge almost imperceptibly into allied hues. The last includes the configuration and environment of the garden, as well as the impressions conveyed by the contours of the varied subjects employed to furnish it. Where the garden is mainly devoted to summer bedding plants, the flat surface, though glowing with brilliant colour, has not a suggestion of beauty of form, but in the sub-tropical garden this can be appreciated at its full value, provided that this portion of the grounds is laid out with due regard to artistic effect. Any attempt at formality, such as planting tall specimens of the same species at equal distances apart, in lines, or at the corners of the garden, if such exist, is fatal to the natural beauty of the spot where, of all places in the grounds, the charm of informal grouping should be most conspicuous, the subjects employed being planted with due regard to effective contrasts of outline and habit. A sheltered dell is the most desirable position for a sub-tropical garden, for here the wide leaves of Palm and Musa are protected from the strong winds that work such havoc with their noble spread, while the setting of greenery provided by trees and shrubs, situated at some little distance, shows off the graceful proportions of the foliage plants to the best advantage. Naturally, such sites are not to be met with in every garden; but in cases where they do not exist, simple beds where such things as Castor-oil plants (Ricinus) and Indian shot (Canna) are massed, with an edging of the glaucous Plantain Lily (Funkia Sieboldi), or wide borders where the lofty shafts of Bamboos and Arundos and the tall flower-spires of the Plume Poppy (Bocconia cordata) stand out from the curving leaves of the noble Acanthus, the sword-like foliage and ivory bloom-spikes of the Yuccas, the narrow, drooping leafage and brilliant flower-heads of the Tritomas, or Kniphofias, and the varied outlines of Crambe, Epimedium, and Solanum, are effective examples of beauty of form. Wherever it may be arranged to locate the sub-tropical garden, border or bed, it is a *sine qua non* that the soil must be both rich and deep, for our summers are none too long or too warm for annual foliage plants to attain perfection even when grown under the most favourable conditions, while, if they are starved, a satisfactory effect is out of the question. Although it is doubtless true that subjects which require the shelter of glass through the winter, and those that must be raised from seed in heat and planted out in the early summer, are indispensable to any sub-tropical garden, fine effects are obtainable from hardy, or comparatively hardy, subjects, at all events in the South of England. Acanthus mollis with its giant, arching leafage and tall bloom-spikes, 6ft. high and more; the dwarfer A. spinosissimus with its prickly leaves; Aralia (Fatsia) japonica and A. spinosa, the latter most effective when grown with a straight stem 8ft. to 10ft. high, whence it spreads its large, deeply-cut leaves and white flower-plumes aloft, both of which are hardy in the south-west; Ailantus glandulosa, the Stag's-horn Sumach (Rhus typhina), and Paulownia imperialis, three handsome-leaved trees, which, if cut down yearly, throw up strong shoots bearing exceptionally large and striking foliage, the two first of which are absolutely hardy and the latter hardy in the south-west, where the great American Aloe (Agave americana) assumes massive proportions; the giant Reed (Arundo Donax) and its tenderer, variegated variety, and the New Zealand Reed (Arundo conspicua) with its graceful white plumes, with Arundinarias and Bambusas, which if protected from cutting winds will stand 20deg. of frost; Dracæna australis, grown in quantity and flowering grandly along the south-west coast; the fine perennial Plume Poppy (Bocconia cordata) with its glaucous white-backed foliage and tall ivory-white flower-spire sometimes 8ft. in height; Crambe cordifolia with its grand leafage; Japanese Maples, ranging in colour from light green to the deepest copper-red; Eulalia japonica and its variegated form, hardy in the Southern Counties; the Plantain Lilies (Funkia), hardy perennials of which the best are F. Sieboldi with blue-green leaves, F. ovata, and F. grandiflora; the Ferulas, with their thread-like foliage; Gunnera manicata and G. scabra, with their giant leaves, best suited, doubtless, by a position at the water's edge, but losing little of their noble proportions even when grown in dry soil; Pampas Grass (Gynerium); the Fan Palm (Chamærops Fortunei), that in many gardens in the southern portion of England has attained a height of 12ft. or 14ft.; Kniphofias; the New Zealand Flaxes, Phormium tenax and P. t. variegata, which flourish amazingly and flower freely in Devon and Cornwall; Polygonum cuspidatum and P. sachalinense, hardy, but requiring an isolated position, lest they encroach upon other less rapacious subjects; and the family of Yuccas, the great Y. gloriosa with its lofty close-flowered spike, the drooping-leaved Y. pendula, Y. flaccida, and Y. filamentosa, form a collection of two dozen species of fine-foliaged subjects that may, in certain portions of England, be planted with impunity for permanent effect, while quite half of the species enumerated are hardy.

Of plants that require to be wintered in heat, or at least under glass, Acacia lopantha is one of the most graceful. Cannas are either raised from seed in strong heat early in the year, or the old plants are taken up, stored, and started again in heat in the spring. An excellent variety of Canna for the sub-tropical garden is C. Ehmanni iridiflora, the Fuchsia-flowered Canna, with large Musa-like leaves and drooping scapes of flowers of a rich carmine-pink colour. Hedychiums are also valuable for their foliage. The Blue Gum (Eucalyptus globulus) is very telling when in a comparatively young stage, as its glaucous colour is at that period particularly effective. Comparatively large specimens can be grown in moderate-sized pots, which may be plunged in the beds. This Eucalyptus grows well in the open in sheltered positions on the south-west coast, some specimens having attained a height of nearly 30ft., while they flower freely and produce fertile seed. However, in none but particularly favoured spots in England can the Blue Gum be treated as a permanent outdoor subject. The India-rubber plant (Ficus elastica) is also often made use of,

and Grevillea robusta is another subject of particularly graceful habit that is valuable in sub-tropical gardening; it can be plunged in the bed well over the rim of the pot, and if repotted after being removed in the autumn, may be kept in good health for some years.

Melianthus major is a plant that, in certain favoured spots in the south-west, proves hardy in the open. Its large, deeply-cut, glaucous leaves give it a striking appearance and render it worthy of a position in the sub-tropical garden. In all but very cold localities, or where the soil is exceptionally damp and heavy, it may be kept through the winter unharmed if its roots are covered with leaf-mould, rough litter, cocoa-nut fibre, or coal ashes.

Musa Ensete is, without doubt, one of the most attractive features of the sub-tropical garden when in vigorous health. Glass shelter during the winter is a necessity for these plants, though cases have been known where specimens, artificially sheltered, have passed through a winter in the open; but where they have survived they have usually received a severe check, which has had the effect of rendering them far less ornamental than if they had spent the winter under glass. Musas may be either plunged in the tubs in which they have been grown through the winter, or the tubs may be removed, and they may be planted in the prepared bed, being lifted carefully in the autumn and taken back to the shelter of a glasshouse. Musas are of particularly rapid growth, seed sown in heat in January or February producing plants that measure from 10ft. to 12ft. high in the summer of the following year. There are few more beautiful sights than these Musas when all their leaves are intact and glossy green, few more pitiable than they present when the leaves are whipped into ragged fringes by blustering winds. On this account a very sheltered position should be chosen for planting out these noble subjects. The hardy Fan Palm, Chamærops Fortunei, or excelsa, for the two are practically identical, has already been spoken of. Other Palms to be used in the sub-tropical garden must be grown in very large pots or tubs under glass during the winter, and plunged in the open during the summer months. Good kinds for this method of culture are Latania borbonica, Seaforthia elegans, Phœnix canariensis, and Kentia Forsteriana. Certain of the Tree Ferns are also exceedingly decorative in the shady parts of the sub-tropical garden. In a few favoured spots in South-western England and Southern Ireland fine specimens of Tree Ferns may be seen planted out in the open and apparently in the best of health, but in the majority of cases tub-culture under glass in the winter, and plunging in the open air during the summer, must be the method resorted to. Good kinds for such treatment are Dicksonia antarctica and D. squarrosa, Cyathea dealbata, and C. medullaris.

Of flowering plants for the sub-tropical garden, Datura suaveolens is one of the most suitable. It has been already referred to. The lofty Cape Hyacinth (Galtonia candicans) also associates well with such subjects, as does Abutilon vitifolium when grown as a tall, pyramidal bush some 8ft. high, and covered with white or lavender blossoms. Many plants raised from seed in heat will be found useful for filling up, such as the Castor Oil plants (Ricinus), especially the dark-leaved R. Gibsoni, the giant Hemp (Cannabis), Nicotiana Wigandioides, Solanum robustum, S. marginatum, and S. pyracanthum, as well as Maize (Zea Mays) and its variegated form.

Of course sub-tropical gardening is only possible in very large pleasure grounds. Masses of Cannas, Solanums, Galtonia, or Datura are necessary to get the true effect of these plants. Tub-gardening has been referred to by Mr. Burbidge, and it is to be hoped that this phase of summer gardening will become more popular. There are no difficulties to overcome, and in many cases it is simply necessary to place the plants in a shed or dry cellar during the winter with sufficient protection from frost. The Agapanthus is one of the most charming flowers for tubs, and when not "over-tubbed," that is, too much soil given, blooms abundantly and continuously through the summer months.

FLOWERING ALOES.

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A CORNER OF THE LAWN AT PANSHANGER

LAWNS AND WALKS.

THE lawn is one of the most beautiful features of the English garden. In this cool and moist climate it is easy to obtain those rich, velvety swards which are the envy of dwellers in hotter and sunnier climes; but, though the grass grows freely, a good beginning and much after attention are necessary to maintain the lawn in condition.

SUITABLE SITES OR POSITIONS.—This is a most important point to consider. It is easy to have a lawn in any aspect; but if upon a steeply-sloping bank, a dry season soon tells, especially if the soil be very shallow and the aspect due south. With a fairly level plot of ground there is little trouble; and a gently undulating piece of well-kept turf has a more pleasing and soothing effect to the eye than a large tract of perfectly level grass. But under no circumstances should there be holes or sudden sinking at places, whether upon a bank or apparently natural undulation. Some portions should be level, and if it is desired to have a tract of table-like smoothness, great care must be taken in the initial preparation of the ground.

SOILS AND DRAINAGE are of great importance, especially the last-named. Although almost any soil will grow grass and weeds, a good loam, of medium richness, is necessary to secure the best lawn grasses in good condition. If the soil be stiff and close, it can be much improved by adding a few finely-sifted ashes. If poor, as well as close, then stable-manures and a little coal soot are a great help. At the same time, where procurable, add as much as possible of a lighter and richer loam, such as that from an old garden. A very light soil is quite as much in need of improvement. Add stiff or heavy soil, and help also

with pig-manure, stable dung from where peat moss litter has been used, and otherwise assist in retaining more moisture. For although a lawn must never be wet and sodden, it must not become dry and parched. A very shallow soil, such as is often found above sand, gravel, and chalk, needs a good layer of stiff loam, and to be treated the same as advised for a light and quickly-drained soil. The most unsuitable soils are those very shallow ones found upon a gravelly or chalky subsoil, and where water is almost always present. The first have been dealt with, but the last must be assisted by good drainage.

DRAINAGE.—Rather than put in deep drains at considerable distances apart, use several 1ft. to 18in. below the surface. The cost is rather less, both for labour and pipes. How close, and also how deep, these drains should be made depends entirely upon the nature of the soil, and whether in a low or somewhat raised position. It is in late autumn and early spring, especially the latter, that a lawn is very wet. If sodden, moss grows freely, strong-growing water grasses seem certain to develop, and the lawn is of little use, even in midsummer. On the other hand, many lawns are over-drained. If the situation is at all raised, or upon a natural slope, no drainage will be needed, even should the soil be stiff and heavy; but where a level portion is to be made upon such a slope, due care must be taken that the rush of surface water from above is carried away to the sides, otherwise a heavy shower will soon turn the lawn into a miniature pond. It is not necessary that pipes be used. A drain can be cut out 2ft. or so in depth and filled in with six or more inches of broken bricks, or other coarse rubble. In the case of pipes being used, be sure that there is at least a fall of 1in. in 6ft., and place a shallow layer of broken rubble over the pipes before filling in again with soil. A little consideration before operations are begun, and also during the work, will make it easy to decide how close, deep, and in what directions the drains should run. Oftentimes these points will vary, even upon a small lawn. The

THE LAWN AT LILLESHALL.

THE TENNIS LAWN, WEST DEAN PARK.

aim is to secure uniformity, as far as possible. A properly-laid drain, of 1½in. in diameter, will answer all purposes, as the drains only need to be a little closer together where the ground is very wet, in which case they are even better than large pipes. Nor can moles gain access through the smaller bore. When drains are laid, be sure to thoroughly ram down the soil again, unless the whole of the soil has been newly made. This is especially necessary where a drain of any kind has been made in a lawn already established, as, unless well beaten down and allowed a little time to sink before the turf is relaid, there will be a distinct depression throughout the length of the drain's course.

LEVELLING is very simple, if a few points be borne in mind. It is not always necessary nor desirable to have a perfectly flat and horizontal surface. The term also applies to the even surface formation of slopes. Having worked the main body of soil as nearly level as the eye will guide, after a glance from more than one direction, decide what shall be your mean height; set a shallow brick here, and at some point, several feet distant, place another. Upon these a piece of stiff "quartering," or a narrow board that will not sag, should be set, and a common spirit-level used to get this perfectly horizontal, raising or lowering the bricks until this is obtained. Put a little soil to this, or remove as may be found necessary. Repeat this operation from various positions, always taking care that the first guide-brick set is on the level. Of course each other brick, after it is adjusted, will be of the same height, and can be taken as a guide accordingly. A strong piece of string, tightly stretched from point to point, is a good guide in the earlier stages, and by driving in a few pegs at various parts of the ground, the tops of which are at the desired level, all risk of movement will be avoided. When making a level lawn upon a sloping piece of ground, set a stump or peg at the lower end at the height you judge will be necessary to take the soil that is to be excavated from the higher end. Now dig a narrow trench just sufficiently wide to take a piece of string easily, and follow this until the further end is deep enough to stretch the string quite level. It will soon be seen whether calculations were correct or not, and repetition of labour avoided. To make

an even slope, use the strings and pegs in the same way, stretching two or more throughout the whole length, and working up to these as may be required. The level and straight-edge come into use here also, as by placing them horizontally, and afterwards using the straight-edge from point to point, in the direction of the slope, uniform slope is secured.

PREPARATION.—Whether seed is to be sown for the future turf, or turf taken from another place put down, the whole surface must first of all be made level and dressed down finely. In the case of relaying a lawn with the same turf it will only be necessary to lift this, in the manner that will be described later on, previous to levelling. One of the most important points is to move the whole of the soil uniformly as far as possible. But in many cases this cannot be done. One should have a portion that is quite solid when making a new lawn upon a slope, and let the remainder be loosely-moved soil. This must be adjusted by ramming that freshly moved and by slightly lifting that portion from which soil was taken. It often happens, also, that the soil left at the upper end is too poor. Remove, then, the rich surface, and enrich the subsoil exposed by one or other of the methods advised under that heading. Always endeavour to let the ground rest a short time before sowing seed or laying turf. The turves must be unrolled and laid as closely together as possible, beating them down as the work proceeds. Before putting down a second row, rake over the soil once more. Use a plank to walk upon, and have a little finely-sifted soil at hand to fill in any small indentations that may be made. The level must be used again in laying the turves, as unless they be cut at a perfectly uniform thickness the previous levelling will be of comparatively little use. Trim off the edges with a sharp turfing-knife, being careful to set the line tight and straight, and give an occasional look to this as the work proceeds. In sowing seed, set a narrow verge of turf around the edges, beat this down well and level, and sow at the following rate. A good mixture of lawn grass seeds can always be obtained at the florist's. A peck will sow a little over 2,000 square feet, or 4lb. to 5lb. can be used to the square rod or pole. The mixture must be kept well stirred during sowing, as the weight of the seeds varies so much. An even better plan is to mix the seed with some light soil, and then scatter the whole broadcast in the most uniform manner possible. Far better to go over the ground twice, from different directions, than to sow too freely at first. Rake the surface over once more, and then stretch several pieces of thread across to prevent birds from picking out the best and heaviest seeds. Seed should be sown in April or late in August, so far as can be arranged.

SELECTING AND CUTTING TURF.—Choose turf from pasture land as far as possible, and see that it does not contain such noxious weeds as Dandelion, Plantain, Daisies, Thistles, Docks, Yarrow, etc. Let each turf be of uniform width, and, as nearly as possible, 2½in. to 3in. deep. Roll the turves up, grass side inwards, or stack them very loosely. Cut the turf as near as can be to the time when it is to be relaid.

TREATMENT AFTER MAKING THE LAWN.—When the turf is set, dress over with some good loam, and work this well into the crevices with a broom. Indeed, sweeping and rolling will do much towards securing a perfectly firm and uniform turf. With seed we must wait until this has grown some 2in. or so, when it may also be rolled and swept, but the broom must be used gently upon the first occasions. Do not cut the grass until it has once more grown up some 2in. after rolling, and then merely clip off the tops. As time goes on these operations must be completed, meanwhile keeping a close look-out for seedlings of weeds, and removing them as soon as noticed. Many complain that lawn grass seed and mixtures are charged with these when purchased; but this is generally wrong. The seed was either in the soil or drifted there and germinated with the grass seeds sown. No matter where a piece of fallow ground may be, these enemies are soon found, even when the older plants are far distant. Once a good lawn is secured no other seeds will have a chance, especially if the lawn be properly looked after. How often a lawn should be cut must depend entirely upon its growth and condition. It can only be said that constant rolling and sweeping

are conducive to a glossy surface, especially when assisted by the dressings to be named later on. Sweeping distributes worm casts, while rolling keeps the useful little worms from being unpleasantly active. Worms are far from injurious to a lawn, being the best natural drainage and doing their work at the parts were most needed. A lawn upon which these are unpleasantly numerous is clearly in want of additional drainage. Towards autumn, when leaves are falling, and again during the winter, when the lawn is too wet for use, sweeping and rolling must still be kept up, although not to the same extent. Otherwise the grass gets coarser, worms draw in so many leaves, and it is generally unsightly. Tidiness is a great help to the lawn, both in appearance and condition.

ERADICATION OF WEEDS AND MOSS AND THE RENOVATION OF INDIFFERENT LAWNS are important items. Such weeds as Yarrow, Dandelion, Dock, Plantain, and others must

A LAWN GARDEN.

be cut out bodily with a Daisy eradicator or other useful tool. The use of lawn sands and various liquids as a means of destroying these is not advisable. How can one hope to destroy such varied and strong weeds, and yet leave the best of the lawn grass uninjured? Nothing but perseverance will be successful, and suitable dressings will then often bring the lawn into good condition again in a short time. Moss is a great trouble in some cases, but this is generally a proof of poor soil or a too wet condition, and can be remedied accordingly. An excellent plan is to rake up as much of the moss as possible, and dress with two-parts rich loam and one of lime in autumn, or at any time when showery. By not dressing deeper than half an inch, and giving a thorough sweeping soon after, one need not have the lawn unsightly. At any time a poor lawn can be much improved by a shallow dressing of decayed vegetable refuse, manure, and loam in equal proportions, the whole being passed

through a coarse sieve. Bare places may be sown with a little seed, as advised for the main lawn, and a thin lawn may be sown with a mixture of grass and White Dutch Clover, using these at one-fourth the rate advised previously, and at the same time a liberal dressing of soil is given. In the summer months, a sprinkling of such artificial manures as Clay's Fertiliser, guanos, bone dust, etc., may be given during showery weather. These are not unsightly, while they quickly promote a rich sward. In late autumn and winter, well-decayed manure from a stable where peat moss litter is used, soot, wood ashes, or any dressing of good soil may be given with advantage. These must not be so overdone as to cause rankness of growth; but if well attended to, and a good quality grass has been obtained, there is little fear of coarseness. Where a lawn is being made near to a newly-built house, pay great attention to the matter of mortar, bricks, etc., that invariably get buried or mixed up with the surroundings, removing these where too prevalent, and afterwards proceeding on the above lines.

A NATURAL GRASS WALK.

No Lawn Tennis Court can be pleasurable unless the grass be evenly cut, of cushion-like softness, and perfectly level. The dimensions of a tennis court are as follows: Full length, 78ft.; width, 27ft.; net to be in centre and extend 3ft. over each side of the court; 3½ft. high at the ends, and 3ft. high in the centre; service lines 21ft. from the net upon each side.

Grass and Gravel Walks.—Walks are needful in all gardens, but there is often needless multiplicity of them, cutting up lawns and pleasure grounds into irritating squares. Every walk should be made with an object and to lead somewhere, but this is not always done, as one may see by visits to English gardens. Always make them thoroughly well, otherwise there will be constant after troubles, and the work will have to be undertaken again. If laid with care at first they will last for years, but when the work is not done well at the commencement no amount of patching up or surfacing with various materials can be satisfactory. The choice of material is wide, and oftentimes one can find some close to hand that is equally as good as the more expensive gravels, etc., from a distance. The main point is to have a dry walk, one that water runs from quickly and does not leave a sticky or muddy surface after every shower. One of the greatest pleasures of gardening is a walk round after a spring or summer shower, and this cannot be enjoyed if the paths are not well made.

Gravel is the material most used, and is generally the least expensive. Some gravels are

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A COVERED WALK.

excellent when wet, but either kick up loosely and patchy in dry weather, or are exceptionally soft after frost. The term gravel is often applied to small sea-beach, which is also frequently used. But this is always more or less loose, and, if dry and clean, by no means so pleasant to walk upon as a firm and well-rolled binding gravel. Burnt ballast and broken refuse from foundries and brickyards are very useful and clean at all times. Then there are asphalte and concrete, which if properly laid at first will last well and have the advantage of being weed-proof. But the last two never look so well in keeping with a garden as walks made of good binding gravel, such as the Croydon and Kensington gravels. Lastly we have grass walks, and few are more pleasant in the flower garden during summer. It is unfortunate that we cannot always use them during other seasons of the year nor in showery weather.

Before going into the uses of the above materials, the formation and drainage of walks must have attention. It seldom happens that a garden is perfectly level, so that the walks will naturally have a slight fall in some direction. If this cannot be secured, and the subsoil is of a retentive nature, side drains must be used. These should be about 3in. or 4in. below the surface, and can be easily laid when filling in with material, for all walks should be excavated to a more or less depth, according to their width and the nature of the soil. The ordinary paths used in villa gardens are more particularly alluded to here, ranging from 3½ft. to 5ft. in width. Take out the natural soil to a depth of 6in. in the centre and 8in. or 9in. at the sides. Then put down a layer of the roughest material possible, such as broken bricks, coarse gravel, flints, clinkers, chalk, broken crockery, etc. Sufficient should be used to leave a fairly level surface some 2½in. below the proposed height of the path. Upon this again place a layer of less coarse material to be well rolled or beaten down. This will generally allow for 2in. or so of surface gravel, and less should not be laid if a good path is to result.

The surface of a path should not be perfectly level, nor, on the other hand, is there need for so great a rise in the centre as is frequently given. An inch and a-half is ample for walks 5ft. wide, provided the top gravel has been well rolled and beaten down, which will rapidly throw the surface water to the sides, where it either percolates to the rougher material beneath or to the small drains laid down in the case of retentive subsoils. Always make the material

firm before adding a layer of smaller grade. It is a good plan to drive in a few stumps or pegs before finishing with the last layers of finer gravel. The tops of these stumps or some mark upon them should represent the height desired when the work is completed. It is also well to make the edges first after the rougher material is down. Let these be well rammed, so as to secure a firm edge. After this it is an easy matter to add the surface gravel to a given depth, raking it down with a very large garden rake or one of the wooden hayrakes first.

This layer should be well trodden down, crossways if possible, and a second man should follow with a smaller rake to remove any stones and remedy the slight inequalities that may appear after the first raking. It must be remembered that a slight sinking now will be much increased when the rollers have gone over and as the path becomes used. It is a mistake to use the heavy roller first after the finishing coat of gravel has been applied. A lighter one puts the top coating into place and secures a more even and firm surface after the heavier roller has done its work. Endeavour to get the gravel quite firm before rain comes. After a gravel walk, or one surfaced with ashes, etc., is made, it still needs frequent rolling to keep it in good order. The times for this vary with the weather and the class of material used.

The edgings or verges of walks are most important. Those formed of sods or turves cut from an old pasture or park are excellent. These may be 6in. to 8in. wide and nearly as deep. Place them so that about 2in. needs paring off, upon the path side, to leave the desired width. Cut down with a sharp spade or turfing-knife, after having rammed the whole firmly. It has a good effect if a narrow turf of better quality can be placed on top after the path is finished except the last raking and rolling. Such verges are excellent guides in the final stages of path making, and should always be made at the level at which they are to remain. If tiles and bricks are used as edgings they should be fixed before the last layer of gravel is put down.

Grass Walks.—The centres of these must not be dug out, as in the case of gravel walks. Here a level surface is needed—or very nearly so—and if very wet a small drain some 4in. deep upon each side. As a rule, a grass walk is merely a narrow strip of lawn, and may be treated accordingly.

THE BROAD WALK, HUNTERCOMBE.

In many English gardens, even where great opportunities exist, the grass walk is a thing unseen, though so delightful to walk upon and a delicate setting to flowers grouped by its margin. Immediately near to the house a grass walk is not advisable, because of its dampness in wet and showery weather, but away from the house, where walks run into the woodland, skirt some mixed border, or intersect shrubberies, the grass drive and walk are grateful to the eye and restful in every way. Grass walks are as readily made as the lawn. Often they exist naturally, or may be taken from the surrounding verdure. The beautiful grass walk leading from the Palm House at Kew was once hard gravel. Now a wide walk of velvety turf is there which does not offend, and creeps back into the surrounding woodland. Occasional cutting is necessary, of course, but grass walks entail less labour than many suppose, certainly not the needless work of weeding and raking, whilst at all times gravel walks are hard and comfortless. The green sward is artistic and agreeable—a cool setting to the mixed border with its wealth of flowers, which, may be, skirts it on either side, with, perhaps, crimson Peonies tumbling over the margin. In the early summer months one seeks the garden, not the terrace garden or formal parterre, but the shady nooks and Rose - perfumed pergolas and the green grass walks which lead up away to the woodland or lure to delightful retreats, where to put a gravel walk would be akin to sacrilege. For many years, with merely attention to the trees near or plants or shrubs by the margin, the grass walk remains cool and pleasurable, but overhanging boughs and shrub branches must be cut away from time to time to prevent the grass becoming bare from want of sun and air. Many of the gardens of England owe their chief attraction to the velvety grass walks and drives. Bulwick would not be so fine a place if all the walks were gravel, and the glorious mixed borders would lose their fresh colouring and wonderful effect. Nor would that garden of grass walks—Alton Towers—prove so interesting without its green vistas, fringed with leafy Rhododendrons and many shrubs.

A FLOWER-FRINGED GRASS WALK.

THE GARDEN AT LILLESHALL.

HARDY FLOWERS.

TO praise the hardy flowers which fill the garden with beauty throughout the year is surely needless; but many useful lessons may be gathered from the remarks concerning this beautiful race. It tells the season of the year as the emblems of each month open out to the sun. Not many years ago the garden was the reflection of a few gaudy exotics, set out in prim beds or banked up into little dumpling-like mounds, as interesting as a graveyard, and unchanged from planting time until the first breath of frost turned them to corruption. This flaming colour made by a few set plants is not got without a large outlay, and the wintering of such plants is an unnecessary cost.

One turns wistfully to the cottage garden in which the white Pinks creep to the garden paths and the Roses garland the porch, flinging their fragrant clusters into the little latticed windows, through which floats the perfume of cherished flowers. Hollyhocks rise above the fence, and Sweet Williams spread into groups of colour, overshadowed may be by some tall Larkspur, lifting its sheafs of blossom as blue as a summer sky. Artless grouping comes by the free growth of the plants themselves—here a Lilac bush with bulbous flowers clustering near to it, there the Mock Orange, burdened with fragrant blossom in late summer—teaches the lesson that in free masses a flower tells best its sweet tale. Happily, an increasing love is apparent for this race, and better ways of planting are adopted, making the perennials occupy their rightful place in the garden, not restricting them merely to the mixed border. Use them in the beds, which in many gardens still are filled with "Geraniums," Lobelias, and a few things repeated until one is heartily sick of their strong colours. When

planted in moderation, all is well; it is their sole use that is aggravating, because a hundred lovely flowers are thrust from the garden.

The garden should be full of colour at all times, even in winter, when the leaves of Saxifrage, Heuchera, and others are painted with rich hues, and the berries of many a shrub glow against the brown bare branches. With the first coming of spring, flowers welcome us in greater array, Snowdrops and a host of early flowers gladdening the garden until the Tulips open their big crimson globes and the first Roses expand shyly in the sunshine.

Onward the procession moves, until in rich autumn-tide the Starworts toss their cool-tinted flowers in the September breezes, the Flame-flowers and Scarlet Lobelias are glorious groups of colour, and the Tea Roses even daintier and sweeter than in the poetic time of the queenly flower—the month of June, which is no longer true. Roses are with us from June until the rains and frosts of winter bid them depart.

Fair is the garden planted with the best perennials, perhaps in groups in the border, or mixed with low evergreens or deciduous shrubs, trying always to get away from beaten

THE ITALIAN GARDEN AT ASHRIDGE.

tracks. Never copy your neighbour, or think the border is the only place for these gifts from afar. One may take, as an illustration, the Starwort, or Michaelmas Daisy, which is welcome in the border, it is true, if not bunched up like a sheaf of corn; but these cool-tinted flowers are seen in a prettier aspect amongst shrubs, over which their graceful stems are tossed in wild profusion.

Another side of the question may be considered, too. The hardy flowers are happy in quite small gardens, whether in the town or the free, pure air of the country. Nor is much preparation of the soil required, unless it be composed of builder's rubbish which would scarce support Daisies. Given reasonable attention, however, and the majority of the hardy perennials described are vigorous almost anywhere, colouring each month of the year, and making life happier by their constant presence. A mixed border or beds of hardy flowers must be places for plants to blossom in succession, from the time of the Crocuses until the Christmas Rose, and this is only accomplished by much enthusiastic work and constant plantings or replantings. A hardy garden demands time and knowledge of the flower world about us.

Acanthus. This is a group of hardy plants of value for their noble leafage and bold growth. They are worth grouping upon the lawn simply for foliage effect, delighting in warm soils, such as light deep loam. When increase is desired, divide the roots early in the autumn, or seeds may be sown in gentle warmth in spring, or out of doors in summer. There are many kinds, but a strong family likeness runs through them. A. mollis is as fine as any. A. hirsutus, A. longifolius, A. lusitanicus, and A. spinosus and its variety spinosissimus are the chief kinds. The strong stems with brownish flowers are handsome also.

Adonis.—A charming family for the border or rock garden, relishing well-drained loamy soil where there is sufficient depth for its roots to go down. The most familiar species is A. vernalis, which bears its large rich yellow flowers in early spring, and when in full bloom a mass of plants makes a brilliant spring picture. This, as in the case of all the Adonises, is easily raised from seeds sown in summer in pans in a cool frame, or by dividing the roots in late summer. The operation of dividing the plants must be carefully performed. A. amurensis is less known, and is very early in flower, in mild years even in February, when its yellow colour is welcome. Plant it on the rock garden in some spot not too exposed to winds and heavy rains, but frosts do not destroy the flowers, which regain freshness with the sun. A. pyrenaica is a good kind, also with yellow flowers.

Alliums.—A few pretty kinds occur in this family, known best by the onion. Those grown for the beauty of their flowers succeed best in soil composed of half loam, with the same quantity of peat or leaf-mould, and to be left undisturbed for years. A. neapolitanum, known by its white flowers, and the dwarf yellow-flowered A. Moly, frequently seen in gardens, are the most familiar. Other kinds worthy of note are A. cyaneum, the plant growing 18in. high, flowers pale blue, a charming tint; A. flavum, August flowering, yellow, the leaves grassy; A. azureum, a tiny species, blue; A. Owstrowskianum, rose pink, 9in. high; A. narcissiflora, very distinct, June flowering, the pink flowers produced in drooping clusters; and A. giganteum, which grows 4ft. high, and has large purple flower-heads. A dainty rose-coloured kind is A. pulchellum. The rock garden is the most suitable position for the smaller forms.

Aloysia citriodora (*Lemon Plant or Sweet Verbena*).—A delightful old garden plant, the leaves emitting a strong lemon-like fragrance when slightly bruised, and their soft green colour is pleasing. This may be grown freely by the sea-coast and against warm sheltered walls, but during hard winters it must be protected by a covering of coal ashes over the roots. A plant to grow against the terrace of a house. Propagate it by cuttings of moderately-ripened shoots taken in summer and put round the edges of pots in a frame or under a hand-glass.

Alstrœmerias.—In Alstrœmerias, or Peruvian Lilies, we have a race of flowers some of which are almost indispensable in the adornment of the garden. Foremost in beauty are the hybrids of A. chilensis, which range in colour from crimson to cream and create a delightful effect when planted in good-sized clumps and masses. A. aurantiaca and A. aurea, two varieties bearing orange yellow flowers, the former of which often attains a height of 4ft., while the latter rarely exceeds half that height, are also valuable both for the border and as cut flowers. A. versicolor is another good garden variety, while A. pelegrina and its white form are charming flowers, which, however, lack the hardiness of the before-mentioned kinds. Alstrœmerias are easily raised from seed sown thinly, as soon as ripe, in pans or pots. In these they should remain the first year, and should then be planted in their permanent positions in the borders after the growth has died down. In warm climates and light soils the roots may be planted at a depth of from 4in. to 6in., but in heavy soils and in exceptionally cold localities at least double this depth is preferable. When Alstrœmerias are once planted, the roots may be left undisturbed for four years, when they should be lifted, divided, and at once replanted. The soil should be well enriched if the plants are to exhibit the full beauty of which they are capable, and, in the case of old plantations, attention in supplying them with liquid fertilisers will be found to have a beneficial effect. The merits of these plants are so self-evident, and their culture so simple, that no one who has witnessed their summer display, and has once grown them, would willingly permit their absence from the garden. Other kinds besides those already alluded to are A. densiflora, a climbing variety, scarlet with black spots; A. Diazi, bearing large rose-coloured flowers; A. hæmantha, with scarlet-red purple-lined flowers; A. Hookeriana, having rosy blossoms tipped with green; A. pallida, flesh-coloured and yellow, veined with red; A. psittacina, bearing drooping flowers of a deep red colour; A. pulchra, somewhat similar in habit to the preceding species, but producing sulphur-white blooms spotted with red; A. Simsi, with bright yellow flowers streaked with red; A. tenuifolia, bearing flowers of a violet-pink hue; and A. versicolor, already mentioned, a variable species, with flowers ranging in tint from rosy crimson to saffron.

Amaryllis.—Of this handsome family few are adapted for the open garden. A. Belladonna, the well-known Belladonna Lily, is from the Cape of Good Hope, a bulb therefore requiring a warm sheltered position. No place is more suitable for it than the narrow south border skirting a warm plant house. Such a border exists in most gardens. Put the bulbs about 1ft. deep and plant in early autumn, protecting during the winter with bracken fern, cocoa-nut fibre refuse, or leaves. A thoroughly drained soil of light loam, well-decayed manure, and sharp silver sand is a good staple for the bulbs. The spikes are sturdy, about 2ft. high, and crowned with an umbel of large delicate rose flowers. A. B. blanda is in bloom in summer, before the species and its flowers are not so rich in colour. The Jacobea Lily (A. formosissima) is less hardy, though if planted in the spring its deep crimson flowers will appear the following summer. But quite a warm, sheltered corner where the soil is light is necessary. It is, as a rule, wiser to grow this Lily in pots, as it may be easily brought quickly into flower with heat.

Anchusa italica.—This is a charming flower for a shady nook in the garden. It belongs to the Borage tribe, and bears a spike of beautiful flowers, as blue as the Borage itself, and they remain for a considerable time. A large colony of it is pretty in quite a shady border backed with an Ivy-covered fence, the rich green Ivy leaves deepening the lovely colour of the flowers. It must be considered biennial, sowing seeds in summer, or, indeed, at almost any time. If in summer, in the open, but at all other times sow under glass.

Anemones (*Windflowers*).—The Anemones or Windflowers constitute a race of plants on which the gardens of both rich and poor are dependent for much of their spring beauty. The following are the leading kinds:

A. alpina.—A strong-growing plant requiring deep soil, attaining, when in vigorous health, a height of 2ft., flowers white, cream, or yellow. A May bloomer. A. a. sulphurea, a form of the last-named, has soft yellow flowers 2in. in diameter. This is a popular and handsome Anemone.

A. angulosa, also known as the Great Hepatica, having sky-blue flowers 2in. across. It grows to a height of 1ft., and does well in deep soil in rockery or border, but should not be planted in a position where it will be scorched by the sun. It is a very early bloomer, flowering in February.

A. apennina (*Apennine Windflower*).—A lovely little plant, easily naturalised in this country, growing well in thin woods and on sloping grassy banks; its light blue star-flowers are 1½in. in diameter, and appear in March and April. Associated in the grass with Lent Lilies, its effect is charming.

A. baldensis, a white-flowered, May-blooming Swiss kind, 6in. in height. It enjoys partial shade.

A. blanda, something after the style of A. apennina, but bearing larger flowers, produced earlier in the year.

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A. caroliniana, a delicate American plant, succeeding best in shady positions in the rock garden; height 9in., flowers whitish purple.

A. coronaria (*the Poppy Anemone*).—This is, without doubt, the most widely distributed of all our garden Windflowers. There are many fine-named strains, both single and double, of the Poppy Anemone, some of these producing flowers 5in. and more in diameter, while the colours are brilliant and varied, creating a bright effect in many a spring garden. The plants are easily raised from seed sown as soon as ripe. If this is saved, not purchased, care should be taken to separate it well before sowing by mixing it with a like quantity of silver sand. The seed-bed should be formed of a fairly porous compost, and situated in an open part of the garden. The surface, before sowing, should be firm and level, and if the ground is not moist, it should be given a copious watering previous to sowing the seed. It is a good plan to scrape the surface of the bed with a worn-down garden broom immediately before sowing, which should be done broadcast, the seed being then covered with a thin sprinkling of sandy soil, after which the bed should be again rendered smooth and shaded from the sun until the seedlings commence to appear, when the shading material must be removed. The bed must never be allowed to become dry until the young plants have finished their growth, or they will wither prematurely. If no hard frost intervenes they should keep green through the winter and blossom well in the spring.

POPPY ANEMONE.

A. decapetala is an American species, bearing creamy-white flowers 1½in. in diameter and growing to the height of 1ft. It blooms in late spring and early summer.

A. fulgens (*the Star Anemone*) is the most brilliantly coloured of the whole family, the scarlet of its blossoms being of an intensely vivid hue. There are both double and single forms of this Windflower, the latter being the most attractive. A. fulgens, though succeeding well in some soils, in others, especially in damp and heavy clays and loams, refuses to prosper. It may be raised from seed in the manner recommended for A. coronaria, In the south-west it often flowers remarkably early, in open winters sometimes in January, although its usual season is May. Its flowers are from 2in. to 3in. in diameter.

A. Hepatica.—This is probably better known as the common Hepatica. It bears in February flowers of varying colours, there being white, pink, and blue varieties, as well as single and double in all three colours. It is happiest in a light, rich soil.

A. japonica (*the Japanese Anemone*).—This well-known autumn-flowering plant was originally seen only in its pink-blossomed form; since then, however, a white strain has been introduced, the named variety A. j. alba Honorine Jobert being of exceptional merit. Two still newer varieties are the American-raised Whirlwind, of the hen and chicken order, and Lady Ardilaun, a semi-double; there are also several intermediate shades between the deep pink and white. In good soil Honorine Jobert will attain a height of 5ft. 6in., and is very floriferous. Propagation is easily effected by root division.

JAPANESE ANEMONE

A. narcissiflora is a North American species, growing to a height of 1ft. 6in., and producing umbels of cream-coloured flowers in May. It does well in a sheltered corner of the rockery.

A. nemorosa (*the Wood Anemone*).—This is a denizen of our own woods, which in the springtime are often spangled with its flowers. Its blue variety, A. Robinsoniana, is one of the gems of the family, and is exquisite when naturalised in grassy dells or round tree boles on the lawn, the silvery blue of its blossoms contrasting prettily with the green of the sward.

A. palmata.—An Anemone growing to the height of 1ft., and producing large golden-yellow flowers in the month of May. It prefers a rich, moist position in the rock garden.

A. Pulsatilla (*the Pasque-flower*).—This Anemone thrives best on a chalky soil. The plants attain a height of from 6in. to 12in., and bear violet-purple blossoms in April. There are several varieties, of which the best known are dahurica, lilacina, pratensis, rubra, and vernalis.

A. ranunculoides.—A pretty low-growing Anemone, with bright golden, Buttercup-shaped flowers, and usually succeeding best on warm, porous soil.

A. rivularis, from the Himalayan districts, is a water-side plant, growing to a height of 2ft., and producing white flowers in April.

A. stellata bears star-like flowers, purple, rose colour, and white, during the month of April, growing to a height of 10in. Double forms of this Anemone are not uncommon.

A. sylvestris (*the Snowdrop Anemone*) produces drooping white blossoms, sweetly scented, and fully 1½in. in diameter, during the month of April. It grows to a height of 18in., and succeeds best in a compost of leaf-mould and peat in a partially-shaded situation.

A. virginiana.—A North American variety, bearing small lilac-coloured flowers in May, and attaining a height of 2ft.

A. vitifolia.—Much resembling the white

Japanese Anemone, but more tender and less vigorous. Propagation effected in a similar manner.

Anthemis.—Of this pretty family, A. aizoon is suitable only for the rock garden; it likes a sunny spot where the soil is sandy loam. The plant is less than 1ft. high, and has silvery leaves in rosettes; the flowers are white, yellow in the centre. A. Biebersteini, A. Macedonica, and A. montana may be grown on the rock garden too, but the most useful of all the Anthemises is the British A. tinctoria, which has free heads of yellow flowers. There are a few good varieties, one, named Kelwayi, having flowers of a very bright yellow shade, and those of pallida are softer in tint. A group of any good variety of this Anthemis is charming, and the plant is easily raised from seed sown in early spring in gentle warmth, and pricked off and planted out in the usual way. These plants will flower profusely in the ensuing summer and autumn and be useful for cutting.

Antennarias.—These are familiarly known as cats' ears, and comprise such kinds as the Pearly Everlasting (A. margaritacea), which is quite happy in a warm soil. Its white flowers are useful for winter decorations, hence the popular name. A. tomentosa is a neat, silvery plant, used largely in some gardens for edgings, as it is quite dwarf, and very cheap, too. It is very useful for the rock garden. A. alpina is also pretty, and all require merely an ordinary soil.

Anthericums.—These charming flowers belong to the Lily tribe, and there are several beautiful kinds, such as the St. Bernard Lily (A. Liliago) and St. Bruno's Lily (A. Liliastrum), both with white flowers borne in graceful spikes, those of the variety of A. Liliastrum named majus being larger. It is worth while growing these plants for cutting. They are hardy, increasing freely in good loamy soil, and may be planted by shrubbery margins, between dwarf shrubs, in the mixed border, or even woodland, if the shade is not too dense. Plant them in early autumn, and they may be increased at that time also by division of the roots. One can raise them from seed sown when ripe in a cool frame.

AQUILEGIA

Antirrhinums (*Snapdragons*).—*See* "Biennial Flowers."

Aquilegias (*Columbines*).—These form a lovely race of plants, and with their beautiful colouring and exquisite shapes are most valuable, not only for the decoration of the garden, but for providing cut flowers for the house. They appear equally at home in the border or in the rock garden, but prefer a situation where their roots can obtain moisture to one where the soil becomes quickly parched. The following list gives the most noteworthy species and garden varieties:

A. alpina, a native of the mountains of Switzerland, bears blue flowers and grows to a height of from 1ft. to 2ft. It succeeds best in a moist and sheltered position in the rock garden. There is a beautiful variety of this plant with white-centred flowers.

A. californica, from California and the neighbouring States, grows to a height of 3ft., and bears flowers ranging from yellow to scarlet in their colouring, having incurved spurs with knob-like terminations. This Columbine is also known under the names of A. eximia and A. truncata. A moist and deep loam, fairly sandy and porous, suits its requirements.

A. canadensis, from Virginia, bearing orange scarlet flowers on slender bloom-sprays rarely exceeding 1ft. in height, is best suited by a sheltered position in the rock garden.

A. cærulea (*the Rocky Mountain Columbine*) bears beautiful flowers 2in. to 3in. in diameter, with white cups and blue perianths, the spurs being long and curving gently outward. It grows to a height of from 12in. to 15in. There is an almost white variety of this Columbine named A. leptoceras, and one supposed to bear larger flowers than the type named A. macrantha. It flourishes best in deep, sandy loam, and should be grown in prominent positions both in the border and rock garden.

A. chrysantha, from California, is a vigorous-growing species, and under good cultivation attains a height of over 4ft. Its flowers are primrose yellow and delicately shaped, with long, curving spurs. It is hardy and will grow in almost any soil, and is a fine subject for prominent positions in the mixed border.

A. fragrans, from the Himalayas, bears scented flowers of white or pale purple, and grows to a height of 2ft. A warm and sheltered position is requisite for the culture of this plant.

A. glandulosa, from Siberia, grows to a height of from 8in. to 12in., and bears large flowers with white cups and lilac blue perianth. It is a beautiful plant for the rock garden, but is very capricious in its behaviour, often dying out at once. It should never be divided when dormant, but whilst making growth. In some gardens it grows without any trouble, while in others it seems impossible to establish it. A deep bed of moist, porous soil containing peat and a good admixture of coarse sand suits it. There are several varieties of it.

A. glauca, a Himalayan species, bears white claret-tinted flowers on stems 1½ft. in height. It should be planted in a warm dry spot.

A. olympica, from Mount Olympus, bears large flowers with white cups and mauve-blue perianth. Height from 1ft. to 1½ft.

A. pyrenaica, from the Pyrenees, a rock garden plant, grows to a height of from 9in. to 12in., and bears lilac blue and white flowers.

A. sibirica, from Siberia, bears bright lilac flowers on stems 1ft. in height, and is well adapted for culture in the rock garden. There is a white variety of this Columbine named Alba, a fair flower.

A. Skinneri, from Guatemala, attains a height of 2ft. It is a slender grower, and bears flowers of yellowish-red with green sepals.

A. Stuarti, a hybrid between A. glandulosa and A. Wittmani, is a splendid introduction, bearing large flowers, sometimes 4in. in diameter, with white cups and spreading deep blue perianths. It grows to a height of from 1ft. to 1½ft., but partakes much of the perverse characteristics of A. glandulosa, and is often difficult to establish. It is worth trying, however, to coax this charming plant into respectable growth.

A. thalictrifolia, from the Tyrol, bears lilac blue flowers on stems 2ft. in height. The plant is covered entirely with a greyish down.

A. viridiflora, from Siberia, bears fragrant green flowers on stems 1½ft. in height. A curious but not particularly showy species. There is a variety called A. v. atro-purpurea, with chocolate-coloured flowers.

A. vulgaris, the common Columbine so often met with in our woods, is to be found in many colours, and both in single and double forms. It is useful for naturalising in out-of-the-way places and in the wild garden, some of the better forms being very ornamental. Wittmani is a variety of the last-named, growing to a height of from 2ft. to 3ft., and bearing large flowers with white cups and dark purple perianth. It is a strong-growing plant, and succeeds well in moist deep loam in the ordinary border. There are several forms of A. vulgaris besides this, alba being the white variety.

Aquilegias, though strictly perennials, very often die out after their second year, and should therefore be treated as biennials and raised annually from seed. This is produced in abundance, and should be sown as soon as ripe in a shady position in the garden or in pans in a cold frame, care being taken to sow the seed very thinly. When the seedlings are large enough to handle, they should be lifted and planted out in their permanent quarters. There is a beautiful race of hybrid Aquilegias, packets of seed of which may be obtained for a small sum, that produce a wonderful variety of charming flowers which are invaluable in the decoration of the garden. These hybrids have been wonderfully improved of late years, and most delicate gradations of colour are to be found in the flowers, saffron cups and deep purple perianths, palest sulphur and blue-grey, white and dark blue, primrose yellow and light pink, chrome and scarlet being some of the combinations, while pure white and pure yellow are also present. The shapes of some of these flowers are very graceful, many of them having long, outward-sweeping spurs over 3in. in length. They lend themselves to artistic arrangement, as cut flowers last well in water, and are easily raised from seed. The strongest of the seedlings usually prove to be coarse double flowers, and such plants should be weeded out of the bed as soon as this extra vigorous growth is apparent, this course allowing the others greater room for expansion. Plants producing double and badly-coloured flowers can be removed as soon as they reveal their characteristics. Aquilegias growing in the same garden are almost invariably cross-fertilised, and it is therefore necessary, where more than one variety is in bloom at the same time, to procure the seed from some other dependable source, unless the plants while in flower are covered with gauze to prevent the insects from reaching the blossoms. This unsightly plan cannot, however, be recommended in the private garden.

Armeria (*Thrift*).—Visitors to the sea-coasts will probably have noticed a pretty tufted plant with rosy flower heads. This is the Sea Pink, or Thrift (A. maritima), a plant that will live almost anywhere and makes a very charming edging. Propagate all the Thrifts by pulling the plants apart in spring, a necessary operation once in three or four years, as the old tufts get too dense, and flowers are few and far between. Another way is to increase by seeds, and some kinds, such as A. latifolia (A. cephalotes), the big Thrift, which is considerably taller than the Sea Pink, are perhaps best increased in this way, sowing the seed as soon as ripe under glass in a cold frame, and pricking and planting out the seedlings in the usual way. The Thrift is pretty as an edging; it forms a dense soft growth, and in summer a mass of bloom, but a sprinkling of flowers is produced for many weeks. Thrifts worth planting in the rock garden are those above mentioned and the tufted A. cæspitosa, the white and deep-coloured varieties of A. maritima named Alba and Laucheana respectively, and the beautiful, richly-coloured A. plantaginea splendens, but it is only the dwarf kinds that are of value as edgings.

Arums.—These are more curious than beautiful, and for the most part evil smelling. To this family belong the native Cuckoo Pint, or Lords and Ladies (Arum maculatum), and the distinct A. italicum, which has prettily-veined leaves, interesting when seen in a group in some moist, sheltered position in the rock garden or similar place. A. crinitum (the Dragon's-mouth), A. Dracontium, and the big A. Dracunculus, which have large lurid-coloured spathes, may be grown in warm borders of light soil, but they are by no means important garden plants.

Asclepias.—This is an interesting family of about fifteen species of perennial plants, the greater number of which are hardy. These latter make handsome summer-blooming border plants, and delight in a porous, rich soil. They are easily increased by division of roots in spring, and may also be propagated by seed. A winter mulch over the roots is advisable in case of severe frosts. All the species are natives of America. The following are best known:

A. incarnata, grows 2ft. high, and bears umbels of purplish red flowers. There is a very distinct variety named pulchra, of which the flowers are similar to those of the type, but the leaves are broader. It likes moisture.

A. syriaca, grows to a height of 5ft., and bears pale purple fragrant flowers.

A. tuberosa, height 2ft., bears bright orange flowers. This is the most generally grown species in English gardens, and is a very handsome plant when covered with its umbels of bright blooms. This is one of those plants that deserves to be more seen in English gardens. The orange scarlet colouring of the flowers is wonderfully rich, and by the sea, in particular, the plant seems to grow with unusual vigour. A soil composed of light, moist, and rich loam is most suitable. A correspondent writing some time ago, in a contemporary, from New Jersey, mentions that it frequently grows wild by the wayside. "Perfect exposure to all the sun possible seems of more importance than special composts; indeed, here are magnificent plants growing, with little or no soil at all, on stony railway slopes or along the fringes of rocky woods, and the most casual observer cannot fail to note their beauty, with flowers so distinctly rich in colour. Its relatives prefer swampy ground, and are also very abundant in this district, but cannot compare with this one in point of beauty, even in all their natural luxuriance."

A. variegata, grows to a height of from 3ft. to 4ft., and bears white and red flowers. The stems of this plant are variegated with purple.

Asphodeline.—An easily-grown class of plants similar to the Asphodelus. A. lutea is the yellow Asphodel, and is pretty in the shrubbery border, appreciating a little shade. A. liburnica and A. taurica possess some beauty.

Asphodelus.—A family perhaps better known under the more English name of Asphodel. The plants are not difficult to grow, but usually best placed in wilder parts of the garden. A. ramosus, white albus, asiaticus, and fistulosa are the chief kinds.

Asters (*Michaelmas Daisies or Starworts*).—No hardy plant of autumn is better than the Starwort, which pours forth its wealth of colouring when Flame-flowers (Kniphofias), Hydrangeas, and other rich flowers of September and October gladden the garden. Yet the Starwort is little understood. It is seldom planted in the best ways, and to bunch up the stems like a sheaf of corn is to deprive the plant of all natural grace and beauty. The Starworts should be grouped freely and well, clustered may be near some dark-stemmed pine, or throwing their flower-laden shoots over evergreen shrubs. The whole garden may be filled with colour when they are used unsparingly, rich masses of purple here, warm clouds of rose there, and again a sea of softest mauve, a spicy perfume scenting the air, and a thousand stems moving gently in the soft wind. It is not, of course, possible for everyone to grow the Starworts in bold masses, but where it can be done, these free groups are delightful. It must be a poor soil that will not satisfy the Starwort, hence in the woodland, even when the flower-rimmed growths are screened from full sunshine, it succeeds, in truth, is as happy in the wild garden as in the trimmed border. These flowers of the

fading year are fairer when growing as in their native prairies than when used in any conventional way. Propagate by dividing the roots in early spring, when new growth commences. Old tufts are apt to become flowerless and weak, and when they get into this condition, division and if possible a fresh site are necessary. Starworts bloom throughout October and far into November if the weather is fair, for storms of wind and rain and even frosts have little effect upon them. Asters differ considerably in stature, some quite dwarf, others even 6ft. in height, their willowy stems as graceful as any Reed. Selections have been given, and the first planted should be varieties from 2ft. to 3ft. high.

Dwarf Asters.—These are precious perennials to make groups of, perhaps creeping up to a bank of shrubs or firs which throw into relief the flower colouring. A. acris is very charming, its compact growths almost hidden in early September with lilac flowers, whilst those of A. Amellus bessarabicus are larger, and rich purple, but the plant is of the same height. A charming kind is Riverslea, its flowers rich purple-violet, an intense and glorious colour. Select also from A. cordifolius, mauve, graceful in growth; ptarmicoides, pure white; corymbosus, white, may be planted in the rock garden: also dumosus, mauve, very compact, and only 18in. high; the same as Lindleyanus, which has rose lilac flowers; Linosyris (Goldilocks), rich yellow; and Thomsoni, pale blue, a kind for the rock garden.

Taller Asters.—It is difficult to know which varieties to reject from the great wealth, but we should select the following before all others: A. Novi Belgi, it must not be forgotten, is a species, and has given rise to numberless forms, of which the finest are: Harpur Crewe, pure white, yellow in the centre; Purity, a beautiful Aster, with flowers of purest white, height, 5ft.; Robert Parker, the tallest of the group, 5½ft., the flowers large, and soft lavender in colour, a kind for all except very small gardens; Edith, pinkish mauve; and Leda, deep blue, height, 3½ft. Another species, named A. Novæ Angliæ, has also given rise to several variations, the most effective being Roseus, ruber, William Bowman, rose purple, and the late-flowering deep blue pulchellus. Of others, good groups may be formed of A. Lævis Apollo, lavender blue; l. Arcturus, very rich blue-purple flowers, and almost black stems; l. Ariadne, blue; l. decorus, soft lilac; and the soft mauve-coloured, late-flowering l. Calliope. Also include Cordifolius, ericoides, Shorti, polyphyllus, puniceus pulcherrimus, a very charming kind for grouping, its flowers almost of a blush tint; diffusus horizontalis, its branching stems smothered with red flowers; grandiflorus, the latest of all in bloom, hence its name of the Christmas Aster—its flowers are deep violet-blue; turbinellus, versicolor, and the small white-flowered but very pretty vimineus. Any or all of these may be planted without fear of failure in growth or effectiveness. The slender sprays of flowers are welcome for the house. Many sweet decorations may be composed of the Starworts arranged with or without other flowers. Seedlings are easily raised by sowing the seed in spring, and in time the plants reproduce themselves. Seedlings as a rule, however, vary, and sometimes a very beautiful form occurs worth perpetuating.

ASTERS (Michaelmas Daisies or Starworts).

Aster alpinus, an alpine species, is quite dwarf, rarely more than 9in. high, and most at home in the rock garden. Its purple flowers appear as early as July, and there are forms of it, one being white. Speciosus is a noteworthy variety, the flowers being large and of a beautiful violet shade.

Astilbes.—The Astilbes are more commonly known under the name of Spiræas, while by botanists they are classed under the generic name of Hoteia. Their root-stocks are perennial and their foliage deciduous, while their handsome flower-clusters are formed of innumerable tiny blossoms ranging in colour between white and carmine.

They are easily propagated by root division, and when grown in the open are best suited by a damp, deep, and porous soil and a partially-shaded position. Astilbe japonica and its varieties are largely used for forcing, the method followed being to pot the roots in good loam and leaf-mould during the month of October, and place in a cold frame, bringing the pots into gentle heat about Christmas, and, after growth has well started, moving into a higher temperature, when they come into bloom in March and April. After a season's forcing it is well to allow the roots a year's rest in the open before the next forcing, as they will, by this method, recuperate their strength, and flower far more satisfactorily than if subjected to forcing in consecutive years.

The best known of the Astilbes are A. chinensis, with blush pink flowers, 2ft. in height, a late introduction from China; A. decandra, an American species, bearing white flowers; A. japonica, the best known of the family. Of this Astilbe there are several varieties, a variegated one (A. j. folius aureo-reticulatus) and a dark-leaved one (A. j. folius purpureis) owing their distinction solely to the colour of their foliage, while A. j. glabrata and A. j. compacta multiflora are advances on the type in the matter of bloom production, the first-named bearing carmine rose flowers, while the last-named is at the present time the favourite market variety, producing larger and more abundant flower clusters.

A. Lemoinei is a beautiful hybrid variety bearing white flower plumes delicately suffused with pink; A. rivularis, from Nepaul, grows to a height of 5ft., and bears yellowish white flowers; A. rubra, a native of North-Eastern Bengal, is also a strong-growing plant, its flower panicles being tinged with pink; while A. Thunbergi also bears white flowers shaded with pale pink.

Astrantia major.—The greyish flowers of this hardy plant may be seen to advantage in wild, rough spots in the garden; but A. major and A. minor are sufficiently showy to introduce into the mixed border. Both kinds are very easily grown, thriving in quite ordinary soil and positions.

Aubrietias.—One of the brightest of our spring flowers is the Aubrietia, or Rock Cress. It will grow in almost any situation or soil, though a sunny site, where it can hang down over wall, bank, or rockwork, and where it has a deep and cool root-run, is best suited to its requirements. Sometimes, after frequent vicissitudes of weather in the way of alternate frosts and thaws, it loses its leaves, and in the early spring appears at the point of death; but the plant quickly recovers itself, and the bare stems are clothed again with leaves and flowers, seemingly as profusely as in seasons when it has been unharmed by the frost. The propagation of the Aubrietia is extremely simple, cuttings taken from the young spring growths, thrown out from the crowns, striking quickly if inserted in pots, pans, or boxes of sandy compost, and placed in frames, from which, when they are fully established, they may be planted out in their permanent positions. When first planted in the open, they should be freely watered in dry weather, or their roots will experience some difficulty in taking hold of and becoming established in the new soil, which should, preferably, be of a porous nature rather than heavy and close, though in some localities Aubrietias may be seen, apparently in the best of health, in soil inclining to clay. These plants may also be raised from seed, but seedlings rarely come absolutely true to colour. The seed may be sown in the open ground, and the seedlings thinned out to 3in. apart when large enough to handle. The plants may also be propagated by division in June or July.

There are numerous forms of the Aubrietia, many practically identical ones bearing different names. Almost all the garden varieties are descended from Aubrietia deltoidea, which was introduced from Naples in 1710. Amongst those to be most generally met with

AUBRIETIAS.

in gardens are A. Bougainvillei, A. Campbelli, A. columnea, A. erubescens, A. Eyrei, A. Fire King, A. græca, A. grandiflora, A. Hendersoni, A. hesperidifolia, A. Leichtlini, A. Mooreana, A. W. Mansfield, A. olympia, A. purpurea, A. purpurea grandiflora, A. rosea, A. Royal Purple, A. Souvenir de W. Ingram, A. spathulata, A. taurica or tauricola, and A. violacea. There is a poor white variety named A. antilibani, but it is of little value and is rarely met with in gardens. Some of the best of the foregoing are Campbelli, lilac; Fire King, crimson; græca, violet paling to lavender; Leichtlini, rose; purpurea grandiflora, large purple; Royal Purple, deep purple; Souvenir de W. Ingram, rich rose; and violacea, violet. No wall garden is complete without the Aubrietias in the chinks.

Auriculas (Show and Border Varieties).—The Auricula in all its forms is essentially a plant for those to grow who only possess small gardens; and to the cottager, or at least to those employed in other avocations than gardening during the day, much credit is due for the charming flowers raised. Successful growers may be found amongst mechanics in smoky towns; indeed, the Auricula seems as happy as the Carnation in mirky, soot-saturated atmospheres. With a cold greenhouse or frame, and careful cultivation, successful results may be obtained in almost any locality, choice varieties being grown in perfection.

There are three great classes, namely, Show, Alpine, and Border, and of these the two first-named are confined chiefly to the exhibition, as a frame is necessary, not for protection, but to shield the delicately coloured and powdered flowers from heavy rains and strong winds. The show Auricula is a flower to look into and discern those quiet markings and shades and perfect symmetry which go to form an exhibition bloom.

Show Auriculas are divided into four groups, named according to the colour of the flowers' margin. Hence there are white, grey, green-edged, and self flowers, and one named fancy, a group of quaint colouring which many enthusiasts in the culture of Auriculas for show admire. Alpine varieties are subdivided into two very distinct groups, one possessing flowers with gold centre, and another in which the colour is either white or grey; whilst the border kinds, those which perfume and beautify the open garden, comprise everything that will stand the trials of an outdoor life.

Culture of Show Auriculas.—Whether the Auricula is required to win prizes at the exhibition, or to add interest to the greenhouse, the assistance of glass is essential. Where a greenhouse is not available, then must a wooden frame be erected; but preference is usually given by growers to the span or lean-to greenhouse, as under such conditions the plants may be readily attended to at all seasons and in all kinds of weather without discomfort. Although much artificial heat is fatal to healthy growth, a little warmth judiciously given is helpful, especially to ward off severe frost and dispel damp. But forcing treatment is fatal. It merely stimulates weakly growth at the expense of flowers, which become drawn and lose entirely their characteristic colouring; for the Auricula in its natural state dwells upon the cold upland meadows. Few new varieties of merit are added to the list of show Auriculas, for the reason that the flowers are already so perfect in form and varied in colour that to obtain anything distinct and beautiful is not easy; whilst possessors of the choicest kinds care too much for them to risk distressing their growth through the burden of seed-bearing.

The greenhouse must be so arranged internally that the shelves are near the glass, otherwise it will be impossible to prevent the plants becoming drawn. Give an abundance of air, although this does not signify careless exposure to draughts, and in the winter admit all the sun, which at that season is not too strong to disturb the growth. Cool treatment is advisable through the summer, and therefore a frame under a north wall is a suitable spot, as a greenhouse or full exposure to the sun in summer is hurtful. Of course artificial shading in the way of screen canvas or mats can be afforded, but this is not so cool and grateful as natural shade. It is easy, however, to make the frame movable, so that it can be moved about according to the season, south, for instance, in winter, and north in summer. The position of the plants must be regulated, too, in the

THE CHINESE FOUNTAIN AT ALTON TOWERS.

THE TERRACE STEPS, VEN HOUSE.

same way, keeping them nearer the light in winter, but further from it, and for preference upon a cool ash bottom, in the summer.

When the weather is very warm, especially in spring, green-fly and other insect pests begin to trouble Auriculas, as well as flowers in general; but they can be quickly eradicated if attacked at once. When destructive measures are not quickly taken, the plant suffers, and the chances of success at the exhibition are considerably reduced. A small brush and soapy water will get rid of green-fly, or tobacco-water and soft soap, dipping the leaves in the mixture. When the visitation of insect foes is severe, recourse must be had to fumigation, using the XL Fumigator or similar contrivance. Watchfulness will prove a sure safeguard. The best policy is to destroy the flies before they have established themselves upon the juicy leaves.

In potting it is a great mistake to use pots larger than needful, and generally the practice of the leading cultivators is to use 3in. or 4in. pots, according to the size of the plants. When dealing with the offsets, that is basal shoots of the old plants, put them into very small pots, and in both instances use for soil a mixture composed of two-thirds sweet, well-decayed turfy loam, free from wireworms, and not made too fine, adding to this old hot-bed manure, well-decayed leaf-mould, crushed charcoal, and white sharp sand. This is an excellent compost for all sections and in all stages, but in the case of seedlings or offsets a rather larger proportion of sand may be added. Avoid those strange and fearful nostrums advised in old books concerning the Auricula. Happily they are not used nowadays, so that a warning to avoid them is perhaps unnecessary. The pots must be carefully drained, putting in plenty of crocks, and on these a few bits of charcoal, then some coarse pieces of soil to keep the finer particles of the staple from running down amongst the drainage and preventing a free egress of water. Always have thoroughly clean pots, and when these are new soak them for some hours before use.

A favourite way of raising Auriculas is by seed, but, as previously mentioned, if one contemplates growing the plants for exhibition, begin with a named collection of the finest kinds in the several sections. Auricula seed germinates very slowly, so much so that sometimes several months elapse before the last seedling appears, this too very likely the most beautiful. When the seed is very choice, sow it in shallow pans or boxes, carefully drained and filled with light soil; sow thinly, pressing the seed into the soil, then watering with extreme care, otherwise the seed will be washed to one side of the pan. Place the pan, or whatever the receptacle may be, in a greenhouse or frame, and cover with a thin piece of glass, or even paper, to act as a shade until the seed germinates, when pricking off must commence. When large enough to handle with comfort, they may be put singly into quite small pots. Insects must be watched for, slugs in particular, and the soil maintained in an even condition of moisture to prevent damping off. The cultivation of each group is generally the same from seed. It is later on that the routine of culture must be varied, as to grow, for example, the show or alpine varieties out of doors would be to court failure. Their wonderful colouring is only intensified when the plants are shielded from the weather; a green-edged Auricula would prove an ineffective flower away from the greenhouse or frame. The show sections may be distinguished by their usually mealy foliage, the flowers having round the eyes a ring of dense white paste, next to which in the edged varieties is a dark-coloured ground, then a margin of white, grey, or green. In the self show flowers there is the white ring of paste also, and the ground colour is a pure self blue, purple, maroon, or similar hue. Alpines have pure green foliage only, and only self or shaded flowers, those possessing gold centres being the most beautiful.

As regards sowing seed, this is best done as soon as it is ripe, but perhaps some difficulty may be encountered in procuring new seed—if so, sow in spring; and seedlings of the show and alpine sections require a space of

two years usually before they are strong enough to flower. This is not the case with the vigorous-growing border Auriculas, and these should be used freely in the garden for the sake of their fine colours and sweet perfume. The shades of colour are wonderfully varied, and a good race may be secured by carefully weeding out poor forms, retaining only the deep selfs, or shades of one colour, which are effective in the garden. The seeds are very easily raised, sowing them in shallow boxes of fine soil in April under glass, and putting a sheet of paper over the boxes. Prick out the seedlings when large enough into other boxes, and from thence transfer them to the open ground. The time to lift and divide the roots, if necessary, is early autumn or after flowering in spring, when they are probably transferred from the beds to make way for the summer flowers. A rather sheltered moist position should be chosen for their summer quarters. When in flower it is easy to reject all inferior varieties, and only in this way is it possible to obtain a beautiful race of good colours. Raise seed saved from the finest varieties only, and never fix upon one season for sowing. April is a good time, as already stated, but it is far better to sow choicer varieties as soon as the seed is ripe.

If a collection of named kinds is required in the several groups, it is better to apply to specialists, such as Mr. J. Douglas, of Great Bookham, Surrey, or Mr. Turner, of Slough.

Bellflowers.—*See* Campanula.

Bloodroot, Canadian, The.—*See* Sanguinaria canadensis.

Boccoonia cordata (*Plume Poppy*).—This is scarcely a plant for the border, but it may be used for free groups on the outskirts of the lawn, amongst other shrubs, or wherever a shrub-like perennial of beautiful leaf colouring is desired. Its admirable greyish-veined leaves and ivory flower spikes add a note of colour to the garden in autumn. It will thrive in ordinary soil, and is easily multiplied by dividing the roots in spring.

Bulbs requiring warm and sheltered positions and well-drained soil.—A certain set of bulbs require special positions, and when their peculiarities can be satisfied they are very charming. The majority come from South Africa and California, and a few are described in the alphabetical list. The remainder, however, are grouped together: Amaryllis Belladonna (Belladonna Lily) or Jacobean Lily (A. formosissima); Babianas, Brodiæas, especially the beautiful B. Howelli lilacina, which bears its lavender flowers in spring; Bloomeria aurea, yellow; Calochortus, Crinum Powelli and its variety album, Homeria aurantiaca; Early Irises, especially the rarer species from Palestine; Ixias, Ixiolirion tataricum, a graceful blue flower, very beautiful; Oxalis, the white Pancratiums illyricum and P. maritimum, Sparaxis, Tiger-flowers (Tigridia Pavonia), T. conchiflora, yellow with scarlet spots, and the varieties of T. grandiflora, especially the lilac and purple lilacea, are very handsome. Include, too, T. violacea, rose; also Zephyranthes Atamasco, white; Z. candida, white; Z. carinata, rose; and Z. Treatiæ. Zephyranthes are very pretty in sunny sheltered borders, their flowers reminding one of the Crocus.

Buttercups.—*See* Ranunculus.

Calochorti.—The flowers produced by some forms of these Californian bulbs are exquisite in colouring and refined in shape. Given a certain amount of care in the preparation of the bed, and a modicum of subsequent attention, the culture of the more vigorous kinds, at all events, should occasion little difficulty. The bed should be slightly raised above the surrounding level, and composed of road grit, leaf-mould, and silver sand, for a well-drained compost, that will under all conditions remain porous, is essential. The bulbs should be planted in October, at a depth of 3in., and should be protected from the heavy rains by the spare light of a frame, or other method, until March, from which time they are able to utilise all the moisture that may reach them. A sunny border is most suitable for their requirements. When the leafage has died down the bulbs should be lifted and stored in a dry place until the planting time again comes round. The whole race of Calochorti, for some time after their introduction, were known as Mariposa Lilies; now, however, they are divided into three sections, namely, Cyclobothras, Star Tulips, and Mariposa Lilies. The first section produces one long, broad leaf, and from six to twelve pendent, globe-shaped flowers. The three best varieties are albus, white; amœnus, pink; and pulchellus, yellow. Of the Star Tulips, the section is sub-divided into the Star Tulips proper and the Giant Star Tulips. In this section the flowers are open instead of globular. Distinct varieties of the first sub-division are Benthami, yellow, cæruleus, bluish white, collinus, lilac, lilacinus, purple, and Maweanus, white; while of the Giant Star Tulips, apiculatus, straw-coloured; Howelli, creamy; and Purdeyi, white, covered with downy hairs, are particularly handsome. It is in the third section, that of the Mariposa Lilies, however, that the acme of beauty is attained, some of the Venustus forms being marvellous in the richness and delicacy of their colouring. The Mariposa Lilies throw up a small, narrow leaf, from the base of which springs a flower-stem, 2ft. or 3ft. in height, and carrying a dozen or more flowers, some of these blossoms being 4in. in diameter. Charming as are all the Mariposa Lilies, the most beautiful are comprised in the sub-section Venustus, of which the best are Venustus oculatus, white with black eye, margined with bright yellow; V. citrinus, lemon yellow, with deep maroon eye shaded with orange; V. purpurescens, markings very similar to V. oculatus, but ground colour externally a rich purple; V. roseus, flesh-tinted with maroon eye and rosy blotch on upper portion of each petal; V. Vesta, the most vigorous variety of all the Calochorti, rosy white, with red-brown base margined saffron. Of the remaining Mariposa Lilies, not belonging to sub-section Venustus, the following are handsome flowers: Clavatus and luteus concolor, clear yellow; Kennedyi, bright orange; Lyoni and nitidus, white with dark spot; and Plummeræ, silvery lilac. It is pleasant to see that these beautiful flowers, like butterflies poised on slender stems, are becoming far more popular, and it is to be hoped that this popularity will increase. They are less troublesome to manage than many suppose. True, certain conditions are required, as one would expect when dealing with plants from such a sunny land as California; but with a warm border and well-drained soils the Calochorti are usually quite happy. The flowers are so beautiful in form and colour that the family will certainly increase in favour with flower gardeners.

Camassias (*Quamash*).—The Camassias may be planted with bold effect in the rougher parts of the garden; but they are worth using in the mixed border too. C. esculenta is the most common kind, the name esculenta having arisen from the bulbs being edible. It is a very hardy plant, and bears tall spikes of blue flowers throughout the summer months. A pure white flowered variety is pretty. When the spikes are cut and placed in water the buds open freely. When planted in the grass the Camassias are delightful, although they are seldom thus grown. C. Leichtlini has pale yellow flowers, and C. Cusicki soft blue. These are the most charming of the family.

Campanula.—The Campanulas are Bellflowers, so named from the bell-like form of the flowers. This is one of the most interesting and important families amongst hardy plants. There is wide diversity of character in the many species, some alpines of fair beauty, others noble perennials, so robust that they may be associated with shrubs even without harm. A few are useful for the window, especially the pretty C. isophylla and its variety alba, so that in many places the Bellflowers may be grown. The majority are distinctly perennial, the chief biennial form being the sumptuous Canterbury Bell or C. Medium, and of annual kinds there are C. macrostyla and others, as recorded in the chapter upon that division of flowers. A few are native to our own land, the

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THE FORMAL GARDEN AT TORTWORTH COURT, GLOUCESTERSHIRE.

"COUNTRY LIFE."

C. CARPATICA ALBA.

Harebell gracing mead and hedgerow with its slender stems of soft blue flowers.

C. carpatica is a beautiful kind which may be raised from seed sown as soon as ripe in a cold frame, but it is necessary to propagate the named varieties from cuttings at the same time, or by pulling the tufts apart, to increase their number. This Campanula should be in every garden, and it will succeed in any light soil. It may be also grown in baskets. Alba is a variety with pure white flowers, and pallida, as its name suggests, is delicate blue.

C. fragilis is a pretty little species with drooping downy shoots, smothered in summer with pale blue flowers. When planted in the rock garden it should have a warm sunny spot and fairly deep loamy soil. This is, perhaps, of all Bellflowers the most useful for hanging baskets in the window or greenhouse. It may be often seen in full beauty in stuffy cottage windows, where one would think few things could exist. It is easily increased by cuttings taken in spring, choosing the little shoots and dibbling them into pots, which should be placed in a cold frame.

C. glomerata is a native kind, with blue flowers. There is a white variety, and one named dahurica, which should be in all gardens, town or country, large or small. Its clusters of deep purple flowers are very handsome, as they are produced with wonderful freedom. No Bellflower is richer in colour or freer than this, and it will succeed in almost any soil.

C. grandis, as its name suggests, is a noble plant, bearing upon its tall stems pale blue flowers. It grows rapidly, and soon forms an imposing group, but is scarcely so fine as C. persicifolia. Increased by division in spring. There is a white variety called alba.

C. isophylla is as popular as almost any Bellflower. This is the kind seen so frequently in the greenhouse and in baskets in the window, its slender drooping shoots wreathed with blossom, blue in the type, and pure white in the variety alba. It may be grown in gritty soil in the rock garden, or even naturalised in the chinks of old walls. Any child almost can grow it in the window, and little cuttings of young shoots strike quickly in the spring in the greenhouse or even in the window. A use not often made of it is as a window-box plant, letting its slender shoots hang over the ledge and drape it with beautiful flowers. Mayi is quite a new form, freer and stronger than the type.

C. latifolia macrantha is a noble plant, the stems frequently 5ft. high, and bearing deep purple flowers in profusion. A group of this is very handsome, and it is not necessary merely to plant it in the border, but amongst evergreen shrubs too. Rich blue and deep green foliage makes an effective association. C. latifolia is a native kind. Van Houttei is also a variety worth growing. The native species should be kept to the rougher parts of the garden.

C. Medium.—Canterbury Bells, which see amongst "Biennial Flowers."

C. persicifolia is the beautiful peach-leaved Bellflower, which is usually most vigorous in deep, rather moist loamy soil and partial shade. It should be in every border, whether in large or small gardens, and may be grown in pots also. A very happy way to use it is amongst evergreen shrubs of dwarf growth. There are several varieties, all beautiful, and some very distinct in form. Coronata, of which there are blue and white variations, has a semi-double kind of bloom, unlike the other varieties. Alba is very pure, and grandiflora, an enlarged edition of it, a mixture of white and blue, is pleasing.

C. Portenschlagiana is the same as C. muralis, or the wall Bellflower, which grows freely in chinks in the rock garden, and has small leaves hidden at flowering time with delicate blue blossoms, which are scarcely so bell-shaped as in many of this family. It is as free in a basket as in the open garden or rockwork, and should be included in a list of all window plants.

C. pulla is a delightful kind, which requires a soil composed of peat and loam. A variety named G. F. Wilson has larger flowers, but of the same deep purple colour. When well grown there are few sweeter Alpine flowers than C. pulla, but it is apt to disappoint, as its growth is scarcely so free always as one would desire. It is wise

CAMPANULA.

to have young plants coming on, and this is best done by striking young growths in gentle heat in spring, potting them off when rooted, and then planting out. This Bellflower is readily known by its conspicuously shaped flower, like a bell hung on a slender stem, and intense purple-blue colour. Propagated by division in early spring or in early autumn.

C. pusilla and its white variety alba are charming Bellflowers of quite dwarf growth, being not more than 5in.

or 6in. high. The flowers are delicate blue in the type, and the plant succeeds in light soil in the rock garden. The white variety may be used even as an edging, as it forms a dense carpet-like growth hidden with pure white flowers like little bells. Very easily increased by division of the tufts.

C. pyramidalis.—This is the well-known chimney Bellflower, which is not only beautiful in the garden, but is also a valuable pot plant for the conservatory in summer. There are two distinct forms, one with clear blue flowers and the other pure white, though some variation will occur amongst seedlings. For growing plants in pots, sow the seed in a cool frame in March, first moistening the soil, as water applied after sowing is likely to wash the seeds, which are very small, out of the pans. Cover with a glass or sheet of paper until germination has taken place, and when large enough prick out the seedlings into shallow pans of fine soil 2in. apart. When established, place in quite a cold frame, and pot singly into either 3in. or 5in. pots, transferring them to 6in. or 7in. size in August. A cold frame or greenhouse will suffice during the winter, when little water is necessary, as too much moisture results in the plants damping off. Give the final potting into 9in. or 10in. pots in April, and use good loamy soil mixed with a little wood ash. Well-decayed manure may be put just over the drainage. During the summer place in a sheltered corner, and if possible plunge the pots in coal ashes to keep the roots cool; at any rate, they must be placed upon coal ashes to prevent worms getting in the holes in the bottom of the pots and disturbing the drainage. Keep the stems well staked, and pick off decayed blossoms to prolong the flower display. When using this Bellflower in the open garden, make groups of it—either the blue by itself, or mixed with the white variety. They are also very charming amongst low-growing evergreen shrubs. Other interesting Campanulas are C. abietina, C. barbata and its variety alba, C. garganica, C. lactiflora, C. Raineri, the beautiful varieties of our wilding Harebell, C. rotundifolia, such as alba, C. Scheuchzeri, C. Trachelium, and C. Waldsteiniana and the variety Tommasiniana.

Candytuft, Perennial.—*See* Iberis.

Canterbury Bells.—*See* "Biennial Flowers."

Cape Hyacinth (*Hyacinthus, or Galtonia candicans*).—This is a noble late July flowering bulb, which should be planted in a bold group or colony to get the best effect from the broad, light green leaves and tall spikes. The flowers are produced towards the end of the spikes, and remind one of large Snowdrops, their colour ivory white. Like many strong-growing bulbous plants, the Cape Hyacinth is very charming planted amongst shrubs, flowering and otherwise, in the woodland or in the border. Its tall stems are less exposed, and they rise gracefully from the undergrowth, so to say, of other things. The plant is propagated by offsets or by seed, and the seedlings are four seasons before they bloom; but this is a good method of propagation, sowing the seeds as soon as ripe in the open ground where the soil is good. Leave the seedlings alone for the first year, keeping weeds from them, and at the end, in very late autumn, when the foliage has died down, lift and transplant into good ground. Never keep the bulbs long out of the soil when received from the dealer, and after the stems have died down pull the surface soil over very lightly to fill up holes occasioned by the dead stem.

Carnation (Border).—"The fairest flowers of the season are our Carnations," declares Perdita in the "Winter's Tale" (Act IV., Scene 3), and these words are true of our own time, when Carnations are the glory of many English gardens. In the cottage plot Clove Carnations make silvery spreading tufts, fragrant with their big crimson flowers in July, and deign even to flourish in quite town gardens. As a rule, however, Carnations in town gardens require frequent renewal; but much depends upon the treatment given as to the length of their life.

Propagating.—There are three ways of increasing Carnations, by layering, seeds, and cuttings, and of these the simplest and surest is by layering the shoots in July, and, of course, in the case of named varieties, the only one, unless cuttings are taken. One can layer also in August, and even in early September; but July is the recognised season. The operation is very simple. First choose the strongest layers near the soil, and make a shallow basin round the plant, filling this partly with a prepared compost, such as one would pot a Geranium in. Then strip off a few of the leaves of the layer where it has to be pegged down, and with a sharp knife make an upright cut through a joint.

SEEDLING CARNATIONS.

Peg the layer into the soil with either a strong hairpin or little pegs made from hazel twigs. Layers put down in July will be ready to lift and plant out or pot, to keep over the winter in frames, in September; but if the summer has been exceptionally dry and free rooting is improbable, it is wise to leave the layers untouched until spring. When planting out the layers make certain that the soil does not contain wireworm, and give a light dressing of well-decayed manure to the surface.

Cuttings may be struck at almost any season of the year, but they take root in July almost as well as at any season. The growths on the stem of the Carnation which cannot be layered make suitable cuttings, and it is simply necessary to take them off, cut just below a joint, and remove sufficient leaves to give a clean stem for insertion in the soil. Put them round the sides of a 5in. pot filled with fairly light soil, and give, if possible, a little bottom heat, but this is not essential in summer, only in spring when the cuttings are taken from pot plants. When rooted, pot them off separately, and do not plant out until the spring, March being the best month.

Seeds.—This is a very interesting way of raising Carnations, because when the best seed obtainable is

sown a few rich prizes may be expected—that is, flowers showing an advance in form or colour upon those already in existence. It is a fascinating pursuit, watching for the flowers to expand in anticipation of a beautiful creation in colour, something perhaps that will earn the possessor fame in the world of horticulture. Sow the seed whenever purchased; but the two best months for sowing are March and April. If a house with a temperature of about 60deg. is available, place the seed-pots in that; but a gentle hot-bed, or the greenhouse, or even a common inverted frame, will suffice. The hot-bed may be made excellent use of for this purpose. Sow in pots or shallow pans filled with light soil, and put plenty of crocks in them for drainage. Merely cover the seed with soil, and when the seedlings are sufficiently large to handle with comfort, prick them out in boxes, and when about 5in. high plant out into the bed, from which the worthless ones may be removed as they flower. This is the trial bed; but seedlings vary. Remember that the Carnation is perfectly hardy, and needs no coddling treatment. It may be associated with Tea Roses, or grouped in the border; and the pure selfs are the most effective, a fine crimson variety, for instance, creating a splendid colour picture, far richer than many suppose. The Carnation should be regarded always as a good garden flower, and be planted largely for its silvery growth, its fragrant flowers, and its effectiveness when freely grouped.

The Carnation is divided into several classes, or races, as a visitor to a Carnation grower will at once notice. There are Bizarres, flakes, Painted Ladies, fancy, Malmaison, tree or perpetual, and even if they fail to approach the standard of excellence required for the exhibition, are pretty garden flowers.

Carnations in the Garden.—A good Carnation for the garden should be of strong growth, and bear sturdy flower stems supporting flowers of full form, good colour, and not split, *i.e.*, the petals held well within the calyx, never hanging over the sides as if bedraggled. Fragrance, too, is a sweet virtue. The soil should be sweet, a good friable loam, for instance, mixed with wood ashes and a little well-decayed manure, and when planting in spring select March for the work. Choice varieties from cuttings or layers put down in autumn should be kept in a cold frame during the winter, given abundance of air, and planted out in spring.

Picotees.—The selfs are of one shade of colour, whilst the Bizarre is distinguished by a stripe of scarlet, crimson, or pink and purple upon a white ground, and the flake Carnation is white with one stripe, rose, scarlet, or purple. One may readily see these characteristics at an exhibition of Carnations, where they are frequently shown in little paper collars, an ugly way of showing a beautiful flower. The Carnation is a delightful plant for the amateur, and the choice fancy, and other classes which are scarcely happy in the open garden may be grown in pots, a method described in the chapters upon indoor plants.

Selfs.—George Macquay, white, a sturdy, free, and beautiful variety for grouping; Murillo, brilliant red; Uriah Pike, an ugly name for a Clove flower, free, fragrant, rich crimson in colour, and does not split its calyx; Raby Castle, a pretty salmon rose flower, very free in every way; Duchess of York, flesh; Mrs. Frank Watts, white; Amy Robsart, deep scarlet; Andromeda, yellow; Asphodel, rose pink; Elgin, white; Sir Isaac, rich yellow; The Cadi, scarlet; Endymion, salmon pink; Exile, deep rose; King Arthur, crimson-scarlet; Mephisto, crimson; Nox, very dark crimson; Seagull, blush; Garville Gem, heliotrope; Ketton Rose, rose pink; Paradox, scarlet; Cantab, crimson, very fragrant; and Miss Audrey Campbell, yellow. The yellow Carnations are the least satisfactory in growth of any varieties.

Fancy Varieties.—Amberwitch, yellowish buff, streaked with rose lilac; Artemis, scarlet, streaked and flaked with lavender; Brodick, yellow ground, flaked rosy red; Czarina, yellow, marked with scarlet; Oliver, buff, heavily edged and spotted with crimson; Cardinal Wolsey, yellow ground, heavily marked with red; Don Juan, buff, flaked and streaked with purple; George Cruickshank, orange buff, flaked crimson; Perseus, rich yellow, edged and streaked with orange red and lilac; Miss Mackenzie, buff, flaked rose; Zingara, yellow, heavily barred and

A BED OF CARNATIONS.

flaked with maroon; The Czar, yellow ground, heavily edged purple; and Melbourne, deep yellow, heavily edged with red.

Yellow Ground Picotees.—His Excellency, clear yellow, narrow margin of red; Mrs. Tremayne, deep yellow, heavy scarlet margin; Miss Violet, yellow, heavy rose edge; Mohican, deep yellow, narrow rosy red edge; Badminton, also of a yellow shade, with similar edge; Cowslip, fine yellow, edged bright rose; Countess of Jersey, fine yellow, heavy rose edge; Dervish, primrose yellow, margined rosy lilac; Eldorado, rich yellow, heavy red edge; Empress Eugenie, rich yellow, narrow rose margin; Florrie Henwood, clear yellow, rose red edge; Golden Eagle, rich gold, prettily edged red; Hygeia, clear yellow, medium rose edge; Ladas, good clear yellow, scarlet edge; Mr. Nigel, deep yellow, heavy crimson edge; Mrs. Robert Sydenham, the best type of yellow Picotee; Stanley Wrightson, deep yellow, scarlet edge; Voltaire, medium yellow, heavily edged rose; Wanderer, golden yellow, narrow rosy red edge.

Show Carnations.—Scarlet Bizarres: Admiral Curzon, Arthur Medhurst, Dr. Hogg, Duke of York, Othello, Robert Houlgrave. Crimson Bizarres: Bruce Findlay, Edward Rowan, Arline, J. S. Hedderley, Master Fred, Phœbe. Pink and Purple Bizarres: Harmony, Melody, Princess Beatrice, Sarah Payne, Squire Penson, William Skerving. Purple Flakes: Charles Henwood, Earl Stamford, Magpie, James Douglas, Mayor of Nottingham, Gordon Lewis. Scarlet Flakes: Alisemond, Flamingo, Guardsman, Matador, Miss Constance Graham, Sportsman. Rose Flakes: John Keet, Mrs. Rowan, Rob Roy, Lady Mary Currie, Thalia, Tim Bobbin.

White Ground Picotees.—Heavy red edge: Brunette, Dr. Epps, Ganymede, John Smith, Princess of Wales, Norman Carr. Light red edge: Emily, Mrs. Bowen, Mrs. Gorton, Lena, Thomas William, Violet Douglas. Heavy purple edge: Amelia, Mrs. Chancellor, Muriel, Mrs. Openshaw, Polly Brazil, and Zerlina. Light purple edge: Ann Lord, Somerhill, Her Majesty, Nymph, Harry Kenyon, Pride of Leyton.

All the above-named varieties—although to get exhibition flowers it is almost necessary, except in the case of the border varieties, to grow them in pots—may be planted out of doors with every prospect of success. They flower freely in the open in the counties of Northumberland and Durham, in the ordinary soil of the garden.

Centaureas. — The most important of this family are the annual kinds, for amongst these are the Cornflowers and the pretty Sweet Sultan. But the perennial kinds are very handsome and stately plants, sending up strong stems bearing, as a rule, rich yellow flowers. They are more fitted for the rougher parts, as the growth is big and coarse. C. babylonica will grow fully 10 ft. high, and a tall grower is C. macrocephala, whilst the silvery-leaved C. ragusina is welcome for its prettily-coloured foliage. Of these the only perennial kind that may be considered a good mixed border plant is C. montana, of which there are several varieties, one with white flowers. This is of comparatively low growth, about 2ft., and the flowers are like those of the common annual Cornflower, but much larger. They are useful for cutting. The plant is readily increased by division or from seed.

CENTAUREA

Cerastium tomentosum is a plant used for edging flower beds, and was more popular a few years ago than at the present time. It will stand very rough treatment, grows freely, and makes dense masses of silvery foliage; hence its name of Snow in Summer. Very easily increased by division.

Chelone obliqua is a good border plant, reminding one strongly of a Pentstemon, the stems being over 3ft. in height, and with intense pink flowers. It remains in bloom for many weeks, and will grow freely in rich soil. C. barbata is generally grouped with the Pentstemon, and is a graceful and beautiful garden flower. Propagation is easily managed by root division, and the plants are readily raised, too, by cuttings or from seed.

Chionodoxas, The.—Gems for the spring are these mountain flowers, which dye the pastures with blue. Fortunately, the family is well known now, and the bulbs are cheap. Plant them freely in masses in autumn to get an effect impossible when dotted about without a thought of ultimate results. The Glory of the Snow (C. Luciliæ) is the more familiar, having been introduced longer than others. Its flowers rise a few inches above the soil, and are pretty in their blue colouring with white centre. Where opportunities exist, naturalise it in the grass, and plant it liberally in the border margins, where, if the soil is fairly light, it will in time sow itself, and form a natural colony. The flowers vary somewhat in size and colour, some with more white than others. C. grandiflora is a very bold and free form, the flowers soft blue, with a little white in the centre, and very large. Its original name was gigantea, since happily changed to grandiflora. C. sardensis is intense blue, as blue as the Gentian, but scarcely so free and robust as C. Luciliæ. There are other kinds, C. Alleni and so forth, but the trio named are the jewels of the family. Propagated by seed or bulblets. All are pretty in pots in the greenhouse, either alone or mixed with other bulbs, as the Snowdrop.

Chrysanthemums, Outdoor.—Of late years one's thoughts have turned from the exhibition varieties of the Chrysanthemum to those known to be hardy enough for the open garden. The Chrysanthemums flowering gaily out of doors during September, October, and even into November in fine seasons, are freer than those from under glass, and the many new varieties raised of recent years have given charming shades of colour, brighter than anything seen before. Happily the growth of the plants is dwarf and compact, and though confined hitherto to the Pompon kinds, there are now Japanese varieties of the same free and graceful character as those under glass. Even after sharp frosts the Chrysanthemum flowers are unharmed, but appear fresh and fair when the midday sun dries the petals. Cuttings may be struck early in the new year, but no time is better than March, or even April and May. It is well, however, not to defer propagation long after March. Take the cuttings from the base of the old plants, and they should

A CERASTIUM EDGING.

be about 2½in. long. Cut them just beneath a joint, and remove the two bottom leaves to give a clear stem for insertion in the soil. Use for soil for the pots one part each of light loam and well-decayed leaf-mould, mixed with sufficient sharp silver sand to make the whole fairly porous. Put the cuttings singly into small pots, usually known as "thumbs," the reason for this being that the little plants can be potted on without damaging the roots. If a large number of plants must be raised, then put the cuttings into shallow boxes, and when rooted pot them off singly. It is a wise plan to put a layer of sharp silver sand upon the surface of the soil, so that when the cutting is inserted the sand may run down and form a foundation for the little shoot to rest upon; the object of this is to prevent "damping off," a term used by gardeners when a cutting decays through too much moisture. Press the cutting firmly at the base, and place in a frame or on the bench of the greenhouse. Four pieces of board, 10in. broad, nailed together in convenient lengths and covered with 21oz. glass, make a useful propagating frame for Chrysanthemums.

Place the pots upon a layer of coal ashes or cocoa-nut fibre refuse, and water with a fine rose watering-pot after a few days. Always remove decaying leaves and wipe off superfluous moisture from the glass, and if the cuttings are in a temperature of about 45deg. they will root within four or five weeks. When rooted pot on, and by the third week in May the plants should be well established in 5 in. pots. At this time make the border, bed, or wherever the plants are to go quite ready. Any soil well manured the previous season answers admirably, but if manure be used at the time of planting, let it be well rotted. Plant firmly, and unless the weather be very hot, delay watering for a day or two, when a thorough soaking is necessary. As soon as it is seen that support is needed, tie up each plant carefully, inserting the stake at some distance from the stem. When the buds develop, do not pick them off, but leave them to expand, otherwise by disbudding one loses those free, graceful stems which make the outdoor Chrysanthemum so charming. A few kinds might want slight disbudding, but the general rule is to leave them undisturbed.

Selection of Varieties.—This is important, and a selection is given that no one will be disappointed with. It includes all the best and brightest of the outdoor Chrysanthemums. Japanese: Mme. Marie Masse, lilac mauve, 2ft.; Harvest Home, crimson and gold, 3ft.; Edie Wright, pink fading to white, 3ft.; George Wermig, deep yellow, 3ft.; François Vuillermet, rich lilac rose, 2ft. 6in.; Mme. Eulalie Morel, deep cerise, golden centre, 2ft.; Edith Syratt, purple, 2ft. 3in.; Ambroise Thomas, reddish bronze, 3ft. 6in.; Mme. la Comtesse Foucher de Cariel, orange yellow, 2ft.; Mychett White, pure white, 18in.; M. G. Grunerwald, pink, 4ft.; Notaire Groz, pink, 4ft.; Roi des Precoces, crimson, 3ft. 6in.; Vice-President Hardy, orange scarlet, 4ft.; Bronze Prince, old gold, 2ft. 6in.; and Ryecroft Glory, orange yellow, 3ft.

Pompons are the more formal flowers, like little balls. The best are Alice Butcher, orange red, and Lyon, rose purple, each 2ft. 6in.; Blushing Bride, rose pink, Bronze Bride, rose tipped with gold, Filberta, canary yellow, and Little Bob, deep red, all 2ft. in height; Canari, lemon yellow, 18in.; Flora, golden yellow, 20in.; Mme. Jolivart, white shaded with pink, 18in.; Martinmas, silvery pink, 3ft.; Miss Davis, soft pink, and Mrs. Cullingford, blush white, each 3ft. 6in.; Mr. Selby, rose pink, 18in.; Piercy's Seedling, bronze, 18in.: and Nanum, blush white, 20in.

Although, of course, immense improvement has taken place in the Chrysanthemum for the open garden, it is not a flower to use recklessly, as often the colours are by no means very bright. A very gay variety is the old Cottage Pink, which one sees in cottage gardens, hence its name. It is a wonderfully free and hardy kind, burdened with purplish rose flowers far into the autumn, and seems to resist rains and early frosts as

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well as any kind of modern introduction. It is quite an old garden flower, but one of those good plants sometimes lost through newer acquisitions being praised beyond their worth. The bright yellow Jardin des Plantes is often very showy in the autumn, as its colour is rich and effective. Besides growing Chrysanthemums in open beds or shrubberies, they may be planted against brick walls, which usually require something to hide their ugliness. Strong plants put in during March will bloom in the following autumn, and if necessary the flowers may be protected with a canvas screen suspended from a coping, as practised in the case of fruit trees on walls.

C. lacustre and C. Leucanthemum, the beautiful native Chrysanthemum of pastures, are useful also; of the latter there is a semi-double variety, which should alone be grown, as the typical plant is common enough in the fields. C. lacustre is known also as C. latifolium, and of our native Ox-eye Daisy or Chrysanthemum there are several varieties, the most popular being semi-duplex, which is a flower of considerable beauty, snow white, and very useful for cutting. Grandiflorum is the name of a larger form, of the same pure whiteness and freedom.

C. maximum is a noble flower, bold and pure white, made purer still by the deep green abundant leaves. It will grow in almost any soil, and should be planted to give cut flowers. Many beautiful varieties of this Chrysanthemum have been raised, some of more importance than others, and perhaps the most distinct and handsome of all is the one known as Maurice Prichard, which was raised from the form called the Rev. Wolley Dod's A1. The flowers are almost massive, so robust, so to say, are the petals, and of purest white, made purer still by contrast to the yellow centre. The Munstead variety is also very fine, and in some catalogues, besides those already mentioned, are recorded Duchess of Abercorn, Elaine, fimbriatum, G. H. Sage, grandiflorum, Mrs. Head, and W. B. Child. Fimbriatum is conspicuous for its thread-like petals of showy white, and grandiflorum blooms later than the type. If only one form could be chosen, Maurice Prichard would be the one to select.

CHRYSANTHEMUM MAXIMUM.

C. uliginosum (*the Moon Daisy*) was formerly known as Pyrethrum uliginosum, and is one of the most beautiful flowers of autumn. Its tall stems, 5ft. or more high, bear big white Daisy-like flowers, which seem to gleam like silver in the clear moonlight of autumn. There are few spots in which this plant will not succeed. It will run riot in a damp ditch, making clouds of blossom in September and October, but the plant is a success even in a town garden. The graceful stems are useful for cutting for the house. It is as easily increased as a weed by division of the plants in spring.

Cimicifuga.—The popular name of this family is Snakeroot, and they are all vigorous border plants, or may be used to beautify rougher places in the garden, shrubbery margins, etc., where the soil is sufficiently rich to support strong growths. The commonest kind is the Black Snakeroot (Cimicifuga racemosa), which has light graceful spikes of white flowers; C. japonica is also worth planting. It is a simple matter to increase them if desired by division, either in the autumn or spring. Many value them for their late flowering, and perennials that bloom after those of the midsummer are past possess much value. Besides C. racemosa and C. japonica one may also plant

GATHERING WILD CHRYSANTHEMUMS.

C. cordifolia, which blooms throughout the autumn, and has straight stems, almost deep black, so dark is the colouring, and feathery masses of flowers. A group of this is welcome, but of course many Cimicifugas are not desirable in the garden. They are plants to use moderately.

Colchicums.—The popular name for these is Autumn Crocus or Meadow Saffron, but Crocus is misleading, for there are many true Crocuses flowering in the autumn months. The Colchicums produce their flowers before the leaves, and there are twenty species, of which the best known are the following: C. autumnale is more familiar than any others, and has light purple-red flowers in October. This species has several varieties. Album is white, and of this there is a beautiful double form, whilst of a rosy tone are roseum and its double counterpart. Striatum plenum has double striped segments. Other species worth recording are C. alpinum and C. byzantinum, both rose coloured; C. Parkinsoni, white, chequered with violet; C. speciosum, a noble flower, crimson-purple, a Colchicum that should be on every rock garden; and the violet C. umbrosum. The Autumn Crocuses are valuable for effect when planted in the grass at the edge of shrubberies, in grassy banks, dells in the garden, or in any position where the tender colouring of the flowers will be set off by the green of the grass. When planted in this way a group of thirty or forty bulbs creates a charming and distinct effect, even at a distance.

Columbine.—*See* Aquilegia.

Convallaria.—*See* Lily of the Valley.

Coronilla varia is, of this family, the most entitled to a place in the border. It is dwarf, vigorous, and has pink-shaded flowers.

Corydalis.—This is the Fumitory family, and the yellow Fumitory (C. lutea) is frequently seen garlanding old walls and ruins with its yellow flowers. It is a plant that should be established in positions like this wherever opportunities exist, as it is a simple matter to sow seeds in the chinks. C. solida or bulbosa, as it is known under both names, has purplish flowers, but not very bright. If a handsome plant is desired, by all means select C. nobilis. It is well named, the plant growing about 1ft. in height, and is happy in light soils, if not poor. The flowers are rich yellow, marked in the centre of each with a deep brownish colour, and borne in a dense cluster.

Cowslip, The.—*See* Primula veris.

Cowslips, American.—*See* Dodecatheons.

Creeping Jenny.—*See* Lysimachia.

Crocus.—The Crocus family consists of more than eighty species, and is distributed over Europe, Asia, and the northern shores of Africa. Many as are the species into which this race is divided, it is probable that very few of them are the progenitors of the garden Crocus of the present day, which owes its being chiefly to C. aureus. The cultivation of the garden Crocus is so simple a matter that the merest novice may plant the bulbs with the assurance that he or she will reap a bright reward in the near future, provided the burrowing mouse and flower-picking sparrow do not interfere with Nature. For the latter pest, no preventive is so successful as a few lengths of black thread stretched tightly above the flowers, while the trap and poison should thin the ranks of the mice. Pots of Crocuses are pretty in rooms and windows in the early spring, a few 5in. pots containing half-a-dozen bulbs each, covered with ashes or cocoa-nut fibre in the open air, frame, or cellar until growth is commenced, making a brave show. Crocuses may be propagated from seed, sown as soon as ripe in light sandy soil in pans or pots, reaching their flowering stage in three years. The garden Crocus has been much improved of late years, the flowers being of large size and rich colours. Golden yellow, purple-blue, pure white, lilac, and white striped with lilac, are the tints procurable, the pure white with golden stamens being, perhaps, the most attractive. But besides these garden forms there is a beautiful set of species, some flowering in spring, others in the autumn. These are frequently delicate in colour, too dainty, and, in truth, expensive to use in the same lavish way as the garden varieties. Of the Spring-flowering Croci, mention may be made of the following: C. alatavicus, whitish yellow, spotted with purple, flowering as early as January and February, the bright orange golden C. aureus, C. banaticus, purple, C. biflorus, mauve white, striped with purple, C. chrysanthus, orange yellow, and a white variety named albus, the handsome C. Imperati, its lilac and buff flowers always welcome in the spring garden, C. reticulatus, white to purple, and C. Sieberi, bright

A COLONY OF COLCHICUMS.

lilac with golden throat. The cloth of gold Crocus is C. susianus, the flowers being golden yellow, deep brown on the outer segments, whilst include too the familiar European C. vernus, ranging from white to violet in colour, and C. versicolor, purple to white, the segments being often streaked or feathered with colour.

Autumn-flowering Croci should be more known in English gardens. It is often forgotten that in this group are splendid colours, which gladden the garden at a time rich hues overspread the landscape. Taking the autumn-flowering kinds alphabetically, C. cancellatus is first, its flowers lavender white, and appear in November; C. iridiflorus is very handsome, in form much resembling an Iris, and purple in colour, C. lævigatus, lavender white, C. longiflorus, purple with golden throat, C. medius, purple, C. nudiflorus, purple-blue, C. ochroleucus, ivory white, C. pulchellus, pale mauve, C. sativus (the Saffron), deep purple, C. serotinus, bright lilac, C. speciosus, purple-blue, C. Tourneforti, lilac, orange throat, and C. zonatus, rose lilac. Of this group none is richer than C. speciosus, which should be planted in the same free way as the spring-flowering kinds, watching the bulbs, however, to prevent mice devouring them. Mice seem more partial to this bulb than any other. This is a Crocus worth planting freely near trees, in the shrubbery, upon the lawn, and, indeed, any place where in the light of an autumn day its rich purple-blue flowers can open widely and show their rich orange stigma. It is very free, and fairly reasonable in price. Such a flower should be used well in the pleasure garden.

Crown Imperial.—*See* Fritillary.

Cuttings.—When one speaks of a cutting it is intended to convey that certain plants are propagated by taking moderately ripened shoots of varying length, usually 3in. or 4in., and after cutting just beneath a joint with a sharp knife, removing the lower pair of leaves to allow a clear stem for insertion in the soil. In the descriptions of plants a note is given as to the best way to increase the family mentioned. The operation is very simple.

Cyclamens, Hardy.—An exquisite family is this, with flowers like those of the Persian Cyclamen, but smaller and more fragrant. The best time to plant is the spring, and to sow seeds early summer, the seed germinating freely in a cold frame; but exercise patience, as the seedlings appear irregularly. Cyclamens may be planted in various positions. If there are shady walks or woodland, where ferns grow, the plants are pleasing here, the bright cheery flowers peeping up from the covering of grass and stray leaves at all seasons. A pretty picture is a colony of hardy Cyclamens in bloom on an early spring or winter day, but where no woodland exists, then plant upon the rock garden. A light shade from hot sun is desirable, as the plants succeed under trees, at least where the ends of the branches cast shadows. The soil must be what gardeners call a "vegetable" compost, that is a spongy ground, made up of tree leaves, loam, and peat, the kind of soil one gets when leaves and sweepings have accumulated in one place for years. Many grow the plants in a cold frame in a compost of this description, and a wealth of colour is the reward early in the year. It is not everyone that can afford to give them this protection, but a frameful of Cyclamens in bloom is a fair sight. C. Atkinsoni, C. coum, C. europæum, C. hederæfolium, or repandum, C. neapolitanum, and album are the hardy kinds. Of these there are varieties, some white and tender shades, making the family more interesting and beautiful.

Cypripedium spectabile (*Mocasson flower*). — The hardy Cypripediums, or Lady Slippers, are mentioned in the chapter upon "Rock Gardens." C. spectabile is, however, the most beautiful of all, and should be planted wherever suitable conditions can be found. Plant when the roots come to hand, and in a moist soil, partly shaded, a bed, for example, in which Primula rosea, Trilliums, and Marsh Marigolds are happy, giving each year a mulch of well-decayed manure. Groups may be formed also in the woodland, where a mass of the pink and white flowers is full of charm and colour. Reference, too, will be made to the hardy Orchids in the general chapter upon the family, but C. spectabile is too precious to leave out amongst the hardy flowers.

Daffodil.—*See* Narcissus.

Dahlias.—*See* chapter upon "Tender Plants for the Summer Garden."

Daisies.—The Double Daisy is a quaint, bright flower used as an edging, or in beds with similar dwarf plants. Unfortunately, the plant dies in some soils; it is uncertain, and has to be renewed in places to which it does not take kindly. When the soil is cool and the tufts are not half-killed by drought in summer, they spread freely, and if an increase of stock is desired, it is a simple matter to pull them apart in spring or in the autumn. The double red and the double white are the commonest kinds, and may be used in association, as the colours are decided. But there are also such forms as the "Hen and Chickens," so-called because the flower sends out lateral blooms, so to speak, suggesting the curious name. Snowflake is a fine white variety, very pure, and with flat petals. Also of good colour are Lord Beaconsfield, rich crimson; Rob Roy, a charming red Daisy, perhaps the brightest and best of its colour; and Queen Victoria, red mottled colour. A variegated variety named Aucubæfolia is in a measure pretty, as the variegation is bright, but is apt to damp off, and fogs are fatal.

Delphiniums. — These are also called Larkspurs, of which there are two distinct groups, annual and perennial, but it is only the perennial kinds that are considered here. These are glorious summer flowers, noble in growth and in bloom, brave masses of colour for many weeks when the principal stems are removed to encourage a succession of side growths. During recent years such raisers as Messrs. Kelway and Son of Langport have striven earnestly to greatly improve the race, and with success. Many of the newer forms are of splendid colour, rich blues, purples, and other shades, sometimes white in the centre with intense blue outer florets, and perfectly double, whilst we have, in such varieties as Beauty of Langport and Primrose, flowers almost white, so faint is the yellow tinge. A pure white variety is sure to follow. A selection of varieties is not given, because all are so beautiful, and it is advisable to see the plants in bloom if possible. The blue varieties are very effective, especially when a sheaf of blossom is thrown into relief by a background of shrubs. Delphiniums are very easy to grow, and may be planted at almost any time, but the best seasons are early autumn and spring, when new growth commences. The great point is to plant them in rich, well dug and manured soil, and strew coal ashes about, for the reason that slugs are very partial to the plants. Ample space must be allowed for full development, as with age the roots increase greatly, so that 2½ft. apart is none too much. Purchase the newer varieties, which are finer in every way than the old kinds, being taller, stronger, and more varied.

Delphiniums are always striking, even in poor soil, but it is only a rich ground that can support the strong growth. In many English gardens the massive leafy clumps are the glory of the place, tall strong stems being sent up many feet and thickly crowded with splendid flowers for colour, perhaps self blue, as blue as the Gentian, or relieved by white segments, sometimes blue and salmon pink — indeed, it is not easy to enumerate the shades found in a good selection—whilst there are perfectly double kinds too. When shrubs are thinly placed, an unusually rich effect is gained by planting Delphiniums between; the sheafs of blossom brighten up shrubberies and last for weeks in beauty, or they may be planted in the back row of the mixed border; indeed, in any place where robust growth is

desired, there the perennial Larkspurs are welcome. In raising seed sow it in April in shallow pans under glass, and prick off the seedlings, when of fair size, where they are to remain. If one has a scarce variety and wishes to increase it as much as possible, take cuttings of the young shoots in spring and place them in a cold frame.

D. Belladonna is a beautiful variety. It is not very robust, but the flower spikes are clear sky blue, a bright sunny colour, especially when a group is formed, thrown perhaps into relief by a sombre-coloured shrub, such as the Yew. Few plants are so quickly spoilt by slugs as this. If a close watch is not kept and the clumps surrounded by coal ashes there will be few flowers.

D. grandiflorum fl.-pl. (*the Double Siberian Larkspur*).—A beautiful flower, perfectly double and rich blue, but so difficult to grow that few can succeed with it. It seems most comfortable in warm light soils.

GROUP OF DELPHINIUMS.

D. nudicaule is a bright scarlet flower, and one of the prettiest of the species. It is dwarf and hardy, enjoying a warm, light soil. Avoid wet spots. It is easily raised from seed, or may be divided, but it is not wise to disturb healthy clumps.

The deep blue D. Cashmerianum, D. cardinale (bright scarlet), D. formosum, and the pretty yellow-flowered Zalil should be on every good rock garden, but all require light soil.

Dianthus.—The Pink family is as precious as any to the flower gardener, as in it are the Carnation and Pink, which are described fully under these names. D. Caryophyllus is the species from which the Carnation of gardens has been derived, and D. plumarius is the origin of the Pink, whilst D. barbatus is the Sweet William. But apart from these a host of flower gems must be considered, Alpines for the most part, and suitable therefore for the rock garden.

D. alpinus (*Alpine Pink*) is, like some others of the family, not easy to manage. It must be coaxed into good behaviour by providing leaf-soil or something akin to it, and a cool, moist position, when it will spread into deep green tufts, smothered in summer with rich rose-coloured flowers. There are forms of it, all much alike, and all needing the same open, sunny position and light, gritty soil. It may be increased by seeds sown as soon as ripe in a shallow pan, well drained and filled with light soil, or by division in spring; but healthy tufts should not be disturbed.

D. Atkinsoni is a brilliant flower, deep crimson, almost blood colour, and more straggling in growth than many kinds. It blooms most abundantly, and for this reason it is well if there is any likelihood of collapse to pick off the flowers and promote growth for cuttings, which strike freely under glass (a cold frame) in the summer.

D. barbatus (*Sweet William*).—This is described under the heading Sweet William.

D. Caryophyllus.—The parent of the garden Carnation and a charming plant for a wall. Many an old castle wall is beautified with its wiry growth.

D. cæsius (*the Cheddar Pink*) is very pretty in the rock garden in a sunny spot where the soil is gritty—loam and limestone, or even bits of old mortar. It is quite dwarf, forming a mat of small leaves, which are almost hidden in early summer with sweetly-scented rosy flowers. This charming plant is delightful, too, on old walls, and the best way to thus establish it is to sow seeds in the chinks. Division of the tufts will give increased stock, and seeds are easily raised in a shallow pan put into a cold frame.

D. callizonus is a lovely species, not so familiar as others, but so handsome that on every rock garden it should be planted. The flowers are large for the size of the plant, and of purplish rose colour. It comes from Transylvania, and delights in warm, gritty soil and a western aspect. Increased by cuttings in summer, or by seeds, which are not so plentiful as in such species as the Cheddar Pink.

D. neglectus is a charming dwarf Pink, and very easily grown, the flowers pure rose in colour and covering the narrow grass-like leaves. It delights in a light, warm soil fully exposed, and is a native of high Alpine pastures. Seeds are easily raised, and the more vigorous tufts may be divided. Those commencing the culture of rock plants should not forget this, because it gives little trouble and is very hardy.

Other interesting species are D. cinnabarinus; the deep crimson D. cruentus, loamy soil mixed with sandstone; D. Seguieri; D. glacialis (Glacier Pink), crevice in the rock garden, gritty soil with sandstone chips, flowers rosy in colour; D. g. gelidus, rosy purple; D. Cyclops, a large pink flower with crimson centre; D. petræus, rose; D. plumarius, parent of the garden Pinks; and the beautiful D. superbus, very fragrant, rosy colour. Sow seeds frequently, as the plants are short-lived. D. greivei is a rose and white hybrid.

D. sinensis (the *Chinese Pink*) is an annual, and described amongst that class.

Dicentra (*Dielytra*).—To this family belongs the graceful rosy-coloured Bleeding Heart, or Lyre-flower D. spectabilis.

It is hardy, but late spring frosts are troublesome, sometimes cutting down the tender growths. Light sandy warm soil suits it best, and it may be placed in the mixed border, rock garden, or indeed anywhere if soil is suitable and shade not too dense. Plant in autumn, and divide for increase of stock at that season. The roots are tuberous. D. chrysantha, D. Cucullaria, and D. formosa are also pretty.

Dictamnus (*the Burning Bush*).—This popular hardy plant obtains its distinctive name of Burning Bush from the fact that on warm summer evenings the glands of the flowers exude in the form of vapour a resinous substance which gives rise to a momentary flash of light. Apart from this interesting feature, the Fraxinella is a handsome border plant, the purplish rose flowers being very fragrant, and in the variety albus they are white.

ECHINOPS (Globe Thistle).

It is of bushy growth, and flowers in midsummer, continuing several weeks in beauty. Propagate either by seeds or division. Sow the seeds as soon as ripe in a pot, and place in a cold frame. Plant out the seedlings in spring. Root cuttings may be taken also, but it is unwise to disturb healthy masses. Take these cuttings in spring, and strike them in a warm soil out of doors.

Dielytra spectabilis (*Lyre-flower*).—*See* Dicentra.

Dodecatheons.—These are called American Cowslips, and, if not plants for all gardens, should be grown wherever suitable soil and surroundings can be given. The position most agreeable to the Dodecatheons is one in which the pretty little Soldanellas, Primulas, Orchises, and moisture-loving plants are happy. A moist, peaty soil and shelter are necessary, then one may anticipate a rich display of flowers. The strongest, perhaps, of all is Jeffreyanum, which has deep purple flowers, and this grows freely also in the mixed border where the soil is light loam. D. Meadia and its varieties are very charming, the flowers varying in colour according to the variety, one of the most beautiful being Splendidum. It is about 8in. in height, less robust than D. Jeffreyanum, but delightful in a sheltered nook in the rock garden. Nor must the kind known as Integrifolium be omitted, with its bright-coloured flowers.

Doronicums.—These hardy and vigorous plants may be readily increased by dividing the tufts, and they succeed in almost any soil. One welcomes them because of their bold, free habit and early flowering, the large yellow flowers appearing in spring, and continuing to make the garden gay for many weeks. The finest of all is D. plantagineum excelsum, which grows in good soils to a height of about 4ft., bearing a wealth of golden bloom. D. caucasicum and D. Clusi are pleasing also; but if one only is desired, plant Plantagineum excelsum, either in the open or partial shade.

Dragon's Mouth.—*See* Arum.

Echinacea purpurea. — *See* Rudbeckia purpurea.

Echinops, or the Globe Thistles, are very handsome plants for the border or in groups in the pleasure grounds. E. Ritro and E. ruthenicus are worth a place in even small gardens, as there is something unusual about the globular silvery blue flower heads, hence the name of Globe Thistle. They are all suitable for ordinary garden soil. Propagate by seed and division, the last-mentioned being the best plan.

Edelweiss.—*See* "Rock Garden."

Edgings.—Every yard of a garden may be clothed with flowers and growth if one so wishes it, and nothing is too humble to pass by. Many otherwise charming pictures are unfortunately blurred by ugly margins — a thoughtless use of crockery or stokehole refuse, and even oyster shells. Many a fair domain is blotched with chipped masonry, called "statuary," many a flower-bed is as patchy as a home-made quilt, but nothing is so foreign to all sense of the beautiful as burrs, shells, or wood. Edgings may be made in themselves gardens of flowers and evergreen growth.

Tiles, wood (a great fungi breeder), burrs, shells, and anything of a "fancy" kind should never be used. Terra-cotta tiles frequently get split by frost into a hundred pieces, and nothing can keep the eye from yards of edging that appear as if chopped at by an axe. Cheap tiles are always expensive, and always wearisome, because changeless from year to year, unless frost cracks and splits them to vary their aspect.

Soft stone, or stone of the district, cannot be improved upon as an edging. In many districts there are disused quarries, and split pieces of stone make the best edgings. If they vary from the straight line or present an uneven surface, this adds rather to the charm of such a margin, and a host of dwarf or creeping plants like the stone to trail over. Flints are of value too, but they are not so useful as stone for edging.

There are many plants, however, useful for edgings, and the cottage garden frequently teaches the value of

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plant growth—a garden where broad masses of white Pinks meet the gravel path, and the Saxifrage and Stonecrop creep up to one another. An edging of this kind is simple, and, made of plants free in growth and in the appointed season, of flowers also.

White Pinks are more popular than any flower for edgings. They are of free growth, and their silvery leaves are at all seasons pleasing to look at, but those in June are hidden with the snow wreath of flowers.

THRIFT EDGING.

Mrs. Sinkins, Her Majesty, the old fringed white, and the newer Albino are all varieties adapted for this purpose.

The dwarf Veronicas, such as V. rupestris and V. taurica, form an edging that may be used by themselves, or associated with other plants, of which one of the most suitable is the white Pink. Plant them alternately—rich blue against pure white, the Veronica growth creeping over the surface of the soil and nestling against the Pinks.

Thrift is seen in many old gardens, but it requires more attention than a stone edging. To preserve its beauty the plants must be lifted, divided, and replanted once in at least four years; a rich, even growth is then the reward. The tufted habit, fresh green growth, and rose purple flowers in summer are enjoyable to look at.

Tufted Pansies make a flowery margin for two or three years, but, unfortunately, they get "sick" of the soil, and need, to prevent sudden collapse, a fresh position; but where time can be given to changing the margin of beds and borders, the Pansies should be planted freely in clear self colours. Fancy shades are a mistake. Pure white, a deep blue, lavender, and tints of this character, give bolder effects than any striped or mottled flower.

Saxifrages (*Rockfoils*) of many kinds—best of all, however, the mossy S. hypnoides and Stonecrops—form permanent edgings, and are throughout the year fresh and bright.

Box is a well-known edging, formal, but in its way charming. A badly-kept Box edging is a blot in the garden, however, and, unfortunately, such a feature is not uncommon. The growth must be regularly clipped each year, say in the spring, and stretch a line the whole length of the edging, so as to show the correct height; then cut evenly and neatly both at top and sides. Box edgings are ruined sometimes through neighbouring plants overhanging them, or by salt thrown on to the walk for destroying weeds; when this is worked to the sides the growth of the Box is ruined. When relaying, take up the plants, pull them to pieces, and use the strong young growths, which must be clipped to one level. Box is very easily grown, and stands pruning with impunity.

The subject of edgings is a wider one than may at first appear. Borders with Peonies falling over the walk and Lavender scenting the air by the pathside are charming indeed, but reference has been made to permanent or dwarf edgings.

Epilobium.—These are plants most at home by the water-side. E. augustifolium, its variety album, E. hirsutum, E. obcordatum, and E. rosmarinifolium are the chief kinds. Willow Herb is the popular name.

Eranthis hyemalis (*Winter Aconite*).—A pretty little bulb, its yellow flowers, in their collar of green leaves, appearing almost before January is out in mild years. It should be planted in the grass, at the foot of trees or amongst shrubs; indeed, there are a score of ways of using such a flower. In the Royal Gardens, Kew, there is a bed of the Siberian Dogwood, a sea of crimson with its brightly-coloured stems, with the Winter Aconite planted amongst it; the effect is very rich. It seems to like a rather dry soil, and establishes itself in some gardens but dies out in others.

Eremurus.—A noble family of hardy plants, the secret of success in cultivation being to protect them from cold, harsh winds and the morning sun. A sheltered southwest aspect should be chosen, if possible, and the big spikes are more imposing when thrown into relief by a background of evergreen shrubs, which, however, should not be so close that the plants are overshadowed. The site for the plants must be well chosen and prepared, for once Eremuri are in position they should not be disturbed. Plant in the autumn in rich loam, sandy rather than otherwise, and mix with the loam peat, thoroughly-decayed cow manure, and sharp silver sand. In planting, never bury the crown, but keep it a little above the surface of the soil, and in severe winters give protection in the form of cocoa-nut fibre. The Eremuri are increased in two ways, namely, by seed and division of the roots. Sow the seed as soon as ripe in a cold frame in well-prepared soil, or out of doors in a sheltered bed or corner. Leave the seedlings there for two years, and transplant in autumn to the positions they are to adorn permanently. Five years elapse before seedlings flower, but a quicker way to increase them is by division in the autumn, separating

those crowns which come asunder easily. E. robustus is the most commonly planted, and is hardier and more easily grown than any of the family. The spike will sometimes rise to a height of nearly 10ft., and is closely set with rose-tinted flowers. A beautiful kind is E. himalaicus, hardy, and with a spike of white flowers about 8ft. high when fully developed. E. Olgæ is not so tall, the spike being only about 4ft., and the flowers are of peach colour. It is very charming and distinct; so also is the citron yellow coloured E. Bungei, which is dwarf, and very conspicuous when in bloom. The Eremuri mentioned are all so beautiful that one cannot name any kind and call that the finest. E. robustus, however, should be the first, as it is more easily grown, perhaps, than any other.

Ericas (*Heather*).—These will be described fully in the tree and shrub chapter.

Erigerons.—A beautiful family of hardy plants, all increased very readily by dividing the tufts in spring, when new growth commences. The most important kind is E. speciosus superbus, which is worth planting in large beds in the grass, and using, indeed, in almost any part of the garden, as its mauve-lilac flowers are produced in rich profusion, so much so that a large mass of it is a sea of colour. It remains long in beauty, and is a plant that should be in every garden. Even if small tufts are planted in February they will be quite large in the summer, and flower gaily—E. aurantiacus, which has orange red coloured flowers, its variety splendens, E. glabellus, E. macranthus, the pretty Daisy-like, pinky white E. mucronatus, E. multiradiatus, also a small-flowered kind, and E. salsuginosus; but of all this throng no one is so vigorous and useful as E. speciosus superbus.

Eryngiums (*Sea Hollies*).—A precious group of hardy plants, represented in our native flora by the little spiny, silvery-leaved E. maritimum, or Sea Holly. They require a warm, thoroughly well-drained soil, where there is not the slightest stagnation about the roots, and a sunny spot, otherwise that steely blue colour, which is their chief charm, will not be developed. They may be increased by division of the roots in spring, and cuttings of the roots, that is, bits of roots, will thrive in light soil, putting them about 2in. deep, and they should be about 1½in. in length. In raising from seed, a very simple and good way of procuring a stock, sow it as soon as ripe in shallow pans of light soil, and place in a cold frame. One must not be impatient about the appearance of the seedlings, but as a rule Eryngium seed germinates well. Plant out when large enough, which will not be for about a year. The most charming kinds are E. alpinum (Alpine Sea Holly), E. amethystinum, E. giganteum, E. Oliverianum, and the pretty small-flowered E. planum, which bees delight in.

The taller group is very handsome, but it is only in the wild or sub-tropical garden that it is advisable to use them. Bromeliæfolium, Pandanifolium, and Lasseauxi are the most striking.

The spiny, thistle-like stems of the dwarfer kinds are useful to cut for winter decorations, as they are in a way "everlastings."

Erythronium (*Dog's-tooth Violet*).—A delightful family of bulbous plants, flowering in early spring, and may be planted in the lower parts of the rock garden, at the margin of shrub groups, or even naturalised in grass. They enjoy a light soil, composed chiefly of leaf-mould, moisture without stagnation, and partial shade. Such a race as this, dainty in colour and form, should be well grown. E. Dens-canis is the best-known kind, and there are many beautiful varieties—white, rose, and other colours, none poor; and this Dog's-tooth Violet is as easy to manage as any. It is never prettier than when planted at the edge of a bed filled with American plants, such as hardy Azaleas and the like. The name Dog's-tooth arose from the bulbs resembling in shape the tooth of our canine friend. Besides this species and its varieties, there are many other beautiful kinds, chiefly from the North-West of America. E. americanum is a graceful delicate yellow flower with mottled leaves, as in Dens-canis; indeed the leaf-colouring of this pretty race is as distinct as the subtle hues of the flowers. E. giganteum, with prettily mottled leaves and yellow and orange flowers, E. grandiflorum, golden yellow, E. Hartwegi, pale yellow, E. Howelli, also yellow, with orange base, E. montanum, pure white, and yellow in the centre, are all worth a place in the garden. Nor must the charming E. revolutum be omitted. Watsoni, E. Johnstoni, and E. Hendersoni are distinct and handsome. The way to increase Erythroniums is by bulb offsets; also by seed, but from four to five years elapse before seedlings bloom. When planting cover the bulbs with sand, as anything approaching stagnation is fatal to success.

Fritillarias.—These constitute a charming race of plants, some of them being especially fitted for naturalisation in

FRITILLARIA (*Snake's-head*).

the grass, where their modest charms are best appreciated. They may be propagated by seed sown as soon as ripe in pans of sandy soil, but five years generally elapse between seed-sowing and flowering. The bulbs also produce small offsets or bulbils which if planted in porous soil in a reserve bed soon attain sufficient size to be set out in permanent quarters. There are about fifty kinds of Fritillary, some of the best of which are here mentioned: F. armena, light yellow, height 6in., a native of Armenia; F. aurea, yellow spotted with brown, 6in., Silesia, quite hardy, and well suited to the lower portions of a rock garden or mossy bank; F. Burnati, brown-red, 8in., the Alps, single drooping blossoms; F. Græca, yellow-brown, spotted, 6in., Greece; F. imperialis, the Crown Imperial, a fine plant for the herbaceous border, often remaining in bloom for a month. It grows to a height of over 3ft., and is a native of Persia. It is to be had in several shades of colour, the clear yellow being the most beautiful; there are also red, orange red, and brown red, while there are double varieties both of the red and yellow forms, but these lack the beauty of the singles. There is also a variety with yellow-margined foliage. F. Kamtschatcensis, purple, 12in., Eastern Siberia; F. Karelini, pale purple, veined and spotted, 6in., Siberia; F. lutea, yellow, 12in., the Caucasus; F. latifolia, purple, with green, yellow, or lilac shading, 12in., Caucasus; F. Meleagris, the Snake's-head Fritillary, a native plant flourishing in many parts of England, especially in the meadows of Oxfordshire. It grows to a height of 18in., and bears solitary, pendant blossoms, chequered with purple on a lilac ground. There is also a white variety, a lovely flower, especially when naturalised in the grass, where it is as at home as are the Lent Lilies. F. Moggridgei, golden yellow, tessellated with maroon in the interior of the bell, 10in., Maritime Alps; F. pallidiflora, yellow, chequered in the interior, 9in., Siberia; F. pudica, orange yellow, solitary drooping flowers, 6in., Rocky Mountains; F. persica, purple-black, 3ft., Persia, very unlike the remainder of the Fritillaries, producing a large number of closely-set blooms on the same stem; F. recurva, bright scarlet, 2ft., California. It often bears several pendant flowers, and is a graceful plant, its blossoms being prettily recurved. F. Sewerzowi, purple-green, 1½ft., Turkestan; F. verticillata, white with green base, Crimea.

Funkias. These are familiarly known as Plantain Lilies, and may be planted in large tubs or pots with excellent effect. The more vigorous kinds are hard to kill, and their leaves are very beautiful in colour—glaucous and grey tints—and form also, whilst the flower spikes of F. Sieboldi in particular are handsome, the flowers white and abundant. These plants are useful chiefly, however, for their noble foliage; hence use them in the wild garden or in beds of subtropical plants. F. lancifolium has several varieties, chiefly variegated prettily with bright colours, such as albo marginata, variegata, and undulata. Funkias, especially the variegated leaved kinds, require warm light soil. Increase by division in spring.

Gaillardias.—Brilliant garden flowers are these when planted in a way to get true effect from them. Small pieces dotted about the border are of little use, but in groups or single beds one can enjoy their rich colouring. Gaillardias are easily grown, requiring a deep warm soil, enriched with well-rotted manure, and a sunny position. In dry and wet seasons alike they are a success, and even in times of drought the plants flower freely and continuously. There is one pest that must be guarded against when new growth is commencing in spring, and that is the slug. Watch carefully for this destructive enemy, and a covering of coal ashes over the crowns will keep them away and give protection from frost. Gaillardias are not very hardy, and in wet ground frequently die off in winter. When such is the case, sow seed on a hot-bed, or in a warm frame or house, at the end of February, sowing thinly, and pricking off and potting on the seedlings until May, when they can be planted out. They will flower well. Seed may also be sown out of doors in June in the same way as the majority of biennials, planting the seedlings in the position they are to adorn in the following September. Cuttings may also be struck in gentle heat in spring or autumn. There are so many varieties that the best way is to leave the selection to such well-known growers as Messrs. Kelway and Son, Langport, Somerset. The flowers are yellow of varying shades, or dull red tipped with yellow; sometimes also pure selfs. The self orange yellow varieties, with flowers of medium size, are very bright.

Galanthus (*Snowdrops*).—The modest Snowdrop is welcome in the early year, its nodding flowers heralds of the spring. It is a bulb to naturalise in the meadow, by woodland walks, at the base of trees, and in shrubbery margins—anywhere, indeed, its pearly white flowers are in harmony with their surroundings. But in small gardens they are pretty, too, and the rarer kinds are happy upon the rock garden, or in pots in the cold house. G. Elwesi is the most handsome of all Snowdrops, tall and pure white. Of this, globosus is a pleasing form with white globular flowers. G. Fosteri, a Snowdrop of more recent introduction, is worth growing, also G. latifolius and such varieties of our common Snowdrop (G. nivalis) as Imperati, the distinctly coloured lutescens, octobrensis, poculiformis, Redoutei, Sharloki, and the Crimea Snowdrop (G. plicatus). Many new kinds have been introduced of late years, G. Ikariæ and others, but as yet they are rare.

Galega officinalis and its pure white variety alba are useful hardy plants which seem happy anywhere. They are of very free growth, the branching shoots smothered with pinkish flowers in the case of the parent, but the variety alba is more useful for cutting, because as white as driven snow. It is very easy to increase either of them by seeds or division of the plants.

Gaura Lindheimeri is a graceful perennial which bears its rose-tinted flowers for months, and is worth grouping with the taller hardy plants, as in some soils, warm light loams for example, it grows over 4ft. in height.

FUNKIA.

Gazanias.—Of this family of annual and perennial kinds, G. rigens and its variety splendens are the best. Splendens is the deep orange, dark-centred Marigold-like flower frequently seen used as an edging to beds in the London parks. It is a brilliant plant of low growth, and likes a warm sunny spot. As a rule, Gazanias do not live through the winter, and it is wise to take cuttings in August, place in a cold frame, and keep them in pots until planting out time the following spring. An edging of G. rigens splendens is very bright throughout the summer.

SNOWDROPS IN A WOOD.

Gentians, The.—It is a poor garden from which the beautiful Gentians are absent. There is rare beauty amongst the many kinds, all widely distinct, yet preserving characteristic features. Upon rock gardens and in borders plant the Gentians, using the dwarf kinds as edgings; but their uses are pointed out in the description of the several kinds. As regards their culture, it must always be remembered that the less Gentians are disturbed the better, as they increase in beauty with age, and in propagating them raise the plants from seed, rather than from division of the roots, unless it be the Gentianella (G. acaulis), which may be pulled to pieces readily. Sow the seeds always when ripe, and use shallow pans or pots, which must be well drained and placed in a cold frame. Water always with great care, and prick off the seedlings into other pans when large enough. The whole business is simple. All the seed may not germinate at once, but as the seedlings develop they may be lifted carefully from the pan and pricked out.

G. acaulis (*the Gentianella*) is a very old inhabitant of our gardens, having been introduced about the year 1630. It is quite dwarf, rising scarcely more than 3in. in height, and the growth forms quite a dense mat, hidden almost in early summer with long deep blue flowers. There are forms of it, however, almost white, rose, and streaked with blue. In some gardens the plant grows as if a weed, and in others it is difficult to establish; the rule is to give it a gritty, loamy soil, well drained, and choose a cool, fairly shady, but by no means sunless position. Small pieces, if in congenial spots, will soon become established. G. bavarica, also a very small Gentian, should be planted in the rock garden, and seems to care little under what conditions it is grown, succeeding in light loamy soil as well as in moist, boggy spots. The flowers are large for the size of the plant, and intense blue.

G. Andrewsi is one of the taller Gentians, rising about 2ft. in height, the clear blue flowers appearing in clusters in early autumn. It delights in a moist soil.

G. asclepiadea is the Willow Gentian, and one of the handsomest of the family; it should be grown freely, being permitted to extend into a bold group. It will succeed in the ordinary border, but is never handsomer than when placed in a rather shady corner in the rock garden where the soil is peaty and moist. There it grows with great freedom, the tall willowy stems being hidden almost with purple-blue flowers, white, or nearly so, however, in the variety named alba. It comes from Southern Europe, and blooms in August, when its wealth of colouring is welcome.

G. septemfida, or the crested Gentian, is an early autumn-flowering kind, and perhaps the most popular of the family, as it grows very freely in almost any situation, caring little whether it be sunny or otherwise, but growth is freer where moisture is present. The flowers are bright blue, and borne on stems that are sometimes erect and sometimes almost trailing. G. affinis is not unlike this species.

G. verna is a delightful alpine flower, and, it must not be forgotten, is found here too. It is unfortunately rather troublesome to manage, requiring a good loamy soil with little stones about the collar, exposure to sun, a cool position nevertheless, and moisture. The flowers are intense blue, a beautiful colour, and appear in spring. When the little tufts are in full flower, G. verna is a treasure indeed.

Other Gentians of value are G. cruciata, blue; G. frigida, G. ornata, deep blue, pretty on a shady part of the rock garden in peaty soil; G. Pneumonanthe, a native kind; G. punctata, 2ft. high, yellow, spotted with purple; G. pyrenaica, 3in. high, flowers deep blue, and fringed; and G. algida, allied to G. Pneumonanthe.

Geraniums.—These must not be confounded with the Zonal Pelargoniums of gardens usually called Geraniums. The plants now under consideration are perfectly hardy, some natives of our own land, as G. sanguineum, G. pratense, the little Herb Robert (G. Robertianum), and others. A very beautiful kind is G. armenum, which is also one of the most vigorous, and bearing in profusion, in summer, large deep rose purple flowers. This plant may be used in many ways, in the rougher parts of the garden where it spreads about freely, near woodland walks, and in the mixed border. One never tires of a plant so bushy, vigorous, and rich in colour. Another kind that may be planted freely in the wilder parts of the garden is G. platypetalum, the flowers of which are deep blue. A

handsome species is G. Endressi, with rose-coloured flowers; and Ibericum, rich blue, is also pleasing. G. sanguineum lancastriense, G. pratense and the white variety, the silvery-leaved G. argenteum and G. cinereum, which has white flowers with purple veins, are all of value, the last two mentioned being happier on the rock garden; they are too small for the border. If one wishes to increase the Geraniums, it is easy to do so by dividing the tufts in spring when new growth begins, or by sowing seeds in a cold frame in spring, or at almost any season. Root division is, however, the simpler way.

Gladiolus.—This is a beautiful family of plants which of late years has received many remarkable additions in the way of hybrids. It is true that the plants are not a success everywhere, but they require in a measure peculiar conditions—a thoroughly drained soil, and warm sunny position. If those who have hitherto failed in the culture of these noble flowers would consider their requirements more closely, the results would not be so unsatisfactory. There are many ways of planting, a delightful one being to mass them amongst evergreen shrubs, which display the rich and varied colouring to conspicuous advantage, or in a distinct bed or beds upon the outskirts of the lawn, or in the pleasure ground, when the full rich beauty of colour and form is not hidden. No less than one hundred species can be named, the majority of which are natives of South Africa. Gladioli may be propagated from seed, in which manner a number of lovely hybrids have been raised of late years. The sorts chiefly used in gardens at the present day are hybrids of the autumn-flowering G. Gandavensis and the early-flowering race, which latter owes its origin chiefly to G. ramosus, G. cardinalis, and G. tristis. These two sections of Gladioli require different methods of treatment. The early-flowering kinds succeed best in light soil, and in the Southern Counties, where the staple is of this description, increase surprisingly fast, and may with impunity be left in the open border without protection through the winter. In heavy, damp soils, however, this course cannot be followed without an ultimate loss of the corms, though if raised beds of light soil be made, the plants may be allowed to remain undisturbed, except in cold districts, if a mulch of cocoa-nut fibre be given before the winter sets in.

GLADIOLUS.

Of the early-flowering Gladioli about twenty kinds are in commerce, amongst the best of which are the following: G. Colvillei, The Bride, the well-known white variety, which is grown by the thousand for the market; Blushing Bride, white with rose pink flakings; Fire King, rich red; Crimson Queen, deep crimson; Delicatissimus, blush white with rose flakings; Insignis, scarlet, flaked purple; Prince Albert, rosy scarlet, flaked white; Salmon Queen, clear salmon pink. These early-flowering Gladioli are valuable for pots, being most decorative in the conservatory during the late spring.

The autumn-blooming hybrids of the Gandavensis section will succeed in a far heavier soil than is suitable for the last-named race, many growers being markedly successful in their culture in strong, adhesive loam. The soil should be deeply dug some three months prior to the planting of the corms, and some well-rotted manure added at the final digging, care being taken that this manure does not come into contact with the corms when planted towards the end of March. It is well at the planting time to surface each corm with a little silver sand. In warm and dry soils in the South of England the corms, if planted at a depth of 7in., will usually come through the winter unscathed; but autumnal lifting is usually practised, and is the safest plan. When the foliage shows signs of yellowing, the corms are lifted, and for a time hung up by their leaves in an airy, dry outhouse or loft, where the foliage soon becomes destitute of sap. They are then taken down, the corms removed and cleaned, and stored in dry sand, drawers, or paper bags. No moisture or warmth must be allowed to affect the resting corms, or they will start into premature growth, which is detrimental to their subsequent flowering. An easy method of propagation is that of detaching the small bulbils, which are found clustered round the base of the corm, and planting them in lines in a well-prepared bed of light soil, mulching this in the winter with long manure, rough leaf-mould, or cocoa-nut fibre, in order to prevent injury by frost. These autumn-flowering Gladioli are also amenable to pot culture, one large corm being sufficient for a 7in. pot. As cut flowers all sections of the Gladiolus family are equally valuable, the spikes opening well in water if cut when the lower blossoms have just expanded. Many named varieties of the late-flowering Gladioli are raised each year, but several old-time favourites have dropped out of cultivation. The brilliant scarlet G. Brenchleyensis has, however, a hardy constitution, and is invaluable for garden decoration. A wide series of colours is represented in this section, the tints ranging through crimson, scarlet, rose, flesh, salmon, yellow, and white.

New hybrid races of Gladioli have been introduced of late years, these being G. Lemoinei, mostly yellow and flesh-tinted, with large blotches of deep colour on their lower petals; G. Nanceanus, producing exceptionally large and brightly-coloured flowers; and G. Childsi, a more robust strain than the last-named, the flower spike being taller, and the individual blossoms possessing exceptional lasting powers. One of the most popular of the Gladioli for pots is G. Colvillei, The Bride, which may be grown in an ordinary greenhouse with complete success, as will be pointed out when flowers for the greenhouse are considered.

Golden Rod.—*See* Solidago.

Grasses, Hardy.—Varied and noble are the hardy Grasses, of which the Pampas Grass (Gynerium argenteum) and the New Zealand Reed (Arundo

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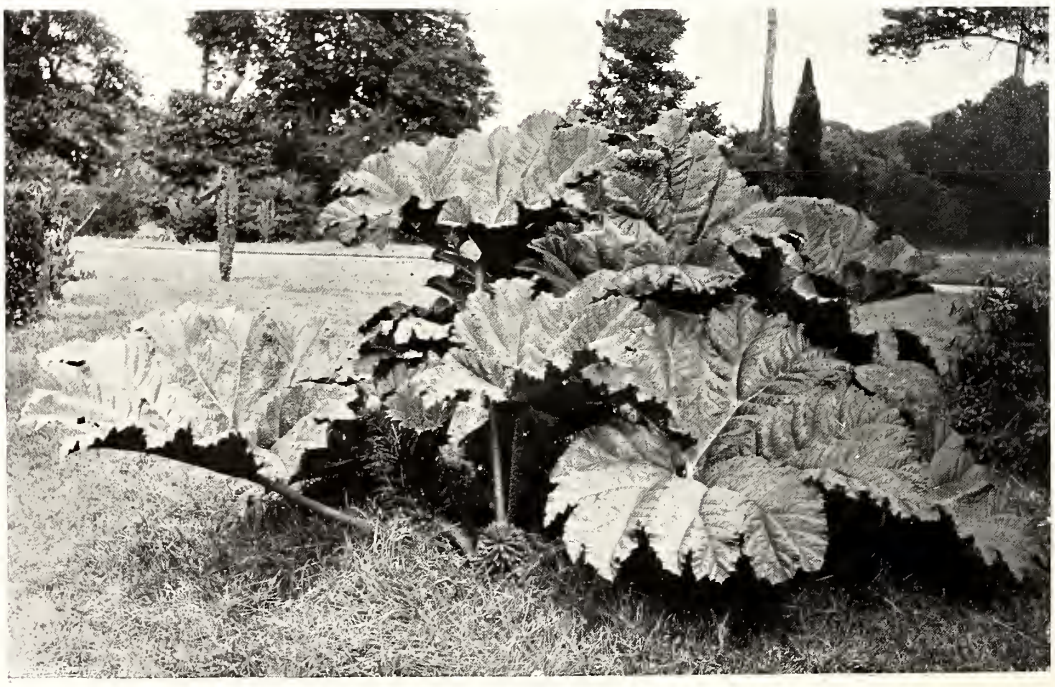
conspicua) are the most important. The Pampas Grass will thrive almost anywhere, though to obtain the best results, that is, plants 10ft. or 12ft. high, the soil should be stiff yet well-drained loam, and the position fairly sheltered. It is the female plants that produce the most beautiful plumes. G. jubatum is pretty, though less vigorous than the more familiar kind, and its plumes are pure silvery white in colour. The Arundo is in beauty about two months before the Pampas, and is a noble silvery-plumed Grass, requiring a moist soil and shelter, but not shade. A. Phragmites is our pretty native Reed, whilst A. Donax is tender, though it should be always tried, especially in the Southern Counties, where it is usually far happier than in more northerly districts. A cover of ashes should be laid over the crown of the plant as protection from severe frosts. The variegated variety is very pretty, the graceful leaves being striped with white. The Arundo conspicua and Pampas Grass should be grouped on the lawn outskirts, or some position in which their fine growth is seen. It is a mistake to crowd them up too much with other things. Eulalia japonica is very graceful and hardy, reaching fully 8ft. in height and 5ft. or 6ft. through. There are three very pretty varieties, one named variegata, in which the leaves are striped with white, another gracillima, well named, as it is the most graceful perhaps of all, and zebrina, which is readily known by the yellow transverse bands across the grassy leaves. The beautiful blue-green coloured Sea Lyme Grass (Elymus arenarius) should also be included. This is worth planting on loose banks, as its roots are of extreme vigour and hold the soil together. The Apera arundinacea and Feather Grass (Stipa pennata) must not be forgotten, and are worth gathering for winter decorations. Annual Grasses are considered in the chapter on "Annual Flowers."

Gunnera.—The Gunneras are noble plants for the water-side, and are amongst the largest leaved of all perennials. It is only by the lake or pond side that this group is happy, and when well placed is remarkably imposing. G. Scabra and G. manicata are the chief kinds, and of the two the former is the more handsome, in both species the leaves measuring sometimes over 6ft. across. The pleasure ground is not the best place for them, and if there be no water in the garden, and this group is desired, choose some sunny spot, open, yet sheltered as when exposed to rough winds the leaves get much torn. Except in the South of England it is wise to protect the roots from frosts by covering over the crowns with dry leaves, removing this covering in the spring. It is not much they require, but this light covering means, in a hard winter, preserving the life of the plant. The fruit spikes are an interesting feature, but it is for their bold ample foliage that one cherishes the Gunneras. G. manicata will develop to an immense size in certain positions, and it loves no place better than by the water-side, where, in time, if the soil be rich and deep, it will spread into a large colony. It is well to give a mulching of manure in the spring, and even applications of liquid manure, as the roots require plenty of rich food. Gunneras are called "Prickly Rhubarbs," and the big leaves are not unlike those of a large Rhubarb. There are other Gunneras, but G. Scabra and G. manicata are the only kinds generally grown. It is rare to find any other species. Of course, to put the Gunneras by the margin of a small pond would be a mistake. They are big plants, require ample space to develop, and if in any way cramped their picturesqueness is lost; associate with them things of like vigour, the stately Polygonum Sachalinense. Bamboos, and similar things. The way to propagate is by seed, or division of roots, which is as easily managed as in the case of the homely Rhubarb. It is wise not to allow many fruit spikes to mature, as naturally these distress the plants considerably. Frequently several are produced by a single clump.

Gypsophila.—The best of the Gypsophilas is G. paniculata, which is valued for its veil of tiny white flowers in summer, a network of stems as fine almost as thread. When the plants are well grown this mass of white is over 2ft. across, and is delightful to mix with cut flowers in decorations. The plant is quite hardy and very vigorous, caring little what the position or soil may be. G. cerastioides is a pretty kind for the rock garden, with larger flowers than G. paniculata, and not carried on such a maze of stems. Very little grown is the annual Gypsophila (G. elegans), which is as valuable in its way for bouquets and similar floral arrangements as Paniculata. The flowers are white and like spray, so fine are the stems. Seed should be sown about March in the open ground.

Heaths.—This charming race will be described fully in he chapter upon "Trees and Shrubs."



GUNNERA.

TUSSILAGO FRAGRANS.

Helenium autumnale is a hardy plant that should be in every garden, large or small, in the country or otherwise. It is one of those free-flowering, vigorous perennials that are gay from summer until almost the time of frosts. The type is tall, quite 6ft. and handsome, but more useful for naturalising or to plant in the rougher parts of the garden; its flowers are yellow. The best variety for gardens is Pumilum, which is about 15in. in height, and almost hidden beneath the mass of yellow flowers. This is a kind worth filling large beds with on the turf, or to use in any way thought desirable. It never fails. Grandiflorum and superbum are tall forms. H. grandicephalum striatum is of tall growth, with a host of rich brown and bronzy striped flowers. It is quaint and curious, but an over-praised plant. Increase the Heleniums by division of the roots in early spring or in autumn, and they will succeed in almost any soil.

Helianthemums (*Sun Roses*) are valuable for warm dry banks, which a good selection of varieties of the common Sun Rose will clothe with spreading stems, studded in summer with brilliant flowers. The common Sun Rose is H. vulgare; it beautifies many a dry wayside bank, the wiry shoots hanging over chalk banks in full sunshine. Secure a selection of the best colours, which vary from white to deep crimson, some of the yellow and orange shades being rich and attractive. Other useful kinds are piloselloides, dwarf, with yellow flowers in masses; Tuberaria, which has yellow flowers measuring about an inch across; umbellatum, white; and H. rosmarinifolium. The way to increase Helianthemums is by seed, or by dividing the roots in early spring.

Helianthus.—A brilliant race of hardy flowers is the perennial Helianthus, so free, graceful, and hardy, that when once established the strong rambling growth is likely to encroach upon other things. It is necessary to group them to obtain a rich mass of colour from the flowers, which line the willowy stems, tossed about in autumn winds. These perennial Sunflowers may be planted amongst evergreen shrubs, just as one would use the Asters or Lilies; but no matter how small the garden is, plant a group somewhere in a corner where if the plants get unruly little harm will result. They appreciate rich soil, but will grow in almost any staple, and should be divided once in three or four years, otherwise the growth becomes matted, and weakly flower stems are the result. There are many poor weedy kinds, so restrict the selection to the following, all of which gladden the garden in autumn: H. decapetalus, height 5ft., soft yellow flowers in profusion, delightful amongst shrubs; H. doronicoides, H. giganteus (6ft.), H. lætiflorus, very handsome, rich yellow flowers; H. multiflorus, the most familiar of all, and its double variety, H. orgyalis (6ft.); H. rigidus, and its noble variety Miss Mellish, which has very large semi-double rich yellow flowers, and strong, tall stems. A large mass of this is imposing in the autumn. If only two or three kinds are desired, choose: H. decapetalus or H. orgyalis; H. mollis, a big yellow flower; H. lætiflorus, H. rigidus, also known as Harpalium rigidum; and the taller variety Miss Mellish.

Heliotrope, Winter.—*See* Tussilago fragrans.

Hellebores (*Christmas and Lenten Roses*).—The Hellebore family comprises about a dozen species, the majority of which are far from effective. The Christmas Roses, however, raised from H. niger, and the Lenten Roses, for which H. orientalis is chiefly responsible, yield to no plants for their value in the winter garden, where they flower from mid-October till April. A list of the species follows: H. abchasicus, from the Caucasus, bearing green or purplish flowers, 2in. in diameter, from January to March; height, 1ft. H. atrorubens, a native of Southern Europe, bearing dull purple flowers, with petals 1in. long, in March; height, 1½ft. H. caucasicus, from the Caucasus, bearing pale green flowers; height, 1½ft. H. colchicus, from Asia Minor, flowers deep purple; height, 1½ft. H. fœtidus, a European species, found in England, bearing green flowers, and valuable for its deep green abundant foliage. H. lividus, from Corsica, bearing corymbs of ten to twenty green flowers. H. niger, Christmas Rose, a native of Central and Eastern Europe and Western Asia, bears white flowers, and is the progenitor of the garden varieties of the Christmas Rose of to-day. H. odorus, from Eastern Europe, produces green, scented flowers; height, 1½ft. H. olympicus, from Greece, bears purplish flowers, and attains a height of 2ft. H. orientalis, from Greece, bears large rose purple flowers 2in. in diameter; height, 2ft. This Hellebore is the chief progenitor of the Lenten Rose. H. viridis, Europe, Britain, bears bright green flowers, and grows 1½ft. high. The Christmas and Lenten Roses deserve separate consideration, the former being more exacting in the matter of culture than the latter.

Christmas Roses require deep, rich soil, and flourish best in a partially-shaded situation, where shelter from cutting and boisterous winds may be obtained. The bed should be prepared at least 3ft. in depth, a thick layer of cow-manure being placed at the bottom, and a good portion of the same worked into the lower portion of the soil, care being taken that it does not come into contact with the roots. Large clumps should not be

EREMURUS HIMALAICUS (*see p.* 92).

planted entire, as when this is done they often refuse to grow, and eventually dwindle away. The clumps should be placed in water, and when the soil has become sufficiently softened it may be washed from the roots with a syringe or hose. When these are entirely free from soil they may easily be divided with a sharp knife into separate crowns, care being taken not to damage the roots more than is necessary. These crowns should then be planted 18in. apart in equal parts of fibrous loam and leaf-mould. In this they should soon root, after which they will quickly thrust down their roots into the stronger and richer soil below. The best times for division and planting are February and September, the first being before they have commenced to make their season's growth, and the second after its completion. After flowering is over the plants should receive a mulch of well-rotted manure, and should be well attended to in the matter of water during dry weather, while liquid fertilisers, such as manure-water and soot-water, are very beneficial in strengthening the growth of the plants, and thus laying the foundation for a satisfactory flowering season. Sheets of glass fixed on legs just over each clump prevent the blossoms getting soiled during wet weather. Frames and hand-lights are often put over them for the same reason, but these are apt, in bad weather, to be kept too close, and they are certainly more cumbersome than the method advocated. Christmas Roses are often grown well in tubs, half-casks, and large pots, but to be successful in this manner of culture it is necessary that they should receive even more care and attention than when they are planted in the open ground. The tubs should stand in a sheltered position, not exposed to the full sunshine for ten months out of the twelve, and be brought under glass as the flower buds show above the soil. The plants must not even be allowed to want for water or feeding throughout the summer, if a satisfactory bloom-crop is to be expected. There are many varieties of the Christmas Rose, but of these some identical forms known by diverse names in different localities. The Giant Christmas Rose, H. n. altifolius, sometimes known as H. Maximus, is the first to flower, often coming into bloom, in the south-west, in mid-October. When well grown it attains a height of nearly 2ft. The leaves are large and very leathery, and their stalks, as well as the flower stems, are heavily spotted with red. The flowers of this fine variety, without doubt the noblest of all, are often over 5in. in diameter, and are generally tinged with pink at the back of the petals. Although commencing to bloom at such an early date, H. n. altifolius often extends its blossoming period until March. H. n. Juvernis, or St. Brigid's Christmas Rose, is a beautiful variety, bearing large, cupped blossoms of the purest white, without the slightest suspicion of pink, both leaf and flower stems being of pale apple-green colour. This Hellebore was of late years rediscovered in Ireland, where it was reported to have been originally brought by the Huguenots. Another valuable Christmas Rose is the Riverston variety, which takes its name after a country seat in County Tipperary, Ireland, where its conspicuous merits were first discovered. It is a particularly free-blooming variety and produces pure white flowers. The Brockhurst variety, is somewhat similar in appearance to H. n. Juvernis. It is a great favourite in the North of England, and is used extensively for supplying the cut-flower trade around Manchester. H. n. major (the Bath variety) is a larger form of the typical H. niger. It is grown in great numbers by nurserymen round Bath, and holds the field in that city in much the same manner as the last-named does in Manchester. H. n. scoticus or augustifolius is sometimes confounded with H. n. Juvernis, but rather it is a smaller and slenderer edition of H. n. altifolius, though with narrower leaves and without any pink on the blooms. H. n. Madame Fourçade is a pure white free-blooming variety much after the style of H. n. Juvernis, but slightly more vigorous. H. n. ruber, or Apple-blossom, is of a clear, light pink shade. Christmas Roses may be raised from seed sown in a moist and shaded bed in porous soil. Blooms may be expected in four years from seed.

The Lenten Roses, which come into bloom in mild winters at the end of January, carry on the display commenced by the Christmas Roses. While they are partial to deep, moist loam, and to a position not too exposed to the sun's rays, and whilst they succeed under the cultural conditions advocated for the Christmas Roses, there is no doubt but that their culture is considerably simpler than that of the varieties of H. niger, which at times refuse to flourish, even when all their wants have been studied and provided for by experienced cultivators. There are now many beautiful hybrids of the Lenten Rose, many named, and many, quite as lovely, unnamed. Great attention has been paid to their hybridisation of late years, both in this country and abroad, and we now have a charming series of colours, ranging from white through peach-blossom and pink to rose-coloured and maroon, some of the white flowers being most delicately spotted with crimson and claret dots and splashes in the interior. Some of the blossoms are cup-shaped and some star-shaped. A few good named varieties are N. orientalis antiquorum Willie Barr, rose; H. o. Commerzienrath Benary, white, spotted crimson; H. o. Gertrude Jekyll, pure white; H. o. Gretchen Heinemann, rose purple; H. o. guttatus, white, spotted claret; H. o. Mrs. Lambert, blush, spotted crimson; H. o. punctatissimus, rose purple, freely spotted; H. o. roseus, deep rose. The Lenten Roses are easily raised from seed sown as soon as ripe in fine soil on a damp border. In many gardens mice have a great partiality for the buds of these plants, and hundreds are often taken in a single night. In using the Hellebores for cut flowers it is necessary to split the flower stems, from their bases, into four divisions for 3in. or 4in. up the stalks. If this is done they will remain fresh for many days, whereas if it is omitted they will speedily wither. The Christmas Roses are injured by having their leaves cut to arrange with the flowers; but leaves of the common Rhododendron will be found to give a similar appearance, and can usually be procured without difficulty.

HELLEBORUS NIGER (*Christmas Rose*).

Hemerocallis (*Day Lily*). — This handsome race of hardy flowers obtains its popular name from the Lily-like character of the flowers and their brief life. There are

several species, all good garden plants, enjoying shade, and for this reason wherever there are shady corners to make beautiful the Hemerocallises should be used liberally. By streamside, in the mixed border, or in the wild garden, the Day Lilies may be planted with success in the autumn. The soil should be well manured, and then it will not be necessary to disturb the clumps for years. If an increase of stock is desired, divide the roots in autumn, a very simple matter. The most important kinds are H. Dumortieri, which comes from Japan. It bears a profusion of rich yellow fragrant flowers, which, if very short lived, appear in quick succession, so much so that their brief existence is not noticed. The variety named Aurantiaca major is of more recent introduction, and is the finest of the family. It is remarkably robust both in leafage and flowers, these being very large, sweet-smelling, and apricot in colour. A large mass of this in the garden is a noble feature. These strong-growing kinds in particular must not remain too long in one place, else the growth becomes weakly through being matted together. A charming kind is the Yellow Day Lily (H. flava), which has pure-coloured flowers, strongly scented, and they do not fade so quickly as those of other kinds. The leaves are graceful, fresh in colour, and the plant increases quickly. H. fulva is the copper-coloured Day Lily, and of bolder growth than the yellow kind, being thus fitted for the wilder and rougher parts of the garden. H. disticha, the variegated H. Kwanso, the double-flowered Augustifolia, and variegata, are all forms of this species. H. minor, or H. graminea, as it is also called, because of its grassy foliage, is smaller altogether, and has large yellow fragrant flowers which remain in beauty for two or three days. The Day Lilies should be grown in quite small gardens, and the pretty H. flava may often be seen flowering freely in the shade in gardens near large smoky towns.

Hepatica.—*See* Anemone.

Heucheras.—This family is of importance in two ways. In some species it is the foliage that constitutes the chief charm, this changing to bright colours in winter, so much so that the leaves are often worth gathering for decorations. The Heucheras are very hardy, and best used in front of shrub groups, as in the mixed border, unless it be the scarlet-flowered H. sanguinea, the plants are in a way lost. H. sanguinea is certainly the brightest of the family as regards flowers, these being scarlet, crimson, or shades of it, and produced in slender spikes. Seedlings vary so much, that propagating the plant each year after flowering by dividing the tufts is advisable, and the experience of most flower gardeners is that to induce this Heuchera to bloom freely, disturbance of this kind once in two or three years is necessary. A warm, loamy soil and sunny position are needful. Grandiflora is a variety with stronger flower stems, and is of richer colour. H. americana, H. glabra (brightly-coloured leaves in winter), and H. Richardsoni or hispida, are useful for their foliage; the flowers are of little account.

Hibiscus.—There are a few of this splendid family, usually suitable for the stove only, that may be treated as half-hardy annuals. One of these is H. Manihot, which has beautiful delicate yellow flowers, with a marone centre. H. africanus major, pale yellow, is also pretty. Sow the seed in warmth in February, and plant out in late May, when frost is no longer to be feared. The Hibiscus is placed here because usually considered perennial.

Hieracium aurantiacum (*the Hawkweed*) is a plant common in many gardens. It is not without beauty, as its flowers are rich brownish red, and produced in a dense head, continuing to appear for several weeks. There is no trouble about growing the plant; it is at home almost anywhere.

Hollyhock, The (*Althæa*).—The Hollyhocks form a noble family of hardy plants, making picturesque groups in the border, especially when backed by an old moss-stained wall. Unfortunately, for many years past disease has played havoc with this stately flower, although happily its visitations are less frequent and severe than formerly. There are many species, few, however, of any value, the race used so freely in gardens having been derived from A. rosea, which is itself a very handsome species. Hollyhocks should not be merely confined to the back row of the mixed border, but grouped in the woodland, where the sun is not hidden, or amongst shrubs. Many effective pictures may be created by using the Hollyhock in the wilder parts of the garden. The soil must be thoroughly good, even rich, putting in plenty of manure, as it is, as gardeners say, a "gross feeder." During the summer months, if the weather is very dry, give water freely, and never fail to securely stake the stems if the position is at all windy.

The way to increase Hollyhocks is by seed, dividing the roots, cuttings, and eyes. Sowing seed is advisable, as seedlings are far less likely to perpetuate any disease than cuttings or eyes. There are several times for seed sowing, namely, in early autumn in a cold frame, when the seedlings must be kept in pots during the winter and

HEUCHERA.

planted out in spring, or in February, using shallow pans for the purpose, which should be placed in a cold frame. Pot off when large enough, or, if the seed be not sown too thickly, leave the seedlings alone until of moderate size, when plant them in the positions they are to adorn. February is a good time to sow. Seedlings do not reproduce the colours of the parents, but give a variety of tints sometimes, though the colours are seldom poor, whilst we cannot be sure of obtaining double kinds. To perpetuate any unusually fine variety, resort must be had to dividing the plants when new growth is commencing in spring. Cuttings may be struck readily in summer-time with a little bottom heat. If one has a spent cucumber-bed, utilise this for the purpose, putting a glass light on, and shading the cuttings from the sun until rooted; then pot off and plant out. In propagating from eyes, which are in the axils of the leaves, these should be treated like vine eyes, and planted in small pots placed in gentle warmth. Let there be a leaf with each eye if possible.

Of other species of Hollyhock, A. ficifolia is very beautiful, the flowers usually soft yellow, but varying in colour. It grows about 5ft. in height. Our British Althæa is A. officinalis, called the Marsh Mallow.

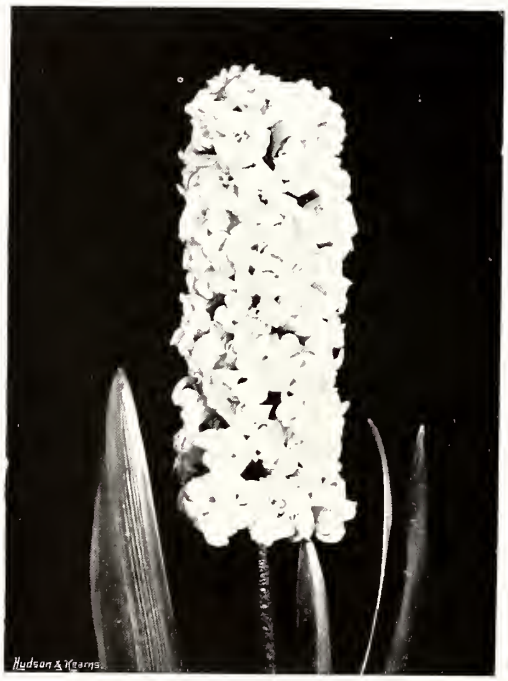
When the plants get diseased, there is, unfortunately,

little to be done, this consisting principally of removing and burning at once any leaf at all infested, and spraying the remainder once a week for about three weeks with Bordeaux mixture, which is a stronger remedy than sulphur.

Houseleek.—*See* Sempervivum.

Hunnemannia fumariæfolia (*the Mexican Poppy*).—A graceful and beautiful flower, which should be seen more frequently than at present. It is really a half-hardy biennial plant, and is readily increased by seeds, which may be sown in autumn when ripe, and as they often remain dormant for some time, the soil must not be thrown away under the belief that the seed has failed. Select a very warm spot for this Poppywort, where the soil is light, otherwise it will not succeed. The flowers are very charming, clear yellow in colour, and the foliage is pretty too.

Hyacinth, The.—The garden Hyacinth of the present day has for its progenitor Hyacinthus orientalis, a native of Syria. The propagation of this bulb is now almost entirely left to the Dutch growers, whose deep, sandy soil is eminently adapted for its culture. New varieties are



DOUBLE HYACINTH.

raised from seed, and named kinds perpetuated by offsets. The culture of the Hyacinth is exceedingly simple, as the bulbs arrive in England containing the undeveloped flower spike, which pushes up when the bulb is started into growth. Hyacinth bulbs are often thrown away after blooming in pots; but if these are carefully knocked out, without disturbing the soil, and the balls lowered into a hole in the earth in a spare border, the soil being subsequently made firm and a good watering given, they will give pleasure for many a year, although the spikes may not be as massive as on the first occasion of their blooming. An out-of-the-way border filled in this manner with some hundreds of discarded bulbs presents a charming spring picture, and furnishes the house with countless scented flower sprays.

For pot culture single bulbs should be used in preference to a greater number, as these seldom are at their best simultaneously. They should be potted in three parts fibrous loam and one part well-rotted manure, with a sufficient admixture of silver sand to keep the compost open. When potted they are best placed in a cold frame and covered with a layer, 4in. to 6in. deep, of cocoa-nut fibre, being removed, when they start into growth, to a light shelf in a cool house, and being placed, later on, if it is desired to hasten their flowering, in a warmer structure.

The early Roman Hyacinth is particularly useful where white flowers are required in the depth of winter. When grown for cutting it is usually planted in boxes, but, subjected to the same treatment as recommended for the Dutch Hyacinths, it makes a pretty winter pot-plant. The bulbs being smaller, three instead of one should be placed in each pot.

Of single Hyacinths the following named varieties are good: White, alba maxima, Avalanche, Blancheur à Merveille, La Grandesse, L'Innocence, Mont Blanc; blush white, Cloche, magnifique, Elfrida, Grandeur à Merveille, Leviathan, Lord Shaftesbury, Mammoth; dark blue, Anna Bolena, General Havelock, King of the Blacks, King of the Blues, Marie, William the First; light blue and porcelain, Amy, Czar Peter, Grand Lilas, La Peyrouse, Queen of the Blues, Regulus; red and pink, Cavaignac, Circe, Cosmos, King of the Reds, La Belle, Vuurbaak; yellow, Anna Carolina, Bird of Paradise, Grand Vedette, John Stuart Mill, King of the Yellows, Obelisk.

Of double Hyacinths, the appended selection is composed of handsome varieties: White, La Tour d'Auvergne, Grand Vainqueur, Prince of Waterloo, La Vestale, Lord Derby, Princess Alice; blush white, La Virginité, Duchess of Bedford, Jenny Lind, Groot Voorst, Anna Maria, Madame de Stael; dark blue, Charles Dickens, Garrick, Laurens Koster, Lord Wellington, Prince of Saxe-Weimar, Bride of Lammermoor; light blue and porcelain, Bloksberg, Mignonne de Dryfhouts, Van Speyk, Magnificent, Delicata, Duke of Norfolk; red and pink, Princess Louise, Bouquet Tendre, Regina Victoria, Duke of Albany, Marie de Medicis, Empress of India; yellow, Bouquet d'Orange, Goethe, William III., Crœsus, Jaune Supreme, Ophir.

It is as well when ordering bulbs to specify the colour required as well as the name, as often two differently coloured varieties are advertised under the same name. Thus, in taking up the catalogue of a noted bulb firm, one finds that a double dark blue Hyacinth is named Charles Dickens, and that the same title is applied to a single red variety. Again there is a double blush Lord Wellington as well as the double blue referred to in the preceding list, while Princess Louise is advertised as a double white as well as a double red, and this by first-class firms.

The only wild Hyacinth worthy of notice is H. amethystinus, a native of the Pyrenees, which bears graceful spikes of sky-blue bells.

Iberis.—The perennial Candytufts are of much beauty and interest, forming dense green cushions pleasant to look upon in winter, and smothered with white flowers in summer. They should be planted so as to hang over ledges or old walls, and here, the position being warm and the soil light, the plants are more likely to weather winter trials. The Iberises are not very hardy, being extremely susceptible to damp. I. gibraltarica is happier in a greenhouse or frame than on the open rock garden. Indoors it will produce its white and lilac flowers throughout the winter, and there is a variety of it named hybrida which is worth growing. It grows about 1ft. in height, and has bright green leaves, which are almost hidden in the flowering season with very large clusters of white or lilac blossom. When not grown in the greenhouse the only position in which it may be trusted is a warm, sunny nook where the soil is light and moisture will run off quickly. Damp, or anything approaching stagnation, at the root is fatal. I. Printi reminds one of I. gibraltarica, but is happily hardier, and bears its pure white flowers in early summer. Plant in an easterly position and in light soil. I. saxatilis is quite dwarf, and has deep green leaves and pure white flowers, and of this there is a very charming variety named correæfolia, which may be planted as an edging to walks. I. semperflorens bears its sweetly-scented

flowers in autumn, white; but the most common of the whole race is I. sempervirens, and it has a distinct variety named Garrexiana. This Candytuft is seen in quite small gardens, and is the hardiest and most easy to grow, spreading about freely on the ground, or hanging over old walls and ledges upon the rock garden. Superba is a well-named variety. Gritty soil is necessary. Garrexiana is a dwarfer variety, with smaller flower clusters. I. Tenoreana has purple flowers, and is not hardy, except in the Southern Counties. All the perennial Candytufts are, however, very easily raised by cuttings, which may be taken in the autumn, dibbled into pots of light soil, kept through the winter in a cold frame, and planted out in the following spring. In the case of such kinds as the last, this constant renewal is necessary if one desires the plant always in the garden. Propagate the perennial Candytufts by seed and cuttings in summer.

IBERIS (Perennial Candytuft)

Inulas.—These are picturesque plants for the most part, especially the big orange yellow I. glandulosa, which is sufficiently vigorous and handsome to make a group of in the rougher and wilder parts of the garden. If one kind is grown, this is certainly the finest. I. Helenium is the British Inula, and I. Oculus-Christi may be also mentioned. All the plants are a success in good soil, and will grow almost anywhere. When an increase of stock is desired, propagate by root division.

Kniphofia (*Flame-flower*).—This is a noble group, frequently catalogued as Tritoma, the old name for the family, and one frequently hears them described by the ugly but apt title of Red-hot Poker plant. The brilliant orange and scarlet spikes suggest flames of fire seen from a distance. The Kniphofias are indeed a sumptuous group of hardy perennials, noble flowers to enrich the autumn garden. Plant them near Bamboos or any tall vigorous plants, to throw into relief the wonderful colouring. Masses in the wild garden or by the lakeside are beautiful too.

K. Uvaria, or Aloides, as it is also called, is the most common species, and is the true Red-hot Poker plant of the cottage garden. It is more vigorous perhaps than any, and has given rise to numberless hybrid forms, which are in many cases very beautiful and distinct in colour. The most noble of all the varieties is grandis, which produces spikes 5ft. or even more in height, and the flowers are orange scarlet in colour or shades of it. Nobilis is, as the name suggests, another handsome form, and others worthy of mention are longiscapa, maxima globosa, præcox, serotina, and Saundersi. In a large collection would also be included K. Burchelli, K. caulescens, the pretty K. corallina, K. Macowani, K. Nelsoni, K. Rooperi (very early flowering), and K. sarmentosa; but restrict the kinds, where a group or two only of the most effective Flame-flower is desired, to K. grandis, or the common Uvaria.

Hybrid Flame-flowers are very beautiful, but they are yet uncommon. Leda is as charming as any, being of strong growth, with coral red flowers, touched with orange. A very bright flower, Matador, has dark red spikes; and those of Obelisk are self golden yellow, a distinct colour, very free, strong, and with broad leaves. This is often preferred to any other because of its clear self colour. Pfitzeri, rich scarlet and yellow, and strong in growth, is another good kind. Kniphofias like a thoroughly deep soil, not in any way damp, through the winter. During hard winters the plants suffer severely, and sometimes are killed outright; but deep planting and a covering of dry leaves are as a rule sufficient protection. When new growth begins in spring, a top dressing or mulch of well-decayed manure is helpful. The easiest and most generally adopted method of propagation is by division of the roots in the autumn or spring. One may also raise the plants from seed sown an eighth of an inch deep in sandy soil in shallow boxes in a cold frame in April. But this is a considerably more lengthy process than root division.

Knotweeds.—*See* Polygonums.

Lake Flowers.—*See* streamside gardens.

Larkspur.—*See* Delphinium.

Lavender.—This precious, fragrant, hardy bush is necessary in the garden. Its sweet-smelling leaves and blue flowers are ever welcome, whether in the border or as a low hedge separating perhaps the flower garden from the kitchen or fruit domain. A very light soil and sunshine are essential. It is a warmth-loving plant, and may be used to beautify banks. One should grow the white Lavender also. Old bushes in some sunny border or corner of the garden are always pretty in colour and picturesque in growth. Lavendula vera is the name of the Lavender of gardens. Propagate by cuttings in quite early autumn out of doors, in a sheltered but not shady place, and plant out when rooted or divide in March, planting out the rooted slips about 1ft. apart in light soil.

Leucojum (*Snowflake*).—A dainty group of bulbous plants, as dainty even as the Snowdrop. There are only about three kinds of importance, and all are pretty in the grass, by the margins of shrubberies, or in the border, and increased either by seed or separating the bulbs. It would be better to plant the Acis, or L. autumnalis, in the rock garden, to derive full satisfaction from its beautiful pinkish flowers. The summer Snowflake (L. æstivum) is the strongest. It bears its white green-tipped bells in clusters upon a stem about 18in. high, and groups near to trees, by the shrubbery, or associated with such plants as the Solomon's Seal, are very charming. L. autumnalis, the autumn Snowflake, formerly called Acis, is a delightful flower, and should be planted in the rock-garden, or in some spot where the soil is warm, well drained, and there is a carpeting of some creeping plant, as Saxifrage, Herniaria, or Sedum, to prevent rain splashing up the soil and injuring the delicate pinkish flowers. Seeds will ripen sometimes, and should be sown as soon as ripe in a cold frame, whilst in very congenial soils it will sometimes sow itself. The flowers appear before the leaves. L. vernum, the spring Snowflake, is charming in rock garden or border, liking a rich, well-drained soil. Its flowers are white, tipped with green, those of the variety L. carpaticum appearing a few weeks later.

Liatris spicata is the most effective of the family. It grows about 2ft. in height, and has purplish flowers in long spikes. L. pycnostachya, also purple, and L. elegans may be mentioned. Give rich soil, and propagate by division of the roots in spring.

Lilies.—It is hardly necessary to praise the Lily. During recent years many beautiful kinds have been added to our gardens, and there is a host of forms to choose from, flowering at various seasons of the year, commencing in early summer and continuing until almost upon the threshold of winter. It is to be hoped that the disease will not increase in severity as the years pass, as in the case of the unhappy Hollyhock, which was almost annihilated through a fungoid pest. Lily growers must take strong measures, especially with the lovely white Lily, the victim in thousands of gardens of a destructive foe. There is a brave procession of Lily flowers, amongst the first to expand being L. bulbiferum, L. davuricum, and L. tenuifolium. Then come the peerless Madonna Lily, the orange Lilies, the Nankeen Lily, and L. elegans, in whose train are the Martagons, the Swamp Lily, the Giant Lily of the Himalayas, the scarlet Turk's-cap, and Humboldt's Lily, the wide-spread scented blossoms of the Golden-rayed Lily, and with autumn the forms of L. speciosum and the Tiger Lilies. The autumn is the best time to plant, but the bulbs are often planted in spring with satisfactory results. A little consideration bestowed upon their quarters in the garden will be well repaid. The Lily-bed should be deep—3ft. deep if possible—and the soil open and porous, without being light. There cannot be a better material than sound, fibrous loam, with which a certain proportion of leaf-mould has been mixed. Lilies rarely are benefited by animal manure, and, though L. giganteum and L. excelsum have been known to thrive when within reach of this fertiliser, it is safer to keep such stimulants outside the Lily-bed. Most Lilies will flourish in the compost mentioned, while for the Swamp Lilies, L. canadense, L. pardalinum, and L. superbum, a peaty soil should be provided. The bed should be sheltered from boisterous winds, for Lilies lose half their beauty if it becomes necessary to stake their graceful stems, and partially shaded, so that the sun does not parch the ground or prematurely wither the dainty petals. If there should be running water in close proximity to the bed so much the better, as even in the heat of summer the air absorbs some of its moisture. In times of drought, the bed should be given copious waterings occasionally; not a surface sprinkling, but a steady soaking of an hour or two's duration. Though many of the Lilies are capricious in their behaviour, and are difficult to cultivate successfully, except by making a special study of their requirements, there are a sufficiently large number that flourish under the most simple culture to render the bed charming from early June till mid-September. A charming way to plant the taller Lilies is amongst evergreen shrubs, a way becoming very popular. The Lilies break up monotonous masses of Rhododendrons, and the rising stems receive protection from frosts, sheltering thus amongst the shrub shoots. The following is a list of the leading kinds:

LILIUM AURATUM.

L. auratum (*the Golden-rayed Lily of Japan*).—This Lily is without doubt the most imposing of all the Lily tribe, sometimes reaching a height of 8ft., and bearing wide-spread, handsomely-marked flowers, frequently in great numbers. There are now four well-defined named varieties of this Lily in commerce, namely, L. auratum rubro-vittatum, a gorgeous flower, the broad yellow band which runs from the base to the tip of each petal in the type being replaced by a crimson band, while the spots, instead of being purple-black, are lake; platyphyllum, a variety having very large flowers, sometimes as much as 12in. in diameter, band yellow, spots generally crimson—this variety has much wider leaves than the type; virginale, deep yellow band, petals very sparingly spotted; Wittei, petals pure white, with the exception of the central band of yellow. Lilium auratum is grown in great quantities in the open air in this country, and no Lily-bed would be complete if this kind were excluded. Still, except in certain favoured gardens, it cannot be depended upon to flower after its first season. Some plantations, after flowering well the summer succeeding their importation, never show a sign of subsequent growth, while others throw up shoots that collapse before reaching the flowering stage. In other cases some bear flowers the second year, fewer the next, and at length the spring brings no sign of visible growth. Soil appears to make but little difference, as these losses occur in carefully-made beds where the natural soil has been removed to a depth of 3ft., and replaced by a specially-chosen compost. Again, these Lilies may be seen growing as strongly in heavy, retentive loam, some years after being first planted, as in fibrous peat, though the latter staple is to be preferred for their culture. Imported bulbs of this Lily can, however, be procured at so cheap a rate, that even in places where they do not permanently succeed, a continuous display may be maintained at a moderate cost by yearly planting.

L. Browni is a noble Lily, about 3ft. in height, with flowers 8in. in length, often solitary, and pure white in the interior, purplish brown outside. It is often found more amenable to open-ground culture than the popular L. longiflorum, and is well worth a trial in the garden.

L. bulbiferum is one of the most easily grown of all Lilies, reaching a height of about 3ft., and bearing orange red flowers spotted with black. This Lily is often confounded with L. davuricum; it is quite hardy, and one of the earliest of our garden Lilies, not being fastidious as to soil.

L. canadense, from North-Eastern America, and from 2ft. to 4ft. high, bears well-shaped flowers, varying from pale yellow to orange red, heavily spotted. Named varieties are L. canadense flavum, golden yellow, and spotted maroon; parviflorum, having smaller flowers than the type; parvum, a Californian variety with brilliant orange red blossoms; rubrum, dark orange; and Walkeri, differing mainly in the character of its leafage. This Lily, together with L. pardalinum and L. superbum, are known as Swamp Lilies, and succeed best in moist, peaty compost, and a partially-shaded situation. They can be easily grown in our gardens if their requirements in these respects are studied, and are extremely

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A GARDEN VIEW AT ALTON TOWERS.

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graeeful, their stems being slender and pliant, and the drooping flowers poised on long, delieate footstalks.

L. eandidum (*the Madonna Lily*) is probably to be met with in almost every town and village in England, and is generally at home in cottage gardens, where it may be seen flourishing under the most dissimilar conditions of soil and situation. It is of easy culture where it is not attacked by White Lily disease, which has unfortunately annihilated many collections of late years. Many theories have been advanced as to its cause and cure, but no satisfactory conclusion has been arrived at as to the former, while, though many remedial measures have been advocated, none have proved entirely successful. The disease usually appears to be more prevalent among imported bulbs than in the ranks of those that have been grown through a long period in this country. There is a variegated form of this Lily known as L. candidum albo marginatum or variegatum, and also a double form. Groups of the Madonna Lily, associated with dark-leaved shrubs, are very beautiful.

THE MADONNA LILY.

L. chalcedonicum (*the Scarlet Turk's-cap*) grows 3ft. to 4ft. in height, and has waxy flowers of brilliant vermilion colour. This is the brightest-coloured of all Lilies, and being perfectly hardy, and of easy culture, should be in every garden, to which, in July, it contributes much beauty. Heldreichi is a good form.

L. concolor is a pretty Japanese Lily, also its varieties Coridion and pulchellum.

L. croceum (*the Orange Lily* of our gardens) is almost as common as the Madonna Lily. It is an European species, and under good cultivation attains a height of from 5ft. to 7ft.; its flowers are orange, dotted with black; it grows freely in any position and any soil.

L. davuricum, now generally known as umbellatum, is 2ft. high, with orange red flowers spotted with purple-black. There are many varieties of this Lily, the best known of which are L. d. atrosanguineum, bicolor, fulgidum, grandiflorum, erectum, Incomparable, multiflorum, and punctatum. This is another good and hardy garden Lily, coming into bloom shortly after L. bulbiferum. It is very easily grown.

L. elegans, or Thunbergianum, a native of Japan, is only 1ft. high, having flowers orange red spotted with darker colour. There are now in commerce about twenty named varieties of this Lily, differing from the type and from each other in size and colour of the flowers and density and tint of spots; the best known are L. elegans alutaceum, Alice Wilson, aurantiacus, Beauty, bicolor, brevifolium, flore-pleno, Horsmanni, a very fine variety, with rich crimson flowers; marmoratum aureum, ornatum, good, with bright orange yellow flowers, spotted black; Prince of Orange, The Sultan, Van Houttei, venustum, and Wilsoni, a strong grower, 2ft. in height, with apricot-coloured flowers, spotted purple—one of the best. This is a June and July flowering Lily, and is useful both for the open garden and for pot culture. Groups are particularly effective in the front of herbaceous borders; they are very accommodating in the matter of soil.

L. excelsum (*testaceum or Isabellinum*), the Nankeen Lily, a garden hybrid, probably between L. candidum and L. chalcedonicum, is very beautiful. It grows from 5ft. to 6ft. high, with pure self flowers of apricot buff colour. An excellent garden Lily, accommodating in the matter of soil, and flowering after L. candidum.

L. giganteum, a Himalayan Lily, is one of the boldest of its race, growing to a height of 10ft., and bearing long ivory white blossoms stained internally with rosy purple, and emitting a vanilla-like fragrance. This Lily is of easy culture, and attains its noblest proportions in deep, rich soils. The bulb dies after flowering, producing a few bulblets which take from three to five years to reach the flowering state. It is well to place it in a position sheltered from winds, which tear the big, handsome glossy green leaves. L. cordifolium, a native of Japan, is not unlike it. It is 4ft. in height, with white flowers stained with purple inside.

L. Henryi is one of the most charming of all the later Lilies. It has been called the yellow Speciosum, and will in good soil reach 7ft. in height, the orange yellow flowers, of a rich, clear, and beautiful colour, appearing in summer. This Lily has proved perfectly hardy, and is a kind to group amongst shrubs or to grow by itself.

L. Humboldti, a native of California, is from 5ft. to 6ft. high, having apricot yellow flowers spotted with lake. A distinct variety of this Lily is L. Humboldti Bloomerianum, or ocellatum, with flowers golden yellow in colour, having conspicuous purple spots margined with light yellow. This form is of less vigorous habit than the type. L. Humboldti is a good garden Lily, growing well in a compost of three parts loam to one of leaf-mould, and succeeding in drier situations than the Swamp Lilies.

L. longiflorum, the long tubed Lily from Japan, and from 1ft. to 3ft. in height, has white flowers. There are many forms of this Lily, the best known of which are L. Harrisi from the Bermudas, and known as the Easter Lily; L. Wilsoni, L. eximium, L. Takesima, having flowers violet tinted on the outside; L. longiflorum grandiflorum, and a variegated form L. l. albo-marginatum. L. longiflorum is well adapted for pot culture, and is grown by the thousand in this way for church decoration. As a garden Lily it is not generally satisfactory, often dying after its first flowering, especially in heavy, damp soil.

L. Martagon (*the Turk's-cap Lily* of gardens) is well known. It bears its much-reflexed flowers on long spire-like racemes, light purple in colour with darker spots. Two very distinct varieties are L. Martagon dalmaticum, attaining a height of from 6ft. to 7ft., with purple-black flowers, and the white Martagon, a beautiful Lily with snow-white blossoms. The Martagon Lilies are perfectly hardy, and succeed admirably in the open border in ordinary garden soil.

L. pardalinum (*the Panther Lily*).—The tall stems of this Lily often carry as many as sixty blossoms. The flowers are variable, ranging from orange to deep red, petals recurved and covered with large purple spots. The following are the best known of the named varieties: L. pardalinum augustifolium, rich scarlet shading to yellow, heavily spotted, leaves narrower than in the type; californicum, deep orange, tipped scarlet, spotted maroon; Michauxi, crimson-scarlet, spotted maroon; minor, a slender-growing variety, 3ft. high; pallidifolium, flowers and leaves paler in colour

than in the type. L. pardalinum succeeds well in the Lily garden under the treatment recommended for L. canadense, and will also grow and flower well in porous loam, although peat or leaf-mould is to be preferred. A fair sight is it to see the tall stems swaying in the wind.

L. pomponium is a very charming Lily, about 3ft. in height, with red flowers. In the variety Verum the colour of the flowers is bright scarlet. It is a good garden plant.

L. pyrenaicum, from the Pyrenees, has chrome yellow flowers, spotted black, with crimson anthers. This handsome Lily is unpleasantly perfumed, which makes it useless for indoor decoration, and renders even the surrounding air in the open garden offensive to some people. It is the earliest of the garden Lilies, often opening in May in the Southern Counties.

L. rubellum.—A new Lily from Japan, and not more than 18in. high. Its flowers are coral pink. It is an exceedingly beautiful Lily, and should it prove sufficiently hardy for general culture in the open garden, will undoubtedly take a high rank among the denizens of the Lily-bed, the pink L. Krameri not proving satisfactory in the hands of most cultivators.

L. speciosum, formerly known as L. lancifolium, a native of Japan, is from 2ft. to 3ft. high. There are about fifteen forms of this Lily, the best known being L. speciosum album, white; Krætzeri, white, with green band running from base to tip of petals; punctatum, white, spotted pink; roseum, white, stained rose and spotted with darker colour; rubrum, white, stained crimson and heavily spotted; and Melpomene, crimson, spotted with maroon. If one Lily only is chosen, it should be this one, as it is so easily cultivated and seems less likely to be attacked by disease than any other. It may be easily grown in pots or tubs, and kept year after year. Many a cottager has noble masses of it.

L. superbum (*the Swamp Lily*), a native of North-Eastern America, grows from 6ft. to 7ft. high, and has bright orange crimson flowers, spotted maroon; as many as thirty blossoms are sometimes borne on one stem, and it succeeds under the treatment advised for L. canadense.

L. tigrinum and its varieties form a brilliant group. L. tigrinum is the type, and grows from 3ft. to 4ft. in height, with flowers orange red with purple spots. There are three well-known forms of the type, namely: L. tigrinum splendens, with larger flowers, and growing to a height of from 5ft. to 6ft.; L. t. Fortunei, a still more vigorous form, sometimes reaching a height of 7ft., and often remaining in bloom as late as October. It is easily identified by its stems being covered with a grey pubescence. There is also a double kind, known under the name of L. t. flore-pleno. The Tiger Lilies constitute a very valuable section of our garden Lilies, being the last of all the Lilies to expand their blooms, and not being particular as to soil or situation. They may be easily propagated by sowing the bulbils, produced at the nodes of the leaves, in a seed pan and planting out later in a prepared bed, where they will bloom in the course of three or four years. Splendens is the best form, and gorgeous in masses.

Other Lilies of considerable beauty are: Alexandræ, the flowers white, and the plant 2ft. in height; Batemanniæ, a beautiful kind from Japan, the plant 3ft. high, and the flowers clear apricot in colour; Catesbæi, from North America, 2ft. high, the flowers orange red, spotted with purple—it is partial to moist, peaty soil, and a shaded position; Carniolicum, 3ft. high, flowers red and reflexed. Hansoni grows 4ft. in height, the flowers like those of L. Martagon in form, and orange yellow spotted with black; Krameri is a very beautiful Lily when one can coax it into respectable growth, and frequently is happy amongst Rhododendrons in a clearing, so to say, where its pink flowers gain in freshness and charm. It is somewhat similar in growth to L. auratum, and is probably a wild hybrid between this Lily and some other; L. nepalense, a Nepaul Lily, 2ft. to 3ft. high, flowers pale yellow, pots; Leichtlini, bright lemon yellow, spotted with purple, a pretty Lily; L. Lowi, from Burmah, flowers white, spotted purple; Neilgherrense, flowers white, 6in. in length, and the plant 3ft. high; Odorum, or japonicum Colchesteri, white, tinged with purple outside; Parvum, yellow, shaded red; Parryi, golden yellow, spotted chocolate, a graceful Lily, 3ft. high; Philadelphicum, a native of North America, with flowers of an orange colour, dotted with purple-black. There are forms of this Lily, differing slightly from the type in colouring. It is most at home in moist, porous soil. L. Szovitzianum grows from 4ft. to 6ft. in height, and has flowers of variable colouring, ranging from sulphur yellow to deep gold, some self, others heavily spotted. It succeeds best in deep, moist loam. Tenuifolium is a native of Siberia, and is only about 2ft. in height, its stem slender, and bearing in June crimson-scarlet flowers. Polyphyllum, cream, spotted with dark purple; Wallacei, ruddy orange, spotted with maroon; Wallichianum, a very tall Lily, height 6ft., flowers white, and 9in. in length; and the Californian L. Washingtonianum, which is about 6ft. high, white flowers, tinged with lilac purple, often spotted. The flower stems sometimes carry as many as twenty blossoms.

ERYNGIUM OLIVERIANUM (*see p.* 93).

Lily of the Valley.—The successful culture of the Lily of the Valley (Convallaria majalis), which is indeed a native in not a few of our English woodlands, presents no features of difficulty provided the plants are afforded a root-run free from invasion by more rapacious subjects, and that their vigour is sustained by judicious solicitude for their requirements in the way of nutriment. It is a popular fallacy that Lilies of the Valley will grow anywhere where there is shade, and therefore are they to be seen languishing beneath Laurels and evergreens, or eking out a precarious existence below rampant climbers. In these cases it is not the shade that is harmful, but the impoverishment of the soil by the all-pervading roots that prevents their due development. Lilies of the Valley will grow well in partial shade, or in the full sunlight, provided the soil they are planted in is deep and rich.

The bed should be of good loam, with which should be mixed about a third part of leaf-mould, and sufficient coarse silver sand or road grit to keep the soil open. A liberal dressing of well-rotted manure should also be incorporated in the compost. The bed should be planted in September or October, the crowns being set singly 2½in. apart each way, their points being just below the surface. In February or March it is well to give a mulch of decayed manure, and when they start into growth occasional waterings with liquid manure will be found to add greatly to their vigour. Treated in this manner the plants will produce large spikes of bloom in profusion. Every four years the beds should be dug up, re-made, and re-planted. By having one bed in the full sunshine, another in partial shade, and a third in a still more shaded position, a long succession of bloom will be obtained; but care must be taken that in no case are the beds invaded by the roots of alien subjects.

Lilies of the Valley are grown in enormous quantities for forcing, the best variety for early work being the Berlin-grown crowns, though the Dutch and Belgian crowns are equally valuable for later batches. These crowns require three years' growth before they become fit for forcing, and those intended for early flowering should be grown in a warm position and porous soil, when they will complete their growth early, and have a lengthy period of rest before being placed in heat, well ripened crowns being a necessity for successful forcing. The crowns for early forcing should be planted in pots or boxes as soon as they can be procured, the commencement of September being none too early. A 5in. pot will accommodate twelve crowns, while in boxes they may be planted an inch apart. When the planting is completed, the pots or boxes should be placed in a cold frame or behind a wall, and covered with cocoa-nut fibre. A low temperature at this period is beneficial, and appears to brace them up for the subsequent forcing. This may commence about the end of October or the beginning of November, a common hot-bed, that will maintain a bottom heat of 80deg., answering equally as well as a propagating frame. The hot-bed creates a genial atmosphere in the frame that is placed upon it, while bottom heat from a heated water-tank cannot be improved upon, as by this method the necessary moisture in the atmosphere is more easily maintained than when pipes are not surrounded with water. The tops of the crowns should stand about ½in. out of the soil, and, as soon as they are placed in heat, should be covered with 2in. or 3in. of moss, being plunged in bottom heat either in moss or cocoa-nut fibre. The bottom heat should never fall below 80deg., and may be gradually increased to 95deg. The frame should be covered with boards or mats, so as to exclude the light; and water, when given, should be of the same temperature as the bottom heat. When the growth is about 2in. high, the covering layer of moss may be removed, and the plants gradually inured to the light. As soon as the lowest flowers commence to expand, the pots or boxes should be removed to a lower temperature, and overhead watering discontinued. By this method of culture flowers may be obtained in November and December. Some growers do not pot or box the crowns until they are ready to start forcing, but early planting, as already recommended, is preferable to this system. Later on, at the end of January, in February and March, the Lilies start much more readily and give but little trouble, warmth, moisture, and comparative shade being the only requisite conditions. Now that retarded crowns of Lily of the Valley can be obtained through the summer months, there is no reason why this charming flower should not be seen in bloom throughout the entire year. Besides the Berlin, Dutch, and Belgian varieties already mentioned, there are other named kinds, among the best of which are Victoria and the newly-introduced Fortin's Lily of the Valley, the latter having been raised in the neighbourhood of Paris, and bearing far larger bells than any other known variety.

GROUPING OF LILIUM TESTACEUM.

Linarias (*Toadflaxes*).—The perennial kinds of Toadflax are flowers treasured for their freedom and charm. To this family belongs the pretty wild Toadflax L. vulgaris, familiar in many hedgerows, its bright yellow flowers a sea of soft colouring, and a form of this known as Peloria is welcome for the rock garden. This has curiously inverted spurred flowers, yellow and orange at the apex, a bright, showy plant in warm light soils. Then one may also plant with good effect L. macedonica and L. dalmatica, both having yellow flowers, and wonderfully free and graceful. Of other perennial Linarias,

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L. alpina is charming, its tufted growth smothered with flowers throughout the summer, and these, if small, are bright in colour, being purple with orange blotches. It seeds very freely, and may be easily raised in this way. The Ivy-leaved Toadflax (L. Cymbalaria) enjoys a wall as well as any place, establishing itself in the rocky chinks, but sow the seeds only in moist spots not too fully exposed to the sun. Sow the pretty white variety as well. The following kinds may be planted upon the rock garden: L. anticaria, L. antirrhinifolia, and L. hepaticæfolia, always planting them in fairly good soil and sunny spots.

Linums.—The family of Linums, or Flax, comprises about sixty species of annual, biennial, hardy herbaceous and greenhouse subjects, many of which are exceedingly ornamental. Some of the handsome perennial species which are hardy in the south-west, in rock gardens, and in positions where the drainage is ample and the soil not too retentive of moisture, cannot be cultivated with success in the open further north. Propagation may be effected by division, cuttings, or seed. The latter should be sown in pans of sandy soil in March, and kept in a cold frame protected from frost until May, when the seedlings may be planted out, or the seeds may be sown directly in the open ground in April. Cuttings should be made from half-ripened shoots in the summer and struck in sandy soil under a shaded bell-glass. Divisions should be made as the plants are starting into growth in the spring. The following list gives the names of the most useful species, the majority of which are natives of Europe: L. alpinum, height 6in., hardy herbaceous, bearing large blue flowers in July and August; L. augustifolium, height 1ft., hardy herbaceous, bearing pale purple flowers in July; L. arboreum, height 1ft., evergreen shrub, from Crete, bearing handsome yellow flowers in May and June (this species is not hardy in the North of England); L. campanulatum, height 1ft. to 1½ft., hardy herbaceous, bearing yellow flowers from June to August; L. flavum, height 1ft. to 1½ft., herbaceous, not strictly hardy except in sheltered positions in the south-west, bearing yellow flowers from June to August; L. monogynum, height 1ft., from New Zealand, bearing numerous white flowers in June and July, not strictly hardy (there is a variety of this plant named L. candidissimum that bears larger flowers); L. narbonnense, height 2ft., bearing beautiful light blue flowers from May to July (this is the best of the hardy perennial Flaxes); L. nervosum, height 1ft. to 1½ft., bearing blue flowers in June and July, an herbaceous perennial, but inferior to the last-named; L. perenne, the common perennial Flax, bearing blue flowers. There are many varieties of this species, such as anglicum, austriacum, Lewisi, montanum, and sibiricum, all bearing blue flowers, and L. p. pallescens, the flowers of which are of a lilac shade. L. tauricum is an evergreen shrub, 1½ft. high, bearing yellow flowers. L. viscosum, height 1½ft., bearing purple flowers from June to August, is a hardy, herbaceous perennial.

LINUM.

Lobelias, Scarlet.—There are few more brilliant flowers of the hardy garden than the Scarlet Lobelias, L. cardinalis and L. fulgens. They should be planted freely in large beds, with a groundwork of blue Pansies, or some colour in harmony with their rich hue; but even in small gardens they should be planted as freely as space will permit. The best time for planting to take place is spring, as these Lobelias are not very hardy, although their behaviour in winter differs considerably. Where, however, it is thought that frosts will inflict no injury, leave them in the beds, but clumps in southern gardens even withstand severe winters. Spring planting, however, is advisable. The position for the Lobelias must be dug out at least 1ft. in depth, and well-decayed manure mixed with the soil. Make the soil firm, and give an abundance of water during the summer. Moisture is essential, and hence the plants are frequently more happy by some stream or pond than in either a bed or border. When well treated through the first summer, the growth will be vigorous and able to withstand the trials of winter. There are several ways of increasing the plants, one of the most common being by dividing the roots in spring, or, if considered necessary, when lifting them in the autumn, but spring perhaps is as good as any time, and the divided portions may be planted out carefully. Many now raise the plants from seed, as the majority of the seedlings are true to name, and vigorous too. This is a good way, sowing the seed about June in shallow pans of light soil, or they may be raised in spring, when the plants will for the most part bloom the same year. June sowing is the safer, and the seedlings, when large enough, must be pricked off and then potted, being kept over the winter in a frame. Use a little bottom heat for hastening seed germination, and harden off always before planting out of doors. Cuttings got from moderately-ripened shoots strike freely in warmth in spring, and when potting on some of the plants, if desired, may be retained in pots for the greenhouse.

Unfortunately a fungoid disease sometimes attacks the plants in late autumn, and under those circumstances it is necessary to take up the plants, remove diseased portions, and plant in a cold frame in light soil. The Scarlet Lobelias sometimes suffer from winter wet and frost. In that case take them up in autumn, and treat as advised, or sometimes covering the crowns with leaves will suffice.

Of recent years many beautiful varieties have been raised. Queen Victoria is, perhaps, the finest of all, a noble plant with dark-coloured leaves and sturdy spikes of rich crimson, almost scarlet, flowers. Very brilliant is Firefly, an intense crimson variety, and the most showy of any. There are others, some with pale rose and other tints, but the two named are richer than any others. L. Syphilitica is a very charming species for wet places, and may be planted by the water-side, as there its blue flowers are prettier than in the border. It is more suitable for rougher spots than the Scarlet Lobelias. There are forms of this, and L. Milleri is a hybrid worth

growing, its flowers of a pure purple colour. L. Tupa has crimson flowers, and is a handsome kind.

Lupines.—As beautiful as any of the perennial Lupines is the bushy Lupinus arboreus, which is almost rare, as one seldom sees its bright yellow flowers in English gardens. This may be due, perhaps, to climate, as the plants delight in warmth, sunshine, and light soil, and frequently collapse after two years. Seeds, however, are easily raised, so much so that the plants will reproduce themselves freely in this way; but as the seedlings vary considerably in colour, if a good bright yellow form is got, increase this by cuttings of the little shoots on the branches taken off with a slight heel attached after flowering-time is over. These put into pots of light soil in a cold frame will soon strike. Try to keep plants of bright yellow colour. Not a few of the Tree Lupines are of very poor washed-out tints, muddy yellow and blues, which are not desirable. A Tree Lupine two years old is frequently 6ft. in height, smothered with fragrant blossom. If seed is purchased, sow it in early spring in the open ground or in pots, but the former plan is best, as then there is no need to disturb the plants. Allow them to flower where sown, thinning out, of course, to give ample space for free development. Tree Lupines are handsome upon high lake banks, in the border, or amongst evergreen shrubs.

Lupinus polyphyllus and its beautiful white variety albus are noble garden flowers, with tall shapely spikes, and happy in warm soils; increased readily by division in spring or autumn. Both the blue and the white forms may be grouped in the rougher parts of the garden, but their noble flower spikes are welcome almost anywhere. There are other Lupines, but those mentioned are by far the most beautiful.

WHITE LUPINES.

Lychnis.—A useful class, many of them with flowers of brilliant colouring. L. chalcedonica is the brightest spot, often, in cottage gardens, and is easily known by its clusters of scarlet flowers. There is a white variety known as alba, and a double scarlet (flore-pleno). L. dioica fl.-pl., L. Flos-cuculi flore albo-pleno, L. Haageana and its forms, L. Lagascæ, L. Viscaria alba, and especially the brilliant red variety called Splendens, are all worthy of a place in the garden. Raise the plants by seed and root division.

Lysimachia.—This is a useful group of plants, best known by the common Creeping Jenny or Moneywort (L. nummularia), which creeps about in any border and is useful as an edging, the vigorous shoots spreading even to the walk, forming a dense mat of leaves, bright with yellow flowers in summer-time. The Creeping Jenny is a favourite plant for draping window-boxes, vases, or ledges in the rock garden. If you want to increase it, divide the clumps. Every bit will become established. There is a golden-leaved variety of it which is not so free and hardy as the parent, but the colour is retained throughout the year. Besides this, there are several much taller kinds, which apparently have but slight relation to the little Creeping Jenny. These are L. clethroides, which has white flowers and pretty leaf tints in autumn, and the yellow-flowered L. thyrsiflora, lanceolata, punctata, and verticillata, all of strong growth and pleasing naturalised by streamside; it is in moist soils that the plants attain luxuriant growth, and they are scarcely handsome enough for the border. In their place few plants are more delightful.

Lythrum.—This is the Loosestrife, and a beautiful plant for pond, lake, or stream side. Our native Loosestrife (Lythrum Salicaria) colours the river and stream margin with its clouds of rose purple blossom. One need not plant this native kind in the garden, because the variety rosea is a more effective plant, its willowy stems hidden with flowers of intense colour. Always use them for the outer margin, and good plants put in during the autumn or in spring will quickly grow into large groups, pleasant to see in the autumn months.

Mariposa Lily.—*See* Calochortus.

Meadow Rues.—*See* Thalictrums.

Meadow Saffrons.—*See* Colchicums.

Meconopsis.—A charming family, of which the Welsh Poppy (M. cambrica) is the best known. All are hardy and of biennial nature, therefore seeds must be sown each year. M. cambrica is the kind to obtain first, as it is stronger and freer than any others, more amenable also to ordinary conditions. It will grow almost anywhere on the rock garden or in the chinks of old walls, its delicately beautiful yellow flowers being always pleasing. Thin the seedlings out freely, so that there is no overcrowding. Even in poor soil it succeeds. M. nepalensis is quite

distinct from the Welsh Poppy. It has handsome foliage, and tall flower stems bearing delicate golden yellow flowers fully 2in. across. M. Wallichi is a handsome plant, the most imposing undoubtedly of the group, with very large rich blue flowers, not a purple shade, but clear pretty blue. Both this and the preceding kind are never happier than when planted in a cool moist recess in the rock garden where the soil is composed chiefly of peat and there is a slight shade from midday sun. A group is very imposing, the blue flowers amidst cool surroundings gaining in beauty. Neither M. nepalensis nor M. Wallichi are Poppyworts for every garden, but they should be planted wherever the necessary conditions can be given.

Mertensia.—A beautiful family of plants, some better known than others, and all suitable for the rock garden. M. sibirica is the most charming of all, and is quite hardy, succeeding in ordinary soil. The flowers vary somewhat in colour, soft blue, however, the prevailing tints, although there is a white variety named alba. More frequently seen than this is the moisture-loving Virginian Cowslip (M. virginica), which appreciates a light soil and shelter. This is always happiest in a position which Trilliums and the like enjoy. If only one kind be chosen, M. sibirica should be selected.

Mimulus.—This is the Monkey-flower, and to the family belongs our common fragrant Musk (M. moschatus), which enjoys a cool, moist, sheltered border out of doors. All the Mimuluses require a moist place, such as by stream, or in boggy recesses in the rock garden where they are screened from the midday sun. M. cardinalis and M. cupreus are brilliantly coloured, but it is the hybrids that contribute so much brightness to the garden. The flowers are of wonderful colours, crimson, scarlet, orange yellow, and other hues laid upon the petals in blotches, or sometimes a variety is quite self, or may be a hose-in-hose kind is obtained, in which one flower seems to be inserted into another, such as one sees in the Polyanthus. A pretty self salmon rose variety is Rosy Morn, but a packet of seed saved from a good race will give many beautiful forms. Sow the seed, without covering it with soil, as it is very fine, in February, and prick off in the usual way, planting out in May. Of course the common Musk and the larger variety called Harrisons' are pretty window plants, indeed, better fitted for this purpose than for the border. A shady corner and plenty of moisture are the chief considerations.

Mirabilis Jalapa.—This is the old Marvel of Peru, a quaint border plant, bushy in growth, and bearing flowers of varied colour from white to crimson. It is a good plan to sow seeds under glass early in the year, much as one would any half-hardy annual, and plant out very late in May, but unless the climate is very mild, the black roots must be lifted and stored during the winter in sand. Plant out again when fear of frost is over.

Monarda.—The best known of this group is the rich red-flowered M. didyma (Bee Balm or Oswego Tea), which delights in a rather moist place, where Trilliums, Primula rosea, and similar moisture-seeking plants are happy. The flowers appear for several weeks in summer. M. fistulosa is the next important kind, with flowers, however, of variable colour. These are the most handsome, and will grow freely in the ordinary border, whilst the way to increase them is by division of the roots.

MUSCARIS.

Montbretias.—The Montbretias, which are now grouped with the Tritonias, are natives of South Africa. They are indispensable in the flower garden, providing a lovely colour effect during the months of August and September with their bright bloom scapes of orange red. The two commonest kinds are M. Pottsi and M. crocosmiæflora, but there are several hybrids of later introduction, of varying shades of yellow and red, that are equally adapted to garden culture. Montbretias may be considered hardy, since they will stand 20deg. of frost, unprotected, even in heavy, damp soils. The young growth is occasionally injured by the frost, and it is a good plan

not to clear away the withered foliage in the winter, as this forms an excellent protection, both for the pushing shoots and the corms themselves. A light, porous soil is perhaps best adapted for the culture of these subjects, and in such a compost they spread with wonderful rapidity, soon forming a solid mass of corms and roots. In such cases biennial, or at all events triennial, division should be effected. Although a light soil is suggested as being the best for Montbretias, they grow and flower well in very different staples, often being seen in flourishing condition in heavy, adhesive loam, while in one case where their growth is exceptionally vigorous they are grown by the side of a pond, with their roots below the water-level. In localities where the winter is very severe it is well to cover the bulbs with a mulching of cocoa-nut fibre. Bulbs are seldom lost through the action of frost, but occasionally batches perish owing to excessive moisture rotting them. One particularly valuable quality of the Montbretias is their capability of flowering well in partial shade; and as they are subjects that lend themselves readily to naturalisation in the grass, pretty pictures may be made by planting them in clumps in grassy glades or in woods of thinly-growing deciduous trees. Montbretia crocosmiæflora under favourable conditions attains a height of from 3ft. to 4ft., and bears branching scapes of orange scarlet flowers. It is a hybrid between M. Pottsi and Crosmia aurea. M. Pottsi has smaller flowers of a yellow-red tint. M. rosea is a form in which the colour of the flowers is of a distinct rosy shade. The following will be found a good selection of the newer hybrids: M. Bouquet parfait, yellow, shaded vermilion; Drap d'Or, golden, shaded apricot; Etoile de feu, orange red and yellow; Eldorado, yellow; Phare, crimson; Rayon d'Or, rich yellow, shaded brown; Solfaterre, primrose yellow; Tigridia, yellow and brown; and Transcendant, bright orange vermilion.

Muscaris (*Grape Hyacinths*).—It is strange that certain races of plants should be neglected in gardens, although vigorous and beautiful in colour. The Muscaris are in this throng, but flower gardeners should plant them freely, whether the garden is small or otherwise, as they increase readily, forming in time quite carpets of leafage and blossom. They may be increased by separating the mass of bulbs on lifting them when this is considered necessary, after the leaves have died. Use the Grape Hyacinths as edgings to the border, in the lower parts of the rock garden, and the more vigorous kinds may be naturalised freely in the grass, if not too long, on a grassy bank and in suitable positions making glorious sheets of blue when spring flowers of a hundred kinds are in beauty. The deep blue M. conicum is very rich; it is vigorous, spreading freely, and the flowers are intense blue. A bank covered with the flowers is delightful; they are fragrant too. Blooming shortly after this is M. armenaicum; then in early February appears the little light blue M. azureum, and of the well-known M. botryoides there are several forms. The type is deep blue, but the varieties are of several colours, according to the distinctive names; thus album is white, and pallidum very delicate blue. The rich self colours are more effective. M. Heldreichi, blue tipped with white, the fragrant M. moschatum, M. neglectum, or the Starch Hyacinth, very deep in colour, M. paradoxum, and the curious feathery M. comosum monstrosum, are also worth a place in the garden.

Myosotis, The (*Forget-me-not*), though not a very large family, is quite indispensable in the garden, owing to its beautiful blue, so valuable as a carpeting for spring bulbs and for bringing soft colour into sequestered nooks and corners. The propagation of the Myosotis is extremely simple, as it is easily raised from seed sown, as soon as ripe, in the open ground, and old plants of Myosotis dissitiflora allowed to remain during the summer in the positions they have occupied during the spring will in the autumn be surrounded with self-sown seedlings. They may also be increased by division of the roots in the spring, or by cuttings inserted in sandy soil under a shaded hand-light during the summer. In the early spring the first flowers of Myosotis dissitiflora, the species most generally in use in gardens, are in exposed situations often of a bright pink on first expanding, and only assume their azure colouring when the atmosphere becomes more genial. In shady positions this species will flower almost until midsummer. The nomenclature of the Forget-me-nots is at present in a very chaotic state, no botanical dictionaries being in absolute agreement as to what are species and what varieties, while the Kew list does not elucidate the matter much. The most generally recognised species are given in the following list:

M. alpestris, a native of the mountains of Europe, is a beautiful plant for the rock garden, flourishing in a moist soil with which disintegrated granite has been incorporated. It is impatient of dryness at the root, and is averse to a heavy non-porous soil. It forms a dense mat of foliage, which is covered during its flowering-time with blossoms of the loveliest blue.

M. azorica is a native of the westernmost islands of the Azores group. It produces flowers of a deep blue tint, which are self coloured, not having an eye of different hue. Its flowers are larger than those of the last-named species, and are produced over a longer period of time. It is a rather tender plant, and should be grown in moist, light soil in an exceptionally sheltered position. There is a white variety alba, while the form known as Impératrice Elizabeth is an extremely beautiful plant of great merit, which, when subjected to pot culture, is very effective.

M. cæspitosa is a spreading plant, of which the form known as M. Rechsteineri is quite a gem, forming dense mats of foliage on moist ledges of the rock garden and bearing, in early summer, numberless turquoise blue flowers. Like the rest of the Forget-me-not family, this subject requires moist, porous soil, fairly rich, to show itself in its true form.

M. dissitiflora is the commonest of our garden Forget-me-nots, its beautiful breadths of blue making lovely spring pictures, especially when forming a carpeting for the Poets' Narcissi, whose white blossoms are shown off to best advantage by their azure setting. There are many varieties of this Forget-me-not, among which may be named M. d. alba, M. d. elegantissima, M. d. grandiflora, M. d. Weirleigh Surprise, with variegated flowers, and M. d. Victoria.

M. lithospermifolia grows from 1ft. to 1½ft. high, and produces an abundance of flowers, which are larger than those of other species.

M. palustris (*the Marsh Forget-me-not*) is common by the English streamsides. Its porcelain blue yellow-eyed flowers are particularly charming, and may be enjoyed in moist, shady spots well into the summer. In marshy places it often exceeds a height of 18in., though in the garden it usually assumes a creeping habit. M. semperflorens is by some regarded as a variety of this Forget-me-not.

M. rupicola, though by some considered to be synonymous with M. alpestris, has sufficient differences of form and habit to entitle it to be classed as a species, being a dwarfer plant with deeper blue flowers. M. Princess Maud is a variety of M. rupicola.

M. suaveolens, an Australian species, bears white or bluish white flowers, but is not sufficiently hardy for open-air culture in this country.

M. sylvatica (*the Wood Forget-me-not*) grows in moist situations to a height of from 1½ft. to 2ft. It bears tall racemes of blue flowers with yellow centres, their hue being intermediate between that of M. dissitiflora and M. palustris. Forms of this Forget-me-not are often used as annuals for spring bedding. There are many varieties of this Myosotis. M. nana and M. pygmæa, sometimes classed as species, are probably varieties of it. As great divergences in height and size of flowers are met with in wild forms as in cultivated varieties.

M. Traversi is a newly-introduced species, said to bear yellow flowers.

M. Welwitschi, from Portugal, bears bright blue flowers with yellowish white centres, and grows to a height of

from 4in. to 6in. It is by some held to be merely a variety of M. sylvatica.

While upon the subject of the Myosotis, the New Zealand Forget-me-not (Myosotidium nobile) may be mentioned. This fine plant succeeds well in the South-West of England, where, grown with the protection of a wall, and with its root-stock covered with sea-sand during the winter, it throws up great heads of bright blue white-margined flowers in the late spring, some of the flower stems being 2ft. and more in height, while the glossy cordate leaves often exceed 1ft. in diameter.

Myrtle.—The Myrtles will be described in the tree and shrub chapter.

Narcissus, The (*Daffodils*).—The Narcissus is essentially the flower of the spring in our English gardens. Brilliant as are the varied colours of the Tulips, and showy as are the massive spires of the Hyacinths, standing in serried array, their blooms are suggestive of exotic extraction, which, though rendering them worthy occupants of the prepared bed, unfits them for the battle for existence under natural surroundings, such as the wild Lent Lilies successfully wage year by year, crowning the lush green of English orchards with a coronal of pale gold. Varied are the heights attained by the different members of the Narcissus family, ranging from the 3in. of the diminutive N. minimus to the tall, 2ft. flower scapes of Maximus and Grand Monarque. The blooming period is a lengthened one, commencing, in warm corners of the South-West Coast, towards the end of January, when N. minimus unfolds its tiny golden trumpets, and extending till late in May, when, in shady gardens, the double, white Poets' Narcissus, with its Gardenia-like blossoms, is at its best. Though Narcissi are well adapted for planting in the border, many varieties are equally at home when naturalised in the grass, under which conditions, with their setting of green turf, they are seen to the best advantage. When thus naturalised by the thousand they present a charming picture, a grassy glade filled with a goodly company of white Star Daffodils (N. Leedsi) being a sight to remember. As pot plants the Narcissi are as useful as the Hyacinths and Tulips, 8in. pots planted with half-a-dozen bulbs of the stronger-growing varieties making a fine show. In planting it should be remembered that the earlier the bulbs can be procured and put into the soil the better. August is none too soon. Late-planted bulbs must necessarily lose much of their vigour by being kept out of the ground so long, and the longer the period of root growth, the stronger should be the flower spikes. As regards soils, one that is fairly retentive of moisture is more suited to the requirements of the Narcissus than a light staple that soon dries up. Bulbs succeed well in deep and fairly heavy loam, while the friable peat and disintegrated granite of the Scilly Isles prove eminently adapted to their culture. Manure must be used with great care, and should on no account come into contact with the bulbs. Fresh manure is fatal if used at planting-time, the best time to use manure being the spring. Old stable manure may be dug in and the ground cropped with a summer crop of other flowers, Geraniums and such-like. The soil will then be in condition for the bulbs in autumn. On rich loamy, rather moist soils stable manure should never be used for Narcissi, only on light hot, rather dry and sandy ground. It is then used not as a stimulant, but to act as a sponge for the retention of moisture, and, in consequence, should be put low down, say at a depth of from 6in. to 12in. The best all-round manure is crushed bones put in with the bulb at planting-time at the rate of 4cwt. to the acre, $1\frac{1}{2}$oz. to the square yard, or basic slag applied at the rate of $7\frac{1}{2}$oz. to the square yard. In addition to this, use on hot, dry soils in autumn after planting sulphate of potash as a surface dressing at the rate of $\frac{3}{4}$oz. to the square yard; this holds moisture during the spring and early summer, and also gives colour to the flower. It should be applied annually. Forcing in the way of subjecting the bulbs to strong heat should never be practised with the Narcissus, though the flowers may be obtained many weeks in advance of their ordinary season by a judicious method of culture. To attain this end, pot or plant the bulbs in boxes, as early as they can be obtained, certainly not later than

NARCISSI IN THE GRASS.

September, and earlier if possible, for the longer the period of their growth before they are introduced into artificial heat the greater is the probability of early and bountiful flower production. After being planted in pots or boxes these should be stood out of doors on a hard bottom, under a hedge or wall in preference, and should be covered with cocoa-nut fibre refuse or cinder ashes to a depth of 6in., and there left for at least three months or twelve weeks, when signs of top growth will become apparent, when remove from the covering. Then place the pots or boxes in a cold frame near the glass, where they should remain until the flower buds appear. Remove them into a cool house, whence, after a week or ten days, they may be taken to a higher temperature, this, however, never being allowed to rise above 55deg., or at the most 60deg. Always keep the plants as near to the glass as possible. When the buds are well set, a little artificial manure may be given sparingly. With a steady temperature of 55deg. and a liberal—not excessive—supply of water, Narcissi should flower by the middle of February or earlier. This method is followed with success in flowering the double Daffodil, a variety more prone to produce blind buds than any of the Narcissus family, with the exception of the double Poets' Daffodil. This blindness is usually caused by the plants being introduced into heat at too early a period of their growth; but by following the plan here recommended the flower buds will have emerged from the bulbs before the latter are subjected to an increase of temperature, and failure of the flowers to expand satisfactorily will be unlikely to occur. Treated in this way, the flowers will be generally found to open sooner than those of batches housed a month earlier.

NARCISSUS MME. DE GRAAF.

Narcissi are divided into three groups, the Magni-coronata, or those having trumpets the same length as the perianth segments or petals, and commonly known as Daffodils proper; the Medii-coronati, or those with cups or trumpets only half the length of the perianth segments; and the Parvi-coronati, or short-cupped Narcissi, the trumpet or cup being one quarter the length of the perianth segments, or less. These groups are each divided into many sections, most of which are numerously represented, but in the following notes only a few characteristic representatives of each section will be alluded to. To see all the groups in flower one should visit such a nursery as Messrs. Barrs' in Daffodil time.

In the Magni-coronata group are the following, which are taken alphabetically:

N. Corbularia or Bulbocodium (*Basket Daffodils*).—Of the Basket or Hoop Petticoat Narcissi there are three colours—bright golden, sulphur, and white. The first of these is most usually grown, but the delicate little N. B. monophylla, with its fragile white flowers, is perhaps the most charming. It is a native of Algiers, and blooms very early. When grown in pans or pots in the cool house it is delightful. It should have a porous, sandy soil, and may easily be had in bloom by Christmas. After potting the bulbs, place at once in the cool greenhouse, and keep moist. The Basket Daffodils are better fitted for pot culture than for planting in the open, except in especially favoured situations. N. Corbularia citrinus, the sulphur-coloured kind, is charming for the rock garden, and should be planted in low-lying pockets. N. cyclamineus is a small Narcissus, bright golden in colour, with a long trumpet and segments reflexed like the petals of a Cyclamen. It is found in Spain and Portugal, growing in marshy ground by the water-side, and when grown in the garden should be planted in moist porous soil, or in grass, as it dislikes the cultivated border.

White Trumpet Daffodils comprise many beautiful varieties. They succeed best in a partially shady border, or may be naturalised in grass, and also prefer a cool, rather stiff loamy soil, and are not fond of hot dry ground. N. albicans is one of the strongest growers of the section, with an almost white flower. N. cernuus, with white drooping flowers of silvery white, is very graceful, and is more suitable for planting in grass than the border. N. moschatus, a rather dwarf kind with pendant white blooms, is delightful when naturalised in grass, and seeds very freely. W. P. Milner is also dwarf, with sulphur-coloured flowers; it is a strong grower. N. pallidus præcox, pale straw colour, succeeds well in grass, but is often unsatisfactory in cultivated ground. William Goldring, often called the Swan-necked Daffodil, has drooping white graceful flowers, and is a strong bulb. N. tortuosus is very pale sulphur white, and has a twisted perianth; it is best planted in grass or in the shade. Mme. de Graaf is a large handsome flower of late introduction, its high price being the only hindrance to its general culture.

Bicolor, or two-coloured, Trumpet Daffodils, of which the following may be relied on as good representative varieties, are very handsome: Dean Herbert, trumpet rich yellow, perianth sulphur white. Empress, trumpet golden yellow, perianth white; of good substance, an excellent variety, good for all purposes, and very vigorous. Grandee, much after the style of Empress, but flowering later. Horsfieldi, very similar to the two last named, but the earliest flowering. These three varieties may be naturalised together, and a long period of bloom secured in this manner. Princess, yellow trumpet, perianth sulphur white; good for forcing or naturalising, and very early. Two beautiful Narcissi in this section are J. B. M. Camm, with pale chrome trumpet and white perianth, and Weardale Perfection, an enormous flower, with pale primrose trumpet, and wide-spreading white perianth; the last of these, however, is too expensive for general use, at present, indeed, being quoted at £10 a bulb.

Large Yellow Trumpet Daffodils comprise several handsome named varieties, some of these being among the most robust of the whole Narcissus race. The following is a good selection: Emperor, very large flower, trumpet rich yellow, perianth slightly paler; an exceedingly vigorous variety, excellent for naturalising or the flower border, rather late in opening. Golden Spur, handsome flower, not quite so massive as Emperor, deep golden yellow; excellent for growing in grass or shady

borders, very early flowering, and one of the best for forcing. Henry Irving, bright yellow; an attractive variety, well adapted for naturalising, and fond of shade, very early flowering, and excellent for early forcing. Johnstoni Queen of Spain, smaller than the three before mentioned, very pleasing; colour, clear yellow; shape, distinct; the trumpet not recurving outwards at the mouth, but terminating with a straight orifice, and the perianth segments slightly reflexed. This Narcissus does well when planted in the grass, and also makes a charming pot plant. Maximus, a deep golden yellow, with flanged perianth, growing to a large size in deep moist soils. Minimus, the smallest of the true trumpet section, with small rich yellow flowers, often not exceeding 3in. in height; good for rock gardens or naturalising on grassy banks, very early. Obvallaris, the Tenby Daffodil, bright yellow, perianth not quite so long as trumpet, early, does well in grass. Rugilobus, yellow trumpet, primrose perianth. The largest of the golden trumpet Narcissi is Glory of Leyden, a new introduction of great merit, its price at present, however, putting its purchase in quantity beyond the means of most cultivators.

The Double Trumpet section includes about ten varieties, amongst which may be mentioned: Telamonius plenus, the old double Daffodil, common in cottage gardens forty years ago, and useful for forcing and naturalisation. N. Capax plenus, or Queen Anne's double Daffodil, with curious star-shaped flowers of pale straw colour; this is best planted in grass or in half shade if in the cultivated border. N. cernuus plenus, a beautiful flower, but rare and expensive; plant in grass.

The group known as the Medii-coronati includes several sections of Narcissi having moderately short trumpets or cups.

N. Barri is a fine section of this group, having shorter cups than the incomparabilis Narcissi. Four out of the

N. BARRI CONSPICUUS.

ten varieties are here named. Conspicuus is a striking flower, with orange scarlet cup and yellow perianth. It is a strong grower and free bloomer. Maurice Vilmorin, lemon cup shaded orange, white perianth. Orphee, cup orange, perianth primrose; very early in bloom. Flora Wilson, pure white perianth, with orange red cup; very distinct and pretty. N. Barri was named in compliment to Mr. Peter Barr, who has not merely raised beautiful Daffodils, but deepened the love for a dainty flower by growing an extensive collection and exhibiting them wherever possible. Barri conspicuus is one of the most charming of the whole family. It worthily perpetuates Mr. Barr's name.

N. incomparabilis (*Star Daffodils*).—Of these there are about thirty named varieties. All are robust in growth and excellent for cutting, and thrive as well in the border as when naturalised in the grass or woodland. C. J. Backhouse is an attractive variety with an orange red cup and yellow perianth: Cynosure has a deeply edged orange cup and showy primrose perianth; Frank Miles, self yellow, very

N. INCOMPARABILIS.

distinct; Princess Mary, with spreading cup of orange yellow and cream white perianth, a very beautiful flower; Sir Watkin, the largest of this group, flower dark yellow and sulphur, very vigorous, and responding readily to all methods of culture, also one of the best of this section for pots and forcing; Stella, perhaps the best known of this section, yellow cup and sulphur white perianth, hardy, and very free. The double varieties of this section number among them the well-known forms to which the English names of Butter and Eggs, yellow and orange, Eggs and Bacon, white and orange, and Codlins and Cream, white and sulphur, have been applied.

Jonquils or Rush-leaved Daffodils are included in the Medii-coronati group, the Campernelle Jonquil (N. odorus) being the best known. It is of a bright self yellow, and very fragrant and very hardy, a gem indeed, grown either in the border or naturalised in grass or by the water's edge. The double variety (N. odorus plenus) is also very pretty, and best grown in grass or partial shade. N. rugulosus is a showy rich yellow flower, and the miniature species (N. juncifolius) is a slender-growing dwarf Jonquil, most suitable for choice positions in the alpine or rock garden, or pots, while some of the Narcissus family can outvie N. Jonquilla for fragrance, but being less hardy than the former species, should be grown in pots or only planted in sheltered, warm parts of the garden. It is also one of the last to bloom.

A numerously-represented section is that of

N. Leedsi (*the True Star Daffodils*), with narrow, spreading perianths and short cups. The following five of the twenty odd varieties are attractive flowers: N. Leedsi, the type, silvery white, good for all descriptions of culture, and especially lovely when naturalised in the grass. Duchess of Westminster, a very beautiful white, of great substance and robust habit. Duchess of Brabant, cup yellow, perianth white. Mrs. Langtry, cup white, edged canary yellow, perianth white; strong

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growing. Katharine Spurrell, with bright gold cup, and broad white perianth, is a large flower and very handsome, but, though not one of the latest introductions, is still expensive.

N. Nelsoni forms another section, of which the type, N. Nelsoni, with goblet-shaped yellow cup, and white perianth, Mrs. Backhouse, Nelsoni major, and N. pulchellus, very similar in colour, are characteristic forms. Other small sub-sections are N. Humei, the Dog-eared Daffodil, yellow, with straight cups; N. Backhousei, yellow with deeper tinted cup; N. Macleai, with small white petalled and yellow cupped flowers; and N. Bernardi, an interesting natural Pyrenean hybrid of N. poeticus, and the wild Pyrenean trumpet or Lent Lily, and N. tridymus, a garden hybrid between the Trumpet Daffodil or the Polyanthus Narcissus, and carrying a head of from one to three flowers. N. triandrus is also a Narcissus that usually bears more than one flower on its stem. The form met with commonly is N. triandrus albus, known by the pretty English name of Angels' Tears, a graceful little plant, carrying from one to four drooping white reflexed flowers. It is a native of North-West Spain, and succeeds well as a pot plant when grown in a light and sandy compost. Pulchellus is a stronger-growing variety than the last-mentioned, and does well in sheltered borders of porous soil. It is pale primrose in colour, and has the same reflexed perianth, as also the rare N. calathinus, which is white.

MARLIAC'S WHITE WATER-LILY.

N. poeticus (*Poets' Daffodils*), included in the third group, that of Parvi-coronati, are beautiful flowers, and in the same section are the Polyanthus or bunch-flowered Narcissi, N. biflorus, and the hybrids of the N. Burbidgei section. Of the Poets' Daffodils, or Pheasant's-eye Narcissi, the most widely known are the following: N. poeticus ornatus, early flowering, with scarlet-margined cup and pure white, broad-petalled perianth, the extremities of the petals being much rounded; N. p. poetarum, differing from the foregoing variety in the whole cup being scarlet, and flowering a fortnight later; N. p. recurvus, considerably later in bloom, identical in colouring with N. p. ornatus, but possessing narrower and more pointed petals, which are generally slightly reflexed; and N. p. flore-pleno, the double form, bearing white, Gardenia-like blossoms, and being the latest flowerer of all the Narcissi, excepting N. gracilis, which is the last of all the Narcissi to bloom, with dainty yellow sweet flowers, borne five to seven on a stem. N. biflorus, a supposed natural hybrid between N. poeticus and N. polyanthus, bears ivory white flowers with small yellow cups, two, and sometimes three, blooms being carried on the same stem.

Of the Burbidgei section, which has been raised from N. poeticus and N. incomparabilis, there are about twenty varieties. The type, N. Burbidgei, is a very early flowerer, having a white perianth with red-margined cup; Baroness Heath has a yellow perianth and orange scarlet cup; Falstaff possesses a snow white perianth with lemon cup, and is much prized for cutting; and John Bain a white perianth and citron cup.

Many of the Polyanthus Narcissi (N. Tazetta) are very handsome, their many-flowered heads being very effective. The earliest are the Paper-white and the double Roman, both of which are invaluable for early pot work. The former, as its name implies, is wholly white, while the latter is ivory white and orange. Both these are rather tender, and are not suitable for the open border, except in very sheltered gardens. Grand Monarque is exceptionally vigorous, sometimes sending up bloom spikes considerably over 2ft. in height; it has a broad white perianth and primrose yellow cup. Her Majesty has also a white perianth, but the cup is deep golden yellow; Scilly White is a pretty and early variety, creamy white in colour; Soleil d'Or is a fine yellow, with golden perianth and bright orange cup; while Jaune Suprême is of lighter shades of yellow both in perianth and cup. The ground for these Polyanthus Narcissi should be covered after planting with some long straw litter or other light material to break the severity of any hard frost, as they are not so hardy as other Narcissi.

Nympheas (*Water-lilies*).—Fairest of water flowers are the Nymphæas, more known now than a few years ago, when the common white Water-lily of our ponds and river back-waters and the yellow Nuphar were the only kinds grown. There are now, however, many beautiful hybrids, raised by M. Latour-Marliac, a French nurseryman, who saw a great future for water-gardening, a phase of flower life as distinct and lovely as anything in the border, woodland, or pleasure ground. It is possible to fill the lake and pond surface with colour, as brilliant and refined as a flower bed, the big open blooms resting like glittering jewels upon the surface. Nor are these hybrids difficult to grow, so that failures need not be encountered, and all are perfectly hardy. This is a great point. To grow tender plants in this way would be expensive and disappointing, but these hybrid Nymphæas withstand severe winters without injury.

There is no more suitable month in the whole year for planting than April, putting the plants into old baskets, the soil in which should be loam mixed with old Mushroom bed manure. Sink these into 1ft. or more of water, keeping the smaller-leaved kinds at the margin, and flowers will be the reward during the ensuing summer. Where no lake or pond exists the Lilies may be placed in cemented tanks, but there should always be about 1ft. of water above the crowns, in case severe weather occurs, and very strong growers may be quite 2ft. or even 3ft. deep. It is not difficult to increase the Nymphæas by division, and if seeds are sown in small pots or pans in early spring they should be filled with light soil. Pans may be more easily immersed in water, and this is necessary, letting there be about 1in. above the pan, and keep the water at a temperature of about

Sodeg. When of sufficient size, pot off the seedlings into 3in. to 4in. or 5in. pots before planting them out.

The following are extracts, reproduced with permission, from M. Latour-Marliac's lecture delivered before the Royal Horticultural Society last year, and published in their official Journal. A list of the finest kinds is first given, but these have been described. He then mentions that the Nymphæas are nearly all of equal hardiness, but "frequently differ among themselves in their early or late blooming, in their standing up above the water or floating on it, in their flowers being many or few, or in their general structure and growth being compact or wide-spreading. Some of them form strong clumps which constantly increase in strength, but do not spread about, whilst others are of a roaming nature, their stolons and interlacing rhizomes wandering over a large space, and quickly spreading across the roots of other varieties. In natural lakes and ponds it is impossible to prevent this confusion; but this irregular growth should not be permitted in artificial basins and aquaria, where each plant in the collection should remain distinct and thrive independently; besides, it would not only produce inextricable confusion amongst the plants, but the weaker ones would be smothered by the stronger. In order to obviate this difficulty, it is indispensable that the Water-lilies should be planted separately and at proper distances, or else in pots or in stonework basins, of which the sides and bottom have been carefully cemented. It is very important that the basins should be divided into several compartments by partitions, which should not be higher than three-fourths of the depth of the water, in such a way that they only prevent the roots and rhizomes from meeting, without preventing the leaves from intermingling on the surface. A depth of 2ft. is enough for the tanks. A bed of earth 6in. deep on the bottom of the basins will be sufficient for the culture of Water-lilies. It ought to be as free as possible from gravel and stones. The best kind of earth is heavyish loam from the garden or meadow, but earth composed of leaf-mould and alluvial soil is also very suitable. One can also make a mixture of them, but it is better not to put with them any fresh manure which is still undergoing fermentation. As regards the choice of water, that which comes from a stream or river is to be preferred, though that from wells will do. When the water is taken from running springs it ought in summer to be turned off, so as to keep the temperature of the water the same as that of the air, for it is essential to remember that Nymphæas thrive best in stagnant water, or at least in a very gentle current.

"In stocking a tank with Water-lilies the object should be to obtain by a harmonious combination and sequence of shades and colours a generally good effect, and for that purpose plants with high stalks should be avoided, as that would destroy the general view. It is necessary also to suppress confervæ and certain under-water plants which are clogging and clinging, such as Chara, Vallisneria, Elodea, and Potamogeton, which live at the expense of the Water-lilies without adding anything to the picture.

"THE PROPAGATION of hybrid Water-lilies is effected in the case of the greater number of varieties by the pulling to pieces of their creeping stems and by the detachment of their tubers. Some individual plants, such as N. Laydekeri rosea, do not give any offshoots, but this is a rare exception. Others bear seed, but the resulting plants have always a tendency to degenerate. The planting can be carried on all through the spring and summer, and presents no difficulty, as it only consists in fixing them in the earth in April or May. If you wish to obtain new varieties you must have recourse to seed and to hybridisation. The method of sowing is quite simple. It is only necessary to place the seeds in shallow vessels in the spring and carefully keep them full of water. The work of hybridisation is more complicated, as it is necessary to entirely cut away, at the very first moment of expansion, all the stamens of those flowers which you wish to artificially fertilise, and on the second day to dust their stigmas with a brush covered with pollen from those kinds chosen for the crossing of them. It is worthy of remark that success in hybridisation depends principally on the care of the operator in only employing subjects of a vigorous growth, well chosen, and fitted to produce types that will be very free blooming and of perfect forms and shades. The flowers generally sink after the third day of blooming, and the pods which they produce come to maturity at the bottom of the water. They come half open when they are ripe, and allow a multitude of seeds about the size of small pearls to drop out, and these immediately rise to the surface surrounded by a gelatinous substance. They must then be collected at once, with the aid of a small strainer, as they only float for hardly a single day, and then sink straight to the bottom, from

HYBRID WATER-LILIES.

which the sticky substance prevents them moving. After their capture they should be kept in water, so as to keep them more safely until they grow.

"People who have no tanks, and who wish to begin the culture of Water-lilies, can very well make shift with casks sawn through the middle. In temperate countries it is unnecessary to protect these tubs against the frost, but in cold countries they must be protected. To do this, a trench is made of a depth of about one-third the height of the tubs, which are then placed in it and banked up to their edges with the earth dug out. One would hardly believe what a charming effect can be produced by tubs arranged in this style.

"Water-lilies are blessed with a surprising vitality, which allows them to live for quite a long time out of the water, and, in consequence, to survive very long voyages without being any the worse. For example, in 1889 I sent to the Universal Exhibition at Paris a collection of my hybrids in a case, which was lost on the railway, and which could not be found for over a month. I was then obliged to replace this first instalment. Some time afterwards I received a memorandum informing me that the package had been found, and asking me what should be done with it. Feeling certain that the plants would be dead, I ordered them to be sent back by slow train, but on their arrival I was astonished to see them in good order, pushing shoots, and very little the worse for being so long boxed up. I have thrown waste plants on to the earth surrounding the ponds, and have found their roots still quite sound after having lain six months on the open ground.

"PESTS.—I have only had to complain seriously of the ravages committed by two kinds of larvæ, the one black and the other white, produced by certain small yellowish white butterflies which deposit their eggs on the floating leaves. These larvæ, at first almost invisible, grow to about the thickness of a wheat straw, and devour the leaves of the Lilies during the night. They are very clever in hiding themselves during the day, laying fragments of the leaves on their bodies and covering themselves up with pieces of Lemna or Azolla. Their devastation would be serious if it could not be easily stopped by pouring on the surface of the water some drops of a mixture of three-quarters colza oil to one-quarter of paraffin, a sufficient dose to poison and destroy them without hurting the plants.

"I should not bring this dissertation on Water-lilies to an end without bestowing a few words on the splendid section of the Cyanea, or blue Water-lilies. It is greatly to be regretted that hitherto all attempts to cross them with their hardy congeners of the Northern Hemisphere have so far failed. It would be a great triumph to add to the already sumptuous collection some hardy hybrids of a sky-blue colour with a delightful perfume. They are very variable, as from the seed of N. zanzibarensis one can obtain the most beautiful colourings of deep blue, tender blue, intense violet, clear violet, violet red, pink, etc., that it is possible to imagine. But, alas! these charming varieties, which have also the advantage of being day-flowering, will only thrive with a considerable amount of heat. At Temple-sur-Lot, which has a great number of running springs, Water-lilies are grown all the year round in the open air thus: From the end of October to April 15th I pass through their basins a constant current of water from the running springs to preserve them from the cold, and as soon as warmth comes I turn off the springs, so that the temperature of the water in the basins becomes the same as that of the air. By these simple means it is possible to enjoy for five months the flowering of these grand plants."

MARLIAC'S YELLOW WATER-LILY (CHROMATELLA).

N. alba.—Of our common native Water-lily there is a splendid variety named candidissima, which has larger flowers than the familiar Water-lily of English ponds and rivers, and is clear white. It is pleasant to see a large group of this on a summer day, with the big white flowers above the green leaves. Alba Rosea is a pretty rose tint.

N. Laydekeri and its hybrids form a delightful group. As these plants are less vigorous than the Marliacea set, they are more suitable for small ponds, tubs, or tanks.

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WATER-LILIES AT WISLEY.

The flowers are wonderfully brilliant, especially fulgens, its cupped petals intense crimson, shaded magenta, with deep garnet stamens; lilacea, rose lilac, very delicate colour; purpurata, carmine rose and orange red stamens; Rosea, a strong-growing kind, the flowers opening soft pink, which deepens to quite a rose shade; and lucida, vermilion tinged with rose.

N. odorata is so named because of its deli ate yet powerful fragrance. This is worth planting in every lake, the flowers large and pure white, with a pink tinge upon the tips of the petals. Of this species there are several varieties, such as Exquisita, very deep colour, an intense rose carmine; gigantea, white, but scentless; rosea, pink and fragrant; rubra, deep rose purple; and sulphurea, deep sulphur yellow, sweetly scented, and a noble Water-lily, which bears its flowers about 6in. above the water, the leaves with brownish mottlings; grandiflora is a large form of it.

Hybrid Water-lilies are now numerous, and the set to which Marliac has given his name is as beautiful as any. The most splendid to make a beginning with—but the lake must be fairly large, because their growth is very vigorous—are N. Marliacea albida, a noble, fragrant flower, fully 10in. across, and dazzling white; Carnea, very vigorous, soft pink in colour, Vanilla scented, very free and bold, a counterpart of the former except in colour; Chromatella, a beautiful canary yellow flower, very sweet—no hardy Nymphæa is more beautiful than this, and its big handsome blooms appear for many weeks; Flammea is of a reddish purple tone, and Ignea extremely brilliant, red magenta against orange red stamens.

Very beautiful Water-lilies are N. Robinsoni, a splendid hybrid for colour, yellow and purple mingling, a rich effect in the summer; N. sphærocarpa, carmine, orange stamens; N. tuberosa, large white fragrant flowers and bold leaves; and the rosy-coloured Rosea and N. pygmæa, which is the pigmy of the whole race, a little jewel, as pure as driven snow, and sufficiently small to place in a tub, tank, or by the margin of the lake. Such a form as this must not be associated with strong-growing Nymphæas. Helveola is a sweet flower, of a pretty canary yellow colour, and brown mottlings upon the leaves. In a good collection there should also be the pale rose-tinted Aurora Caroliniana, flesh colour, and its white form nivea; flava, a pretty citron yellow; fulva, yellow touched with red, and two kinds of wonderful colouring, in both instances the flowers of a brilliant carmine purple, but in Ellisiana rather paler than in gloriosa. M. Latour Marliac describes it as "bright currant red; the fiery orange colour of the stamens has a very fine effect." Gloriosa is a handsome kind; to use the French hybridist's words, "a floating scented flower 7in. in diameter, very double, and of perfect form; currant red washed with rose white at the tips of the lower petals; stamens rich red. The only Water-lily which has regularly five sepals." Sanguinea is rich amaranth, its stamens deep orange; and in Seignoureti they are "medium sized, rising from 5in. to 6in. from the water, shaded with pink and carmine on a ground of pale yellow; leaves marbled with brown on the stem, and streaked with red-brown underneath."

An ideal place for the Water-lilies is a calm lake or pond, sheltered yet not overshadowed by trees, and not peopled with water-rats, water-fowl, or swans. In such a place as this the plants will grow into broad groups, and the surrounding leafage will intensify the flower colouring. The flowers may be cut for the house, and create a distinct and beautiful form of decoration. Reflex the segments to prevent the bloom closing, and gather quite young flowers, those not more than a day old, and float them in ample water.

Rats are frequently very troublesome, and may be shot or trapped, and water-fowl must be closely watched. If one wishes for Nymphæas upon the water's surface animal life in a large measure is impossible. A spacious lake is not needful, for in any quiet pond where the water is from 2ft. to 3ft. deep the Nymphæas will succeed.

The introduction of species and the raising of hybrid Water-lilies has created a new and undying interest in a distinct and beautiful phase of flower gardening. There is no excuse for ugly ponds and lakes when all this wonderful wealth of flowers is available.

Œnotheras (*Evening Primroses*).—The genus Œnothera, or Evening Primrose, comprises about 100 species, some of which are perennials, some biennials, and some annuals. The perennials may be propagated by seed sown in pans of light, porous soil, placed in a cold greenhouse or frame in March and April, the seedlings being planted out in the open border in June. They may also be increased by cuttings taken off during the summer, and inserted in almost pure sand in a shady position under a bell-glass, air being gradually given as the cuttings become established. The roots may be divided in the autumn or spring, when rooted suckers may be removed, which will soon form plants. A sunny position, in porous loam, suits these subjects well. They should be mulched and watered in dry weather. Good forms of the perennial Œnotheras are Œ. fruticosa, a very free-blooming yellow; Œ. marginata, a lovely white, sweet-scented, well adapted for the rock garden; Œ. macrocarpa, with large pale yellow flowers; and Œ. speciosa, white. Of the biennials, perhaps the best known is the giant Evening Primrose, Œ. Lamarckiana. The seed of these species should be sown one-sixteenth of an inch deep in a semi-shaded situation in the open during April, the seedlings being well thinned out and planted in their flowering positions in the autumn. The annual species, from which the handsome named varieties of the so-called Godetias have sprung, should be propagated by seed being sown thinly in prepared beds where the plants are to bloom. April is the best month to sow, though in warm and favoured situations a late summer sowing will give fine plants for a succeeding year's display. Thin out the seedlings to 6in. apart each way as soon as they can be easily handled. All Œnotheras are benefited by copious supplies of water during parching weather, but the beds in which they grow should be well drained, and their position well exposed to the sun. The perennial species are better for lifting and dividing every three years or so.

Omphalodes.—This is a very charming family of hardy flowers, belonging to the Borages. There are three species, O. linifolia, O. Luciliæ, and O. verna. The first is an annual, but the other two are perennial. O. Luciliæ has bluish flowers and grey foliage, and is very pretty hanging over a ledge upon the rock garden, but the soil must be thoroughly well drained. It must be protected from slugs, which have a strong partiality for the young growths. A beautiful flower is O. verna, which quite early in the year bears its deep blue flowers, as blue as those of the Gentians on alpine pastures. It is a rock garden plant, and will run freely in cool positions near hedges, shrubs, or half-shady walks. Its flower colouring is intense. Alba is a variety that is not so fine as the type. Propagate Omphalodes by division or seed.

Onopordon Acanthium and O. arabicum (*Cotton Thistles*) are very picturesque and handsome plants in the woodland, but must not encroach upon choice subjects. The spiny stems clothed with glaucous leafage rise 8ft. and even more in height. Easily raised from seed sown in early summer, and may be regarded as biennials.

Orchises.—It is possible to cultivate quite a number of these interesting plants, provided their requirements are studied. As a general rule the bed in which these are grown should be at least 1½ft. deep and composed of porous soil. Calcareous loam suits such sorts as O. longicornis, O. lactea, O. militaris, O. pallens, O. papilionacea, O. pauciflora, O. purpurea, O. sambucina, and O. undulatifolia, whilst a compost consisting of two parts leaf-mould, one part peat, and one part loam meets the requirements of O. latifolia, O. maculata, O. mascula, O. Morio, and O. spectabilis fairly well. O. foliosa (the great Madeira Orchis) will succeed in the latter compost, but is benefited by a rather more shady position than is advisable for the others named, which prefer a sunnier site. These terrestrial Orchids should be planted from September till November, the tubers being placed 2in. below the surface. During the period of growth an abundant supply of

ŒNOTHERAS (Evening Primroses) AND OTHER FLOWERS

water should be given, while a mulch of well-decayed hot-bed manure in March will generally be found to strengthen the growth. Propagation may be effected by division of the tubers in the autumn, but it is a pity to disturb the plants if they are healthy. A light covering of rough leaf-mould or cocoa-nut fibre makes an effective protection during the winter months. Other so-called Orchises, such as the Bee Orchis, Humble-bee Orchis, Fly Orchis, Spider Orchis, Saw-fly Orchis, and Looking-glass Orchis, though belonging to the Orchidaceæ, are classed under the name of Ophrys. These should be grown on sunny rock gardens in sandy loam with which chips of limestone or chalk have been incorporated, otherwise the cultural directions already given for the terrestrial Orchids will apply.

Ornithogalums. — This extensive family comprises about eighty species, natives of Europe, Asia, Africa, and America. They are bulbous plants, and the greater portion are only fitted for culture under glass, though a few are hardy, and well fitted to assist in the embellishment of our gardens. A rich, sandy soil is found most adapted to their requirements. The taller kinds are well suited for planting in the herbaceous border, while many of the dwarfer species are seen at their best when naturalised in the grass. One of the greatest merits of these Stars of Bethlehem, as they are prettily styled, is the length of time they remain in bloom, the flower spikes of some of the species remaining in condition for close upon three months. The following are amongst the best of those suitable for culture in our own country:

O. armeniacum, a native of Armenia, bearing its white flowers in umbels during May; height, 6in. to 9in.

O. arabicum, a beautiful flower from Algeria, blooms white with black eye, 1in. to 2in. in diameter, borne on a tall flower stem, attaining, under good cultivation, a height of nearly 3ft. In England it usually blooms in May or June. Although not, strictly speaking, hardy, it generally passes through the winter unharmed in sheltered situations in the Southern Counties. In colder climates pot culture will be found most suitable.

O. comosum, Europe, a perfectly hardy plant, bearing racemes of white flowers, and growing to a height of 6in. It blossoms in May and June, and is well adapted for positions in the rock garden

O. exscapum, Europe, a very dwarf, hardy species, bearing umbels of large, white flowers just clear of the ground; an April bloomer.

O. fimbriatum, from the Crimea, hardy, producing greenish white flowers. A dwarf plant useful for naturalising in grass; blooms in early spring.

O. glaucophyllum, Asia Minor, hardy, bearing umbels of white flowers, height about 6in., blossoming in May and June.

O. latifolium, a native of Tauria, hardy, bearing a tall head of as many as a hundred large, white flowers. Under generous treatment it attains a height of 3ft., and flowers during the months of May and June. It is very valuable for open-air culture.

O. montanum, Europe, dwarf, hardy, bearing racemes of greenish white flowers.

O. narbonnense, Europe, a hardy plant, bearing white flowers, 1in. in diameter, on stems 2ft. in height. It blooms in June, and is in every way desirable for grouping in the border or wild garden.

O. nutans, Europe, bearing loose racemes of drooping white flowers with green reverses, height, 6in. to 10in.; a June bloomer. This bulb had better be relegated to the wild garden or naturalised in the grass, as it quickly spreads and is with difficulty eradicated, if planted in a border, without unduly disturbing the other occupants.

O. pyramidale, Europe, is the noblest of all the Ornithogalums, producing tall spires of white flowers 3ft. to 4ft. in height. It blossoms in June. When grown in rich deep soil, and allowed to remain undisturbed, it forms fine clumps, which are exceedingly decorative in the border or in the wild garden. This is a variety of O. narbonnense.

O. pyrenaicum, Europe, producing long racemes of pale yellow flowers, height 2ft., flowering in June. This species is found wild in parts of England.

O. umbellatum, Europe, a hardy, well-known kind, bearing its white flowers in umbels some 6in. in height. It blooms in May, and is seen at its best when naturalised on a grassy bank.

There are thirty-three other species which were introduced from South Africa, while of the remainder six hail from America, O. alliaceum, O. bifolium, and O. corymbosum being natives of Chili, O. biflorum's habitat being Peru, and that of O. chloroleucum Brazil, while O. ixioides is a Californian bulb.

Orobus.—*See* Lathyrus.

Oxlip.—*See* Primula.

Pæonies are divided into two classes, the herbaceous, which dies down every winter and shoots up from the ground the succeeding spring, and the shrubby, or tree section, which forms large, permanent bushes. Though differing greatly in their manner of growth, herbaceous and tree Pæonies require very similar treatment. They luxuriate in deep, rich soil, in fact it may be said that the soil cannot well be too deep or too rich. Where practicable, the bed in which the Pæonies are to be planted should be excavated to a depth of 3ft.—indeed, strong-growing herbaceous Pæonies send their roots down to a greater depth than this—and well enriched with cow manure in all but the heaviest soils, where stable manure may be substituted. The bed or beds should not be close to trees or very vigorous-growing shrubs, whose roots will impoverish the soil, though, at the same time, a certain amount of shade is beneficial, and shelter from boisterous winds is a desideratum. The best time for planting Pæonies is early in the autumn, the month of September, when they are in full leaf, for choice. When carefully lifted and planted at the time advised, and given a copious watering, they will quickly recover from the shift and push out roots into the surrounding soil, whereas they often remain dormant for weeks after a spring planting, and make little or no growth during their first season in new quarters. In dry situations it is always well to plant in a slight depression, so that when water is given, as it should be liberally and often during dry weather, it may not run away, but thoroughly permeate the soil. Surface mulchings of manure given in the early spring have a very beneficial effect on Pæonies, as the stimulating properties of the dressing

SINGLE PÆONIES.

are washed down to the roots just when they are most in need of assistance, while the covering keeps the surface of the soil in a moist condition, and prevents the roots being parched during the summer months. Supplies of liquid manure in the spring and summer also tend to preserve the plants in a vigorous state of health. Pæonies should not be placed too near together in the beds, 1yd. apart each way being quite close enough. If it is thought that the beds will look bare for the first year or two, they may be surfaced with carpeting plants, such as Tufted Pansies, Saxifrages, or such-like. When once planted in congenial soil, and well looked after in the matter of feeding, Pæonies may be left undisturbed for a dozen or more years; indeed, it often takes four or five years for them to attain their normal size after being first put out. A pretty spring picture is afforded by planting the yellow trumpet Narcissi close to herbaceous Pæonies. These then bloom just when the Peonies are throwing up their young carmine shoots, and the contrast of colours is very effective. Lilies also may be planted with advantage among groups of Pæonies, as the foliage of the latter shelters the young Lily stems, while, after the Pæonies have finished blooming, the Lilies commence to expand their tall flower spires.

PÆONY MOONLIGHT

The herbaceous Pæonies are usually divided into two classes, the early-flowering, May-blooming, species, and the June-flowering varieties of Pæonia albiflora, or Chinese Pæony, whose numberless double and single forms are so well known in our gardens to-day, and have been added to greatly of late years by such raisers as Messrs. Kelway and Son of Langport. These latter may, with advantage, be planted 6in. deep, but the early-flowering species, with the exception of the old double garden Pæony, are better planted not more than 2in. below the surface. The following are the best known of the early-flowering species: P. anomala, a native of Northern Europe, with single flowers of a bright red colour, 4in. or more in diameter, and beautifully-cut foliage. Of this species there are several varieties of different shades of crimson. A. arietina, from Southern Europe, flowers crimson, single, leaves glaucous. Of this Pæony there are about a dozen varieties, of which Crown Prince, rich crimson, and Northern Glory, rose pink, are the best.

P. albiflora, introduced in 1548, is a native of Siberia, and bears large single white flowers with golden stamens, upon stems from 2ft. to 3ft. long. The June-flowering herbaceous Pæonies, both double and single, are varieties of P. albiflora or edulis. Their flowers are very large and handsome, and range in colour from white through blush, pink, and rose to deep crimson, the majority of them being sweetly scented. The following twenty-four named varieties form a good selection: Agnes Barr, rose and white, shaded yellow; Countess of Clancarty, white, very double; De Candolle, rose pink; Duke of Edinburgh, deep rose; Eugène Verdier, blush white; Festiva maxima, snow white spreading flowers, very fine; Joan Seaton, cherry rose; Lady Beresford, blush pink; Leonie, blush white; Lord Salisbury, crimson; Madame Furtado, rose; Madame Loise Mère, pale pink, late; Madame Calot, white, tinted rose; Nimrod, deep rose; Prince Prosper, deep crimson; Princess Clotilde, flesh white; Reine des Françaises, silvery pink; Sir Walter Scott, brilliant rose; Solfaterre, sulphur white; Summer's Day, creamy white; Torquemada, peach; Triomphe de Paris, white; Whitleyi, white, tinged yellow; and Zoe Verniory, pink and primrose; while the following eight are excellent singles: Argus, bright rose; Duchess of Sutherland, flesh pink; Hesperus, bright pink; Queen of the May, rosy pink; The Bride, white; The Moor, crimson maroon; Venus, white, shaded rose; and Water-lily, snow white and globular, fine.

P. Broteri, a native of the mountains of Spain and Portugal, flowers single, bright pink, stems coral red, leaves green above, glaucous beneath.

P. corallina, from Asia Minor, flowers single, carmine pink. The seed-vessels are particularly attractive in the autumn, when they open out and disclose the crimson seeds, which have the appearance of coral. This Pæony grows wild on the Steep Holme Island in the Bristol Channel. A variety of this is P. Russi, from Sicily, flowers single, large, of a light purple colour, and sweetly scented, foliage blue-green and glistening.

P. coriacea, a native of Spain, flowers single, bright rose, the foliage being of a blue-green tint, and the stems coral red.

P. corsica, from the island of Corsica, flowers single, bright crimson-red.

P. decora, from Eastern Europe, flowers single, crimson. There are named varieties of this species, of which elatior Ianthe and Pallasi are good.

P. Emodi, a native of the Himalayas, flowers single, white. This is a singularly beautiful species, and is said to be allied to P. albiflora.

P. humilis, from Southern Europe, flowers single, carmine pink.

P. lutea, a native of Southern China, flowers single, yellow, with red stamens.

P. microcarpa, from Spain, flowers single, crimson, leafage downy.

P. mollis, from Siberia, flowers small, single, deep red, plant dwarf.

P. officinalis, a native of Southern Europe, flowers single, bright crimson. This is the progenitor of the old double Pæonies of our gardens. Forms of this species are P. anemonæflora, blanda, lobata, rosea, and other named varieties, of colours ranging from crimson to flesh.

P. paradoxa, from Southern Europe, flowers single, deep purple-red.

P. peregrina, a native of Southern Europe, flowers single, rich crimson. There are several named varieties of this species, ranging in colour from crimson to blush pink, of which two colours, Brilliant and Blushing Maid, are good examples.

P. tenuifolia, a native of the Crimea, flowers single, rich crimson, leafage feathery and Fennel-like. There is a handsome double variety of this plant.

P. triternata, from the Caucasus, flowers single, soft pink in colour. In the autumn the seed-pods of this Pæony, which are larger than in most species, open and

DOUBLE HIGH-CENTRED PÆONIES.

disclose ten to thirty seeds, about the size of peas, the fertile ones blue-black and the sterile of a bright scarlet, the effect being even more decorative than the flower display.

P. Wittmanniana, from Persia, flowers single, primrose yellow.

The Tree Pæony, or Pæonia Moutan, was introduced over 100 years ago, and has probably been cultivated by the Chinese for more than 1,000 years. It is perfectly hardy, but occasionally gets badly crippled by spring frosts and cutting winds, owing to its habit of starting into growth very early in the year. For this reason it should be retarded as much as possible, by planting in a position where it gets but little sunshine, especially morning sunshine, this being particularly dangerous to frozen shoots and buds, which if allowed to thaw

THREE SINGLE VARIETIES.

gradually in the shade take little harm, but are speedily destroyed if the sun reaches them while they are still in a frozen state. Cutting winds from the north and east often play havoc with the swelling buds, and young leaves and plants are rendered unsightly for a whole season owing to this cause. For this reason it is well that shelter should be arranged towards the direction from which these devastating winds blow, in order that a season's display may not be sacrificed in this way. Winter protection is often synonymous with coddling, which, in the case of Tree Pæonies, is disastrous in its consequences, as it forwards the growth and renders it more susceptible, instead of retarding and consolidating it. The only description of protection that is admissible is an open wire canopy, over which a mat may be thrown on frosty nights, and even this will not be requisite unless the buds are far advanced. The Tree Pæony, although revelling in rich soil, is not so much incommoded by the lack of it as is the herbaceous Pæony. Many fine plants of the older, semi-double Pæonia Moutan, bushes 6ft. high and as much through, may be seen growing in unmanured soil, and even established in the grass in some parts of England. These Pæonies are useful for pot culture, if well fed, and may easily be forced into bloom during the months of February and March, though, after such forcing, plants require a year's rest before being again subjected to similar treatment. The propagation of the Tree Pæony is effected by grafting on the roots of the herbaceous section.

A selection of eighteen handsome named varieties is here given: Athlete, white, flaked purple; Beauté de Canton, mauve; Blanche de Noisette, white with lilac spot at base of petal; Duchess of Teck, white; Donckelaari, peach; Julius Cæsar, crimson lake; Lactea, white with purple spot; Lord Macartney, crimson; Louise Mouchelet, salmon pink; Madame Stuart Lowe, salmon, shaded red; Osiris, crimson

maroon; Purity, snow white; Reine Elizabeth, silvery pink; Robert Fortune, rosy crimson; Sarah Bernhardt, flesh pink; Samarang, vermilion red; Triomphe de Vandermael, bright rose; and Ville de St. Denis, mauve and white; while the following are excellent single varieties: Henry Irving, dark crimson, especially good; Jean de Reszke, white, an enormous flower, almost a foot in diameter; Lord Iveagh, cerise red; Mrs. J. W. Simcox, salmon rose; and Mrs. McMillan, deep rose.

TREE PÆONY.

Pansies (*Violas*).—The Pansy of the garden is a Violet, because all Pansies belong to the same family as the little fragrant blue flower of the shady hedgerow, and the various species are described under the name of Viola. The Pansy is considered here because so familiarly known by this name, but to call any one group by the name Viola is misleading, for that is the title of the entire family.

Tufted Pansy is so called because the growth is tufted yet creeping, in opposition to those kinds with straggling stems which rarely bloom for many weeks. The Pansy is a good garden plant, and one to group freely in conspicuous positions, by itself, or, better still, in association with other things. Beds and borders may be margined with it, or it may be planted amongst dwarf shrubs, su h as hardy Azaleas, choosing always rather damp spots, not exposed to the full force of a summer sun. It is the tufted kinds that must be used for this purpose, not show, fancy, or other types, which are seen frequently at exhibitions, yet in the garden are of poor effect. Plant either in the autumn or the spring, choosing the first-named season when an early display of flowers is desired. Select early October for the work, and make the soil moderately rich by incorporating rotten manure with it, or, if very sandy, cow manure is advisable. Prepare the surface in the usual way by making it fairly fine, and plant from 9in. to 1ft. apart. If the garden is very low-lying and damp, never plant in the autumn, otherwise the Pansies will suffer in winter. It is even more necessary to dig the soil deeply for spring planting, as then the plants withstand better a dry summer. Put well-rotted manure deep down in the trenches, leave the surface rough, dress it with soot, and then after the frosts and rains of winter it will break up finely, ready for the plants to be put out in early spring. If when received from the nursery they are in any way attacked with green-fly, dip them in a preparation of soft soap, 10oz. to a gallon of water. Keep the buds picked off for a time, until the plants have become established, and also gather decaying flowers, as these, of course, produce seeds, the double strain proving too much for the plants.

Propagation may be effected by seeds or by cuttings. Charming variations in colour occur amongst seedlings raised from the best seed, and not infrequently some variety of great beauty, distinct from anything else in our gardens. Seed may be sown out of doors in some prepared spot in July, and if the seedlings are carefully pricked out, then transferred to their flowering quarters, they will bloom the following year. Or seed may be sown in gentle warmth in February. Well harden the plants off before they are put out in the open, and indeed in their seedling stage it is well to transfer them to the garden. Watch for slugs, which appreciate juicy Pansy seedlings in particular. If named kinds are to be perpetuated, propagation by cuttings is necessary.

The show and fancy Pansies are not very popular in England. They are often very beautiful in the cool climate of the North, and one reas on for their scarcity in the South is that the plants are almost a failure. They are seen at the exhibitions, but to enumerate the curious points connoisseurs value would interest few flower gardeners. It is the tufted kinds that bloom so continuously and freely, and which one may gather to fill small glasses upon the table.

Selection of Varieties.—Tufted Pansies—Choose any of the following:—Blue: Blue Gown, a beautiful shade, one of the most charming of all Pansies, very pretty by an old wall, or even on the wall itself—pansies, it must not be forgotten, will flower well when upon walls; Ophelia, and the well-known Archie Grant, grown so largely for market. Edged or margined flowers: Duchess of Fife, Border Witch, and Goldfinch. Fancy or blotched: Mrs. C. F. Gordon, Cottage Maid, and Isa Ferguson. Rose: Maggie and William Niel. White: White Empress, Ethel Handcock, Masterpiece, and Niphetos. Yellow: Pembroke, Princess Louise, Sir Robert Peel, and Ardwell Gem. Other colours: Florizel, lavender and blush; Norah Mary, blush; Rosea pallida, very delicate blush; and Devonshire Cream, cream.

Miniature Flowered.—This is a dainty class, the flowers quite small, as the name suggests, and as pretty as those of many of the alpine species. Of this group the most charming are Violetta, white; Lavinia, rosy blush; Walter B. Child, white margined with lavender blue; Gold Crest, golden yellow; and Blue Bell, soft blue.

Fancy Pansies.—The best of these are Agnes Mabel, Col. M. R. Buchanan, Jeanie R. Kerr, Maggie McPhail, Marmion, Mrs. D. Johnstone, Mrs. W. Watson, Tamworth Yellow, Bernard Doulton, Jeanie R. Lister, Maggie Watson, and Constance Steel.

Show Pansies.—Alex. Black, John E. Martin, Bessie Smellie, Miss Cramb, Mrs. John Hunter, Winnie Irvine, Col. Stirling, Jessie Thomson, and Agnes Kay.

Pentstemon.—The Pentstemon family is known best by the beautiful hybrid kinds which flower so gaily in the summer and autumn, furnishing material for cutting, and gladdening the garden with colour. This race has been obtained by hybridising, P. Hartwegi and P. gentianoides being the foundation. Unfortunately the plants are not very hardy, frequently collapsing in winter, but it is so easy to raise seedlings that one is not concerned about a want of hardiness. Cuttings may be struck in autumn, wintered in a cold frame, and planted out in April, or seed may be sown in June in shallow pans, and the seedlings wintered in a frame. These produce excellent tufts for flowering the year following sowing; in fact, this is treating the Pentstemon as a biennial. There is yet another time to sow seed, namely, in January in gentle warmth, when the plants will bloom freely the same season. There is

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no difficulty about sowing, as a shallow pan of light soil, well crocked, suffices. Pot off the seedlings when large enough, and plant in a moderately rich soil and sunny position. The Pentstemon makes a beautiful bedding plant, and large beds may be filled with it alone with excellent results, or group it in the mixed border, in any spot indeed that needs colour. A wonderful range of hues may be found in this race, varying from self blood crimson to pure white, and the great point is to get only the finest tones, not muddy magenta shades.

Periwinkle.—*See* Vinca.

Phloxes, Dwarf.—The so-called Alpine Phloxes are, like the rest of their family, natives of the North American Continent. They are admirable occupants of the rock garden if they can be accommodated with a deep and moist root-run in porous soil, fibrous loam and peat in equal proportions, with which a liberal allowance of disintegrated granite has been mixed, proving a most satisfactory compost. Much as these charming plants appreciate a cool, deep root-run, they are not partial to shade, and succeed best where their foliage and flowers can absorb the sunshine. They are particularly useful in the spring, coming between the Narcissi and the early summer flowers. Although these dwarf species seed, they do not, as a rule, do so freely enough to lead to their general propagation being effected in this manner, so that the usual methods in vogue of increasing the stock are those of dividing the plants and taking cuttings. The latter should be taken off in July, and inserted in moist, sandy soil, in a cold frame, care being taken to keep them shaded from the bright sunshine until struck. By the succeeding spring these should have formed nice plants. Old plants which are to be divided should have a mulch of light soil given them after their flowering season is past, and the division should take place in the autumn, when the mulch of light soil will be found full of roots from the buried stems. The following list gives the best-recognised species of the dwarf herbaceous Phloxes:

P. amœna, bright rose, 4in. to 6in. in height, a very persistent and most floriferous bloomer, being a mass of flower in the spring, and often blossoming as late as October and November.

P. divaricata, with large lilac-blue flowers, grows to a height of 1ft. A variety of this, P. d. canadensis, has even larger flowers, of a rather deeper colour. There is also a white variety.

P. linearifolia has flesh-coloured flowers, and attains a height of 1ft.

P. ovata, with reddish purple flowers, grows to a height of 1ft.; Carolina, with large deep rose flowers, is 1½ft. high; while Listonensis is a purple variety of the same species.

P. pilosa bears purple flowers, ½in. in diameter, in large clusters during June, and grows to a height of 10in. or 12in. There are varieties with rose and white flowers.

P. procumbens, bearing flowers lilac and violet, height 4in. to 6in., is a creeping species, now unknown as a wild plant.

P. reptans, or verna, another prostrate species, has deep rose flowers.

P. stellaria, a very beautiful species, bearing masses of silver-grey flowers, is very distinct; height from 4in. to 6in.

P. subulata, growing to a height of 6in., also known as setacea, and by the English name of Moss Pink, is a very beautiful species, of which there are now numerous lovely varieties in commerce. The type has blossoms of a soft rosy pink; P. s. alba is a clear white; P. s. Aldboroughensis, fine rose; P. s. atropurpurea, deep purple rose; P. s. Fairy, cream white, shading to lilac; P. s. frondosa, pink with dark centre, very vigorous; P. s. G. F. Wilson, clear mauve, very fine; P. s. grandiflora, bright pink with crimson blotch, and larger flowers than the type; P. s. Nelsoni, white; P. s. nivalis, white; P. s. pallida, rose shaded lilac; P. s. The Bride, white with rosy eye; P. s. Vivid, brilliant rose with carmine centre.

Phloxes, Herbaceous.—A noble garden flower, and may be used in many ways, best of all in groups of one kind, not necessarily in the border, but amongst shrubs even, by shrubbery margins, or water-side, where in the moist soil growth is vigorous. The reason plants are frequently poor is because their treatment is little understood. They must have a rich soil with plenty of manure in the bottom, and during dry summers mulch and water them well. Planting may be carried out in spring or in autumn, and the way to propagate is by dividing the roots when new growth commences. When the plants are three years old, and seem matted together, showing obvious signs of failing vigour, divide them, and the strong outer pieces will make splendid new stock. The herbaceous Phlox is one of the most vigorous of all perennials, quickly exhausting the soil, and for this reason lifting and dividing every three or four years is essential. Another way to propagate is by cuttings late in autumn from the side shoots that have not flowered. They should each be about 4in. long, dibbled round the sides of a 5in. pot, and when rooted potted off singly. Keep over the winter in the frame, and plant out in spring. Increasing a stock by shoots from the roots is simple, these being seen pushing up in spring. Remove carefully, and when about 2in. in length put into 5in. pots, and give a little warmth, such as in hot-bed or greenhouse. These may be planted out in May, and a few grown on, if desired, in pots for the adornment of greenhouse and conservatory.

It must not be forgotten that Phloxes can be raised from seed, sown when ripe, or indeed at any season. Soak the seeds in lukewarm water for four or five hours to soften the hard outer skin, and sow them in a shallow pan of fine soil, which should be placed in a warm frame or greenhouse. When the seedlings appear pot them off separately, and when 6in. or so high plant them out, when, if the seed was obtained from good varieties, the colours will be pleasing. If, however, a decided colour is required, the plants must be purchased or obtained by division of the roots.

There are two sections of herbaceous Phlox, the one the early or midsummer flowering group known as the offspring of P. suffruticosa, the other group having been obtained by hybridisation from P. decussata, P. paniculata, and other North American species. As regards varieties, little seems to be known about them, and one sees in gardens kinds of purplish or magenta colours which are unpleasant and ineffective. The taller decussata or late-flowering race is the most handsome, and the finest varieties are Avalanche, pure white, very free, a beautiful flower, dwarf; Coquelicot, brilliant orange scarlet, as effective as any variety in the garden; Etna, crimson touched with scarlet and orange; Erato, vermilion, purple centre; Jeanne d'Arc, white and dwarf; La Candeur, white with cherry-coloured eye; Lothair, scarlet with a tinge of purple in it; Roi des Roses, rosy salmon, crimson centre; W. Robinson, salmon rose; Eugene Danzanvilliers, lilac; Purest of All, pure white; Magnet, carmine red; Lafayette, mauve shade; John Forbes, rose; Mme. H. Jacotot, red, crimson centre, very dwarf; Regulus, carmine, violet centre; and Dr. Bayol, white, rose centre, all being dwarf in growth.

Phygelius capensis.—This is a plant worth a place in warm soils, and if planted in quantity makes a brilliant display. It depends entirely upon the climate as to where it should be put, but, except in the favoured Southern Counties, should have as a rule a warm sunny border, or one of those borders in which the Zephyranthes, Calochorti, and other warmth-loving bulbs are happy. It grows about 3ft. in height, and has a strong stem of scarlet flowers, which appear for many weeks. If an increase of stock is desired, propagate by dividing the root stock in spring.

Physalis.—The best known is the bright Winter Cherry (P. Alkekengi), conspicuous for the inflated orange scarlet covering enclosing a Tomato-like fruit. These calyces hang on rather slender stems, and make a brilliant show in autumn. P. Franchetti is comparatively new, and

larger than the more familiar species in every way. It retains its leaves longer, and makes a showy bed later in the year. When cut, before soiled by the weather, these shoots last long as winter decorations. A warm, fairly light soil and sunny position suit the Physalises best, and they are raised from seeds sown in the open in April, or by root division in spring.

POLEMONIUM RICHARDSONI

Pinks.—Who does not love the fragrant silvery-leaved Pink, which makes spreading masses if not disturbed, and is pretty when covered with snowy drifts of blossom. It must be poor soil that will not support them, and they are propagated by cuttings, or pipings as they are usually called in the gardener's vocabulary. Cut them just under a joint, remove sufficient leaves to leave a clear space for insertion in the soil, and dibble them in light soil surfaced with silver sand. Place a hand-light over them and they will soon root, when they can be transplanted in the autumn to the positions they are to adorn. Another way is to layer them as one treats the Carnation, and this method has its recommendations. The white varieties are the most popular, and the old fringed white has many admirers still, but the kind usually seen is Mrs. Sinkins. Albino is a beautiful variety with smooth, very pure, robust petals which do not fling themselves out of the calyx. Her Majesty, Mrs. Lakin, very dwarf, compact and free, Mrs. Welsh, conspicuous for lateness, and Snowflake are all good. White Pinks make delightful edgings. A broad margin to a mixed border is a rare picture in June. Beware of wireworm when planting Carnations and Pinks in new soil, especially if the top spit of a pasture. Very little edging will remain after a few weeks.

Laced Pinks are quaint, interesting flowers, the colours being as a rule rose purple, and laid on the margin of the florets, which have a pure white ground. Boiard, Clara, Emerald, Empress of India, Eurydice, Harry Hooper, Minerva, Modesty, Mrs. F. Hooper, and The Rector are the best of the race. Plant in early September. These are the Pinks grown for exhibition, the markings upon the flowers constituting their chief value.

Plantain Lilies.—*See* Funkias.

Platycodons are closely allied to the Campanulas. The chief kind is P. grandiflora, which has large bluish flowers, produced in clusters on the short stems. The plant is not more than 18in. in height, and wants a thoroughly well-drained spot. Anything approaching stagnation is fatal. Deep loam and an open spot on the rock garden suit this family. Mariesi is still dwarfer, bearing flowers of similar colour, but there is a white variety, too. Propagate by seed and root division.

Plumbago Larpentæ is a hardy plant, with blue flowers, not unlike but deeper in colour than those of P. capensis. It is a neat-growing plant, requiring a warm sunny place where the soil is moderately light. Divide the roots in spring for increase of stock. P. capensis is very useful for putting out in large pots or tubs upon the turf or terrace in summer, but it is not hardy. Its soft blue flowers are usually seen in the greenhouse.

Podophyllums.—Two of this family are sufficiently important for our gardens. P. Emodi is a bold perennial with broad handsome leaves, tinted with red, and large red fruits. P. peltatum (the May Apple) has wrinkled leaves and white flowers in spring. Both require a peat soil and shelter. Frequently one sees in rock gardens a warm recess or bay in which such plants as these are a success.

Polemonium.—A dainty family, known generally as Jacob's Ladder, and should be in every good garden. The most common species is P. cæruleum, which has very pretty blue flowers, and there are white and variegated forms also. All the Polemoniums rejoice in rich, thoroughly-drained soils, as anything approaching stagnation probably means loss in winter. P. confertum is a charming species, dwarf, and with deep blue flower clusters, which in the variety melitum are larger. It is necessary to choose an especially well-drained light soil for them. P. himalaica and P. Richardsoni, its white variety, and the creeping P. reptans are also handsome, except the first-named, which is more suited for the rock garden than the border.

Polyanthuses are doubtless forms of the common Primrose, and beautiful flowers, frequently of quaint form, such as hose-in-hose, and some gold laced, that is, a margin of gold colour to the petals, very rich in contrast to the centre. Though less useful and effective than the Primrose for the garden, Polyanthuses, when the flowers are bold and well coloured, perhaps some rich self, are precious in the border in spring. They may be increased in the same way as the Primrose.

Polygonatum.—*See* Solomon's Seal.

Polygonums.—These are known as Knotweeds, and are for the most part vigorous perennials, especially Polygonum cuspidatum, a tall, graceful plant, beautiful in a group by the water-side or upon the grass, and of which there is a compact form named compactum; P. Sachalinense, wonderfully tall and robust, noble in leaf and aspect; the white-flowered P. Molle, beautiful in the autumn with its plumes of blossom; the dwarf P. amplexicaulis, P. Brunonis, P. vaccinifolium, and the crimson P. sphærostachyum, which deserves a place in the rock garden.

Pond-flowers.—*See* streamside gardens.

Potentillas.—Quaint and interesting are the hybrids raised by crossing such species as P. atrosanguinea. The colours are varied and pleasing, ranging from quite reddish brown to crimson, and the plants may be easily raised by dividing the roots. Sunshine and fairly light soil are essential. Several good varieties are Atrosanguinea, scarlet, single; Californica, double golden yellow; chromatella, yellow; Nigra plena, crimson; perfecta plena, yellowish hue and crimson; Velours pourpre, purple, double; and William Rollison, orange red. Amongst the alpine species are many pretty rock plants, of which a few are the following: P. alba, P. alpestris, P. recta and varieties, P. pyrenaica, and P. aurea ambigua, which all delight in warm, fairly dry, sunny positions.

Poppy, Mexican.—*See* Hunnemannia fumariæfolia.

Primroses.—The Primroses of the garden are flowers of many colours, all derived from the wild Primrose (Primula vulgaris) of wayside banks and copses. By growing a set of seedlings interesting variations occur, and it is wise to reject every kind of poor colour, reserving only those clear, decided hues which are effective in the bed and border. There are single and double varieties, with hues of yellow, rose, violet, pink, and pure white, even blue, or at least a colour approaching the true blue of the Gentian. The blue Primroses, which are more of a violet-purple shade, are charming in cool spots, by the margin of some shady brook, or against mossy stones, which throw into relief the distinctive colouring. This blue race was raised by Mr. G. F. Wilson of Weybridge, and some of the forms have been named, Oakwood Blue perhaps the most beautiful of all, the flowers very rich in colour, with reddish centre; but reject in the seedlings all dingy purples or those of magenta shades. Primroses, both single and double, appreciate shade, and may be grown freely by woodland walks, or used as edgings in the border; indeed, there are a hundred ways of planting these sweet spring flowers. Seed may be sown out of doors in early summer, and named varieties propagated by dividing the roots after flowering. The time to plant is in autumn, when the summer bedders are over, for a spring display; if necessary to remove the Primroses for the summer flowers, transfer them in May to a reserve place, such as the kitchen garden, where they will be sheltered partly from the hot suns. Part them, then, not into very small pieces, unless of course one desires to obtain as much as possible of a particular kind. Many of the double varieties are very beautiful, and are always most satisfactory in a deep, well-drained moist soil in partial shade. Very effective are brave masses of white, lilac, and crimson, such as in the old Pompadour, lavender and yellow. The bunch-flowered Primroses are Primroses with the flowers bunched together on a stem, and remind one of the Polyanthus, and when the colours are pure the effect of groups of them is very fine, orange, yellow, and shades of these colours predominating. The double Primroses are unfortunately not a success everywhere, because their requirements are somewhat peculiar. A cool moist climate is necessary, and a well-drained soil. The double crimson is especially difficult to manage, and must be cultivated with the utmost care to ensure a free display of its rich crimson flowers, each like a rosette.

PRIMROSE.

The Oxlip is a natural hybrid, that is a cross that has occurred naturally between the species, and in this case the Cowslip and the Primrose are the parents. The Bardfield Oxlip is Primula elatior, and a beautiful garden flower, whilst the common Cowslip is P. veris.

Primulas.—To the beautiful Primula family belongs a host of our most treasured garden flowers, such as the Auricula, Primrose, Polyanthus, and others, those mentioned especially being described under their popular names. But apart from these, there are many charming species which should either be established upon the rock garden or in the border.

P. amœna is closely allied to the common Primrose, and is known by its lilac-coloured flowers, which almost smother the strong leafy tufts. It makes an effective plant for edgings.

P. capitata.—This is a very beautiful Primula, with rich purple fragrant flowers crowded into clusters, and must be frequently raised from seed, as old tufts disappear after two or three years. It enjoys a moist peaty spot screened from the hot midday sun, and if water is necessary in summer, dryness is quite as important during the winter. Early summer is the season for flowering.

P. cortusoides Sieboldi is a very charming species, and has given rise to many varieties, which are more frequently seen in pots in the greenhouse than in the open garden. This Primrose is however, quite hardy, but it is wise to select the stronger colours for the open air, as the more delicate tints are apt to get sullied. Plant them in a well-drained soil, raised as much as possible, *i.e.*, a place from which rains drain away. It is a simple matter to grow the plants in pots, using 6in. pots for the purpose, and letting the soil be loam mixed with a little thoroughly well-decayed manure. Do not overcrowd the pots, and place them in a cold frame, but damp must be kept away. Judicious watering is essential, and during winter very little is necessary. A variety of kinds may be grown in a cold frame, and the plants last many weeks in bloom. The rose-coloured species, P. cortusoides, is very charming upon the rock garden.

P. denticulata is a delightful Primrose from the Himalayas, and not at all difficult to grow or propagate, as divided portions quickly become established. The flowers, which are in clusters poised on stems about 2ft. in height, are delicately coloured, usually of lilac-purple shades; but there is a considerable variety of tints amongst them. Of named varieties very distinct are the deep purple Cashmeriana and Henryi; but there are others too. Always plant this species in groups in sheltered spots, and in moist places it is happy. Alba is a beautiful variety; loamy soil.

P. farinosa (*the Bird's-eye Primrose*).—A dainty British Primula, with rosettes of pretty silvery leaves, and quite small flowers in a cluster; soft lilac, with yellow centre. Plant it in loose soil, thoroughly well drained, in the rock garden, or some moist crevice where the soil is deep and light. It is not very vigorous in growth, neither is the purple-flowered native, P. scotica. Do not plant very deep, and if there is a bog garden the Bird's-eye Primrose may be established there.

P. japonica (*the Japanese Primrose*) is the boldest, perhaps, of all Primroses, bold not only in leafage but in flower spikes too. It was at one time considered tender, but that has proved to be erroneous, as it will even succeed where other Primroses fail. A group of this on the outskirts of woodland and shrubbery, or even in a clearing of trees, is full of quiet charm. The spikes of

flowers rise to about 2ft. in height, bearing whorls of flowers of varying colours, some white, or with a deep crimson eye, others pure crimson, and a succession of bloom is long maintained. Sow seed, as soon as ripe, in a shallow pan filled with light soil, which must be placed in a cold frame. It germinates very irregularly, and therefore the soil must not be thrown away until every seed has had a chance to germinate. This Primrose is handsome in pots too.

P. rosea (*the rosy Himalayan Primrose*) is easily raised from seed sown when ripe, and delights in a moist, almost boggy, spot, where it will frequently spread freely. It is hardy, and flowers in early summer, the colouring varying considerably, sometimes deep crimson, but generally of paler shades. Grandiflora is a beautiful form. Another way to increase it is by dividing the tufts; but one should not meddle with these unless division is apparently needed.

P. Sikkimensis.—A well-known Primrose with a profusion of yellow flowers in summer, and pretty planted freely in the woodland or in the border, but must have a peaty soil. It is a mistake to disturb it, although, as it is short lived, ceasing to flower freely after three or four years, a new stock must be constantly raised from seed sown in early summer, or whenever ripe, under glass.

P. viscosa is a charming rock plant and very easy to grow; the flowers are purple, and appear in clusters. Loam and broken sandstone suit it, not chalky or lime formations. C. v. ciliata is a pretty variety; but perhaps the most pleasing of all is the pure white nivalis.

Other interesting Primulas are P. latifolia, requiring a sunny spot in the rock garden, light soil, moisture in summer, but the reverse in winter; divide the tufts for propagation. The flowers are violet, and fragrant. P. luteola, yellow, tall, and likes moisture and sunshine; a group on the rock garden is pretty. P. marginata, very pretty in the rock garden, choosing a moist, open, northern place; the flowers are of a violet shade, and the leaves quite silvery; use for soil loam mixed with peat and broken limestone. P. minima is the Fairy Primrose, a delicate little alpine, requiring an open spot in the rock garden where the soil is very light peat and loam; increased by division or seed, and though the tiny flowers are not produced freely, they are charming in colour (soft rose) and form. P. imperialis is a noble Japanese kind, with whorls of deep yellow flowers, but little is known of its behaviour yet in the open garden. P. obtusifolia, deep bluish purple; P. purpurea, or ciliata purpurea, a beautiful variety, crimson-purple, loam and broken stones; P. Parryi, purple, a very fine species, requiring a moist and peaty spot in the rock garden; P. viscosa, a charming alpine species, with rosy-coloured flowers formed in clusters. Loam and peat for soil.

In the case of almost all the alpine Primulas it is wise to mix broken limestone with the soil.

Puschkinia labanotica compacta is a pretty April-flowering bulb, the flowers being white with veins of blue. It grows freely in the rock garden, and succeeds in a 6in. pot, putting half-a-dozen bulbs in each.

Pyrethrums.—The Pyrethrum is known best by the series of beautiful varieties which have come from P. roseum. During the early summer months these plants are gay with blossoms of many colours, which not only add to the beauty of the garden, but are also useful for cutting. A vase filled with the flowers loosely arranged makes a pretty adornment for the table or other parts of the room. The plants require a rich soil and rather moist position. If in very dry soil the growth is poor, it must be made good by thoroughly incorporating with it plenty of well-decayed manure or mulch round the tufts during hot seasons. When the ground is very poor the flower stems and growths are weakly. The best time to propagate is early spring when new growth has well started, carefully lifting the clumps, and shaking all soil from the roots. Then divide so that each tuft is a healthy plant with about ten leaves. These divisions may be either potted up to become thoroughly established or planted out, the latter course being the most simple. The first year a rich display of flowers will result, but richer still during the two following years, after which the better plan is to lift them and divide. Flowers, especially as regards ground plants, will be produced in autumn as well as in the early summer. There are so many varieties that it is difficult to make a careful selection, but the following are distinct and pleasing in colour. Single: Cassiope, purple crimson; Apollo, pink; Agnes Mary Kelway, rose; James Kelway,

PYRETHRUMS.

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scarlet; Mary Anderson, soft pink; Princess Marie, pure white; Hamlet, rose purple; and Merry Hampton, crimson. Double: Primrose; Lord Rosebery, carmine, very bright; Aphrodite, pure white; Carl Vogt, also snow white; Leonard Kelway, rich rose; Melton, deep crimson; Meteor, crimson, white tips to the florets; Pericles, of a pinkish shade and gold in the centre; Wega, pink and yellow; Mont Blanc, white; Niveum plenum, quilled florets, very chaste; and the older double white and rose, known respectively as Album plenum and Roseum.

The Feverfew is a Pyrethrum (P. Parthenium), also known as Golden Feather. It is used largely in bedding, but good gardeners care little for it. At any rate, it is a mistake to use the plant too freely, otherwise the yellow leaves have a sickly, uninteresting look. The way to raise plants is to sow seed in February, treating the plant as a half-hardy annual. It is very easily raised, and grows freely out of doors. All flowers must be kept picked off, as the plant is grown simply for edgings and for its yellow leaves.

Ranunculus, The.—The Ranunculus family is a large one, comprising about 160 species of mostly perennial plants, many of which, such as the common Buttercup, are unfitted for garden culture. The following are the best known:

R. aconitifolius, with branched stems 2ft. in height, bearing white flowers in May and June. It enjoys a cool, moist position. There is a double-flowered variety of this plant that is known under the name of Fair Maids of France, and is decidedly ornamental.

R. acris is the common Buttercup. There is also a double form of this.

R. alpestris, from the Pyrenees, bears large white flowers on stalks from 3in. to 6in. high in July. It is a handsome species, and succeeds in light, porous soil in semi-shaded positions of the rock garden.

R. amplexicaulis, from the Western Alps, bears pure white cups, some 2in. in diameter, on stems 6in. to 9in. high during April and May. It is easily raised from seed, which is freely produced.

R. anemonoides, from the Styrian Alps, is a dwarf plant about 6in. in height, bearing large flowers, pink on the outer sides of the petals and greenish white within. It blooms in April, the flowers often appearing before the leaves. It is a rare plant, and succeeds best under the system of culture recommended for R. alpestris.

R. aquatilis (*Lodewort*).—A British plant, bearing white flowers from May till August. There are many forms of this plant, distinguished from one another by varietal names.

R. asiaticus, a native of the Levant. This, in its double forms, is the common Ranunculus of our gardens, and comprises the varied sections known under the names of Dutch, Scotch, Persian, and Turkish Ranunculi. If the best results are to be attained a considerable amount of trouble should be taken in the formation of the beds, which should be well drained, for these Ranunculi are very impatient of stagnant moisture, and filled up with a porous compost of loam and leaf-mould, to which a liberal addition of well-decayed cow manure has been added. Road grit should also be mixed with the compost, and the bed prepared by the end of the year, the tubers being planted in February at a depth of 1½in. and pressed well into the soil. This Ranunculus, though disliking stagnant moisture, will not succeed if it is allowed to become dry at the roots, and benefits greatly by copious waterings during rainless weather when planted in porous soil such as advocated. A mulch of cocoa-nut fibre or leaf-mould will be found useful in keeping the surface of the soil in an equable and moist condition. When the leaves turn yellow the tubers should be lifted, dried, and stored in drawers or paper bags where no moisture can affect them until the planting season again returns. The Persian varieties bear the most symmetrical flowers, but the so-called Turban section are of stronger constitution, and produce somewhat larger if coarser blooms. There are many varieties of the several sections, which will be found enumerated in bulb catalogues. Though seldom seen in gardens, the crimson-flowered type with its large single blossoms is very effective.

R. bilobus, from the Apennines, is somewhat similar in appearance to R. alpestris. It bears white flowers, and blooms in May and June.

R. bulbosus is the common field Buttercup, bearing yellow flowers in the spring.

R. cardiophyllus, a native of North America, grows to a height of 1ft. and bears large golden yellow flowers in May.

R. cassubicus, from Eastern Europe, a dwarf grower, bears yellow flowers in June and July.

R. caucasicus, from the Caucasus, produces large yellow flowers on stems 4in. to 6in. high.

R. chærophyllus, from the shores of the Mediterranean, bears yellow flowers on short, downy stems in April and May. This species possesses very finely-cut foliage.

R. cortusæfolius, from Teneriffe, grows to a height of from 1ft. to 1½ft. It bears corymbs of large brilliant yellow flowers in May. In its native habitat it flourishes in the stoniest situations, and in the South of England, where it may occupy a permanent position in the open, it should be allotted the sunniest spot available and grown in porous soil.

R. cretanus, from Styria, bears large white flowers on stems 3in. to 4in. high in April and May. Culture similar to that of R. alpestris.

R. creticus, from Crete, grows 12in. high, and produces large golden flowers in April and May.

R. Ficaria (*the Lesser Celandine*) is a well-known British plant.

R. Flammula (*the Lesser Spearwort*) is likewise common in England.

R. glacialis, from the Alps and Pyrenees, is found close to the melting snow on the loftiest heights, and bears flowers at first pink, and then changing to coppery red, on stems 3in. to 6in. in length. Its leaves are thick and fleshy, and of a deep green in colour. The culture of this plant is attended with some difficulty, as the conditions which obtain in its home among the glaciers cannot readily be reproduced in our gardens. It is most important that the position occupied should be an exposed corner where the plant may obtain the full benefit of the sun's rays from daybreak to nightfall. The spot should have ample drainage, and the soil should be porous and gritty. When growth commences water should be given, gradually increasing the supply, so that at the flowering time the plant may always be surrounded with a moist atmosphere. During winter the plant should be kept as dry as possible.

R. gramineus, from Southern Europe, has grass-like leaves, and bears yellow flowers on stems 1ft. in height during May. A position in the full sun and light soil are advisable.

R. Lingua (*the Greater Spearwort*), a semi-aquatic British plant, bears golden yellow flowers 2in. across on stems from 2ft. to 3ft. high. This is one of the most beautiful of all water-side plants, but little seen in English gardens.

R. Lyallii, from New Zealand, bears large white flowers 4in. in diameter on branched stems 3ft. to 4ft. high. In its native habitat it grows in peat close to the water, and becomes thoroughly frozen during the winter, while in the summer it experiences a high temperature. It is an extremely handsome plant, but unsuited to outdoor cultivation in this country.

R. millefoliatus, from Southern Europe, grows to a height of 6in., and bears yellow flowers in June. If given a very sunny and dry position it may be grown in the rock garden.

R. monspeliacus, from the Mediterranean shores, bears yellow flowers, on stems 1½ft. high, in April and May.

R. montanus, an European species, bears yellow flowers, rather larger than those of the common Buttercup, on stems 6in. long, during June and July.

R. parnassifolius, from the Alps, bears large white flowers, on stems 3in. to 6in. long, in June and July. It is found growing in disintegrated granite. Cultural details similar to those recommended for R. glacialis should be followed in the case of this plant.

R. pedatus, from Eastern Europe, grows to a height of 1ft., and bears yellow flowers in June.

R. pygmæus, from the Tyrol, is very dwarf, scarcely exceeding 1in. in height, and bears in June one small yellow flower on each stem.

R. pyrenæus, found in the Alps and Pyrenees, bears small white flowers, on stems 6in. high, in May and June.

R. repens is a troublesome weed, of which there is, however, a double form that is sometimes used in gardens.

R. rutæfolius, from the Scandinavian Alps, grows 6in. high, and bears small, many-petalled white flowers in May and June. A semi-shaded position in moist, porous soil is advisable.

R. Seguieri from the Alps, bears white flowers in May and June.

R. spicata, from Algeria, grows to the height of 1ft., and bears large, bright yellow flowers in the spring.

R. Thora, a native of Southern Europe, bears small flowers of a deep yellow colour on stems 6in. high in May and June.

Rhododendrons will be considered in the shrub chapter.

Rock Cress.—*See* Aubrietia.

Rockets. — The most worthy of these plants for garden decoration is undoubtedly the double white Sweet Rocket (Hesperis matronalis alba fl.-pl.). It is one of our best old - fashioned flowers, its delicious scent rendering it particularly acceptable. It thrives best in deep, rich loam, and should be lifted and divided every autumn or spring, and planted in fresh soil. If allowed to remain undisturbed in the same position for any length of time it speedily decreases in vigour. If carefully divided, every rosette of leaves will develop into a fine plant. It should be mulched with well-rotted manure in the spring. There is a double purple form of this plant, but it is uncommon, and is less attractive than the white variety. In soil that suits it this Rocket will grow to a height of 3ft. or more. The single form of the foregoing, though not possessing the attractions of its double variety, is pretty in wild gardens or at the verges of shrubberies, and may be propagated by seed sown in the open in April, in a sunny position, the seed being covered with a quarter of an inch of soil. The Night-scented Stock (Hesperis tristis) is a biennial, and is best grown on old walls, ruins, and such-like. The seed may be sown in the interstices between the stones during the early summer

Roses, Christmas or Lenten.—*See* Helleborus.

Rudbeckias.—A useful family of hardy perennials, the most effective of which is that known as R. Newmani; but the true name is R. speciosa. It is sufficiently effective to plant a centre bed with, the plant growing about 2ft. high, and bearing flowers of intense orange yellow colour, made richer still by the marone-coloured centre, a conspicuous flower indeed, lasting in beauty throughout August and September. This kind is preferred to all others, and ordinary soil suffices, whilst to increase the stock it is simply needful to divide the roots when growth is commencing in spring. R. purpurea is a tall kind with purplish flowers, very distinct in colour. It is effective because of its unusual shade, and is very free and hardy, thriving best in warm soils.

Sanguinaria canadensis (*the Canadian Bloodroot*) and its variety major are very hardy and attractive spring flowers, white, and very pretty in some shady spot where the soil is neither very heavy nor wet.

Santolina incana is a pretty plant for edgings, as it is very dwarf, and the leaves are of a pleasing silvery grey colour. It is happy in ordinary soils.

Saponarias.—A family of perennial and annual flowers. The annual kind is S. calabrica, which has a wealth of small flowers like little pink stars upon the frail stems, and there is a white variety also. It is of very compact growth, not more than 4in. certainly, and a mass of bloom. Seed may be sown in autumn for an early display the following spring, or in April for flowering the same year. Suitable for the rock garden are the little alpine S. cæspitosa, which has pink flowers in clusters and requires a warm sandy soil, and the trailing S. ocymoides, which to be seen in full beauty must be planted so that its slender shoots fall over the face of rockwork, a sea of colour from the hundred pink flowers which crowd thickly upon the slender drooping growths. Give the plant deep loam for soil. Splendens is a variety with flowers of rich rose crimson colour. An old cottage flower is the Soapwort (S. officinalis), which has flowers varying in colour from white to a rosy shade, but the double form (fl.-pl.) is the one to choose. Where few things thrive this will succeed, caring not whether the position be a rough woodland or a hot dusty roadside garden. It seems to grow everywhere, flowering for many weeks, and, if not suitable for association with more delicate flowers, is welcome because so free, vigorous, and hardy.

SAPONARIA OCYMOIDES.

Saxifraga.—The Saxifrages are seen in most gardens, and may be used in many ways. The majority of them are pretty in the rock garden, the larger and more robust kinds in the border, and the Megasea group in masses wherever their noble leathery leaves are seen to advantage. We may divide the family into divisions, as the various kinds, so to say, group themselves. Thus some kinds are silvery, that is, the little leaves are encrusted with silver, others mossy, such as the well-known Saxifraga hypnoides and the Megaseas. As regards culture, the Saxifrages want very little, as they are of extreme vigour for the most part, but the little crusted kinds, which as a rule are not very quick in growth, should have a soil

composed of loam and sandstone or pieces of stone partly buried around them. Sunshine is essential.

Silvery or encrusted Saxifrages number such gems as S. aizoides, S. Aizoon, very pretty in a sunny spot on the rock garden, S. aretoides, the little silvery S. cæsia, S. diapensioides, S. Hosti, S. Lantoscana, white flowers in panicles proceeding from silvery tufts, and S. Rocheliana, very beautiful in spring with its pure white flowers. The smaller kinds must be protected from other things of more vigorous growth. S. Burseriana is one of the first flowers of spring. It comes almost with the Snowdrop, and makes charming little cushions of greyish leaves, completely hidden with large pure white flowers, borne on a little rosy stem. This is best planted on the rock garden in a sunny spot, giving a gritty soil. Major is the best-known variety, its flowers being larger than those of the type.

The most beautiful of the Silvery Rockfoils is

S. Camposi.—This should be in every garden. It is known also as S. Wallacei, and belongs to the mossy section. It blooms later than S. Burseriana and is very vigorous, forming masses of pale green leaves, which are not much seen when the white flowers are open. It will succeed well in pots, indeed there are few positions in which it will not thrive. Propagate by cuttings, which may be taken off and put in light soil under a bell-glass out of doors. Plant out when large enough.

SAXIFRAGA CAMPOSI.

S. Cotyledon and its variety pyramidalis, the last-mentioned in particular. They must be included either for growing in the rock garden or in pots for the greenhouse. The flowers appear in panicles and are white, sometimes dotted with pink, whilst the rosettes of foliage are handsome. Use a light, thoroughly-drained soil, in which lime is not present. Offsets are produced which make new plants, or seeds may be sown in a cold frame.

S. Fortunei is a delicate kind, but may be grown readily in the greenhouse, when its flowers will appear in the late autumn. Divide the plants once in every two years, and repot each August, as the grub of a weevil is very destructive to the root. It seems to have a special partiality for this Saxifrage. S. Fortunei has not only charming flowers, but the leaves, too, are pretty.

S. granulata is a native Saxifrage, but its double white variety, flore-pleno, is the one generally grown in gardens, being pretty when naturalised in the grass; but where no such opportunity exists in the garden, grow it in a moist position in light soil on the rock garden.

S. hypnoides.—This is the well-known mossy Saxifrage, which is a useful kind to form edgings of, as the growth is very free and quite mossy, making fresh green carpets throughout the winter months. Such plants as this should be used as a groundwork for spring bulbs, or the Colchicums, which produce flowers without the leaves in autumn. The Saxifrage acts as a protection, keeping heavy rains from splashing up the soil. It may be easily pulled apart to make fresh stock and flowers in the early summer. Moisture and a little shade are appreciated, but it must be a poor garden that will not suit this vigorous and beautiful plant.

S. longifolia makes beautiful rosettes of silvery foliage, frequently 1ft. across, in themselves sufficiently attractive to make the plant of value; the leaves are 6in. or 7in. in length, whilst in spring appear beautiful panicles of pearly white flowers, pyramids of blossom. Plants got from their Pyrenean home are seldom satisfactory, as few alpine plants transplant well, but this Saxifrage is easily raised from seed, which may be sown at any time in pans of light soil and placed in a cold frame. When sufficiently large, plant them out, preferably in crevices in the rock garden, where the soil is moist, as the roots will run to a great length, hence one can understand that transplanting from their native rocks is difficult. It also makes a delightful plant for the greenhouse.

S. oppositifolia is as brilliant a little flower as any that deigns to appear before winter has passed. It is hardy and a bright picture nestling against some rocky ledge, or making rich masses of growth in the border. Its proper place, however, is the rock garden, and wherever planted let it have a soil composed of loam, leaf-mould, a little peat, and sandstone mixed with the other ingredients. Never plant it in a hot, dry spot, as moisture and cool surroundings are necessary to obtain that free growth one desires. A scorching summer sun is hurtful. There are several varieties, splendens being as brilliant as any, the flowers of a rose crimson colour, intensely rich when a spreading plant on some cool slope is in full beauty. Major, or grandiflora as it is also called, pyrenaica, and alba are pleasing also

S. sarmentosa is familiar in cottage windows, and the cottager calls it Mother-of-Thousands, presumably from the free way in which the plant may be increased by little tufts upon the long slender stems. It is not, however, a very hardy kind, and must have a warm light soil. It is advisable to trust it chiefly in pots. Tricolor is a much-coloured leaved variety suitable only for under glass, and then it must be treated with extreme care to prevent the plant damping off.

S. umbrosa is the popular London Pride, which will grow almost everywhere, but is happiest in light vegetable soil, that is a soil in which leaf-mould forms a large part, and half-shade. The deep green leaves and panicles of rose-dotted flowers are charming. When the plants are becoming worn out, take up and divide the tufts, and seed may be also easily raised at almost any time. London Pride is a useful plant for edging, and is found wild about Killarney, in Ireland.

Other Saxifrages not separately described but very charming are: S. ceratophylla, which will grow in almost any soil, one of the mossy group; the pretty S. Hirculus, which requires similar conditions to S. oppositifolia; the delightful little annual, S. Cymbalaria; S. juniperina and S. luteo-viridis, both charming kinds, early, and with yellow flowers, soil as in the case of S. oppositifolia; the pretty

S. muscoides, of which atropurpurea is the best variety; and S. rotundifolia, which will succeed in almost entire shade and where the surroundings are cool and moist. It may be almost naturalised in cool chinks in the rock garden, and the slender clusters of white flowers dotted with pink are attractive.

Large-leaved Saxifrages.—These are usually known as Megaseas, and so nearly allied to the true Saxifrage that they are placed here. They are handsome, the leaves large, leathery, and in winter turn to charming tints of crimson and rose, or bronzy green. The plants will succeed almost anywhere, and should be always grouped in the rougher parts of the rock garden or in wilder places where a mass of noble foliage is well seen. They may also be planted with good effect by shrubberies. Not only for their leafage, but also for their flowers, must this family be commended. And the finer kinds are worth growing in pots, as when the flowers appear very early out of doors frosts usually cut them off. They may be raised from seed or divided, and of the many forms a good selection would be Cordifolia and its beautiful variety purpurea, which has deep purple flowers, Crassifolia and the rich rose-coloured variety orbicularis, ligulata and the variety rubra, and the handsome Purpurascens, of which the flowers are rose purple borne on slender purplish stalks. Stracheyi is worth growing also, but all the early-flowering varieties must have a sheltered corner.

Scabiosa caucasica is a beautiful perennial which makes most vigorous growth upon well-drained, fairly light soils, especially in the case of the variety alba. The type has delicate bluish lilac flowers, a clear, pretty shade, and grows about 3ft. in height, branching out freely. Propagate by seed and root division. It varies from seed, some forms being much finer than others.

Schizostylis coccinea (*Winter Gladiolus*).—This is like a late-flowered Gladiolus, hence its name, and in well-favoured positions about 3ft. in height, the flowers rich crimson in colour. It is the kind of bulb to plant against a warm wall or fence where the soil is good and not too dry, as it appreciates moisture but not stagnation at the roots. When severe weather arrives during the flowering time it is wise to give protection, as the crimson spikes are useful for cutting. Mixed with white Chrysanthemums the spikes are very bright.

Scillas.—The Scillas are a family comprising nearly eighty species of bulbous plants, the majority of which need glasshouse culture. A few are hardy, but of these only about half the number are worthy of cultivation. They are spring bloomers, and may be left alone for years after being once planted; the best known is S. nutans, the Wild Hyacinth, appearing by millions in our woods during April and May. Scillas may be propagated by offsets, or may be raised from seed. The best for the garden are the following:

SCILLAS (Woodland Bluebells)

S. amœna, from the Tyrol, carrying indigo blue flowers, few in number, on weak stems about 6in. in height. It should be grown in a sheltered spot or bank in the wild garden.

S. bifolia.—This is the earliest to flower of all the Scillas, and in warm winters, in the South-West, often opens its blossoms in January. It comes from the Mediterranean region, but it is quite hardy, the type producing spikes of dark blue flowers some 6in. high. There are many named varieties of this Scilla, some of the best known being the white alba and candida, the pink carnea and rosea, the stronger-growing taurica and maxima, and the early-flowering præcox, all of which are worthy of culture. A sunny and somewhat sheltered position in the rock garden is best suited to its requirements.

S. campanulata or hispanica (*Spanish Scilla*), a strong-growing species from Spain, bearing spires of light blue bells 1ft. to 1½ft. high. Its rigid stems prevent its attaining the grace of S. nutans, but it may be naturalised in shrubberies and woods with good effect. Of this there are white, rose, and other forms, all free and vigorous. This Scilla grows well in shade.

S. italica, from Italy, bears pale blue scented flowers on stems 6in. to 10in. long in May. It should be treated similarly to S. bifolia.

S. nutans (*the Wood Hyacinth, Wild Hyacinth, or Bluebell*) is well known over the length and breadth of England. Though so common, it is, without doubt, the most graceful of all the hardy species. There are many variations of colour in the Wild Hyacinths, plants bearing white flowers not being uncommon in some woods, while there are also rose-coloured and French grey varieties, but none are more beautiful than the typical blue form.

S. peruviana, from the Mediterranean shores, is a sturdy-habited plant growing from 12in. to 18in. high. It produces blue flowers, which are arranged in a closely-packed pyramidal spire during May. In its native habitat it is found growing on rocky slopes, and should in this country be planted in light soil in a sunny situation. In damp heavy soil it often perishes. There is a white variety of this Scilla, as well as strains with yellowish and reddish flowers.

S. sibirica, a native of Siberia, is a charming spring-flowering kind, very hardy, free, and with deep blue blossoms. This Scilla should be liberally planted.

Scutellaria.—This is not a very important family, and somewhat uncommon in gardens, yet a few kinds possess much beauty. As regards culture, all that is necessary is a sunny spot and ordinary soil; divide the roots for increase of stock, or sow seeds in a cold frame. S. alpina, which has purplish flowers, is of spreading growth, and the variety versicolor is welcome for its distinct contrast of colour, blue and white, whilst the deep blue colouring of S. macrantha is distinct and attractive.

Sea Pink.—The Sea Pink or Thrift, as it is also named, is an Armeria (A. vulgaris), and is called "Sea Pink" for the reason that by many bleak sandy shores, and upon exposed cliff-tops, even when swept by the salt spray, this charming little rose-coloured flower grows as thickly almost as the Heather upon the moor. A few strong tufts carefully lifted from their native wilds will live in the garden, even of a town suburb. Of course one does not mean wholesale pillage.

Sedum (*Stonecrops*).—This is a large family, to which belongs the little creeping Stonecrop; but the many kinds are of varying habit of growth, some fitted only for the rock garden, others happy in either this place or the mixed border. All will grow in ordinary garden soil, and may be propagated freely by parting the roots in spring. The most frequent kind is S. acre, which is seen on walls, rocks, and similar places; it makes a charming plant for edging, its greyish tone being very distinct through the winter months. The most conspicuous variety is aureum, so called because of the yellow colour of the ends of the growths. Another good kind for edgings is S. Ewersi, which has rosy purple flowers in profusion in summer, and all the following are pretty on the rock garden, or wherever an uncommon edging is desired: S. glaucum, S. Kamtschaticum, the purple-flowered S. pulchellum, S. Lydium, S. rupestre, the brilliant-flowered S. sempervivoides, and S. stoloniferum. The purple-stemmed S. atropurpureum must not be forgotten, nor our native S. Telephium, or the dwarf S. Sieboldi and its variegated variety, so frequently grown in pots in the greenhouse. As popular as any Stonecrop is S. spectabile, which is a noble kind making quite a little bush, covered with rosy flowers in late summer, these continuing to appear until the time of frost. It is a plant for town as well as country gardens, requiring no particular soil, and will even grow in shade. Its glaucous, fleshy leaves are also pretty.

SEDUM.

Sempervivum.—This is the Houseleek family, interesting and useful for the rock garden or to add a note of colour to old walls. S. tectorum is the common Houseleek, which colours many a cottage thatch, and is sometimes used as an edging to beds in the flower garden. Houseleeks may be placed where few other plants thrive, such as dry sunny spots in the garden, chinks in walls, and even in the border. They are difficult to kill, and may be increased with the utmost ease by offsets. One of the prettiest kinds, which should only be planted in the rock garden, is the Cobweb Houseleek (S. arachnoideum), so named because the little tufts are covered with a veil suggesting a cobweb. S. atropurpurea is used in forming carpet bed designs. A handsome Houseleek is californicum, which is a deep green rosette of leaves tipped with a brownish red colour. This should be planted in every garden, as it is as free in growth as the common Houseleek and much richer in colour. Other good Houseleeks are S. flagelliforme, S. globiferum, S. montanum, and S. triste.

Senecio.—A bold, showy group of hardy flowers, S. elegans, the purple Jacobæa, being the annual kind. Of the perennials, S. japonicus is very handsome, and may be naturalised in moist places, such as by the waterside, or in some damp hollow where the soil is deep rich loam. It is useless to plant it in poor ground. The growth is upwards of 5ft. in height, and the leaves quite leathery in texture and much divided, whilst the flowers are large and deep orange in colour. Another noble kind is S. pulcher, one of the brightest of late autumn flowers. So late is its season of blooming that frosts sometimes spoil the display. It grows between 2ft. and 3ft. in height, and like S. japonicus needs a rich loam and moisture. Give this plant a rather shady spot sheltered from harsh winds, not from any tenderness of constitution, but to shield the flowers from frost and protect the big fleshy leaves. Its flowers, carried on branching stems, are of rich colouring, deep purple rose set off by a golden centre. The way to propagate this kind is by taking root cuttings in spring. Cut them into 1in. lengths, and place in shallow pans of light soil, and in a greenhouse, which will afford sufficient warmth to stimulate growth. S. Doronicum is effective, and the little alpine orange-flowered S. abrotanifolius may be placed in the rock garden.

Shortia galacifolia.—This is a very beautiful rock garden plant from North America. It is not common in English gardens, but is too dainty and distinct to pass over. The flowers are white and like little frilled bells, on short crimson-toned stems. It is very free blooming, and makes a tuft of leaves which change in autumn to brilliant colours. The plant is quite hardy, and delights in loamy, well-drained soil, with sandstone about the collar, whilst it is charming grown in a cool or cold house, as the flowers are purer than in the open. Propagate by seed and division.

Silphiums are strong-growing perennials, more fitted for the rougher parts of the garden, such as by woodland and shrubbery walks, than for the mixed border. They are of vigorous growth, with stems from 6ft. to 8ft. in height, and yellow flowers. S. laciniatum, S. terebinthinaceum, and S. trifoliatum are amongst the best-known kinds. They are not unlike the single perennial Sunflowers, needing a strong soil, and may be increased by root division in autumn or spring. When planting in the woodland, the only true effect is obtained by grouping them.

Sisyrinchium grandiflorum.—This is the Satin-flower, so called from the satiny sheen upon the pretty drooping petals. The Sisyrinchium belongs to the same family as the Iris, having grassy leaves, and slender stems about 8in. high, upon which are poised the purplish bell-shaped flowers, white in the variety album. They appear in quite the early spring, and the bulbs require light sandy soils, selecting warm nooks and corners upon the rock garden. To increase stock, divide in autumn. Sisyrinchiums are very pretty under a hedge.

Soldanellas.—*See* rock garden.

Solidago.—The Solidago is the Golden Rod which flowers so freely in the autumn. The various kinds are rich yellow, for the most part, and too coarse as a rule except for the rougher borders or wilder parts of the garden. S. arguta, S. canadensis. S. serotina, and S. Virgaurea are as good as any. Very hardy, and succeed in any soil.

Solomon's Seal.—Few hardy plants are more graceful than this, known as Polygonatum, and P. multiflorum is the most beautiful of all, its arching stems from 2ft. to 3ft. in height, and lined with creamy white flowers. The

plant is worth growing for cutting alone, but there is distinct charm in a colony of Solomon's Seal sheltering in the shade of tree, copse, or shrubbery, and in grass too. Rich loam, not too heavy, suits the plant best, and it seeks shade, which is not congenial to most plants. Top dress the soil about the plants yearly with leaf-mould, to promote vigour, and if more are desired, seed may be sown in autumn, and will germinate freely in the following spring, or the root stocks may be divided in autumn or spring, and will soon make strong tufts. There are several varieties, but none are so fine as the type. P. officinale is smaller, but gives quiet beauty to many English woodlands, and also worthy of culture are P. latifolium commutatum, also known as Giganteum, P. biflorum, a very pretty kind, P. roseum, which has rose-coloured flowers, and P. verticillatum. These shade-loving flowers are suitable for all kinds of gardens. The ordinary Solomon's Seal will succeed in the shade of a suburban garden, but it is also suitable for sunny spots if moist.

Spiderwort, Virginian.—*See* Tradescantia virginica.

FLOWERS BY THE LAKESIDE.

Spiræas.—These will be described in the chapter upon trees and shrubs.

Starflower, Spring.—*See* Triteleia.

Sternbergias.—There is really only one Sternbergia, or "Winter Daffodil," of consequence for the ordinary garden, and that is S. lutea, which bears its yellow Crocus like flowers in autumn with the leaves. This is supposed to be the Lily of Scripture. Other kinds are Fischeriana and macrantha, but plant S. lutea before any others. Such bulbs as this, flowering so late in the year, must have a warm soil and sunny position, where for example the Belladonna Lily or the Zephyranthes thrive. Put the bulbs about 6in. deep in light sandy loam, and choose, if possible, a narrow border skirting some warm plant house. It is necessary to get the bulbs thoroughly ripened, and this is only possible in quite warm spots. Under such conditions it will not be necessary to lift them, as in severe weather a light mulch will be sufficient protection.

Stonecrop.—*See* Sedum.

Streamside Gardens.—By this is intended gardens of flowers that are only happy in the moisture of stream, lake, or pond side. Many plants struggle for existence in the mixed border, but flourish exceedingly in a moist loam or some damp hollow. A selection of plants is given for the sides, then for beautifying the surface of the water itself. Of the former, choose from amongst the following: Day Lilies (Hemerocallis), a beautiful family which appreciates greatly damp and shade, but not stagnation. There is a difference between stagnation and mere dampness, a soil through which water drains away, leaving the earth fresh and sweet. Herbaceous Phloxes may be named, strong perennials which often fail in hot weather through lack of moisture. It does not seem to occur to many flower gardeners that some things are far nobler by the stream than in the mixed border, in which they are usually put. Irises, of course, delight in moist soil. It is only under these conditions that the Japanese Iris (I. Kæmpferi) is seen at its best, and it is worth while grouping or planting it freely, margining the water with its fine growth, and in late summer big handsome flowers of varied colours. The self varieties are the most effective, one decided colour painted upon the florets, not mottlings or indistinct mixtures. Pure white and purple are very effective, but there is a rich choice. Under similar conditions may be grown the Siberian Iris (I. sibirica), a charming grassy plant, which delights in moist soil. It will, indeed, grow almost anywhere, but is freer and brighter with its roots in a cool soil. The Flag or German Iris will also flourish in the moisture of stream or pond bank, and big groups thus placed give soft colouring to the garden in the early summer. If the lake is large, establish the yellow Flag of native streams (I. Pseud-acorus), as lovely as any Iris from other lands; the big-leaved Gunnera scabra and G. manicata, Rheum (large-leaved Rhubarb), Ferula, as beautiful almost as any Fern in foliage, the glorious American Swamp Lily (Lilium superbum), Loosestrife (Lythrum Salicarica roseum), which makes drifts of rose purple flowers in summer, Ferns, especially the Ostrich Fern (Struthiopteris) and the Royal Fern (Osmunda regalis), and Marsh Marygolds or Kingcups, Caltha palustris and its double form. These golden flowers of spring are reflected in the clear water of river back-waters, and come with the earliest Primrose

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A FLOWER-MARGINED LAKE AT GREAT TANGLEY.

"COUNTRY LIFE."

and Lady Smock. A moist way through a copse, where the bushes are not so thick as to preclude sunshine filtering through them, is lined sometimes with these tufts of green and yellow, Primroses scattering their softer flowers near.

A native plant, far too uncommon, is the Great Spearwort (Ranunculus Lingua), a vigorous perennial with quite a tall stem and large Buttercup-like flower. It is one of the handsomest of native plants, and may be seen with blue Forget-me-nots clustering round its stem—a sweet picture by the stream or pond. The Globe-flowers (Trollius) are a host in themselves. They run riot literally in a moist soil, but in a dry hungry border are seldom comfortable. This is a beautiful family, rich in flowers of fine colour, and establishing themselves thoroughly in moist places, where the Kingcups and the Primulas spread out their tufts of leaves.

The Japanese Primrose (Primula japonica) is never finer than in moist soil, not actually in water, but in loose damp places. It is surprising how strongly this Primrose will establish itself in a shady place by the lake, forming a colony, and in time becoming naturalised by self-sown seedlings. The plants seed about freely, and the seed in congenial soil quickly germinates. There are many forms, pure white, crimson, and white with dark centres, the flowering time lasting many weeks. The flowers expand in tiers, so to say, up the spike, and in the subdued light of a woodland by water the deep self shades seem richer still. Of a different type of plant life is the Willow Herb (Epilobium), which fringes many river-sides with its pink-tinted flowers, and to the list may be added the Great Reed (Arundo Donax), this only in mild districts, New Zealand Reed (A. conspicua), Lyme Grass (Elymus), Sea Buckthorn (Hippophaë rhamnoides), Bamboos, Butterbur (Tussilago Petasites), Knotweeds (Polygonum cuspidatum and the taller, broader-leaved P. sachalinense), Spiræas, not forgetting the crimson-flowered S. palmata, which loves its feet in water, Willows, the beautiful Cardinal and yellow-barked kinds in particular, and the grassy Carex pendula and paniculata.

A STREAMSIDE GARDEN.

Flowers that Live in Water.—A host of lovely flowers actually live in the water, beautifying the quiet unruffled surface. It is hard to establish anything in swift streams. The following plants are aquatic in the truest sense: The Fringed Buckbean (Villarsia nymphæoides), Buckbean (Menyanthes trifoliata), an exquisite native flower, Reed Mace (Typha), Bulrush, Cyperus longus, very graceful, Water Dock, delightful colouring in autumn, the leaves changing to rich tints, Burweeds (Sparganums), Arrowheads (Sagittaria), the single and double forms especially, Nile or Arum Lily (Calla æthiopica), but only in the extreme Southern Counties of England and Ireland, Bog Arum, Golden Club (Orontium aquaticum), Acorus Calamus and its variegated variety, Cape Pond-flower, the fragrant Aponogeton distachyon, Club Rushes, Water Forget-me-not, Water Violet (Hottonia palustris), Frog-bit (Hydrocharis Morsus-Ranæ), Pontederias, Water Plantains (Alismas), and Water Soldier (Stratioides aloides). Of course before any of these the glorious Nymphæas, or Water-lilies, must be named. By referring to many of these plants under separate headings additional information will be found.

A comprehensive list is given, but it would not be desirable to attempt to cram everything mentioned into one place; much depends upon the extent of the water-side and water. A small selection of the most beautiful should include the following: By the water-side, Day Lilies, Herbaceous Phloxes, Irises, especially I. Kæmpferi in its many forms, Loosestrife (Lythrum Salicaria roseum), Kingcups or Marsh Marygolds, Great Spearwort (Ranunculus Lingua), Globe-flowers (Trollius), Japanese Primrose (Primula japonica) in variety, Spiræa palmata, and Polygonum Sachalinense or cuspidatum, whilst of actual water flowers choose first the Nymphæas (Water-lilies), Buckbean, double white Arrowhead, Arum Lily (where it will succeed), and Cape Pond-flower (Aponogeton).

Sunflower, Perennial. —*See* Helianthus.

Sweet Williams.—A quaint garden flower is this, and it belongs to the Pink family, being named Dianthus barbatus. Plants may be raised in almost any garden, and they will spread freely—too much so—until the growth becomes matted, when it is well to lift the stock and throw it away, two or three years being sufficiently long for Sweet Williams to remain in the border. There are many varieties, and one group is named Auricula-eyed; but the golden rule is to choose only self colours, those spotted in any way losing greatly in effect. Deep crimson, clear rose, white, and similar shades make a rich and bright display. The single and double deep crimson varieties are charming garden flowers. Seed may be sown in April, in a sunny bed out of doors, thinning out the seedlings in due course, and planting out in their permanent positions early in the following September. To increase any particular kind resort must be had to cuttings, which are easily struck in early summer, from the moderately ripened flowerless shoots. These dibbled into light soil under a bell-glass quickly root, and may then be planted out.

Thalictrums are chiefly grown for the beauty of their leaves, which may be used even for accompanying cut flowers, as they are very much like Fern fronds. T. minus is as charming as any, but there are many others. T. aquilegifolium is very handsome, with its elegant foliage and tall stems of soft yellow flowers. It will grow to a height of 4ft. Ordinary soil, if not too heavy and cold, suits these Meadow Rues, as the Thalictrums are popularly called.

Thrift.—*See* Armeria.

Thymes are useful for edgings or the rock garden, and may be increased freely by cuttings placed in a little bed of light soil, and covered with a bell-glass. A beautiful kind is the variety of the British Thyme (Thymus Serpyllum) named Coccineus, which is covered in summer with crimson flowers. Bees will cluster thickly upon its carpets of blossom.

Tradescantia virginica is the Virginian Spiderwort, a hardy, vigorous, free-flowering plant, the most beautiful of its race. The type has purple flowers, produced over a long season, but there are varieties of it, in one well-known catalogue no less than eight being recorded, from white to double red. If increase of stock is wanted, divide the roots in spring. Any soil and position will suit this Tradescantia. It is sometimes vigorous by a shady woodland walk, and in a hot mixed border.

Trilliums.—The most beautiful of this race is the White Wood Lily (T. grandiflorum), which opens out its large white flowers in spring. It loves a somewhat moist, peaty place, and grows freely amongst dwarf shrubs, in the front of a shrub group, or in association with hardy Ferns. But it may be grown too in the border and rock garden, especially in a rather shady peaty recess. Other kinds are in a measure attractive, though not as beautiful as this, such as T. erythrocarpum, T. erectum, etc.

Triteleia uniflora.—This is sometimes known as Milla, and is a small group of pretty, early flowers, which may be planted amongst dwarf bulbous plants, such as the Windflowers or Anemones, at the foot of Rhododendrons, or in front of shrubs in general. Uniflora is the most common kind, and known by its white lilac-tinted flowers, which in the variety violacea are blue striped with violet. Biflora is very pretty; its flowers are white. Whilst it is advisable to grow this kind in pots and plant out in March, the others may be planted in the autumn.

Tritonia.—*See* Montbretia.

Trollius (*Globe-flowers*).—This is a charming family of hardy plants, running riot in rich soil, and enjoying shelter from the full sun. It is unfortunate that a family so rich in beautiful flowers should receive scant attention, but perhaps the plants fail through being on hot borders, where too often the soil is poor. This is not the way to grow Globe-flowers. Plant them in colonies on the fringe of shrubberies, beds of peat-loving shrubs, or by a pondside; indeed, it must be a sorry garden that fails to satisfy the Trollius. Spring and early summer are the times when they are in bloom, and the following are the most handsome: T. europæus is the ordinary Globe-flower, and as well known as any of the family. It is one of the most charming of native plants, growing rather over 2ft. high, and bearing pale yellow flowers with the scent of Cowslips. There is also a very dwarf form, almost white, known as T. europæus albus. T. napellifolius has rich yellow flowers with orange stamens, large, and borne freely on the branching shoots. This is a bold and showy kind. Another handsome kind is T. japonicus fl-pl. (Fortunei fl.-pl.), the flowers semi-double, deep orange, and effective. Orange Globe is a variety of it, with large flowers of rich yellow colour, and may be considered the finest of the family. Gibsoni is a striking variety of T. japonicus, and the golden-coloured T. asiaticus may also be mentioned. The way to propagate Globe-flowers is by root division immediately after blooming or early in September, not later, otherwise they cannot get established before winter. If not done then, wait until growth commences in March; but when spring division is carried out, the flowers the same year are naturally poor. Seeds sown in a cold frame in September or early spring will germinate freely, and reproduce as a rule the parent. But they are slow indeed to germinate, and three years must elapse before any effect can be expected from the seedlings.

Tropæolum polyphyllum.—This is a noble hardy tuberous Tropæolum, and should be grown in every garden where such a plant is admissible. It will not succeed everywhere, and is usually most vigorous when planted on the upper parts of the rock garden in a loamy soil, and where its prostrate stems covered with greyish leaves can creep along, through dwarf shrubs, perhaps, and hang over a ledge. It loves to wind about amongst shrubs or to cover some fairly moist bank. Once established, leave it alone to increase in beauty with age. The grey colouring of the leaves is sufficiently attractive to call attention to the plant; when these are almost hidden with a wealth of rich yellow flowers in summer, one can understand that this tuberous Tropæolum is handsome indeed.

Tropæolum speciosum is popularly named the Flame Nasturtium, an apt title, but unfortunately this species is far less amenable to cultivation than T. polyphyllum. Cottages are sometimes aflame with its rich vermilion flowers in the highlands of Scotland, and it seems only successful in a cool, moist, bracing air. It is, however, a plant worth trying hard to coax into respectable growth, planting it in a position where its graceful shoots can hang over some rocky ledge, or creep through evergreen shoots, which it will festoon with glorious blossom. The soil should be loam and peat, moist, and the position shady. When the plants are vigorous, growth is fast, the shoots mantling over shrubs and everything near to them. Plant the roots about half a foot in depth in spring, and increase by division or seed, but the roots should be left alone once they are established. This, however, is the way to propagate it. Seed should be sown as soon as ripe in a pan of light loamy soil, moist, and placed in a cold frame. The seedlings, if the seed be sown in autumn, will appear in the following spring.

Tulip, The.—A noble family of spring bulbs is the Tulip, the flowers bold in form, and rich and varied in their colouring. From the first of spring until it has passed away, this group gives colour to the garden. During late years the sumptuous May-flowered or Gesner's Tulips have been planted, and they should continue to be sought for. Tulipa Gesneriana or one of its many forms makes rich pictures of colour, a species which is of great splendour it itself, but the forerunner too of the self varieties and the quaint striped forms.

Darwin Tulips form a distinct class of late-flowering self Tulips, all with short broad petals of great substance that withstand the hot sun of May well. They were raised by a Dutchman who died a few years back, when the collection was bought by Mr. Krelage, who started selecting the various varieties and named them after Professor Darwin. The self or May Tulips are placed first, for the reason that they are less known than the early-flowering

PARROT TULIPS.

Dutch Tulips, familiar in parks and gardens early in the spring. Gesner's Tulip, described in catalogues as T. Gesneriana spathulata, or T. G. major, should be planted in bold groups by itself or with other plants. A happy association is a colony amongst Quince trees, the great goblet-shaped crimson flowers, when expanded in the May sun, glowing as if alight with colour. Dull and ineffective are all other kinds against this splendid flower, tall, vigorous, and rich in colour, made still more so by the bluish centre. In large gardens fill distinct beds with it, and use it too in the hardy border or permanent beds of perennials as a relief to other things. T. elegans, the dark crimson florets reflexing at the apex, Fulgens, crimson, Golden Beauty (also known as Bouton d'Or), deep yellow, and Golden Eagle, also yellow, but with a margin of crimson to the florets, are also handsome. A delightful kind is Macrospila, a form undoubtedly of Gesneriana, but the flowers are rose carmine in colour and sweetly scented; no Tulip is so fragrant as this sturdy kind. Then there are various varieties of Gesneriana—carminea, with its white centre, and alba marginata, ivory white, thinly margined with rose. Picotee is dainty in form and colour, and not quixotic as some kinds—T. Greigei, for instance—in its behaviour. The flowers are pure white, the florets narrowing towards the apex, where they recurve, and the soft rose edge adds to their delicate beauty. Viridiflora is quaint, the flowers green with yellow colouring towards the margin, but this should not be thought of before any of those previously named. T. Didieri is a hardy graceful kind, bright crimson with black base, and the variety alba is a good kind, also T. vitellina, the flowers soft yellow, a tender shade, and T. flava, a handsome, bold, very late yellow flower.

A host of Tulips less vigorous as a rule than those mentioned comprise such gems as T. australis, yellow; the brilliantly-coloured T. Batalini; the wild Tulip Sylvestris, and T. suaveolens, pretty in the grass where they can be established; T. Clusiana, or the Lady Tulip, a slender dwarf variety of rose and white; T. lanata, and T. linifolia, scarlet; the dwarf T. persica, sweetly scented and yellow in colour; and T. undulatifolia. The Tulip family numbers, however, many beautiful species and varieties, and of late years their number has been greatly added to through the introductions from Russia, Armenia, and Eastern Europe generally.

The Parrot Tulips are a strange group, and their origin is hidden in mystery. T. platystigma is probably one parent, as in a group of it flowers show gashed florets similar to those that distinguish the Parrot race. Whatever their origin, they possess distinct charm, but the bulbs sometimes disappoint. Unfortunately, gaps are not uncommon, though when a bed is a success the blaze of bizarre colouring is Oriental in its splendour. The long beds of Parrot Tulips in Mr. Walker's nursery at Ham are a brave sight, colour pictures painful almost in their intensity. The flowers are bulky, florets gashed and cut grotesquely, the colour laid on in splashes and blotches, sometimes self, sometimes yellow against crimson—a curious but never inharmonious medley. The flowers are too heavy for the stems to support, and therefore it is wise to plant the bulbs in groups, colonies, or in a carpet of some low-growing plant, as the Saxifraga, to prevent them being splashed by rains beating up the soil. Through the uncertain flowering of these Tulips, it is advisable not to plant them too freely. When used, plant a little closer together than in the case of other Tulips.

The late-flowering Tulips, described as Darwin, are of undoubted value, and from an almost complete collection of them the following are selected as not only distinct, but clear and agreeable in colour: Carminea, carmine, tall and handsome; Dorothy, lavender shot with buff; Early Dawn, rose purple, silvery towards the margin, a pleasing shade; Charles Dickens, bright crimson; Flambeau, brilliant carmine; Firebrand, deep crimson, a bold flower on a tall scape or stem; Glow, well-named, its neat shapely flower aglow with crimson colouring; Loveliness, bright carmine; Bronze King, rich bronzy, outer segments margined old gold, the inner ones entirely of the latter shade; Phyllis, a beautiful Tulip, white, margined rose, the centre of the segments feathered with buff yellow; Salmon King, salmon; and The Sultan, which is almost black, so intense is the colouring.

The early Tulips are familiar in parks and gardens before the nobler later kinds are in bloom. Such clearly-coloured varieties as Canary Bird, yellow, or Chrysolora, of the same colour; Cottage Maid, rose pink; the various Van Thols, of course not omitting the scarlet and yellow form, Keizerskroon; Pottebakkers in their several shades; Vermilion Brilliant, vermilion, and Ophir d'Or, are important. Amateur gardeners know,

DOUBLE TULIPS.

or should do, their value, especially the Duc Van Thols, for potting up and gently forcing, or leaving them to come on gradually in the greenhouse. A potful of some bright-flowered Tulip in the room early in the year is a welcome reminder of lengthening days and sunnier skies. The double Tulips are less graceful, but they have their value. They possess a great virtue—a longer blossoming time. Loam mixed with rather less than half well-decayed manure, or a mixture of old leaf-mould, loam,

and manure, with sharp silver sand, forms the best compost. When potted stand outdoors under a sheltered hedge or wall on a hard bottom, and cover the pots over 6in. deep with coal ashes or cocoa-nut fibre refuse. Here they should remain from ten to twelve weeks at least, exposed to all autumn rains, etc. When the tops begin to move, remove the pots to the greenhouse after removing the fibre from the surface, and give a little weak liquid manure water until growth freely begins. The way to get even potfuls of Tulips is to see that the bulbs are of an even size when potting, or the very early pots may be made up from store pots or boxes, that is, bring the bulbs on in gentle heat, and transfer to the pots before the flowers expand. Give plenty of water when forcing the bulbs. Tulips are very easily brought early into flower, but to obtain early bloom, say at Christmas, the bulbs must be potted up in September.

The so-called florists' Tulips, the breeders, bizarres, byblœmens, and roses, are not grown so largely as other forms, nor are they of the same value in the garden. But they are amongst the famous flowers of history, and the favourites of certain men who have raised new kinds, each to be as perfect as possible in distribution of colour fixed by rule. Those who wish to grow these remarkable flowers should see such a fine named collection in bloom as that of Messrs. Barr and Sons of Surbiton. There are few large collections in the country, although for centuries they have been cultivated in English gardens. The flower is self at first, but will break in course of time (sometimes many years elapse) into another form—a flamed or feathered Tulip, a remarkable change, and not the least interesting phase of plant life. Florists' Tulips are far less effective than the selfs, of which T. Gesneriana is most splendid.

Tulips require careful cultivation, especially the florists' forms, byblœmens, and those of that class, and when in the early bud stage storms of hail and heavy rains try them considerably. Many promising flower displays are destroyed through weather troubles, and the leaves also get damaged, with sometimes unfortunate results. It is shelter from storms of wind and rain that Tulips ask for, and it is wise to give canvas protection if possible. The self Tulips appear less susceptible to disease and injury from storms than the striped forms. Early November is the time to plant, putting the bulbs 2½in. deep, and once in two years lift them, planting in fresh ground. The dwarfer, more delicate species should be planted on the rock garden.

Turkey's Beard.—*See* Xerophyllum asphodeloides.

Tussilago fragrans (*Winter Heliotrope*).—A sweet, fragrant flower in winter. This is a plant that spreads freely in dry soils, near shrubberies or on banks. Its greyish flowers are quaint, and, if not bright to look at, exhale a delicate nutty perfume.

Veronica.—This is a large and beautiful family, the plants of varying height, some quite creeping, others tall and handsome in the border. V. longiflora is as conspicuous as any, and grows almost anywhere, so robust is the growth. A strong, handsome kind is the variety subsessilis, which has deep blue flowers in large spikes, and there are forms, such as alba, rosea, and Hosti. Other beautiful Veronicas are V. chamædrys, V. gentianoides and its varieties, the dwarf silvery-leaved V. incana, V. pectinata, a trailing kind, pretty on the rock garden with its lines of blue flowers, or rosy-coloured in the variety rosea; also the creeping V. repens, V. rupestris, and the rich blue V. satureioides. Worthy of a place, too, are V. saxatilis, and V. Teucrium, also known as V. prostrata. None of these are difficult to grow. Propagate the herbaceous kinds by division, and the shrubby ones by cuttings.

RAISED BEDS OF VIOLETS.

Violas (*Violets*).—Besides the tufted Pansies and the sweet Violets we love so well, a beautiful race remains, the kinds from the mountain pastures of the world, flowers of delicate beauty, sometimes sheltering in the hedgerows when the Dog Violet in spring dyes the grassy bank with softest blue or white. These lovely flowers are generally fit only for the rock garden, where in sandy loam and cool position they bloom freely for weeks. V. biflora, with its pretty yellow flowers, is a charming alpine Violet, so, too, the neat little V. lutea, and the Bird's Foot

Violet (V. pedata), V. calcarata, the pale blue V. cornuta, once so popular for bedding, before the tufted Pansies came into force so prominently, and its white variety alba must not be omitted; V. cucullata, V. Mundyana, a delightful blue-flowered Violet, the Rouen Violet (V. rothomagensis), purple or white, and V. sylvestris and its forms. No daintier flower group exists. Every kind is precious to the flower gardener.

Violets in Summer and Winter.—These fragrant flowers are ever welcome, and to have them over a long season the plants must be well grown, an important point being to transplant them frequently. A close, thick bed of Violets is charming in spring, but the flowers are usually small, and the stalks short. The way to obtain a plentiful supply of flowers is to select strong, healthy single crowns in April or early May, and plant them 1ft. apart on ground which has been liberally manured and deeply dug. Trench the ground in winter, giving at the same time any manure which may be available, or fresh manure will suffice, and in March give a further dressing of short decomposed hot-bed manure, forking it in. Early in April rake over the ground, and set out the plants, pressing the roots firmly in the soil. Keep them free from weeds and runners, and if the season is dry mulch between the plants with old compost of any kind. Old mushroom beds broken up fine and spread evenly between the plants provide excellent material. This saves watering and encourages growth. The Giant or Czar grown in this way, and planted at the end of September in a sheltered position at the foot of a wall or warm hedge, will flower all the winter. Marie Louise, Princess of Wales, or any other variety, double or single, grown thus, and either potted up in September or planted in frames, will flower throughout the winter, the blooms produced under glass being clearer and finer than anything from outside. The Improved Russian varieties are frequently, however, very fine in sheltered borders. Plants under glass, that is, in cold frames, will need little water in winter, and they must be near the glass. Remove the lights in warm, dry weather, as anything like coddling treatment is fatal to success, and pick off dead or decaying leaves. As regards Violet growing in the open air, it is a good plan to leave a bed or two undisturbed the second season, because this produces such a wealth of blossom, but after the second season Violets want a change of soil, or they deteriorate. On hot soils red spider is often troublesome, but it may generally be got rid of by mulching and an occasional soaking of water.

The double Violets, namely, Neapolitan, Marie Louise, and Comte de Brazza, are not successful out of doors, unless in very sheltered gardens, but are the best kinds for flowering in frames. If planted out of doors, scatter a handful of long straw over the beds on the approach of sharp frosts; they bloom under this when otherwise the buds would be destroyed. A scattering of straw during severe frosts is always beneficial to all Violets. The finest single kind is Princess of Wales, the flowers being very fragrant, large, borne on a long stem, and rich in colour. It is finer than California.

Vinca.—This is the well-known Periwinkle; at least there are two popular kinds, V. major and V. minor, which are of great use for clothing the rougher parts of the rock garden, shady places in the woodland, and the margins of shrubberies; indeed, these vigorous creeping plants are so hardy and strong that they will succeed almost anywhere and in any soil. V. major is, as its name implies, the larger Periwinkle, and there are charming variegated varieties of it which keep their colour well. V minor has given rise to several forms, one with white flowers and another rich blue, this perfectly double. A pretty kind is the soft mauve-flowered V. acutiloba, which blooms late.

XEROPHYLLUM ASPHODELOIDES (Turkey's Beard).

Water Gardens.—*See* Streamside Gardens.

Water-lilies.—*See* Nymphæas.

Welsh Poppy.—This is dealt with under Meconopsis.

Willow Herb.—*See* Epilobium.

Xerophyllum asphodeloides.—This is the Turkey's Beard, a quaint and uncommon grassy plant, which must have a moist, peaty, and rather shady corner, where it will produce a strong stem supporting a compact white raceme. Moisture and peat are essential. It needs much the same treatment as the Trillium and Marsh Marigold.

Yuccas will be described in the chapter upon shrubs.

Zauschneria californica and its variety splendens must have a warm, sunny corner or border where the soil is light. So necessary are these conditions that this brilliant scarlet-flowered plant will even root into the crevices of old walls. It is suitable for the Southern Counties of England, and is sufficiently bright and pleasing to merit more care than is usually given to perennials. Increased in the usual way by root division in spring, or by seeds sown in gentle warmth at the same time.

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A BORDER AT HOLME LACY.

"COUNTRY LIFE."

THE HALL, BRADFORD

MIXED BORDERS AND ROCK GARDENS.

By S. W. Fitzherbert.

OF late years there have been innumerable accessions to the ranks of hardy flower growers, a cult that is slowly but surely ousting the inartistic and expensive system of "bedding-out," which, with its carpet-patterns and crude combinations of flat colour, held sway for so long a period in our English gardens. At one time, not so many years ago, few were the gardens, except those of cottagers, that were not affected by this undesirable innovation, though, even when the bedding craze was at its height, there were examples to be found, attached, probably, to some old manor house or grange, where the restful reign of the old-fashioned favourites had continued unbroken by the incursion of the more showy invaders. Little by little, however, the taste for hardy flowers has again come into vogue, and now there is scarcely a garden, large or small, that does not contain a "mixed border" and a certain number of rock plants. The term "herbaceous border," although it has been severely criticised as being an infelicitous title, probably serves better than any other to denote the nature of the majority of the denizens of such a bed, for these are mainly composed of plants that die down during a certain portion of the year, and after a period of rest throw up fresh foliage and flower stems. One of the first questions asked by the novice who contemplates the addition of an herbaceous border to his or her garden is "What shall I plant to have the bed gay during the spring, summer, and autumn?" and therefore it may be as well at once to admit that at no time is the whole border, throughout its length and breadth, a blaze of colour, since the extent and disposition of its tints change with the changing months, as the varied breadths of flowers break into blossom or lose their effectiveness, and thus provide a picture infinitely more beautiful to the artistic eye than is afforded by the level and wearying sameness of bedding plants.

Care should be taken in planting the herbaceous border to avoid all appearance of formality, since formality is antagonistic to the picturesque. The characteristic of Nature's beauty is unconventionality, but formality is artifice not art, which "itself is Nature." For this reason any planting in lines or patterns should be rigidly discountenanced, and the

varied plants should be grouped in informal masses. Here and there groups may be allowed to mingle where they approach one another, the taller-growing subjects of which one section is composed becoming less closely set as they approach the confines of their allotted space, and throwing up their lofty flower spikes at greater intervals as they advance in scattered formation into the ground occupied by the neighbouring dwarfer-habited group. Narrow borders, naturally, do not admit of the same latitude in the disposition of the plants as is afforded by those of greater width, but even in the former the breadth of the groups should not be unduly limited, or the effect of foreshortening, when the border is viewed from the end, will give it the appearance of being planted in lines. For this reason it is better, in very narrow beds, to allow one group to occupy the entire space from front to back rather than to divide the width between two genera. The practice of dotting plants singly about the surface of the herbaceous border is one that cannot be too strongly condemned, yet it is one that unfortunately obtains in a vast number of cases. This custom has entailed much undeserved obloquy upon the mixed border, which has in consequence been designated a "confused muddle"; but when laid out with an artistic sense of the rightful values of colour and form, no such stigma can attach to it.

A BORDER AT HAMBLEDEN MANOR HOUSE.

Having briefly touched upon the grouping of the plants destined to fill the border, with regard to their presenting a natural effect, the question of colour-association has to be considered. Plants may be disposed in unconventional masses, and yet the herbaceous border may present anything but an attractive appearance, owing to the fact that no thought has been bestowed upon the arrangement of colour harmonies and contrasts. The border should be a picture both in colour and in form. Discordant hues are strictly tabooed on the artist's canvas, and it is equally important that they should not be allowed to sully the fair beauty of the garden. Harmonies should, as a rule, be aimed at rather than contrasts, though, if employed sparingly, as in Nature, effective contrasts add interest to the border. Thus the tall white flower spires of the Cape Hyacinth (Galtonia candicans) rising from an undergrowth of the deep blue Salvia patens are, as an exception to the general rule, distinctly charming, and many other like contrasts that might be cited are not only allowable but valuable, but these should be used in moderation and with discretion, or the border will lose that sense of repose that should invest every portion

of the garden. Scarlet and rose colour, the tints respectively of the Oriental Poppy and many of the herbaceous Pæonies, should never be allowed in close proximity, but scarlet and crimson merge agreeably into orange and yellow and the latter into straw colour, ivory white, and white. The different shades of purple and blue form in themselves quite a colour gradation; the lighter blues associating, through pale yellow, with white, while lilac and mauve also harmonise well with soft yellow. The latter colour may also be used in juxtaposition to pink and rose tints. In this manner, though discordant colours may be represented in the same border, they may be disposed in such a manner, by surrounding them with allied colour-tones, melting by infinite degrees into others that, by gentle gradations, eventually harmonise with the opposing hue, as to produce a delightful rather than an offensive effect. As has been already observed, herbaceous plants do not bloom simultaneously, but succeed each other, and it is therefore requisite that the places of the earlier-flowering subjects should be taken, later on, by others of the same colour that are planted in close proximity, or the effect of the carefully-considered colour-scheme will be marred. Many of the earlier-blossoming plants will, as they die down, become unsightly, and for this reason they should be placed immediately behind others that make their growth at a later date, and thus hide their imperfections.

In arranging mixed borders, especially if these be wide ones, many subjects other than herbaceous plants may be used with advantage, while some, whose tenderness obliges their removal before the advent of winter, are of such decorative value that they may well be allotted positions in the border. Of the latter the large-flowered Cannas, Cactus Dahlias, Lobelia fulgens, Salvia patens, and scarlet Gladioli may be mentioned, while of the former a large list might be given of plants valuable by reason of their flowering qualities or for their contour, nobility of form being a matter of almost as great importance in the border as beauty of colour. Of these may be cited Bamboos, Yuccas in variety, Eulalias, Arundos, shrubby Spiræas, flowering shrubs of many kinds, and climbing Roses grown on rough poles.

Although, in arranging the occupants of the border, as a general rule, the tallest subjects will be relegated to the back row and the most dwarf accommodated in the forefront, a graduated scale of heights from back to front should not be followed throughout the whole length from end to end, as this will impart an appearance of stiffness the reverse of pleasing. Here and there a group of taller plants, a flowering shrub, or giant reed standing in a forward position, makes an artistic break in the continuity of the view and gives character to the informal border.

Rock gardening is a phase of floriculture that possibly does not number such an extended array of votaries as do homage to the charms of the herbaceous border, though there is no doubt but that, where this particular branch is once essayed, it is usually followed up with a zest that even the most zealous orchid-grower would feel no cause to be ashamed of. One reason for this being the case is, doubtless, the fact that, when the rock garden is once formed, the amateur can, if he is at all skilled in gardening lore, do all the necessary work with his own hands. He can plant and divide in the porous soil almost without soiling his fingers; he can pull up the stray weed without breaking his back, and keep a watchful eye on the progress of his little favourites while standing with dry feet on the stony path.

In the rock garden the microcosm of gardening is to be studied. In a few square yards hundreds of rare and interesting plants may be collected—plants whose culture, in spite of their hardiness or rather because of it, often presents no inconsiderable difficulties, for here are the denizens of the fringe of the Alpine snowfields, who, in their native habitat, are for months at a time buried beneath several feet of snow and burst into blossom almost immediately their white covering is dissipated, and

barely have time to ripen their seeds ere the snowy mantle again descends upon them and the long winter darkness ensues. Very different are the climatic conditions of the English rock garden—mild and muggy winters, with spells of sharp frost alternating with sudden thaws, followed, perhaps, by biting north-east winds and cutting hailstorms, and so on *ad infinitum*. Small wonder if the little strangers, bewildered by these unforeseen vicissitudes, enveloped in a steamy mist just as they were preparing for their long winter's rest, frozen just as the mild weather has tempted the sap to flow again, fail to grasp the situation and eventually succumb. For the enthusiastic rock gardener, however, difficulties are only created to be surmounted, and, in spite of the clerk of the weather, the losses of the most resourceful are surprisingly small. It must on no account be concluded, from the foregoing remarks, that the rock garden is entirely furnished with such capricious subjects as those above alluded to. These rare gems, whose successful culture is beset with such uncertainty, form but a tithe of the delightful plants

A WELL-CONSTRUCTED ROCK GARDEN.

that in the springtide of the year will clothe the ledges with beauty; be the winter what it may, in fact, the rock garden may easily be filled with subjects of the highest decorative merit all of which are absolutely hardy, but it is against all precedent to expect that one who has made this branch of gardening his hobby will be deterred by fear of failure from trying his hand at coaxing the less tractable Alpines to make a permanent home in the nooks he has so carefully prepared for their reception.

Rock gardens should be so constructed as to offer a congenial abode for as many genera and species of mountain-loving plants as possible, and for this reason they should afford the varied conditions and exposures best suited to their individual needs. Some plants, such as Ranunculus glacialis, may be found, bearing from thirty to forty flowers, within a couple of yards of the snow at the foot of a glacier, growing in what is, apparently, nothing but disintegrated rock; other little Alpines may be seen spreading their rosettes of leaves over a tiny crack in the rock into which the blade of a pen-knife will barely enter;

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ALPINE FLOWERS AT TANGLEY MANOR HOUSE.

"COUNTRY LIFE."

but if the rock can be broken and the roots followed up they will be found, very possibly, to follow the fissure inward for a yard or more. In both of these cases the roots, following the line of least resistance to great depths, considering the size of the plants, remain always moist, while foliage and flower are permeated with the warm rays of the sun. This hint should be followed in our English rock gardens and the plants provided with deep crevices where they may enjoy similar conditions, and, where this is done, they will testify by their behaviour that such thoughtfulness is appreciated. Androsaces will pour from ledge to ledge a very cataract of bloom, Edelweiss will flourish as on its native mountains, and the little Campanulas bear their frail bells in profusion.

A ROCK GARDEN IN SURREY

Rock gardens should not be, as some of their constructors appear to imagine, gardens of rocks. The mission of the stone is, not to be the prominent feature, but merely to offer suitable root-run and protection for the plants. During the first year or so the stone will naturally be rather more in evidence than desirable, but if the planting has been carefully and systematically carried out, the main portion will soon be hidden beneath flower and foliage.

Piling up rocks one above another, as if it were desired to make a stone-yard, is not the way to create a beautiful rock garden; and though this evil has been pointed out by authorities upon the subject for many years past, this form of gardening, which may truly be called "rockery," is painfully common. No alpine meadow flowers can garland these dreary wastes of rock, put together without a thought of the plants that need deep pockets of soil or crevices for their far-reaching roots. Another evil is a combination of rockery and "rootery." A "rootery" may be artistic, if constructed with rare taste, but putting roots here and there in the rock garden is the best way to fill the whole place with objectionable fungoid growths. In a few years the roots commence to decay, fungi follows naturally, and the flowers sicken. Far

better is it to make a smaller rock garden than to attempt an elaborate design with insufficient material. Rock garden making is not a simple task. It demands a knowledge of the flowers there to find a home, but when artistically formed is a never-failing source of delight.

MAKING THE MIXED BORDER.

A MIXED border, if carefully made, and laid out with a due regard to the natural and therefore artistic aspect which it should present, constitutes one of the most pleasant features of the flower garden. Many an English garden depends in no small degree for its beauty upon the broad mixed borders, in which the perennials flower year after year with increased freedom. Unfortunately mistakes are often made, which are not easy to rectify without disturbance of choice bulbs and roots. Take care that a good foundation is laid. There appears to be a general impression that hardy plants, of which section the occupants of the border should mainly consist, can grow anywhere, and are indifferent alike to the depth and condition of the soil in which they are planted. This is, of course, a misconception, and unhappily, in numerous gardens, the plants show by their want of vigour that their requirements are insufficiently studied. In some the SOIL OF THE BORDER is too shallow, and in hot summer days the roots of the plants are parched; in others the border lies too low, the soil is stiff and badly drained, and during continuous rains the plants suffer in consequence; while, oftentimes, a hedge of stalwart Laurel or hungry Privet runs the whole length of the border and appropriates with its all-pervading root fibres the sustenance that should be reserved for the perennials. The ideal mixed border should be deep, a depth of 3ft. being none too much where such plants as Pæonies are grown, for these, when in vigorous health, send their roots down fully this distance. Besides being deep, the soil should be well enriched, for a good beginning is half the battle; and when plants start away well, their subsequent vigour for a considerable period is assured, provided they are given ordinary attention. As regards soil, nothing is better than sound fibrous loam. If this can be obtained there is no need to seek further; but in many cases, where such staple cannot be procured, one must make the best of what is nearer at hand. Mix light soil with well-pulverised clay, leaf-mould, and peat, if procurable, while cow manure should be used for enriching it. Heavy soil should have a liberal admixture of road-grit, coarse sand, burnt earth, or old mortar rubbish to render it porous, while for

MIXED BORDER AT HENHAM HALL, SUFFOLK.

the lighter ground stable manure should be employed as a fertiliser. In making the border, plentifully dress the lower half with fresh manure, while to the upper half, with which the roots will first come into contact, add only well-rotted manure. In such a border, richly stored with food, the plants will grow vigorously and attain full development, while they will retain strength unimpaired until their increased dimensions render division necessary, and then the border may be partially or entirely remade. Mulchings are useful, and light coverings that do not become sodden and "cake" tend to conserve the warmth in the soil if applied during the autumn, but a heavy damp coating lowers the temperature at the ground level considerably during the winter months, at which time, moreover, the plant roots, being dormant, cannot utilise the fertilising elements washed from the mulchings by the rain.

MIXED BORDER AT FAIRFIELDS.

In the spring and summer the case is different. At the former season the roots are stirring, and eagerly convert the manurial agents to their use, while in the summer a slight mulch tends to keep the surface soil moist, even in very dry weather, and root action progresses unchecked. A slight sprinkling of soil above the mulching will be sufficient to render it inconspicuous.

Planting the Border.

After making the border, one must plant it; and in directing attention to this point, it cannot be too strongly emphasised that the one portion of the garden above all others from which artificiality should be most rigorously banished is the mixed border. Here there must be no geometrical patterns, no planting in lines, no dotting of single specimens of a family about the bed, such as will tend to produce a confused, muddled effect. The plants should be arranged in informal groups, not all of an exact size or contour, and if the outlying pickets of a troop of tall-growing subjects stray into the territory occupied by plants of lowlier stature, so much the less formal will be the effect.

The border should be wide, 8ft. to 10ft. offering a better opportunity for artistic grouping than a narrow width, and the background will necessarily be filled with the tallest-growing plants. This should not, however, prevent some of them from occupying forward positions, where they will create an artistic break in the level, and disturb an unbroken uniformity of height.

Some care should be exercised in selecting the positions for the different plants, or groups of plants, so that the kinds which flower in the early summer and later on become unsightly, such

as the Lyre-flower, or Bleeding Heart (Dielytra spectabilis), and the Oriental Poppy, shall occupy sites immediately behind subjects that are more deliberate in making their growth, and will thus blot out the former when they are no longer ornamental. Of this latter class the white Japanese Anemone and perennial Asters may be mentioned as types. As regards colour, if the flowers are grown, as suggested, in masses, it follows that the colour scheme will disclose itself in breadths, after the manner of Nature's handiwork, rather than in dots and lines, the former being restful, while the latter are trivial and artificial. In some of these flower masses, allied tints form a delicate harmony, as in the hybrid Peruvian Lilies (Alstrœmerias) and Columbines; while striking contrasts are often valuable for effect, such as the vivid scarlet of the Oriental Poppies flaming over a colony of white fragrant rockets, Gladiolus brenchleyensis associated with white Phlox, and the vermilion scarlet Lobelia (L. cardinalis) with the deep blue Salvia patens.

If pinks and scarlets, colours that invariably clash, are kept apart, direct contrasts or gradations of colour, passing by half tones from one decided tint to another, are equally admirable. If the border backs upon a high wall, this may be covered with all manner of beautiful creeping plants, climbing Roses, Jasmine, Honeysuckle, Wistaria, Clematis, and scarlet Tropæolum, while billows of Gypsophila may be allowed, here and there, to encroach over the verge of the path, which in other places may be hidden by the grey-green leafage of Pinks, or the flowers and foliage of trailing plants.

In borders shaded by trees, few flowers will, of course, succeed. One must plant shade-loving perennials—the Day Lilies, in variety, a noble group for such positions; Pæonies in subdued light; Irises, the German kinds in particular; Primroses, hardy bulbs, Scilla campanulata (Spanish Scilla), and varieties rose and white, Ferns, Solomon's Seal, and the Bluebell and its forms.

Some Beautiful Border Flowers.

ALTHOUGH the mixed border is never a blaze of colour from end to end, there is no season, from early spring to late autumn, during which it is without its charm of flowers. Amongst the large number of hardy plants available for its adornment, the following list offers a representative selection: In the spring there are bulbs of various species, such as Snowdrops, Crocuses, Scillas, the Glory of the Snow (Chionodoxa Luciliæ and C. sardensis), the spring Snowflake (Leucojum vernum), and the Daffodils, of which Narcissus obvallaris, N. maximus, N. Golden Spur, and N. Emperor, of the golden trumpet section, and N. Horsfieldi, N. Empress, and N. Grandee, of the bicolor trumpets, as well as N. Sir Watkin, N. Stella, and N. Cynosure, of the incomparabilis type, are vigorous varieties; while of other beautiful Narcissi there are the Pheasant's Eye, N. poeticus ornatus, and N. p. recurvus, with the double, Gardenia-flowered Daffodil, N. p. flore-pleno, the Star Daffodils of the Leedsi section, and the handsome N. Barri conspicuus. Many of the Anemones will add to the springtide effect, such as the well-known A. coronaria, A. apennina, A. fulgens, A. Robinsoniana, and the Pasque-flower (A. Pulsatilla); while, later on, A. narcissiflora will bloom, and, about the edging, such plants as the Aubrietias, Arabis, and Alyssum will flower. The bulbs may be planted among the herbaceous subjects, which, with their rapidly-spreading foliage, will soon hide them after their flowering period is past. The Lyre-flower (Dicentra spectabilis) and the Giant Leopard's Bane (Doronicum plantagineum excelsum Harpur Crewe) are two of the earliest-blooming of the herbaceous section, and are both highly ornamental; then the purple Campanula glomerata comes into flower, to be followed, later on, by other Bell-flowers, C. grandis and its white variety, the Peach-leaved Campanula (C. persicifolia), with its white, double white, and newly-introduced large-flowered sport (C. p. a. grandiflora). Cheiranthus Marshalli, with its brilliant orange flowers, creates a telling spot of colour in the border, and the Dittany or Burning Bush (Dictamnus Fraxinella), and its white variety, are pretty, old-fashioned plants, a remark that applies to the crimson Bergamot (Monarda didyma) and the fragrant double white Rocket, which latter subject is benefited by being divided and transplanted into fresh soil every autumn.

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A HILLSIDE MIXED BORDER AT DOWNSIDE, LEATHERHEAD.

"COUNTRY LIFE."

The Irises are a host in themselves. Of the bulbous section, the Spanish and English are best suited for cultivation in the mixed border, and of the two, the Spanish (I. Xiphium) is the earlier, effective varieties being Snow Queen, white, Canary Bird, yellow, Celestial, blue, and Golden King, orange; while of the English (I. Xiphioides), Mont Blanc and La Grandesse, white, are handsome flowers, and there are striking varieties of light and dark blue, purple, claret, and lavender sold under different names by various firms. In the two foregoing sections care should be taken to procure self-coloured, and not splashed or mottled, varieties, and to plant each variety in groups by itself, as by this means a far broader colour effect is obtained than if the different varieties are mixed or those bearing splashed flowers are made use of. In the large section of Flag Irises, usually known under the name of German Irises, there are a large number of decorative varieties, amongst which some of the best are Princess of Wales, white; flavescens, pale yellow; atro-purpurea, dark purple; florentina, white, turning to pale grey, sweet-scented;

A BORDER AT WEST DEAN PARK.

pallida and pallida dalmatica, of different shades of lavender, very fragrant; Queen of the May, rosy lilac; Madame Chereau, white, margined with blue; Darius, golden and brown; Virginius, violet and white; and venusta, rosy lavender. Other good Irises for the border, where the soil is deep and rich, and does not readily become dry, are I. orientalis, also known as ochroleuca and gigantea, white and yellow, and I. aurea and Monnieri, both bearing golden flowers. These three Irises are of precisely similar habit, and, under favourable circumstances, attain a height of almost 6ft. The charming winter-flowering I. stylosa and its white variety succeed well in light soils in warm localities, and bear their fragrant flowers from October to March.

The Lily tribe affords an even larger number of species suitable for cultivation in the mixed border. The first to bloom is L. pyrenaicum, with chrome yellow Turk's caps and red anthers, a handsome flower, but possessing a strong and somewhat offensive smell. In southern

IRISES IN A GLOUCESTER GARDEN.

gardens this commences to flower in May, to be followed shortly by the many varieties of L. bulbiferum, also known as L. umbellatum, to which L. Davuricum is very similar. These Lilies bear orange red flowers of varied shades, spotted more or less heavily with dark dots. Good varieties are atrosanguineum, erectum, immaculatum, Incomparable, bicolor, and Sappho. The old Orange Lily (L. croceum) is a vigorous-growing species, attaining, under good cultivation, a height of 7ft. L. excelsum, also known as L. testaceum, apricot buff in colour, which is a cross between L. candidum and L. chalcedonicum, is an excellent garden Lily. The well-known Madonna Lily (L. candidum), with its spotless white blossoms, is the most deservedly popular of all Lilies, and well merits its extended culture. The Turk's-cap Lily (L. Martagon) is an old occupant of our gardens, but its purplish flowers are not of a particularly pleasing colour, though its white variety (L. M. album) is a gem of the first water. L. pomponium verum is a pretty little Lily producing scarlet blooms, while, in forward positions in the border, L. elegans or Thunbergianum, another low-growing Lily, with bright orange flowers, is very decorative. In July the giant Lily of the Himalayas (L. giganteum) blossoms. This, when in vigorous health, often attains a height of 10ft., and bears a dozen or more long, ivory white flowers, heavily stained in the interior with purple and emitting a delicious vanilla-like perfume. The Panther Lily, though classed as one of the Swamp Lilies, grows well in porous loam, and often attains a height of 7ft. It is of strikingly elegant habit, its red reflexed and heavily-spotted flowers being borne on the extremities of long footstalks, thrown out from the slender, graceful stems, more than sixty blossoms being sometimes carried on a single stem. L. Humboldti is a superb Californian Lily, succeeding in loam and bearing flowers of a light apricot colour spotted with lake. A fine variety of this Lily is Bloomerianum, having darker-coloured blossoms. Late in July the most brilliant of our garden Lilies flowers. This is the scarlet Turk's-cap (L. chalcedonicum), its blooms being of a vivid vermilion tint. Last of all come the Tiger Lilies, of which the best are L. tigrinum splendens and L. t. Fortunei. The latter is of very vigorous habit, often reaching a height of 7ft. Their orange red flowers, spotted with purple-black, are well known. Of new introductions L. Henryi, called the yellow speciosum, bearing an abundance of deep yellow flowers and attaining a height of 8ft., and the coral pink L. rubellum are well worth a prominent position, as they seem likely to flourish in the open border and are both exceedingly ornamental. L. auratum, L. longiflorum, and L. speciosum, though very handsome Lilies, are not to be depended upon for more than the first year in the majority of gardens. As their cost, however, is not ruinous, they may be well given a trial, as, should they continue to prosper, they will add materially to the attractions of the border. Lilies should be provided with deep and porous soil, and much care taken that no manure comes into contact with the bulbs at planting-time. They flourish well if planted among herbaceous Pæonies. These latter require a deep and rich soil, and are best planted early in September. When in vigorous health and full blossom, they are superb subjects for the mixed border. Their varieties are almost innumerable, and are being increased year by year by further meritorious introductions. Other plants well

adapted for the mixed border are the double white Achillea Ptarmica fl.-pl. The Pearl, Peruvian Lilies, or Alstrœmerias, both the hybrid section, whose flowers range through gentle colour gradations from cream to crimson, and the orange-blossomed A. aurea; the hybr d Aquilegias, with their graceful, long-spurred flowers, whose yellow and white cups are shown off by wide perianths of purple, blue, grey, scarlet, pink, and flesh colour, and which form exquisite pictures when grown in breadths. These plants should be raised annually from seed and planted in the border during their second autumn, when they will provide a far finer display than if the old plants are allowed to remain another year. Coreopsis grandiflora, which produces a profusion of large bright, yellow flowers, is one of the most useful plants for the mixed border, as it comes into bloom at the end of May and continues its display through the summer, while Gaillardia grandiflora is equally decorative. Centaurea macrocephala, with its great yellow flower heads, is a striking subject planted well back in the bed, as is the Globe Thistle (Echinops Ritro), while the Sea Hollies, Eryngium amethystinum and E. Oliverianum, provide a steely-blue that is quite unique in the border. Chrysogonum virginianum is attractive when bearing its yellow flowers in the spring, and Chelona barbata when it perfects its spires of drooping orange scarlet flowers in the summer.

The Day Lilies are handsome both in flower and leafage, the earliest of them, Hemerocallis flava, bearing clear yellow, scented flowers. This is followed by the stronger-growing, orange buff H. fulva, the double H. Kwanso, with strikingly variegated foliage, and

FLOWER BORDER WITH BOX EDGING.

the late introduction, H. aurantiaca major, a very vigorous variety, bearing eight or ten flowers on a stem, some of these being 7in. in diameter. Hypericum Moserianum is a pleasing St. John's Wort, and Inula glandulosa bears large, narrow-rayed star-flowers of a bright orange colour. Geum coccineum fl.-pl. produces its bright crimson blooms over a long period of time, and Gypsophila paniculata with its billows of flower-lace, composed of countless minute white blossoms on a maze of hair-fine stalks, is invaluable for enhancing the attractions of its companions in the border by its distinct habit. The white Libertia grandiflora, the scarlet

Lychnis chalcedonica, the Musk Mallow (Malva moschata), the yellow Evening Primroses, Œnothera fruticosa and Œ. Youngi, herbaceous Phloxes in decided colours, avoiding all washed-out purples and pinks, Pentstemons, Poppies in variety, especially the gorgeous Oriental Poppy (Papaver bracteatum), with its mammoth blossoms of flaming scarlet, and the Iceland Poppies (P. nudicaule), yellow, white and orange, for a forward position in the bed, while in sheltered positions in the south-west the most beautiful of all the Poppy worts, the Californian Romneya Coulteri, that bears wide-spread, crêpe-like white blossoms, deliciously fragrant, with a central boss of golden anthers, may be grown. Phygelius capensis, which bears tall spikes of pendant crimson blossoms, is a good autumnal subject, as is the orange-flowered Rudbeckia Newmani and the deep rose R. purpurea, while the well-known white Japanese Anemone is then in flower in almost every garden. Scabiosa caucasica is valuable for its porcelain blue flowers, and Ranunculus aconitifolius fl.-pl., better known as Fair Maids of France, is pretty when grown in a mass. Senecio pulcher, Statice latifolia, and Tradescantia virginica, the latter of which bears flowers of a deep violet hue, are all acceptable border plants, while of the Globe-flowers (Trollius), Orange Globe, an excellent variety, with large flowers of a brilliant orange, is a distinct acquisition. The Cardinal Flower (Lobelia fulgens) can only be left out during the winter with impunity in a few gardens, but is such a glorious sight when bearing its tall spires of glowing vermilion blooms that it well repays a little trouble in winter housing, which same may be said of the deep blue Salvia patens. Of tall plants suitable for positions at the back of the border, the following may be named: The Plume Poppy (Bocconia cordata), Cactus Dahlias, Cimicifuga racemosa, Chrysanthemum maximum, Delphiniums, Galega officinalis and its white form, Hollyhocks, Kniphofias, Œnothera Lamarckiana, Pyrethrum uliginosum, the taller Starworts, or perennial Asters, and perennial Sunflowers, such as Helianthus rigidus Miss Mellish, H. lætiflorus and H. giganteus, while of biennials, white Foxgloves (Digitalis), the Chimney Campanula (C. pyramidalis), and Celsia cretica prove effective in a like situation. In such positions, too, flowering shrubs are decorative, Prunus Pissardi, Almonds, Lilacs, and Syringas (Philadelphus), Spiræas, both of the shrubby and herbaceous sections, Berberis Darwini, the flowering Currants (Ribes), Viburnum plicatum, Weigelas, Abutilon vitifolium, Brooms, double Deutzia, and many others creating a pleasing variety. Various bulbs may be used with advantage to add to the summer and autumn effect of the mixed border, such as the white Gladiolus Colvillei The Bride, the scarlet G. brenchleyensis, the white Cape Hyacinth (Galtonia candicans), Camassia esculenta in varied colours, Ornithogalum pyramidale, Montbretias, whose bright orange scarlet is such a feature in the autumn garden, and the Winter Flag (Schizostylis coccinea), that carries its spikes of crimson flowers well into December. Where the border is sufficiently extensive, a fine effect is produced by the introduction of noble leafage, and the Acanthus, Arundos, Yuccas, Funkias, and Cannas are valuable in this respect.

Making a Rock Garden.

The spot where it is intended to construct a rock garden should be excavated to the depth of at least 18in. and good drainage ensured, for stagnant moisture is fatal to the health of many of the most beautiful rock plants, and such subjects as require a boggy soil can be accommodated in an outlying portion of the garden. As regards the staple soil, one half peat and one half fibrous loam, with which sufficient grit or coarse sand has been mixed to render it porous, will be found a generally satisfactory compost. It is not, however, all rock plants that will flourish in this staple, some preferring pure peat, some a richer soil, some apparently containing little else than grit, some a limestone soil, while others object to the presence of lime. It is, generally, only by experience that the needs of each individual plant are learnt, both in the matter of soil and exposure, that which proves successful in one locality often failing in another.

The rock garden is most effective where it is not constructed on the dead level, as greater contrasts in formation are possible where the lie of the land is uneven than where all inequalities have to be artificially constructed. Thus a steep rise can be utilised advantageously by enabling

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THE OLD BOWLING GREEN, SUTTON PLACE

"COUNTRY LIFE."

a greater difference of levels to appear in the garden, the little alpines being planted on the eminences and the stronger-growing subjects in the lowest positions. Where water is at hand these differences of elevation are particularly valuable, since they admit of a streamlet being brought down by a series of picturesque falls or cascades from the upper to the lower levels. Some rocks of large size should be used and rock masses built, which will provide a nobility of form that must necessarily be absent where stones of a uniform bulk are alone employed. Shelter is valuable where this can be provided without the shade of trees. A screen of shrubs situated at such a distance that their roots will not penetrate the rock garden, and acting as a break to the prevailing winds, is a distinct advantage; but the rock garden should be open to the fullest sunshine, and shade should be provided for such things as need it by planting them on the sunless side of perpendicular rocks. All large blocks of rock should be placed in position before the soil is added, and the remaining stones introduced as the work proceeds. The soil should be deep, so as to admit of the roots descending or running back between the interstices of the stones, and reaching a depth where the earth remains moist and always of an equable temperature. If the soil is shallow it soon becomes parched in hot weather, and all but the most vigorous subjects will be liable to perish; but by providing a deep root-run between and at the bases of the stones, the plants may enjoy those conditions that the majority of them appreciate so highly, namely, a full exposure to the heat of the sun combined with a moist root-run.

THE ROCK GARDEN AT HIGHNAM COURT.

In the lowest portion of the rock garden a moisture-retaining depression may be formed, where such things as the Lady's Slippers (Cypripedium spectabile, C. acaule, C. Calceolus, C. guttatum, C. japonicum, C. macranthum, and C. pubescens), the Wood Lilies (Trillium grandiflorum and T. sessile californicum), and some of the finer Orchises should flourish, while if a pool of water can be added to the other attractions of the garden, Marliac's beautiful Water-lilies, in their varied colours, may be grown. A few cultural directions as to the requirements of the various plants named in this chapter may prove useful. The Arabis is of the easiest possible culture in any soil not being a clay. A deep root-run is preferable, but even in comparatively shallow soil it grows and flowers well. Acænas will succeed in ordinary soil and grow well in crevices of rockwork or in the herbaceous border. Achilleas of the Alpine section do best when planted in porous soil on the rock garden, but the stronger-growing species are indifferent as to soil or situation, provided the latter is not sunless. Alyssums grow freely in well-drained garden soil. Androsaces succeed among rock fissures planted in sandy peat;

they should be grown in the full sunlight in an airy situation, but should be provided with a deep and moist root-run.

Æthionemas, especially Æ. cordifolium, are well suited for the rock garden. They should be planted in porous soil in a sunny position. The Anemones thrive best in a partially shaded site in sandy loam. Antirrhinum glutinosum succeeds well in light, rich soil in a warm position. Anthemis carpatica is of easy culture and is not particular in the matter of soil.

BOLD ROCK WORK.

Anthyllis montana is well adapted for culture in the rock garden in sandy peat. It is a pretty creeping Alpine plant that should not be overshadowed by stronger-growing subjects. Arenarias grow readily in sandy peat and loam, A. balearica being especially well adapted for covering moist rock surfaces with its creeping tendrils and countless minute white blossoms. A. montana is another valuable species. Armerias (Sea Pinks) succeed in any ordinary soil in an open position. Aster alpinus likes a warm, porous soil and full exposure to the sun. Aubrietias will

THE ROCK GARDEN AT NEWSTEAD ABBEY.

grow and flourish in any ordinary garden soil, but are seen at their best when given a deep and moist root-run and a position where their flowering growths may hang over a wall, bank, or rock surface. Calandrinia oppositifolia and C. umbellata, brilliant crimson flowers, touched with magenta, are pretty in warm soils. Campanulas, or Harebells, of the Alpine section are of themselves sufficient in variety to fill a good portion of the rock garden. They are charming plants, and generally succeed well in a tolerably open position in sandy loam. In some gardens many of the species and varieties do not prove perennial, but as self-sown seedlings usually appear around the parent plants, these are easily replaced.

The following kinds are amongst the best for the rock garden: C. abietina, C. Allioni, C. alpina, C. barbata, C. cæspitosa, C. carpatica and its forms C. c. turbinata and C. c. pelviformis, C. cenisia, C. excisa, C. fragilis, C. garganica, C. isophylla, C. Loreyi, C. mollis, C. nitida, C. patula, C. pulla, C. pusilla, C. Portenschlagiana, C. Raineri, C. rotundifolia, C. tridentata, C. valdensis, C. Waldsteiniana, and C. Zoysi. Cardamines will grow in any open soil, but prefer a damp situation, and do not object to shade. Cerastiums are of easy culture in ordinary garden soil. The Cheiranthus, or Alpine Wallflower, will thrive almost anywhere in the rock garden provided it is not shaded, while the same may be said of the Dianthus family. Dicentra canadensis likes moderately rich, light soil. The Dodecatheons, or American Cowslips, prefer a moderately shaded, moist spot, and grow well in leaf-mould and loam. Dryas octopetala succeeds in moist sandy peat, but should not be shaded in any way. The Edelweiss requires an open position, and succeeds in well-drained sandy peat or loam. Erysimums are hardy plants of easy culture in ordinary garden soil, in which Genista hispanica will also flourish. Gentians of the verna section do best in a position fully exposed to the sun in peat mixed with disintegrated granite, while G. acaulis and its varieties will thrive in a rather richer soil and are not so impatient of

slight shade. Chips of stone placed on the soil around the plants are useful in keeping the surface roots cool. Geums are of easy culture in well-drained, moderately rich soil. Gypsophila cerastioides is benefited by an admixture of old lime rubbish with the soil, which should not be heavy and damp. Helianthemums grow well on banks of sandy soil. Hutchinsia alpina grows freely, and quickly spreads into large patches, in porous soil, in a slightly shaded situation.

The Iberis family will flourish in ordinary garden soil if given a position well exposed to sun and air. I. gibraltarica, however, must have a very well-drained, light compost if it is to survive the winters. Ionopsidium acaule is an annual that sows itself in light soils. Libertias grow well in sound loam, and Linums are not particular in the matter of soil, though a porous loam is to be preferred for them. Lithospermum prostratum does well in peat and disintegrated granite in a position fully exposed to the sun. Lychnis Lagascæ is at home in sandy loam on a sunny slope. The Malvas will thrive in moderately rich garden soil. Morisia hypogæa succeeds in a deep, gritty soil of peat and loam. Myosotis alpestris should be planted in porous soil that may be kept in a moist condition during the whole of the growing and flowering season, during which time slight shade is also beneficial. Nepeta Mussini will grow in any light sandy soil. Omphalodes verna will succeed in light or heavy soil, in full sunshine or in shade. O. Luciliæ should grow in a mixture of peat and loam with which grit and small broken pieces of stone have been mixed. Onosma tauricum should be planted in a well-drained, sunny portion of the rock garden. The Oxalis thrives in warm and dry situations in sandy soil. Pentstemons flourish in a rich, porous loam. The dwarf, so-called Alpine Phloxes succeed best when given a deep, moist root-run in porous soil between rocks while their foliage is fully exposed to the sun. The dwarf Polygonums will grow in ordinary soil. Ramondia pyrenaica is most satisfactory when planted in fissures on the north side of perpendicular rocks, where it gets no sun, in gritty peat. Saxifrages and Sedums will grow in any open, porous soil on the rockwork,

A COLONY OF CYCLAMENS.

the sunnier the spot the better. Soldanellas alpina and minima, dainty little bell-like fringed flowers, require a moist peaty soil and partial shade. The Silenes flourish in any light, loamy soil, as will Scutellaria alpina, Tiarella cordifolia (foam-flower), and the creeping Veronicas. Viola cucullata succeeds best in a moist spot in peat and loam. Wahlenbergia serpyllifolia grows well in sandy loam in a sunny situation.

EDELWEISS.

We append a list of plants that may be grown in the rock garden. Of course many kinds are omitted, but if anyone has all the beautiful flowers named, the collection will be of extreme interest. Many of the flowers named are alluded to previously:

Acænia microphylla, Adonis vernalis, Æthionemas, Alliums, Alyssums, Androsaces (sunny fissures where the roots can go deeply into soil of loam, peat, and limestone chips; dryness is necessary in winter), Anemones (especially the dwarf alpine varieties), Anthericums, Antennaria, Anthemis, Aquilegias, Arabis, Arenarias, Arnebia echioides (Prophet-flower), Armeria (Thrifts), Artemisia, Arum italicum (moisture), Aster alpinus, Aubrietias, Borago laxiflora, Bulbocodium vernum, Calandrinia umbellata, Calthas (Marsh Marigolds)—boggy soils, Campanulas (the dwarf Bell-flowers, which are often only happy in the rock garden), Cardamine, Catananche, Cerastium, Cheiranthus alpinus Marshalli, Chelone barbata, Chionodoxas, Cistuses, Colchicums (autumn-flowering bulbs), Convallaria (Lily of the Valley), Coreopsis, Coronilla, Corydalis, Crinum Powelli, Crocuses, Cyclamens, Cyanthus lobatus, Daphnes, especially D. rupestris, D. Cneorum (Garland-flower), D. Fioniana, and the fragrant D. Blagayana, Delphinium nudicaule, Dianthuses (Alpine Pinks), Dondia Epipactis, Dodecatheons, Drabas, Dryas octopetala, Edraianthus serpyllifolius, Epimediums, Erigerons, Erinus alpinus (warm fissures in rocks), Erodium, Eryngiums (Sea Hollies), Erysimum, Erythræa, Erythroniums (Dog's-tooth Violets), Fritillaries, Galanthus (Snowdrops), Gentians (an important family), Geraniums (on rougher parts), Geum, Gnaphalium Leontopodium (Edelweiss), Gypsophila, Haberlea rhodopensis, Heleniums, Helianthemum (sunny spots), Hemerocallis (like shade), Hepaticas (well-drained, moist, loamy soils), Herniaria glabra (carpet plant), Heuchera sanguinea, Hutchinsia alpina, Hyacinths, Iberis, Irises, Ixiolirion tataricum, Leucojums (Snowflakes), Lilies, Linaria, Linum, Lithospermum (especially the deep blue prostratum), Lychnis, Mazus Pumilio, Meconopsis, Mestensia sibirica and virginica (moist soil), Mimulus (moist, cool, loamy soil, and partial shade), Monarda didyma (Oswego

ERYTHRONIUM.

CERASTIUM BIEBERSTEINI.

Tea), moisture, Muscaris (Grape Hyacinths), Myosotis (Forget-me-nots), Narcissus (Daffodils), Nierembergia rivularis (a damp spot), OEnotheras (Evening Primroses), Omphalodes verna (creeping, a beautiful blue flower, a loamy soil, appreciates shade), Onosma taurica (Golden Drop), Orobus (especially azureus and vernus), Papaver (Poppies), Pentstemons, Phloxes (Dwarf), Phyteuma comosum (blue and purple flowers, gritty loam in clefts in rock garden), Plumbago Larpentæ, Podophyllum Emodi and peltatum, Polemoniums (Jacob's ladders), Polygonatums (Solomon's Seal), Potentilla, Pratia angulata, Primulas, Ramondia pyrenaica (moist soil, in shade), Ranunculus, Rodgersia podophylla (handsome foliage plant, moist shady spot), Sarracenia purpurea (hardy Pitcher plant, peaty bog), Saxifragas, Schivereckia podolica (light loam, sunny spot), Sedum, Sempervivum, Senecio, Silene, Soldanellas, Sternbergia lutea (Winter Daffodil), Thymes, Trilliums, Trollius, Tropæolum polyphyllum, Tiarella cordifolia (Foam-flower), Violas, Waldsteinia, Zauschneria californica, Zephyranthes.

Upon the garden or border a world of flowers may be placed, flowers of exquisite beauty and, except in a few instances, of easy culture. Even plants difficult to manage are worth consideration, for the sake of their loveliness when thoroughly established. It is interesting indeed to grow things that will not live anywhere.

FERNS ON ROCKWORK.

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A PANORAMA OF ROSES.

ROSES AND ROSE GARDENS.

By William Paul, F.L.S., of Waltham Cross.

"HIGH, high above your head, and on every side all down to the ground, the thicket is hemmed in and choked up by the interlacing boughs that droop with the weight of Roses, and load the slow air with their Damask breath!"

Everyone may not care to have a garden of Roses exclusively, but who among lovers of flowers would not like to see in his own garden a scene like the above, which was met with in Damascus and brought into notice by the facile pen of the author of "Eothen"? And to obtain such is the easiest thing imaginable. Plant some score or more free-growing Roses on any regular or irregular piece of well-manured and well-trenched ground, placing the plants in position 3ft. apart. Prune closely the first year, and then leave them to their own devices. They will flower yearly, and in three years "high above your head, and on every side all down to the ground," the branches will be crowned with masses of flowers. We have taken up the pen to record and emphasise this fact; and let it be noted that what is done once may be done over and over again with the different varieties, either in single or clusters of masses almost ad infinitum.

But we cannot leave the Rose with this brief notice. Grand as are the masses of Roses we have occasionally met with, we have never yet seen anything even approaching our conceptions of the scenes of grandeur and beauty that might be worked out by the massing of the modern varieties of Roses. A Rose garden is now almost indispensable, either as a part of or adjunct to every large and comprehensive garden. It may be a botanical Rose garden, an exhibition Rose garden, or what we are now advocating—a massing of Roses.

If in the original plan of a garden it cannot be conveniently worked in with the

general arrangements, then a separate piece of ground should be set apart for the purpose. This we have often seen done, and always found it a most interesting adjunct. But apart from the immediate question whether there is a separate Rose garden or not, Roses should be found plentifully in every general garden, for owing to the varied forms they are capable of assuming, either naturally or by training, they are seldom anywhere out of place. What with dwarfs, dwarf standards and standards, climbers, trailers, weepers, pillars, and pot Roses, there exists ample material to adorn the most select position, or to obliterate the most awkward spots, bringing them into harmony with the general design.

But what should a Rose garden formed with masses of Roses be? We will give our ideas as briefly as possible. It should be formed of few beds of sizes suitable to the space in hand, with gracefully-curved outlines and few points or angles, as Roses do not fill these angles satisfactorily. The beds should be placed far enough apart to admit of a few neat and dwarf evergreens being placed singly between them for the sake of foliage, in which Roses are too often deficient. The walks or spaces between should be generally of grass, which sets off the flowers to best advantage, with only here and there a walk of gravel, in order that the flowers may be conveniently reached in wet weather. The ground occupied should be free from the influence of both tops and roots of large trees, and be deeply trenched and enriched with well-seasoned manure previous to planting.

A FRAGRANT BOWER.

Now, the beds being ready, what are the best varieties to plant in them? This will depend on the uses to which the proprietor intends to put the flowers, or the direction in which he looks for gratification. Taken broadly, there are three distinct styles of Roses: (1) Roses for decorating the garden or massing; (2) Roses for decorating the dwelling-house (cut Roses); (3) Roses for growing for prizes at flower shows. Now, although some in each of these classes might serve for the purposes of the other, the best selections for each purpose would be widely different. This matter of selection is of vital importance. Most of the disappointments that we have been witness of, during a long life, have been due to injudicious selection; it may be good enough in itself, but not fitted to meet the ultimate objects in view. Free-flowering, free-growing, hardy Roses should be planted for massing.

In conclusion, we would say to everyone about to plant Roses, whether you adopt the principle of massing or not, before selecting the varieties make up your mind what you want in the future, and then, if you do not yourself know Roses, delegate the choice of sorts to someone who does, and whom you can trust to furnish you with sorts and plants best fitted to realise the ends in view.

Propagation of the Rose.

The Rose is too beautiful and important a flower of the English garden to lightly pass over, hence general remarks are given concerning it, and then each group taken separately. There are numerous races, all charming in their degree, and some little valued, although possessing great decorative beauty in beds, borders, and the pleasure ground. As propagation is frequently a vexed matter with amateurs, remarks are first made upon this interesting phase of Rose-culture.

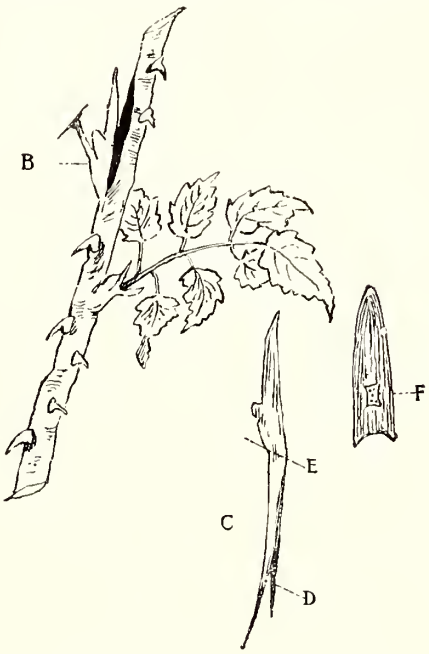

FIG. 1.

Propagation.—There are many methods of increasing Roses. They may be rooted from cuttings, both of matured and young wood; from eyes; by seed; and by budding and grafting. Budding upon some suitable foster-stock is the plan generally adopted. It gives much quicker returns, imparts more vigour to many varieties, and often, especially in the case of the darker-coloured Hybrid Perpetuals, a deeper and more brilliant colouring. This matter will be referred to again under the heading of "Stocks and their Preparation."

Budding.—Although a simple operation, it is not easy to describe. Therefore a rough illustration is given. Fig. 1 represents the bud and method of removing same, while Fig. 2 shows the bud inserted. But before one goes further into this subject it will be well to consider the selection of buds.

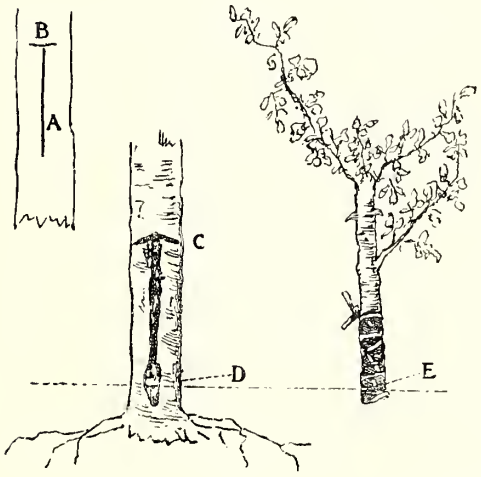

FIG. 2.

Always select from a healthy tree or plant, such as those that have given the most characteristic flowers of a particular variety. It is too much the practice to take buds from plants which have plenty of wood, not only because there is a natural reluctance to cut a plant which has carried and is carrying many blossoms, but because one does not seem to be wasting future flowers. This question of selection is of great importance, for if buds are got from a plant that is in any way poor, one naturally gets others of even less merit than the parent. The shoot from which a bud or eye is taken must be a little more than half ripe. The lower buds upon a long, growing shoot are in the correct stage; so, too, are those left below a full-blown flower. It is a good test to break off a few prickles. If they snap off freely, the wood is ripe enough, but if they hang, it is either too old or the reverse. The bark must lift easily, so that one can remove a small portion and also the piece of wood which will be covering the seat of the bud. Fig. 1 shows a piece of Rose growth

and the method of taking the bud. First of all the leaf is cut off about half an inch above the eye, as shown at A. Now insert a sharp knife about an inch above the bud (see B) and cut it out. In practice it is found better not to bring the knife quite through, but to tear off a portion of the bark, as shown by the detached bud C. This greatly facilitates the removal of that small portion of Rosewood covering the seat or root of the eye. The piece of wood must be detached, as unless the root—which will be referred to later—can rest upon the wood of the stock the whole operation will fail. Turn back the strip of bark, and the point of wood (D) will be easy to seize, when it must be snatched or jerked out. It is better to take a downward direction, commencing from the back of the bud; but should any wood still remain, it can generally be picked out from the opposite direction. As a matter of fact, unless this slight portion of Rosewood comes away easily the bud is not in a fit condition. Now cut off the bark as shown at E, and the root or seat of the eye should show prominently inside this portion (see F). Unless this seat or root be down so that it can rest fairly upon the young wood of the stock, they cannot form a union. If the bud is too old or the reverse, the root will tear away with the portion of Rosewood and leave a tiny hole often as large as a pin's head. Such a bud is useless.

FIG. 3.

Fig. 2 illustrates the method of preparing the stock and inserting the bud. Make a cut lengthwise of the stock as at A, and this may be 1½in. long, just penetrating the bark. The cross cut at B is simply to render the operation of lifting the bark more easy. Use the handle of a budding-knife, or a piece of thin ivory, and gently raise the bark without disturbing the glutinous sap between it and the wood more than can be avoided. Now slip the end of the prepared bud beneath the raised bark (C) and slide it down to the end of the cut (D). The next operation is to tie it in securely and firmly, but without undue constriction, leaving the bud exposed as at E. One must consider where to insert the bud. Our illustration portrays a dwarf stock raised from a cutting, such, for example, as the Manetti, De la Grifferaie, or Briar might be; but a dwarf from a seedling would need working in the same way. It will be seen that the bud is inserted as close as possible upon the roots. This is to avoid suckers from the stock, and to get the future Rose bush sufficiently low, so that valuable shoots may issue from its base. When budding a standard stock the buds are placed in the side branches or shoulders, again being careful to insert as near to the main stem as possible. Continental growers frequently bud their standards in the main stem, but they use a much younger stock than is general here.

Budding should be done during July and August as far as possible; but it is obvious that one must be guided by the season and condition of stock and bud.

FIG 4.

Fig. 3 is a rough illustration of a half-ripened cutting taken from a growing shoot. Generally speaking, the growths below a faded bloom, and also those that failed to produce a flower, and yet have stopped growing, are in excellent condition for this class of cutting. They should be from 4in. to 6in. long, and removed with a small portion of the older wood, as shown by the dotted lines at A. Longer growths, so long as about half matured, will also root if cut

into lengths of 4in. to 6in. and trimmed off close below an eye, but by far the most valuable form is that of Fig. 3.

In the case of cuttings while still in leaf, it is not advisable to remove the foliage, except it be the lower leaves to give a clear stem for insertion. Dibble the cuttings into a compost of sand, leaf soil, and turfy loam in equal proportions, using a 5½in. pot, and thoroughly drain this. The cuttings should be made firm, be well watered at once, and stood in a propagating case or deep box over which some squares of glass can be placed. A partially shaded position must be found for them, and if they get at all dry, give another thorough soaking in preference to overhead sprinkling. In from six to eight weeks they will have formed a ball of white substance—callus—at the base, and some of them will have produced a few roots. Give them a little higher bottom heat if possible, but still keep them quite close and avoid any suspicion of drought or excessive dampness. When it is found they have rooted, gradually remove the glass and expose to the air, after which, turn them out of the cutting-pots and repot into the same class of compost, this time placing each into a single pot—a convenient size is 2½in. across the top. Thoroughly water once more and replace in the case or box, keeping them quite close until it is seen that they have taken to the new soil, after which gradually expose and grow on as will be advised under the heading of "Pot Roses."

Ripened cuttings of Roses may be made in the autumn and treated exactly the same as will be described when dealing with "Stocks and their Preparation."

Rose eyes, in the same condition as that recommended for budding, can also be rooted freely if taken and inserted as shown in Figs. 4 and 5. This method will need no more explanation, except to say that they require the same soil and treatment as the half-ripened cuttings, but are better if given a gentle bottom heat as soon as callus is formed, and when about a sixteenth of an inch of silver sand is spread over the surface of the pots. Either of these methods may be adopted when Roses are wanted upon their own roots.

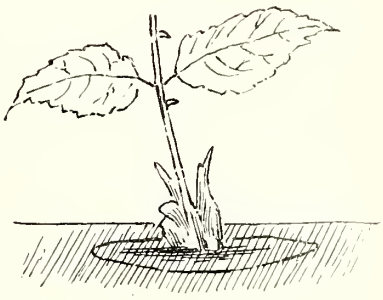

FIG. 5.

PREPARATION AND SELECTION OF STOCKS.—This is of great importance, for if the wrong stock is chosen for a Rose, or one indifferently prepared, no after culture is of any avail. For standards, the common hedge Briar is used. The Briars are collected during late autumn, the stems cut off to about the same height as the future Rose stem is to be, and the rough roots trimmed rather hard. It is better even to split the stem away, leaving only a small portion of the older root as a heel, than to have a coarse knob of old root. Younger knobs may also be cut back much harder than is generally practised. They should be planted at once, in a fairly stiff soil, and at least 4in. deep. In all cases of stocks it is better to plant them somewhat thickly, lift the Rose the first season after its maiden growth, trim the roots carefully, and replant into their permanent quarters. This saves space, blanks in the beds, and also the somewhat rough and unsightly appearance of stocks during their first season. Nor do stocks need so rich a soil as will be beneficial to the future Rose; indeed, they are better without, as a coarse-growing stock will frequently flood the bud with too much sap and swell so rapidly as to completely smother it.

Standard Briars may be planted 4in. apart in the rows, which should be 3½ft. asunder. Tread them up firmly, especially after a severe frost. When young growth breaks in the following spring, rub off all but two or three of the growths placed about the height the stem of the future Rose is desired to be, never allowing one branch to be directly beneath another.

Dwarfs are obtained from three distinct stocks, viz., the De la Grifferaie, Manetti,

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"COUNTRY LIFE."

and Briar, in both cutting and seedling form. The first two, and cuttings of Briar, are made up late in the autumn, ripened growth of the current season being used and cut into lengths of 8in. to 10in. In all of these the lower eyes are carefully cut out, and only two or three at the top left. Even one is sufficient. With ripened growth of Roses, however, the eyes should not be cut out; the reason, when preparing stocks, is to avoid future suckers, but in the case of Roses upon their own roots these would be the most valuable growth. Insert the cuttings into a sandy loam, taking out a trench some 6in. or so in depth and setting the cuttings at the back of this, 3in. from each other. Turn over more soil, until another row can be set in 15in. from the first. Continue this until the whole are inserted. Hoe between them during the following spring and summer, and plant out for budding upon early in the spring. Seedlings are raised from heps, which should be placed in sand as soon as gathered, kept free from mice, and rubbed between the hands to separate the seed early in February. Sow in boxes of light soil, or in a cold frame, transplanting them the second spring. Any that are as large as a cedar wood lead pencil will do to bud upon the ensuing summer, as they swell more quickly than other stocks.

A TEA ROSE.

Consideration should be given to the matter of distances at which to plant the stocks. If a few be placed 1ft. apart in the row, and the rows 2ft. apart, that will suffice for medium and weak growers. But with such rampant-growing varieties as Gloire de Dijon, Ulrich Brunner, and others, a third more room will be needed.

When the stocks are lifted there will be several pieces of side roots growing from where the eyes were removed. These should be cut off closely, and also the coarser ones of all other roots. Trim back the tops to within two or three eyes. Always plant dwarf stocks very shallow, and draw some of the surrounding soil around their base as protection. Unless planted shallow, it is almost impossible to work the Rose bud as low as is desirable (see Fig. 2). Previous to inserting the bud, draw the soil away, and you will have a moist easily lifting bark, and be able to get the bud well upon the crown of the roots.

The question of what stocks to use is mainly dependent upon the soil and variety of Rose to be placed upon them. The Manetti is a capital stock for most Hybrid Perpetuals, Bourbons, and a few of the Hybrid Teas; but it is almost fatal to the weak growers of either section, and should never be used for the Teas and Noisettes. It does not so much matter with Roses in pots, as here the coarser-growing roots are confined. The Manetti is earlier in blooming, and plants worked upon it will generally be a week or two ahead of others in the same position. It is suitable for light and medium soils,

The cutting Briar is the most useful of all dwarf stocks, as it will suit all Roses and soils; but it is, unfortunately, the worst to transplant. If seedlings are used, the tap root must be cut back when planting for budding, and again when lifting the maiden plants previous to placing them in their permanent quarters. The Briar is a stock that can scarcely be surpassed, and is now far more generally used than all the others combined. De la Grifferaie is a rank grower, and suitable for a heavy soil and for climbers.

SOILS AND MANURES.—Almost any soil will grow Roses, provided a proper selection of varieties be made and attention given to the application of suitable manures. Of course, Roses enjoy a rich soil, but to keep adding cow, horse, and pig manures upon a naturally rich ground is not so beneficial as a change to nitrate of soda in the case of light soils, or soot for those that are naturally very close and stiff. This subject is, therefore, more a question of judicious manuring than selection. Roses are brought from a wide area, as the exhibitors' cards at any of the National Rose Society's exhibitions reveal. It is not unusual for all three countries to be represented. As a matter of fact, at the Crystal Palace Rose Show of 1897 no less than thirty counties sent Roses for competition, and in many cases the soils in these differed to a remarkable extent. The golden rule is to add what the ground is most deficient in, and never to apply close, moisture-retaining manures to a soil that is naturally stiff and moist. A very dry and sandy compost may easily be made suitable by adding a few loads of stiff loam and clay, also by manuring with pig manure; while, by adopting the opposite plan, a stiff, poor soil may be worked into equally good condition. The ideal material is fairly stiff, not too wet, and not less than 3ft. to 4ft. in depth. This can be enriched at will.

ENEMIES AND DISEASES.—These probably afflict the Rose as much as any other plant, and some of them are serious plagues. Among insects are the aphis or green-fly, scale, thrips, red spider, maggot and grubs, caterpillars, weevils, beetles, and the larvæ of the stem-boring saw-fly. In diseases, the worst are mildew, red rust, orange fungus, canker, and a fungus known as Actinonema rosæ. The last is very prevalent in some years, seldom appears before autumn, and consists of dark purplish brown spots, which soon spread all over the leaf. It spreads rapidly, and will in a short time denude the trees of all foliage. The first leaves should be picked off and burnt as soon as affected.

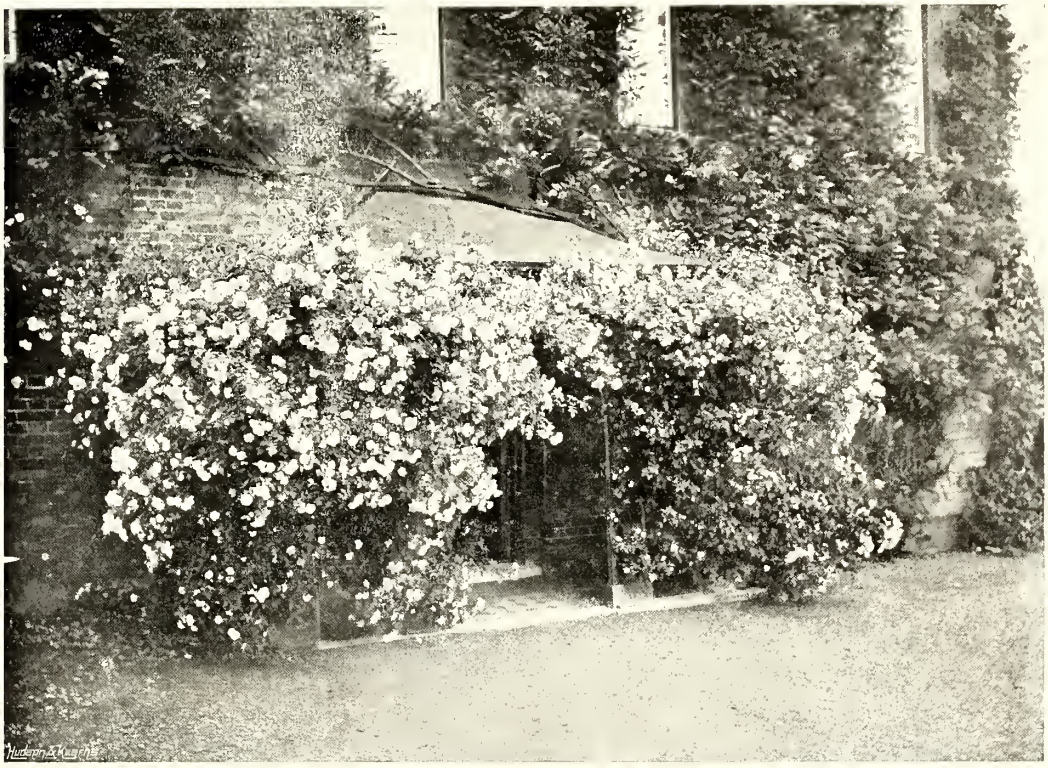
Mildew is by far the worst of the diseases. It is a grey, dust-like fungus, forming upon young foliage and growth in the first place, and soon causing the whole to shrivel. It will sometimes completely ruin the prospects for a season. Experience has proved that it is generally brought on, and certainly much encouraged, by draughts and sudden atmospheric changes. In fact, extremes of any description are almost certain to develop mildew. Many solutions have been tried, but the recipe given at the end of this section is generally acknowledged as being the safest and most effectual. Still, no remedy will be of permanent service unless one seeks the cause of this disease, therefore one must look to that point at the same time as applying the solutions.

Red rust and orange fungus are supposed to be periodical conditions of the same disease. Orange fungus is a small, wart-like excrescence covered with a powder of a deep orange colour. It does little, if any, harm in this stage, but when the spores develop into red rust the matter is more serious. Red rust soon causes the leaves to look as if ripening prematurely, and to become parched and brown, soon falling off, almost as if a sharp frost had occurred in the autumn. There is no known cure for this, and it is fortunate that our beautiful autumn-flowering Teas and Noisettes, also the Rugosa kinds, and a few more, are not affected with its ravages. It seldom appears before autumn, and is equally as prevalent upon all stocks and soils, and during seasons of opposite character.

Canker has most effect upon Maréchal Niel, William Allen Richardson, and a few more; but it also affects other varieties when grown upon unsuitable stocks, several of the Hybrid Perpetuals and Teas quickly showing symptoms of its presence if upon the

Manetti. This is another disease that is not thoroughly understood yet, for a Maréchal Niel or other Rose may be suffering from it badly, and yet a second plant, placed in the same soil and under exactly similar treatment, will go on for many years and not develop the least suspicion of the disease. Canker is a warty lump that develops quickly. The decay seems to work inwards and constrict the plant. It usually occurs near the base of a plant, and has more than once been noticed in greater virulence than usual after a strong-growing Rose has been cut hard back while in full growth and sap. On the other hand, plants have been so pruned year after year with no ill results. It is not caused by an insect in the first place, or we should undoubtedly not find the many isolated examples among Roses in perfect health. That insects visit such cankered growth, and by irritation succeed in drawing the sweet sap which would eventually form into callus, and thus are to some extent responsible for the rapid failing of an affected plant, the writer has not the least doubt.

The best cure, or rather assistance to a plant so affected, seems to be to remove as much as possible of the excrescence and give an application of fresh cow dung. At the



A ROSE-COVERED DOORWAY.

same time, it is always well to have a young specimen ready to take its place, and, as before remarked, it is highly improbable that this will also develop the disease.

Green-fly or aphis is the most prevalent insect enemy. It troubles Roses both under glass and in the open ground, and is generally a great trial early in the season. Its appearance is too well known to need any description here.

Red spider is generally worse under glass, but can be easily battled against if the atmosphere be kept more moist. Once it has obtained a firm hold upon the foliage, it forms small webs beneath the leaves, and it is difficult to reach them with any liquid solutions. It is not red in any way, but a minute grey-coloured insect which soon causes the leaves to put on a parched, starved appearance and cripples the plant seriously.

Thrips cause much the same appearance, but are a tiny, dirty brown insect with a

long body. The same methods are adopted to kill both. A larger variety of thrips generally affects Rose blooms in the open, more especially when the summer has been very dry. These completely spoil the light-coloured flowers. There seems no way of getting rid of these, and it is fortunate that the first shower is the best remedy. Syringing has been resorted to in hopes of accomplishing the same end, but never with any material benefit.

Scale is a small shell-covered, brown insect, ranging in size from a small to a large pin's head. It is difficult to kill, and unless the plant be of much value, it is best to burn it at once. Climbing Roses under glass are most affected by this pest.

Caterpillars and grubs must be killed by hand; so too must the leaf-curling maggots. No syringing seems to actually kill these without being too strong for the Rose itself. Pinch the curled leaf and insect between the thumb and finger. A little observation soon makes it easy to distinguish between those curled by the enemy, or naturally curled before full expansion, and perseverance for a few days early in the season will keep them at bay for the rest of the summer.

THE ROSE GARDEN AT BATTLE ABBEY.

Weevils are a great nuisance during some seasons, especially the night feeders. They eat holes in both petals and leaves, and also gnaw around the pod of the bud to such an extent as to quite spoil it. Here, again, the best method is hand catching. Approach the plant very quietly late in the evening, slip a sheet of paper below it, and then flash a light on it, the result being that many may be caught before they can drop and regain their shelter.

Amongst the worst spring and early summer pests are the stem-boring saw-flies and their larvæ. These lay their eggs in the points of shoots, and the maggot soon hatches, eats the pith out of the stem, and causes it to die above. Many promising shoots and blooms are annually ruined in this manner. Among the Standard Briars, too, they are particularly destructive, generally eating through the pith of the Standard stem, and penetrating so deeply from the top as to pass and kill the shoulder carrying Rose growth. It is a good plan, in districts where these insects abound, to place a little mastic over the tops of Briar stems and wherever an important branch is cut. Pitch, wax or a composite candle, in equal proportions, with a very little resin, will make a good mastic if boiled down together. This may be applied

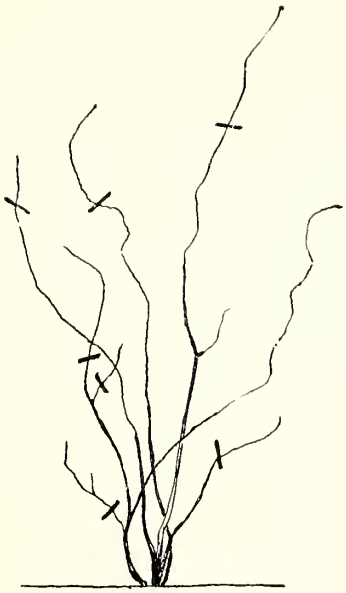


FIG. 6.

warm enough to work easily, when a large number of wounds can be made secure in a short time. If fumigation be used, let the fumes of tobacco be weak, but continued for a couple of hours, in preference to a very strong application.

INSECTICIDES.—Boil 2lb. of soft soap in two gallons of water; while still on the boil, and immediately it has been removed from the fire, add half a pint of paraffin oil and a quarter of a pound of flowers of sulphur. The black sulphur is less unsightly than the yellow, but not quite so destructive. Stir the whole together and bottle off when cool. Before using, shake the bottle well, and then add half a pint of the solution to a gallon of soft water, applying with a syringe, and at a temperature of 70deg. to 75deg. This is suitable for all washes, but if red-spider and thrips are very prevalent it may be used a little stronger. The sulphur deposit is left upon the foliage in a far more uniform manner, both above and below the foliage, than can possibly be the case by dusting, while the combination of these ingredients is deadly to all insects and mildew germs. For scale, the solution should be used direct from the bottle, but this must only be applied with the point of a stick or a small brush, letting a little come into contact with each full-grown insect.

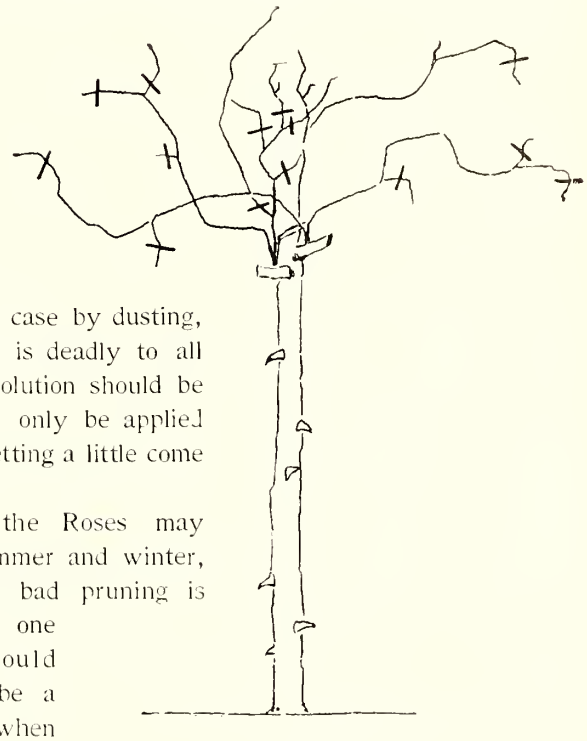


FIG 8.

PRUNING.—No matter how well the Roses may have been grown during the previous summer and winter, satisfactory results cannot be expected if bad pruning is allowed. To prune all Roses upon one system would obviously be a mistake, when one remembers the vast difference in habit and growth. The little Fairy or Lawrenceana Roses seldom grow more than 15in. high; whilst Maréchal Niel and Rêve d'Or, with others, often exceed 15ft. In many sections we find these extremes of growth. Then, again, one must give a little consideration to the object in view when pruning. Is it to obtain a quantity of bloom or a few flowers of the highest quality? Only a few general rules can be laid down here, and in order to simplify this part of the subject the question of classes will be almost ignored.

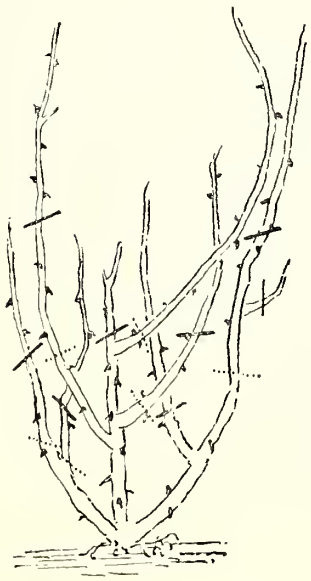


FIG. 7.

Fig. 6 is a representative of a medium-growing dwarf Rose, about two years old. Not all of these will be as clean in growth as the one represented, but the same system of pruning may be adopted where a good display of blossom is wanted. The cross

marks show where to prune. If you want a few flowers of high quality the plant should be pruned at the dotted lines, and then assisted by high culture. Fig. 7 is a strong grower of the Ulrich Brunner type, and one which gives better results when its long shoots are left almost intact, pegging them down to within a few inches of the ground. To cut away the whole of these long, flowerless growths would only result in a number of similar shoots being made, and if the same system of pruning was again followed, the variety would probably be condemned as a shy bloomer. It is the same with climbers upon walls or fences, and with strong growers when upon Standards. In fig. 8, the cross marks again show the spot where the shoots should be severed.

In pruning always use a sharp knife, cut off at an eye with an outward tendency, and thin the centre of the plant as far as possible. There are cases upon walls where a system of spurring in the side growths can be adopted to advantage, as otherwise the wall

ARCHES OF ROSES.

would be comparatively bare; but with strong-growing Standards the long branches will droop over from the weight of flowers and have a more charming effect. A Standard of a medium grower would be pruned similarly to the dwarf plant shown in Fig. 6.

HOW TO PLANT A ROSE may seem a simple matter, but many have laid the foundation of failure through bad planting. Never plant in a very wet soil, nor allow crude manures to come into direct contact with the roots. See that the roots are spread out properly and naturally, not pressed into a small hole and cramped and distorted from the first. Plant dwarf kinds 2in. deeper than the junction of Rose and stock, and Standards 3in. below the original root when taken from the hedgerow. To place a small grower side by side with one of three or four times the strength is a great mistake, and the weaker grower has no chance whatever. For medium growers 3ft. is a good distance, while plants of greater vigour will need to be from 4ft. to 6ft. apart. Do not plant against a wall, but leave some 4in. or 6in. between the wall and the base of the plant.

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ROSES IN POTS, AND AS CLIMBERS UNDER GLASS.—Mention has already been made of pruning and insects, with various diseases. All these remarks apply to Roses in pots, except that the latter are generally pruned a little harder than those in the open. Drain well, pot firmly, and use, as nearly as possible, the following compost: Turfy loam one half, with one fourth each of leaf soil and well-decayed manure; add a few half-inch bones and a dash of coarse sand. Never break the compost up finely, but place the coarser portions over the drainage and ram in the remainder with a blunt label. Ventilation is the great point here, and endeavour to secure an uniform temperature ranging from 40deg. to 45deg. when first starting growth, gradually increasing to 65deg. If bright suns and keen winds prevail, slight shade is necessary to assist in keeping the temperature at a lower stage without so much risk of draughts from over-ventilation, which is by far the most prevalent cause of mildew. Give liquid manures freely to growing plants when their roots are established, but let it be weak. Do not fear to damp down with a little of the same, as Rose foliage is much improved by the ammonia arising from this.

GENERAL REMARKS.—Roses in the open, and especially when in an exposed situation, need a slight protection against severe weather. All dwarf plants can be earthed up, in much the same way as potatoes are, when if a few branches of heath, gorse, fir, or laurel be stuck upon the exposed side during a spell of severe weather they will come through the winter safely. Standards will need the same, or straw tied among the heads, if much exposed. Maiden Roses should be carefully earthed or moulded up early after new growths break; and at pruning time, all stocks, Dwarfs and Standards, should be cut back close to the Rose bud inserted during the previous summer. A mulch of manure during winter, and again in summer, if dry, will be a great help, while watering and disbudding depend entirely upon whether one wants extra quality or not.

Selections for Various Purposes and Soils.

TWENTY-THREE ROSES FOR POTS.

REDS.—General Jacqueminot, W. F. Bennett, Princesse de Sagan, and Souvenir de T. Levet.

WHITES.—Niphetos, The Bride, Souvenir de S. A. Prince, and Mme. Lacharme.

PINKS.—Souvenir d'un Ami, Catherine Mermet, and Mme. Lambard.

YELLOWS.—Marie Van Houtte, Mme. Hoste, Medea, and Perle des Jardins.

ORANGE AND APRICOTS.—Mme. Falcot, Mme. Charles, Sunset, and Francisca Kruger.

SALMON AND YELLOW.—Comtesse de Nadaillac, G. Nabonnand, Princess of Wales, and Comtesse de Panisse.

TWENTY-SIX CLIMBERS.

REDS.—Reine Marie Henriette, Waltham Climber No. III., Cheshunt Hybrid, Mme. Desir, Reine Olga de Wurtemburg, Crimson Rambler, and Longworth Rambler.

WHITES.—Aimée Vibert, Climbing Niphetos, Felicité-Perpetue, and Madame Alfred Carrière.

PINKS.—Setina, Climbing La France, and Pink Rover.

YELLOWS.—Belle Lyonnaise, Celine Forestier, Maréchal Niel, Bouquet d'Or (buff yellow), and Gloire de Dijon.

ORANGE AND APRICOTS.—Comtesse de Bouchard, Duchesse d'Auerstädt, William Allen Richardson, L'Ideale, Madame Chauvry, Rêve d'Or, and Mme. Bérard.

TWENTY-FOUR FOR BUTTON-HOLES.

REDS.—General Jacqueminot, Prince C. de Rohan, W. F. Bennett, and Princesse de Sagan.

WHITES.—Niphetos, Boule de Neige, Elise Fugier, and The Bride.

PINKS.—Goubault, Jules Margottin, W. J. Grant, and Mrs. W. C. Whitney.

YELLOWS.—Perle des Jardins, Madame Hoste, Medea, Isabella Sprunt, and Marie Van Houtte.

APRICOTS.—Mme. Falcot, Francisca Kruger, and Jules Finger.

SALMON AND YELLOW.—Anna Ollivier, Dr. Grill, G. Nabonnand, and Maman Cochet.

TWENTY-FOUR FOR TOWN AND SUBURBAN GARDENS.

REDS.—General Jacqueminot, Alfred Colomb, Abel Carrière, Dupuy Jamain, and Cheshunt Hybrid (climber).

PINKS.—Mrs. John Laing, Baroness Rothschild, La France, Captain Christy, and Pink Rover (climber).

WHITES.—Boule de Neige, Merveille de Lyon, and Aimée Vibert (climber).

YELLOWS.—Marie Van Houtte, Mme. Hoste, Emily Dupuy (climber), and Medea.

APRICOT.—Francisca Kruger, Safrano, Rêve d'Or (climber).

SALMON.—G. Nabonnand, Bouquet d'Or (climber), Dr. Grill, and Felicité-Perpetue (creamy salmon, climber).

TWENTY-FOUR FOR MASSING.

REDS.—Marquise de Salisbury, Cheshunt Scarlet, Crimson Queen, and Mrs. Baker.

WHITES.—Augustine Guinoisseau, Merveille de Lyon, Marchioness of Londonderry, and Edith Gifford.

PINKS.—Baroness Rothschild, La France, Heinrich Schultheis, and Common China.

YELLOWS.—Amazone, Marie Van Houtte, Isabella Sprunt, Medea, and Mme. Hoste.

SALMONS.—Viscountess Folkestone, Dr. Grill, G. Nabonnand, Luciole, Mme. Lambard, Mme. de Watteville, and Maman Cochet.

SIX CLIMBERS FOR AN EXPOSED AND COLD POSITION.

Gloire de Dijon, Emily Dupuy. Mme. A. Carrière, Reine Marie Henriette, Mme. Bérard, and Climbing Souvenir de la Malmaison.

TWELVE BUSH ROSES FOR SIMILAR ASPECT.

Captain Christy, General Jacqueminot, Baroness Rothschild, Boule de Neige, Souvenir de la Malmaison, Homère, Viscountess Folkestone, Caroline Testout, Marie Van Houtte, Francisca Kruger, Mrs. John Laing, and Ulrich Brunner. This is a mixture of Tea and Hybrid Roses, all varieties of exceeding beauty and great vigour, the Teas especially.

TWELVE ROSES VERY SWEETLY SCENTED.

Mme. Alfred Carrière (yellowish white, climber), Waltham Climber No. III. (crimson, climber), Goubault (rosy buff), Mme. de Watteville (salmon and pink), Socrates (salmon and apricot), Catherine Mermet (pink), La France (salmon pink), Viscountess Folkestone (salmon and white), Laurence Allen (flesh), Heinrich Schultheis (pink), General Jacqueminot (deep red), and Charles Lefebvre.

There will be found more than one duplicate in the lists given, but in these cases the variety is so useful for each purpose that it could not be passed over simply because it had been already mentioned.

THE TEA ROSE.

WHEN the Blush Tea Rose came from China in 1810, few flower gardeners were aware that in their midst was a plant destined to change the face in no small degree of the English garden. The old Roses of the day scented the June breezes with their sweet breath, but the Tea Roses of our time, which had their origin in the Rose from China, have upset the old order of things. Rose time is no longer the leafy month of June, for the Teas, Chinas,

A BUNCH OF TEA ROSES.

and other hybrid races are with us until the late autumn rains and frosts. Ten years later than the Blush Tea came the Yellow Tea, with the result that the still precious and always beautiful Devoniensis was born into the Rose world through this union. Few kinds, however, were raised until 1860, but between this year and 1870 a noble set of varieties was given to the world, including Alba Rosea, Belle Lyonnaise, Catherine Mermet, Jean Pernet, La Boule d'Or, Mme. Charles, one of the most beautiful of the whole race, Mme. Margottin, President, the Noisette Reve d'Or, and Maréchal Niel, which was raised in 1864. It is interesting to know that the Rev. Mr. Hollingsworth was one of the first to exhibit Tea-scented Roses, and his flowers at the show held in Hanover Square Rooms in 1858 were a revelation.

Their subtle tints and sweet fragrance stimulated an interest in the race. Tea Roses are the most queenly flowers of the family, tender and beautiful in colouring, careless in growth, but welcome always for their leaf tints, especially when the young shoots, as crimson as the Pæony, spear through the ground in spring. Such pure colours are not found in any other group, and either on the plant or when gathered for the house their delicacy is delightful. It is pleasurable indeed to wander into the garden on an autumn morning and gather the dew-spangled flowers, fresher and richer in colour even than in summer, when Roses fling their odorous burdens over shrub and hedge. There is an artlessness and freedom about the Tea Rose—nothing prim or suggestive of the show-board; and let it be remembered that from early summer until the late autumn, even winter when the weather is kind, this lovely tribe offers its precious gifts.

Culture of Tea Roses.

Tea-scented Roses are easy to grow. They delight in a very sunny position, well sheltered by trees or walls from north and east winds, and with a good selection of the true Teas and the Hybrids the beds would give flowers for many months. Plant each variety in a group by itself, never mixing up the kinds indiscriminately, say twelve plants to one group, with, if desired, Pansies or low-growing flowers amongst them. Make the border in a similar way to one for Vines, giving ample drainage and no surfeit of manure. If the natural soil be poor, take out 3ft. of it, and put in 1ft. of brick rubbish and 2ft. of good silky loam, which if somewhat stony will be none the less valuable. Add to the loam some crushed bones or bone meal, and thoroughly decayed cow dung and wood ashes. Put turf at the bottom on the drainage, and well mix the other ingredients. If the soil be very heavy, mix with it burnt clay, and raise the beds a little to throw off superfluous moisture. An old gravel pit filled up with garden refuse makes a good place for Tea Roses. When dealing with very light and sandy soils, add stiff loam, well pulverised by air and frost.

The time to plant is October or early November, or in March and April, choosing October before the other times, but Roses may be even planted in August, September, or

RED DAMASK ROSES AND WHITE LILIES

throughout the spring, if transferred from pots. Prepare the ground a month before planting.

As regards stocks, use for dwarfs the seedling Briar, but the cutting Briar is also a good stock, and both the De la Grifferaie and Polyantha are also employed. To simplify matters use the seedling Briar and avoid the Manetti, which makes a bad union. Much depends upon the stock used, and frequently failure may be attributed only to the wrong kind. Where possible, always, however, procure own root plants, *i.e.*, plants upon no stock whatever. When forming Standards, use, of course, as a stock the familiar Dog Rose. Tea Roses make buxom Standards, which, unfortunately, are subject to annihilation by frost. A hard winter will kill them wholesale, even when protected by sticking fern amongst the branches. Standards should be frequently transplanted, or laid in under a north wall each autumn until spring. This practice will naturally retard them somewhat, but this is better than an ugly crippled stick, an apology for a Standard Rose.

GLOIRE DE DIJON ROSE.

The way to protect Tea Roses is, in the case of dwarf or low plants, to mould them up each autumn with burnt garden refuse or soil, which should be removed in the following April. Unless the climate and situation are very favourable, movable glass copings are advisable on walls of Tea Roses, and bracken amongst the shoots, too, if severe weather is anticipated.

If the border be made as advised, very little feeding will be needful until the plants have been in their present position more than three years. An excellent fertiliser is night soil, which may be poured on in May and June into drills drawn in the centre of the rows and covered up. Rains will wash it down to the roots. A safer liquid manure is made with cow dung, sheep's dung, wood ashes, and bone meal, but always remember that weak doses given often are more effective than a few very strong applications.

SPECIAL TREATMENT OF VARIOUS KINDS.—Many kinds, such as La Boule d'Or, Souvenir d'Elise Vardon, Medea, and Cleopatra, are best grown at the foot of a wall. Make a shallow, saucer-like cavity around each plant, and give good doses of liquid manure during the growing period. Remarkable blooms may be obtained in this way, and one wants high-class flowers for exhibition. Certain kinds of poor growth, of which Ethel Brownlow, Corinna, etc., may be instanced, require to be well thinned. It will be well to lay slates down on the soil when the plants are on low walls, to throw off superfluous moisture in wet seasons. Hoeing is a useful operation, and much better than applying too much water in a hot year. If the plants are watered there must be no stint, then hoe freely afterwards and mulch with strawy manure.

To induce the Roses to bloom as freely as possible, cut some of the flowers before they expand, as this will enable the shoot to ripen more quickly and commence another growth. Tea-scented Roses require abundance of moisture in hot weather, if the drainage be good, and this will keep them growing and also flowering freely. If movable lights were placed over some beds of Tea Roses in September the buds would develop better and continue to expand until Christmas.

INSECTS AND DISEASES.—Tea Roses are perhaps freer from insect trials than other classes. They cannot stand stagnant moisture, which causes the leaves to drop. Thrips are troublesome, and sully the flowers, but when flowers are required for show it is well to tie them up in a paper bag. They suffer less from fungoid troubles than the Hybrid Perpetuals, otherwise all Roses share about the same fate.

PROPAGATION is effected by budding in July, by cuttings, by grafting, and by layering. Cuttings should be selected from wood that has flowered, and put them in during July in sand under glass. Make the cuttings about 3in. long and do not remove the leaves. Sprinkle the cuttings occasionally and keep them slightly shaded, when they will quickly root. Pot up when rooted and grow on in gentle heat, and plant out in the following spring. This course is strongly advised. Grafting is done by using the roots of Briars in November. Lay them in a shed in sand, and bed out in April. Strong growers, such as Gloire de Dijon and Grace Darling, can be layered very easily, and July is the most suitable month for the work.

TEA-SCENTED ROSES IN POTS.—This group and the hybrid forms are delightful pot plants, and under glass the colours are very pure, although frequently the charming tints seen on the petals in the open garden disappear. A good time to procure plants for pots is in autumn, when they can be purchased already established, or pot them up from the ground and grow out of doors for a year. Prune them according to the time they are desired in flower; that is, if to flower in February and March, prune in November. Keep the plants dry, after pruning, until the new growths are 2in. or 3in. long, and soak them then with water slightly warm. This is a point of much importance. Cold water chills the roots and checks healthy growth. Be careful in watering to keep the plants at first rather too dry than otherwise. This class of Rose appreciates warmth, preferring a temperature of about 55deg. at night, rising to 60deg. or 62deg. in the daytime. The Meteor is a very useful indoor kind and largely grown in America, where it is considered the best winter red flower, but it is useless out of doors. It must have a temperature of 65deg. at night, with a proportionate rise by day. After first flowering, thin out the shoots and grow on the plants again in heat, turning them out of doors about July. They should then be repotted if necessary, but some growers do not repot every year, merely top dressing the plants. Specimens of this kind, if the pots are full of roots, would require liberal feeding with liquid manure, and an occasional sprinkling of some good artificial fertiliser. The compost for pot Roses should consist of three parts of good fibrous loam, and a part each of well-decayed cow dung and leaf mould with a little sharp silver sand, wood ashes, and bone meal.

The most successful results are, however, obtained from plants in borders under glass, not pots. When this practice is followed, trench the ground well, working in some bone meal, and plant out from 48 sized pots in June. In two or three years the plants will be from 3ft. to 4ft. high, with wood as thick as one's finger. Give the plants a rest for three weeks or a month in July or August. They will then make new growth, and produce beautiful flowers in September and October, continuing to bloom all the winter. The lights of the houses should be movable, so as to allow rains and dews to fall upon the plants at times.

When the Roses are in pots, and they have been taken out of doors after flowering, stand them upon bricks and then plunge in coal ashes or cocoa-nut fibre refuse. Keep them watered and give liquid manure occasionally. If flowers are desired at Christmas, pick off all the buds until September. Then remove the plants to a cold house, when buds will be produced which will develop, with gentle heat, about Christmas. The Tea-scented Roses make noble pot specimens, and in the past plants of Mme. Willermoz and others have been as high as 7ft., bearing upwards of 200 flowers, a glorious feast of beauty.

Maréchal Niel is best grown, where space is available, as a Standard, and the way

to get a plant of this kind is to prune back hard the first year and train two shoots horizontally. Take growths the next year from these perpendicularly, and these will flower freely the following season. Then, after blooming, cut them down to the main stems. They will make somewhat long growths the same year to supply next season's burden of blossom.

W. A. Richardson, another favourite Rose, and others of its nature, may be grown in pots, and the long growths tied down to wires running along the bench. These shoots bear flowers from every eye, and after blooming cut them down and grow on the plants in heat to produce new growths—like a pot vine—for next year's flowering. Some of the dwarf Teas make beautiful half climbers. Plants fully 10ft. high, of Niphetos and Sunset, may be seen at Hatfield House well covered with flowers. They are in a conservatory where Camellias flourish in the borders.

Hybrid Tea Roses.

THIS is a very charming race, as a rule, of stiffer and sturdier growth than the true Teas, but quite as free in every way. Not a few, however, approach very closely the Hybrid Perpetuals, indeed it is difficult to trace any difference between the two groups. They force readily, and will stand cooler treatment than the pure Teas.

ROSE WHITE PET IN GREY JAR.

The first Hybrid Tea, and one of the most beautiful, is La France, which appeared in 1867; it is interesting to know that the well-known Captain Christy and Cheshunt Hybrid were introduced in 1873, and five years later Mr. Henry Bennett commenced to send out his famous hybrids. This raiser gave to the world such exquisite Roses as Grace Darling and Viscountess Folkestone.

The Noisettes, which so closely resemble the true Teas, originated from a cross between the Musk and the China Rose, and were obtained by M. Noisette in America in 1820. The flowers are produced in bunches, but the dividing line between the two groups is so thin that the two races might be merged into one another with advantage.

TEA ROSES FOR THE GARDEN.—Chief amongst these are Anna Ollivier, Marie Van Houtte, Perle des Jardins, rich yellow; Francisca Kruger, rich bronzy shade; Mme. Hoste,

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ROSE BEDS AND CLIMBERS AT SHIPLAKE COURT, HENLEY.

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Princesse de Sagan, Sylph, pink and white; Innocente Pirola, ivory white; Francis Dubrieul, crimson; Mme. Lambard, deep pink and bronzy hue; Souvenir de S. A. Prince; Mme. Charles, a beautiful garden Rose of delightful colouring, the flowers as rich as an apricot in colour; Comtesse Riza du Parc, Ernest Metz, Niphetos; Safrano, a mingling of many tender colours; Mme. Falcot, apricot, which experience shows to be rather uncertain; Catherine Mermet, Marquise de Vivens, Hon. E. Gifford, white; Souvenir de C. Guillot, scarlet and orange; Mme. C. Pernet, Ethel Brownlow, pink; Dr. Grill, bronze, yellow, and other shades, a beautiful garden Rose; Adam, Rubens, Jean Ducher, Souvenir de Paul Neyron, Corinna, pink and buff; G. Nabonnand, a Rose of charming colours, strong, free, and very hardy, a variety to make large groups of; and the now popular Maman Cochet and its white form.

HYBRID TEA ROSES FOR BEDDING.—Grace Darling, Kaiserin A. Victoria, Camoens, Papa Gontier, the beautiful Viscountess Folkestone, a Rose everyone who has a good garden

HYBRID TEA ROSE VISCOUNTESS FOLKESTONE.

should possess; Mme. Pernet Ducher, Clara Watson, Mme. Abel Chatenay, Souvenir de Mme. E. Verdier, Antoine Rivoire, Princess Bonnie, Josephine Marot, Grand Duc de Luxembourg, Marquise de Salisbury, a brilliant self crimson, almost scarlet, Rose; La France, Caroline Testout, one of the finest of its race, a pink Rose of much beauty; Captain Christy, Belle Siebrecht, Gustave Regis, Gloire Lyonnaise, a clear lemon colour, and the charming Augustine Guinoisseau, which has very fragrant flowers, white with pink suffusion in the centre—an excellent garden Rose, particularly for the autumn.

BEST TEA AND HYBRID TEA ROSES FOR CUTTING UNDER GLASS.—Bridesmaid, deep pink; The Bride, white; Catherine Mermet, pink; Perle des Jardins, yellow; Niphetos, La France, Duchess of Albany, rich pink; Belle Siebrecht, Safrano, Kaiserin Augusta Victoria, creamy white; Souvenir de President Carnot and Papa Gontier, crimson.

BEST CLIMBERS OF TEA AND NOISETTE SECTIONS.—Gloire de Dijon, Maréchal Niel, Climbing Devoniensis, Belle Lyonnaise, Mme. Berard, Bouquet d'Or, Duchesse d'Auerstadt,

Alister Stella Gray, Mme. Chauvry, Kaiserin Frederick, Climbing Perle des Jardins, and Climbing Niphetos. Of Noisettes none are more charming than Mme. Alfred Carriere, Aimée Vibert, W. A. Richardson, Celine Forestier, Reve d'Or, L'Ideal, and Mme. P. Cochet. Of Hybrid Teas choose Cheshunt Hybrid, Reine Marie Henriette, Waltham Climber No. III., Reine Olga de Wurtemberg, Souvenir de Mme. J. Metral, Pink Rover, Marie Lavallée, and Gustave Regis.

ROSE COMING OVER WALL.

The Hybrid Perpetual Rose.

This group of Roses has been overshadowed considerably, as far as the garden is concerned, by the dainty Tea varieties; but to ignore the older and stronger race is wrong. Hybrid Perpetual Roses possess much beauty. The flowers are often of resplendent colouring and strong fragrance, richer and more fulsome, perhaps, than the soft perfume of the Tea Rose, although as welcome in the garden. Unfortunately hot suns quickly destroy their freshness; the petals seem too stout and velvety to withstand days of fierce sunlight. If delicate and subtle tints are less frequent in the Hybrid Perpetuals than the Tea Rose, there is greater brilliancy, richer perfume, and hardiness. The Hybrid Tea varieties may be exhibited with the Hybrid Perpetuals, but the former will not be described with them, as they are alluded to when reviewing the Tea-scented section.

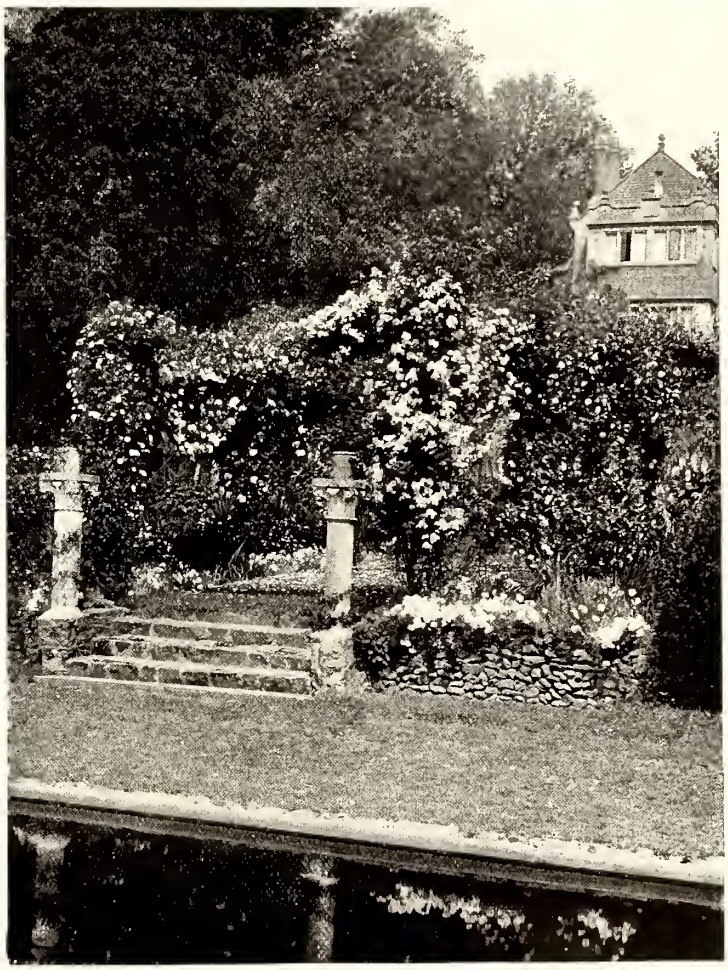
The Hybrid Perpetual Roses, as the name signifies, are of hybrid origin, but the Tea-scented kinds have greater claim to the description of "perpetual," as they commence to bloom quite as early, and remain in beauty even into the winter when the weather is mild. They have their origin in the Damask Perpetual on the one side, and the Gallica, Hybrid Chinese, Bourbon, and allied tribes on the other. All the beautiful varieties now in gardens have been raised since 1844, the majority of the finest exhibition kinds appearing during the last thirty years. The raisers of old, of whom mention may be made of Mons. Laffay, used the Hybrid Chinese, Hybrid Bourbon, and others, and laid the foundation of the first Hybrid Perpetual group, and were wiser than the hybridists of our own day, who hybridise Hybrid Perpetuals with the Tea-scented and lose hardiness and fragrance to gain freedom of bloom. Some of the more recent Hybrid Teas are by no means hardy.

Cultivation.—When reasonable care is taken there is little difficulty in producing handsome flowers, unless one wishes to excel in the exhibition, when of course greater skill is necessary than in growing the plants simply in the garden. Always select an open spot, away from trees and shrubs, and sheltered from north and north-east winds, which are more hurtful to the young tender growths in spring even than frost. By shelter is not intended

"coddling" treatment, as this is as great an evil almost as full exposure to every wind that blows. The soil must be strong, a good heavy loam, thoroughly well drained, and when this is not natural to the garden the staple must be made as suitable as possible by incorporating loam and manure judiciously. Where, however, the soil is naturally very light, preference should be given to the Tea-scented Roses, as these enjoy a lighter ground than the Hybrid Perpetuals, which, more than any other class, need a strong staple.

Amateur gardeners, and indeed gardeners of all kinds, are too often inclined to believe that an abundance of rank manure is essential to success. This is a mistake. A soil, especially if heavy, saturated with rank manure does not promote healthy growth, and frequently malformed flowers result from this unnatural treatment; indeed, fresh manure is not required at planting time at all, unless put down below the roots, so that as they spread and develop they reach it in time. It is far better to use a little bone meal when planting, and to apply manure, in the form of a mulch, early in summer, when hot weather is anticipated.

Before the mulch is applied, hoe the soil frequently to admit air and moisture to the roots, and this operation is more important than many suppose. It is impossible to expect healthy growth when the roots are deprived of air. Mulching, or rather manure, may be given in the autumn, removing a small portion of soil around the plant and placing in cow manure, returning the soil again to cover it.



ROSES OVER PERGOLA.

STOCKS.—This is a very important point. It is impossible to expect even reasonable success unless this question is closely studied. As far as possible stocks should be dispensed with, and only own root plants grown, that is, plants raised from cuttings; but when one is desirous to win prizes at the exhibition, stocks are needful. Four stocks are used for the Hybrid Perpetuals, namely, Briar cutting, Seedling Briar, Hedgerow (Standard) Briar, and the Manetti. The worst stock of these for ordinary garden Roses is the Manetti; but the exhibitor must have it, because it promotes earliness hence the Northern growers can compete at the first shows. The exhibitor who has to deal with a loamy soil should choose the Briar cutting, and for the light ground the Manetti. The Seedling Briar is very useful on a deep clay, and especially to induce abundant blooming in the autumn, but the Briar cutting yields the most perfectly formed and coloured flowers. They appear almost as early as those upon the Manetti, and the roots running so close to the surface quickly utilise the fertilisers given. It

is essential that Roses be planted near the surface, and for this reason procure dwarf plants budded almost on to the root of the stock. Short hedge Briars make excellent stocks for Roses, as they are as serviceable as the taller Standards, upon which only the most vigorous kinds should be grown. Standards may be discarded entirely for Hybrid Perpetual Roses, and used for the Tea-scented.

HYBRID PERPETUAL ROSES FOR BEDDING.—If one wishes for a display of Roses from June till October the Hybrid Perpetuals must not be relied upon, as the Tea, Hybrid Tea, and China Roses are those that may be called perpetual, that is, flower from early summer until autumn. But there are many Hybrid Perpetuals that make for a week or two a magnificent display, and of the majority named below plenty of flowers in the autumn may be expected too. There are few gardens where space can be afforded for beds of one kind, therefore it is necessary, to produce a good effect, to have all varieties in one bed of a similar habit of growth, or, at least, a tall variety in the centre and dwarf outside, not *vice versa*. To assist planters in this direction a selection of the best Hybrid Perpetuals is given for bedding, divided into three groups: (1) Very dwarf; (2) robust; (3) vigorous. Dwarf: Marquise de Castellane, Merveille de Lyon, Baroness Rothschild, Gustave Piganeau, Fisher Holmes, Victor Hugo, Crimson Bedder. Robust: Baronne de Maynard, Violette Bouyer, Mrs. Sharman-Crawford, Mrs. Rumsey, Helen Keller, Mdlle. Eugenie Verdier, Victor Verdier, Alfred Colomb, Captain Hayward, Etienne Levet, General Jacqueminot, Earl of Pembroke, Madame V. Verdier, Crown Prince, Jean Cherpin. Vigorous: Clio, Jeannie Dickson, Mrs. John Laing, Heinrich Schultheis, Bladud, Gloire de Margottin, Ulrich Brunner, Dr. Andry, Charles Lefebvre, Ella Gordon, Margaret Dickson.

ROSES OVER ARCHES.

OTHER ROSE GROUPS.—Besides the Hybrid Perpetual so called and the beautiful Tea-scented Roses there are other charming races, which are herewith described:

Alba or White Rose (*Rosa alba*).—This tribe comprises those varieties usually known as the Maiden's Blush Roses. It is a distinct class, although not large, and a peculiar feature of all the varieties is the beautiful glaucous hue of the foliage, so marked as to leave no doubt to which group they belong. In many an English cottage garden the Maiden's Blush has grown into large bushes burdened with blossom in summer-time, as delicate as the colour of a maiden's cheek—hence the name. Celeste is a lovely Rose. The strong growers require moderate pruning, but the others must be pruned rather more closely. They form excellent pillar Roses. The gooseberry-fruited Rose, Rosa pomifera, would seem to belong to this tribe. The best kinds are: Blanche Belgique, milky white, very free in flower and growth; Celestial, the most beautiful of all summer Roses, many

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A GLORIOUS ROSE GARDEN.

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shades darker than the Maiden's Blush, and the foliage distinctly glaucous; Felicite (Parmentier), another Rose that should be in every collection—its flowers are rosy flesh margined with white, compact in form, very double and very free, the growth vigorous too; Mme. Legras, flowers sulphur white, large and full.

Austrian Briars (*Rosa lutea*).—These are very valuable hardy yellow Roses. Unfortunately they are not perpetual, although now and then a stray flower will appear in autumn. The single form, Rose lutea, is a native of Italy, Germany, and the South of France, and was introduced to England nearly 400 years ago. This single form is still one of the best, and in early June plants that have been allowed to grow as they like are covered with the rich yellow blossoms, that harmonise charmingly with the various single Roses then in full beauty. A dry soil with a good supply of chalk or lime is most suitable. R. Harrisoni forms an excellent hedge, and may be had in rich beauty by severely cutting down the plants every three or four years to keep them furnished at the base. The Austrian Briar Roses should never be pruned, save just topping the shoots and removing dead wood, except when grown as hedge plants. They make good Standards if trained in umbrella shape. The shoots then are covered with flowers. A double set of plants should, if possible, be planted, so that one set may have an alternate severe pruning to keep up their vigour. The best kinds are: Harrisoni, introduced from America early in the century. Its colour is not so intense as the Persian Yellow, but the plant is far easier to grow. It is the best Rose for large towns. Persian Yellow was introduced to England about the year 1837. The flowers are of the rich Maréchal Niel colour, but the plant is somewhat difficult to cultivate. It is advisable to have a double set of plants. One group should be cut down almost to the ground, the other left unpruned. This cutting will promote vigorous young growths that are bent down and allowed to flower the next season. The single Yellow is bright primrose yellow. The Austrian Copper Briar, known botanically as Rosa lutea bicolor, is a lovely Rose. Its colour is rich red on the upper surface of the petals, but old gold beneath. A most attractive Rose, worthy of a place in every garden. The double Yellow, sometimes called the Yellow Scotch Rose, is an abundant and early bloomer. The Yellow Provence is really Rosa sulphurea, and has no relation to this tribe. Its flowers are large and even more double than the Persian Yellow. There are a few good examples in the country, but many fail to get it to grow. It has flat glaucous leaves, of a pale yellowish green, the growths being covered with long thin prickles. It is supposed to be a native of Persia, and the flowers are much given to bursting, being so double. That it likes an abundance of lime is evident. A western aspect is best for it, and it must not be pruned.

AYRSHIRE ROSES.

Ayrshire Roses (*R. arvensis*).—These are our hardiest and most rambling Roses, running over banks, walls, and thickets, and clambering into trees. They are allied to the Evergreen Roses, but their growths are more wiry and slender. They are of native origin, also abounding in Europe. As Weepers on tall hedge Briars they are most effective when their pendulous growths trail on the ground, reminding one of a fountain of Roses. They also make noble pillar Roses. The best varieties are: Ruga, flesh colour, changing to creamy white, large and fairly double, as delicate in colour as a Tea Rose, indeed it is said to be a cross between the species and the Tea-scented: Dundee Rambler, of medium size, pure white, double, and compact; Bennett's Seedling (Thoresbyana), double white, very beautiful; Splendens

pale shell pink, with crimson buds, an effective contrast; Virginian Rambler, one of the daintiest of Roses, with white, shaded pink flowers, much expanded, and produced in large clusters; Queen of the Belgians, creamy white, double, and of slender growth.

Banksian Rose (*Rosa Banksiæ*).—This was named in compliment to Lady Banks. In warm countries, such as Italy and France, these Roses grow luxuriantly, but unfortunately they are not very hardy with us, although in sheltered spots one frequently discovers plants in rude health. They prefer a dry, warm border, and if screened from the north-west, north, and east winds so much the better. They are handsome in conservatories, the white variety filling the structure with the fragrance of Violets. They flower, however, only once (May and June), and after flowering luxuriant shoots should be cut out and the remainder merely tipped. The new growths, if pruned back to two or three eyes the next spring, will yield abundance of blossom. The only two varieties worth growing are the Yellow and White, and both require the same treatment; they may be layered freely in July. The established plants are often budded all over with Maréchal Niel and Cloth of Gold, and splendid flowers of both these Roses are obtained in this way.

BANKSIAN ROSES.

Berberry-leaved Rose is a native of Persia, and has single yellow flowers with crimson spot. It is not often seen, but the variety Hardii is more generally cultivated, although very tender. It is really a greenhouse plant, and has yellow flowers with rich chocolate spots at the base of the petals. It is very subject to mildew, so must be planted where it is not likely to be in a draught. It is an autumnal variety.

Bourbon Roses (*R. indica Bourboniana*).—The true Bourbon Rose was discovered in the Isle of Bourbon in the early part of this century, and was generally supposed to have been a hybrid between the Chinese and Four Seasons. Many years ago, before the advent of the Hybrid Perpetuals, these were the fashionable Roses of the day, and one cannot be surprised at this, for they are in every way charming for their autumn flowers. The colours are, however, very bright, and the petals round and smooth. A short acquaintance with these Bourbon Roses will soon enable the grower to pick them out from among other kinds by their distinct foliage, which is usually oval, leathery in texture, and the wood is thick and rigid. As one might expect, the autumn flowering of these Bourbons induced many raisers to utilise them for hybridising with other classes, and thus we have, under the name of Bourbon, Bourbon Perpetual and Noisette Perpetual, a mixed group, indeed many of the so-called Hybrid Perpetuals are in reality Hybrid Bourbons. The same treatment applies to all three sub-divisions, and to generalise one might say that, with the vigorous growers little pruning is required, but the moderate growers must be cut in hard if Roses of fair quality are desired. They all delight in a rich soil, that is to say, good heavy loam, well cultivated, and a supply of cow dung afforded in autumn. Many, if not all, the vigorous kinds make splendid Pillar Roses and Standards. Even the moderate growers, of which Souvenir de la Malmaison, the oldest and best, is one, make remarkably fine heads on Standards. It will be convenient to keep a selection of each group separate. Commencing with the True Bourbons, the varieties really worth growing are: Acidalie, pure white, blush centre; very sweet. Armosa (syn. Hermosa), a charming Rose, grown by thousands in America for bedding. It blooms regularly and also makes a fine market variety for pots. The flowers are deep pink, very double and regular in form, and seem to partake in a large degree of the nature of the monthly Roses. Kronprinzessin Victoria is a sulphur white sport of Souvenir de la Malmaison, beautiful in colour, perfectly distinct, and in habit resembles the parent variety. Lorna Doone is a handsome massive flower of a magenta carmine colour touched with scarlet. It is very floriferous both in summer and autumn; moderate in growth, very sweet, and should be grown as a dwarf. Marie Therese de la Devansaye has pure white flowers somewhat in the way of those of Kronprinzessin Victoria. It is an excellent variety for cutting, and a welcome addition in every way. Mrs. Paul is a useful garden Rose, unique in colour and form, which reminds one of the Camellia, and very showy upon the plant. The colour is pinkish white, and the growth quite as free as the seed parent, Madame Isaac Pereire. Queen, a delightful Rose for massing, producing numerous salmon flesh blossoms upon short stumpy growths. Robusta is of rampant growth, so much so that shoots from 8ft. to 9ft. in one season are not

at all uncommon. Unfortunately it flowers very little in the autumn, but in the summer its deep crimson flowers are a rich picture, and it makes a formidable rival to Crimson Rambler. Sir Joseph Paxton is too dull in colour, being a rosy shade of crimson. It is, however, a good variety in smoky districts upon walls, pillars, or in shrubberies. Souvenir de la Malmaison needs but little notice here, as it is so well known. Even to-day, as an autumnal variety, it is of much use. The flowers are very charming when half-open as buds, but the flat expanded blossoms are not generally admired. They are showy, however, upon the plant. Purity is a beautiful white Hybrid Bourbon.

The Bourbon Perpetuals usually produce their flowers in clusters, and both here and among the Noisette Perpetuals some of the hardiest and freest white Roses are found. Taking them in alphabetical order, the first to be named is Baron Gonella, a peculiar Rose of beautiful shading, the deep carmine and lilac and white harmonising delightfully. Baronne de Maynard is perhaps the best of the white Roses, very pure, and with remarkably smooth petals, which give the plant when in full blossom an effective appearance; it is also thoroughly perpetual. It is not unlike the next Rose in many ways, but of the two the former is certainly the best. Boule de Neige, a perfect little white flower with petals of great substance, which are frequently lined or splashed with red. The rich green glossy foliage and pale green growths are very distinct. Mme. Isaac Pereire, a splendid Rose, the flowers rosy carmine in colour, large and full, a good summer as well as autumn Rose, vigorous, and hardy. This is probably the parent of many Roses, such as La France de 89 and Mrs. Paul. Mme. Pierre Oger, one of the most beautiful of all Roses, the colour shading being delightful, white with heavy rose suffusion, and the form is perfect. Reine Victoria is doubtless the

HYBRID PERPETUAL PURITY.

parent of the above. It is a perfect flower, bright rose in colour, and very free.

The Noisette Perpetuals appear to fall in with the Bourbon group more than with the Noisette Roses, which originated from the Musk, or Moschata, and Chinese. In this section are some excellent decorative Roses, as free almost as a Tea or China, and far too valuable to suffer extinction. The best are: Coquette des Blanches, which

ROSE BLAIRII No. 2.

is pure white, free and hardy; Mme. Alfred de Rougemont, white, delicately shaded with rosy pink. The small unopened buds are red, and very attractive mingled with the expanded flowers. A useful Rose for the garden, and constantly in flower. Mme. Auguste Perrin, pale rose flowers with a satiny sheen and produced in large corymbs. Mme. Fanny de Forest, a noble white Rose, larger than any of the preceding. It is a showy pot plant, but is none the less beautiful outdoors. Mme. Francois Pittet, very double, like little snowballs, so pure are the blossoms. Here again we have the red buds, so conspicuous among the snow white flowers. Paul's Single White is certainly the most beautiful of the single Roses, covering large spaces in a short time with its long semi-climbing growth.

Boursault Roses (*Rosa alpina*).—Now that we have the Crimson Rambler, the Boursault Roses are scarcely worth retaining. They grow with extreme vigour, flower freely, and are very hardy, but the flower colouring is dull. They came to us from the Alps of Switzerland, and will flower in poor positions, but must be freed from crowded growths when pruning. The long growths of one and two years old should be left their entire length. The best kinds are: Amadis, crimson-purple, quite smooth, reddish wood when matured; Blush, pale blush; Gracilis, cherry colour, shaded with lilac, which much mars an otherwise good Rose; the prickles are very large and the foliage rich green.

Hybrid Chinese.—This is rather a varied family. Originally they were hybrids of the French and Provence crossed with the Chinese, but latterly the Noisettes and Bourbons have been hybridised with the same tribes. None of the varieties bloom in the autumn, as is the case with the true Chinese, Noisettes, and Bourbons, therefore the whole may be practically grouped together. As a rule the plants are very hardy, vigorous, and quickly clothe a pillar, or make excellent Standards or pot plants; and as one does not want such Roses to flower twice in pots, they are equally as valuable as the Hybrid Perpetuals for this purpose. For town gardens, smoky districts, or in positions not favourable to Roses, this race is happier than any other. The foliage is handsome, and the vigorous, almost climbing shoots are graceful. Although nowadays they are much neglected, they pay for

good culture. Many will remember the splendid examples of Coupe d'Hebe, Chenedole, Charles Lawson, etc., that were shown at the first Rose exhibitions. Give them good soil, liberal supplies of manure, well thin the growths, and do not prune too severely, and they will give unbounded pleasure in the early summer. The best kinds are: Blairi No. 2, rosy blush, lovely in colour, very vigorous, often making shoots 10ft. to 12ft. long in a season; Blanchfleur, a clear white, very early; Brennus, carmine; Charles Lawson, deep pink, fragrant; Chenedole, light vermilion, at one time a great favourite; Coupe d'Hebe, deep pink, a dainty colour; Fulgens, a brilliant crimson climber; Juno, pale rose, a handsome pot plant: Mme. Plantier, pure white, wonderfully free, like a huge snowball when fully out—this is a delightful garden Rose, also a noble Standard, and it may be grown, too, as a pot plant for the market; Madeline, creamy white, margined with crimson, a beautiful Rose; Paul Perras, rose; Paul Ricaut, rosy crimson, double and very free, a fine early red variety; Paul Verdier, crimson, very fragrant; Souvenir du Pierre Dupuy, deep velvety red. An excellent garden Rose.

China or Monthly Roses.—This is a beautiful group of free-flowering Roses, and rapidly gaining the popularity they certainly deserve. Of course the old pink monthly is known to everyone. It may be seen in almost every cottage garden and in masses in larger domains. No variety is so hardy as this common old Blush variety, and it would be a good thing if raisers employed this kind more to impart hardiness to the many beautiful varieties of weaker growth. As a climber the old Blush forms a beautiful picture if permitted to cover a large space, as it undoubtedly will. It also makes a capital hedge plant 3ft. to 4ft. in height; the variety mostly cultivated now, excepting the latter, is Mme. Laurette Messimy. One can hardly describe this wonderful Rose. It is as beautiful as any flower in the garden, the loose soft petals moving with every breath of air, and making more charming still the delicate rose colouring which stains them. The plant grows freely, producing, in rich soil, thick shoots like the Tea-scented Roses. It has produced a lovely seedling in Mme. Eugene Resal, which is of richer colour, a Buttercup yellow shade pervading the flowers. Craimoisie superieure is the most scarlet of all, and double as well. It is not so free in growth as might be wished, but it makes up for this by its brilliancy, and of course it bears abundantly. If plants are budded upon Briars and well cultivated the growth and colour are much improved. Fabvier is a better grower than the last, but its flowers are only semi-double. It is, however, a fine showy scarlet kind, and effective in the borders if planted in large masses. Indeed, all the China Roses should be grown in groups to obtain effect. Manure the soil well in the autumn (and nothing is better than cow dung for them), and if available give good waterings with stable drainings during the autumn and winter. Do not dig amongst the plants, but merely prick up the surface soil an inch or so before applying the manure. Prune very sparingly, and a light soil is best for these Roses, far better than a heavy cold one. Other useful kinds are: Queen Mab, a very pleasing variety, and likely to be in much demand for cutting. The lovely rich apricot buds remind one of Safrano, but are even richer. The growth is also vigorous, in fact, quite Tea-like, with beautiful ruby shoots that contrast well with the buds. Duke of York is also becoming a favourite variety, remarkable for its bicolor peculiarity, the centres of the flowers being often flamed with carmine and the outsides and edges almost white. Generally, however, the colour is rich carmine shaded with white. It is a good grower, and suitable for pots. Mrs. Bosanquet is so well known that it merely requires mentioning. It is certainly a useful Rose, delicate in colour, and very free flowering. Archduke Charles should be

A GROUP OF CHINA ROSES.

possessed by everyone, if only for its changeable nature. Sometimes the flowers are crimson, and occasionally the crimson centres give place to a light blush edged with crimson, and *vice versa*. Ducher is the best white variety at present obtained, but it is not quite the kind wanted, not being so free-flowering as the foregoing varieties. Marie Wolkoff is delightful, quite new, of a velvety crimson colour, and always in flower. Belle de Florence makes a good hedge Rose, as dainty in growth as Fellenberg, the popular Noisette variety. Its cherry-coloured flowers are produced in dainty clusters. Little Pet is a double little Rose, produced in immense clusters. When cut one would take it for a spray of the Evergreen Rose, Felicité-Perpetue. It seems to be a hybrid, and belongs more to the Polyanthas than the Chinese, although usually grouped here. It is a valuable kind for massing, regular in growth, not too strong, but sturdy enough for this purpose. A charming Rose for graves or similar positions. Red Pet is a good companion to the latter, but the colour is dull, rather inclined to maroon. It is almost as profuse as the Little Pet. The above are the cream of the Monthly Roses. All that is wanted now is a good yellow as free as the Old Blush.

The Fairy Roses should really be included with the Chinese. They must not be confounded with the Polyanthas. The true Fairy Roses are also known as the Lawrenceana Roses. They were used, years ago, in great numbers for pots, rarely growing more than 1ft. in height, and the tiny blossoms are no larger than a sixpence. There were formerly several varieties in cultivation, but the white, pink, and crimson only are now to be obtained. They make pretty little rock plants if planted in a dry and sheltered fissure.

Damask Roses (*Rosa damascena*).—This group is of great antiquity, and was certainly introduced to this country over 300 years ago. They are grown by thousands in Bulgaria and elsewhere for the production of Attar of Roses. The Damask Roses have been largely utilised by raisers, first in the production of the Damask Perpetual and later the Hybrid Perpetual. Their growth is robust, and in this particular they differ more especially from the rambling-growing French Roses. The Damask Roses have beautiful bright green foliage, downy and leathery, and make splendid shrubbery plants, quickly spreading into large bushes, and their foliage has a most refreshing look. They require rather close pruning, and the centre of the plants must be well thinned; they are not of much use as Standards, except Mme. Hardy, but most of the kinds make noble Pillar Roses. The best varieties are: La Ville de Bruxelles, a very early kind, of a bright rosy pink colour, the flowers very flat, but showy; Leda, or Painted Lady, a beautiful Rose, crimpled, and edged with rosy carmine on a flesh-coloured ground; Mme. Hardy, an exquisite Rose, pure white, excellent for the garden decoration, and should be grown in the smallest place—it is of vigorous growth, and makes an excellent Standard or Pillar Rose; York and Lancaster, the true variety of this not worth growing unless it be for its historical associations—the variety more especially known under this name is in reality Rosa Mundi, a very large striped form of the old Red Damask; old Red Damask, very old-fashioned single Rose, with large petals of a rosy crimson colour.

Evergreen Rose (*R. sempervirens*).—This group differs from the Ayrshire, as it retains its foliage longer, hence the name; but it is misleading to call them Evergreen, for the foliage is usually gone before Christmas. However, they are delightful Roses, and bear their flowers in clusters, not singly, a characteristic of so many of the Ayrshires. The species is tender, a singular fact, for the varieties here named are as hardy as most Roses, although in some years frost cuts them down to the ground. If, however, own root plants are obtained, they soon recover from the check. Very little pruning is needed. Let them run wild, but prevent them becoming a tangled mass of growths, for then they are disappointing, and often fail to flower, mainly owing to the unripened state of the wood. Wherever fast-growing climbers are desired, the Evergreen Roses are welcome. The loveliest of all is Felicité-Perpetue. Each flower forms an exquisite little flesh-coloured rosette, and as the flowers are produced in graceful trusses, they are effective when once a fine specimen is secured. It is the best white companion to Crimson Rambler, both varieties flowering simultaneously, although the latter will last rather longer. Myrianthes Renoncule is as vigorous and free as the latter, but differs in colour, being of pale peach or rose shade. Leopoldine d'Orleans has large handsome clusters of creamy white flowers, fairly double and globular in form. Donna Maria is a pure white cup-formed flower of great beauty. The flowers are produced in large trusses, but the growth is not quite so vigorous as the first-named. Flora is wonderfully vigorous, making very thick reddish shoots, like a climbing Tea-scented Rose, which it seems to resemble. The flowers are of fine Camellia-like form, and bright rose in colour, with pale edges. Rampante blooms profusely and is pure white. Rosea plena is rosy flesh, changing to white. It has glossy green leaves and very double flowers.

French Rose (*Rosa gallica*).—This race was formerly extensively grown. The varieties seed abundantly, consequently a numerous progeny was promoted. The flowers are too flat, according to modern conceptions of a Rose, but they, nevertheless, are delightful in the early days of June, before the Hybrid Perpetuals and Tea-scented commence to unfold. The French Roses will grow almost anywhere, and they have a peculiar way of spreading by underground suckers In this class there are almost all colours except yellow, and it includes the best striped Roses. The Hybrid Chinese (a useful class for large towns) have descended from the French Roses. Although they grow so freely, and almost anywhere, they well repay for good cultivation, and this, in addition to good soil, means also well thinning the plants. Do this severely, and prune the remaining shoots to four or six eyes, according to the vigour of the variety. They may be freely increased by layering, and quite a mass may be had in a few years, simply by layering the growths and allowing these to remain The front of shrubberies is a good place for these French Roses, and they would also be at home in the wild garden, but the plants must be from layers or cuttings. The best kinds are: Adele Prevost, blush; Boule de Nanteuil, crimson-purple; Cynthie, pale rose; Duchess of Buccleugh, crimson, bordered blush; Kean, velvety purple; Lœtitia, rose; Ohl, violet-purple; Surpasse tout, cherry The best striped forms are: Dometille Becar, a splendid Rose, and Œillet Parfait.

Gloire des Rosomanes.—This remarkable Rose is one that greatly perplexes the rosarian as to its origin. The almost single flowers are brilliant carmine, and it makes long straggling growths that will quickly adorn pillar and arch. Naturally raisers have fixed upon this Rose as a seed parent, and many of the kinds are well worth growing. Perhaps of these General Jacqueminot is grown more extensively than any Rose in Great Britain, and in its progeny a remarkable diversity is seen. Abbe Bramerel is another rich Rose, reddish crimson in colour, with velvety shading Empereur de Maroc, perhaps nowadays too small, is in colour intense maroon, shading almost to black. Geant des Batailles has gone almost out of cultivation, but created quite a sensation fifty years ago, and was then one of the best crimson Perpetual Roses. Gloire de Margottin is a great advance upon Gloire des Rosomanes, and no Rose is more brilliant, although many kinds are of a deeper scarlet. It is a handsome Pillar and Standard kind. Even for bedding its long growths may be so trained that an effective glow of colour can be produced. Eugene Appert is as scarlet as any double Rose we at present possess. Even the wood has a reddish hue. It is not so free as varieties like Victor Hugo, Brilliant, and Cheshunt Scarlet, to be found among the Hybrid Perpetuals; but it is certain the colour is as intense as that of any of the kinds mentioned, and a useful race might be evolved from this Rose were it taken in hand by hybridists.

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THE FOUNTAIN GARDEN, ASHRIDGE PARK, BERKHAMSTED.

"COUNTRY LIFE."

PEGGED-DOWN ROSES.

Japanese Roses (*Rosa rugosa*).—The species was known many years ago, and was mentioned by Thunberg. It is sometimes called R. ferox. The Japanese Rose and its varieties are widely distributed, and form handsome shrubs, rising to a height of 8ft. or more. They are excellent hedge plants, especially the single crimson and the single white, and a 9ft. hedge when in full bloom is a fascinating flower picture, as also later when covered with the showy fruit. The foliage is rich olive green, quite glossy, and leathery. They are useful Roses to plant for game covert. The flowers appear continuously from June to October. The Single Red is an excellent kind, and may be freely produced from seed, although many of the seedlings will come white, and *vice versa;* the Single White is a delightful Rose, of the purest white. The Japanese Roses are being freely hybridised, and remarkable results have been achieved. Many not in commerce may be seen at Kew Gardens, and they bid fair to become an important race. Mme. G. Bruant is double, white, and has buds almost as beautiful as the Tea Rose Niphetos; Blanc double de Courbet is also white, and double. It is the purest white known. Belle de Poitevine is a semi-double, rose-coloured variety with immense flowers, sweetly fragrant. Calocarpa is single, and of a rose colour, followed by large bunches of fruit. These are not nearly so large as in the two first-named, but are produced with great freedom. The effect is somewhat marred, however, because the fruit ripens rather late in the year. Fimbriata has a fringed flower like a Primula, of a pretty blush colour, but not showy. Mrs. A. Waterer is the result of a cross between the type and General Jacqueminot. It has double red fragrant flowers of the colour of the latter, and they are produced on the whole length of the shoots. These Roses are of easy culture, but repay for good attention. Do not prune much, but cut away some of the old shoots each year to give the younger ones plenty of light and air. They are perfectly hardy, and may thus be planted in many places where other shrubs would be a failure. When it is desired to keep them within a restricted space cut back hard each spring.

Macartney Rose (*R. bracteata*).—Introduced from China by Lord Macartney in 1795; a delightful white Rose, flowering in August and later. Its flowers are of large size, enriched with Buttercup yellow stamens. The growth is very slender, and the glossy leaves quite small. It should not be grown unless a south or west wall can be given. One would imagine the new Rose Wichuriana to have originated from this Rose, as it greatly resembles it in foliage. The other variety, Maria Leonida, is double, with white flowers, the centre rosy and sometimes creamy. There are crimson anthers also, which increase its beauty. The buds of this Rose are as pretty as many of those of the Tea-scented class. The calyx is covered with hairy-like spines. The foliage is larger than that of the single form, and the flowers appear at the same time of year. It is a medium grower, well suited for a low wall in front of a greenhouse.

Microphylla Rose.—This is a quaint Rose, having a calyx not unlike a small Spanish Chestnut. The flowers are rosy carmine, and the leaves very small. It is a native of the Himalayas and of China. A hybrid raised by M. Guillot is a splendid climber. It is named Ma Surprise, and is a very sweet Rose, with white flowers having rosy salmon centres. If its flowers expanded more, it would be of still greater value, and in any case is worth growing.

Moss Roses (*Rosa centifolia*).—These delightful old Roses are deservedly held in high esteem at the present day. It may be that sentiment is responsible in part for this, but they are really fine garden Roses, hardy, and in many cases vigorous. The moss-like covering upon their calyxes has given them their popular name, but they really belong to the Provence or Cabbage Roses, and are generally believed to be sports from this race. Their introduction is wrapped rather in obscurity, but most authorities agree that they were introduced from Holland about the year 1596. The group has not made great advances compared with others, but during recent years several good novelties in point of size of blossom have been raised, but the moss-like peculiarity of the calyx is not so pronounced. Moss Roses require rich cultivation, plenty of room, and rather severe pruning, unless it be that they are trained in pillar form, for which purpose some kinds are well adapted Those grown as Standards must be moderately pruned, not forgetting to well thin the centre of the heads. The Common Moss, Blanche

Moreau, and Little Gem make excellent pot plants grown in cool greenhouses. Moss Roses are preferable upon their own roots; failing this the Manetti is the best stock. The following are the best varieties in the three leading colours: Pink and blush: Common, the most beautiful of all in the bud, good as a Standard, and useful to form a low hedge; Crested Moss, very quaint with its parsley-like wrapping round the blossoms; Gloire des Mousseuses; Gracilis, extremely free; Little Gem, an exquisite miniature Moss; Mme. William Paul, one of the best perpetual kinds. White: White Bath, exquisite in bud, and well mossed; Blanche Moreau, paper white, with dark green mossy growth, very vigorous and free; Comtesse de Murinais, immense panicles of blossom, very attractive, good as Standard or Pillar; Perpetual White Moss, very interesting and free growing—it often has pink flowers, with no mossy growth; Reine Blanche, very clear white. Crimson and purple: Baron de Wassanaer, the best climber, and a very good red variety; Celina, rather small, but pretty; Lanei, well mossed; Crimson Globe, grand flowers as large exhibition Roses—it makes a good Standard; James Veitch, a good perpetual kind, of a purplish crimson colour; Mme. E. Ory, one of the best. In addition to the above there is a single variety named Muscosa japonica. It is beautifully mossed the entire length of the growths, and the young shoots are very pretty.

Multiflora Rose.—This is not a large class, although of late years one type, the Polyantha Rose, has become popular. The Multifloras proper are natives of Japan and China, and were introduced into England early in the century. Very few of the varieties are cultivated now, but one kind, namely, the Crimson Rambler, is remarkably popular. This famous Rose appears to have been accidentally discovered in Japan, and sent home by the discoverer to his friend in Scotland. It was exhibited at a meeting of the Royal Horticultural Society under the name of Engineer. Passing into the hands of an English firm, it quickly became popular because of its brilliant crimson colour. Its popularity has somewhat waned, as doubtless many were induced to plant it upon south walls, perhaps the worst place for it. It seems more adapted to the mixed border. Here upon a 12ft. iron stake it will give the greatest satisfaction and create glorious colour effect for a long time. It is a splendid pot plant, and even plants in 48 pots will flower, whilst noble specimens trained balloon or pyramidal shape are equally as free. Cuttings strike easily, and the plant will probably be much used for hedges, copses, and spinnies, or in the wild garden.

The only other kind of this section worth growing is the De la Grifferaie, which is, like the last, a rampant grower, and much used as a stock for Tea Roses in this country. The flowers are deep rose, changing to white. When used as a stock for Tea Roses, the suckers are quickly recognised, for the foliage is of woolly appearance and altogether distinct from that of any other Rose. If anyone has this Rose it would be advisable to bud it all over with the Crimson Rambler, which would result in a fine specimen in a short time. The second section is summer-flowering only, and of climbing forms Claire Jacquier is a lovely Rose, but will not display its beauty under three or four years. It has immense corymbs of tiny orange yellow flowers, paling to white as they expand. The growth is very vigorous, but rather tender: it makes a splendid pyramidal pot Rose. The single Polyantha is not unlike a Blackberry in blossom. It is of rampant growth, and charming in the wild garden. A much better form is Thunbergi. The centre of the single white blossoms is a bunch of golden stamens. Grandiflora is larger still, and has pure white flowers in clusters.

BENNETT'S SEEDLING ROSE.

Musk Roses.—These are very old Roses, certainly known in England 300 years ago. The flowers are insignificant individually, but collectively are pleasing, and appear late in August, when there is usually a dearth of blossom upon climbing Roses. They require good culture and very little, if any, pruning. As pillar Roses they are seen at their best. The variety called Fringed is very pretty, and it strikes freely from cuttings. Its colour is white shaded sulphur. All the Musk Roses have a peculiar

Musk-like odour, but this is distilled only on still, damp mornings or evenings. Eliza Verry is white, very free, the flowers appearing in large corymbs; Rivers' Musk is a pretty pink variety, well worth cultivating. Of the Hybrid Musks, the Garland is of rampant growth, and an extremely beautiful companion to the Crimson Rambler. It has immense corymbs of tiny white flowers with innumerable little buff-coloured buds peering out among them. Madame d'Arblay is another rampant Rose with strong shoots like walking-sticks. It spreads about freely in the wild garden; indeed, the whole group is most at home there. Nivea is a beautiful kind for a pergola or low fence.

A CLIMBING ROSE.

Noisette Roses.—The true Noisettes are distinguishable from the Teas by the elegant pendulous growths, and large clusters of flowers with a peculiar Musk-like odour. They almost invariably flower from the long secondary growths of the previous year, and require careful pruning, merely thinning out old and very small wood. The long growths should be practically untouched with the knife. Among the hardiest kinds the best are: Aimée Vibert, one of the most useful of our pure snow white climbers. It is as evergreen as any Rose, and the foliage is rich dark green. It makes a good companion to Crimson Rambler, and is also an excellent variety budded on a tall stem to form a weeping plant. Celine Forestier is another old favourite, with primrose yellow flowers. It succeeds well as a Standard, and too many of the lateral growths must not be removed, for on these the best flowers are often produced. It makes a splendid pot plant if the long growths are twined about in balloon shape, so as to induce all eyes to break. Deschamps (syn. Longworth Rambler) is one of our best rosy crimson autumnal climbers. Fellenberg is good for bedding or massing, its colour being a rather dull rosy crimson. A splendid novelty seems likely to eclipse this old Rose. Its awful name is Gruss au Teplitz, but its colour is a bright currant red. Other good useful kinds, although somewhat tender, are: Adelina Viviand Morel, small yellow and orange flowers, climbing habit. Josephine Bernacchi has beautiful long buds of a creamy yellow. Marie Robert is a vigorous kind, with flowers of the same shade as Ernest Metz. It is a valuable pink climber. W. A. Richardson is one of the most popular of all Roses, but it has one bad quality, viz., yielding a quantity of white flowers instead of the rich apricot shade so much admired. This is no doubt attributable to our cold springtime, for usually the autumn flowers are of a rich shade. Alister Stella Gray is a valuable autumn climber, with huge corymbs of white flowers. The yellow buds are very charming. Of the very tender Noisette Roses the following are the best (where possible they should be given a warm position, and of course they would do well in a greenhouse): Lamarque is a lovely white Rose, too tender for outdoors here. In Cannes it grows to perfection, and is much grown for cutting. Solfaterre is not so tender, although a seedling of the last-named. It has large trusses of sulphur yellow flowers, and makes an excellent conservatory Rose.

Maréchal Niel is a true Noisette. Those who have hitherto failed with this Rose should try it upon a hedge Briar about 3ft. high. If it commences to bulge out at the bud, cut a longitudinal slit down the Briar stem, just the depth of the bark. This will let out superfluous sap and often save the plant from further injury through canker. In cultivating this Rose indoors it should have, if possible, a house to itself. Give it a good border, the same as would be provided for a vine. Induce it to make long rods by affording plenty of heat and moisture during the summer. Ripen off well in autumn, and it will then give an abundance of bloom from these young rods. As soon as the flowers are over cut down hard, say to two or three eyes of the main stem, and give the same heat and moisture as before, to provide rods for next season's display. Cloth of Gold is not worth growing in this country, especially as Maréchal Niel is a far better Rose. Fortune's Yellow is a charming Rose, the loose graceful flowers full of colour, yellow, apricot, and a mingling of other shades. It requires similar treatment to Maréchal Niel. L'Ideal is beautiful in colour, but disappointing as a climber. It is advisable to grow it as a Standard or bush. Mme. Pierre Cochet really surpasses W. A. Richardson in some respects. Its flower is an intense coppery orange colour. Everybody should have this Rose, and if no space can be found for it as a climber, then it will grow equally as well as a bush.

Polyantha Rose (*R. multiflora*).—The Polyantha Roses are for the most part of low growth, the flowers being very small indeed, as many as fifty appearing in a single cluster. Doubtless they owe their existence to a cross between the second group of Rosa multiflora and the Tea-scented. Most of them are delightful edging plants to Rose beds, and form rich groups by themselves, flowering early and late, and making a glorious mass of

colour. They are very beautiful in pots, tiny little plants in 48 size being useful for table decorations or for the conservatory. As half Standards they are also pretty. The best kinds are: Perle d'Or, nankeen yellow, with orange centres, as yet unsurpassed in colour. Gloire des Polyantha, bright rose, and wonderfully free. One of the best decorative Roses in any class. Perle des Rouges, the brightest crimson yet obtained—a little gem. Anna Marie de Montravel has pure white flowers, produced in great abundance. A Rose everyone should possess. Blanche Rebatel, a rosy crimson variety, very distinct, and almost as free flowering as the last. Little Dot, soft pink, very diminutive. Cecile Brunner, bright rose, each tiny flower being of perfect shape. A vigorous grower, and a good dwarf hedge plant. Golden Fairy, a pretty Rose, but more white than golden. There is just a suspicion of yellow in some of the flowers. Mme. E. A. Nolté, a delightful little Rose, with apricot buds and white expanded flowers. Very free and vigorous. Etoile d'Or, pale chrome yellow, very small and pretty, the plant of dwarf growth. Magdeleine de Chatellier, a stronger grower than the last-named, and perhaps the purest yellow yet obtained. Mosella, a delightful novelty, much larger than any of the preceding. The flowers are quite 2½in. in diameter, the base of the petals of a soft canary yellow, the outer ones being white. A good grower, quite Tea-like in this respect. It will be necessary to make a sub-section of these larger-flowered kinds if they multiply, as they are out of place with the smaller forms. Clothilde Soupert is one of the most perfect formed Roses we have, almost as shapely as a Camellia. It is useful for growing in pots, and the flowers are pearly white, with rosy pink centre.

Provence Rose (*R. centifolia*).—Surely everyone knows the old Cabbage Rose, the Rose so often considered the most fragrant of its beautiful race. The habit of the Provence Roses is rather pendulous, and they thus form excellent Standards, whilst they are, perhaps, the most perfect of the Globular Roses, and one could wish there were more of this shape. Provence Roses prefer rich soil, rather hard pruning, and plenty of room. The best varieties are: Common, or Cabbage, flowers rosy pink, form globular, growth vigorous. Crested, or Cristata, usually called the Crested Moss. It is a dainty flower, and the buds are beautifully crested. It was first seen flowering upon the walls of a convent near Berne in 1827. Prune hard, as the crest-like character is more developed if the growth is vigorous. Unique, or White Provence, is believed to be the York Rose. The flowers are paper white. The miniature Provence Roses are also of this company. They give excellent results if planted in groups in shrubberies. The De Meaux makes a distinct edging Rose, as it is of neat growth; the colour is pink. Spong is not much different from the above, but the growth is stronger. White De Meaux is a charming Rose, with its white flowers and pink centres; the Burgundy Roses are also of this class, but they have practically gone out of cultivation.

Scotch Roses (*R. spinosissima*).—These well-known Roses are the earliest to flower out of doors, and are ever welcome. They are natives of Britain, and there have been numerous varieties. The Scotch Roses seed most freely, and would make excellent kinds for the amateur hybridiser, as brilliant colours are much wanted. These are obtained chiefly in the single varieties, and nothing is more lovely than a round bush of a single crimson Scotch Rose, far more effective than many of the single kinds in gardens.

MALMAISON AND CLIMBING AIMÉE VIBERT ROSES IN MID-SEPTEMBER.

The Scotch Roses are excellent for hedges, and as they are very prickly the hedge is a very formidable one. The knife must be used severely now and then upon these hedges, or they become leafless and unsightly at the base, otherwise they require no pruning. They are easily propagated by suckers. The Scotch Roses are best seen in shrubbery borders where they have room to spread out. The flowers of the double kinds are like pretty little balls, the double white being especially charming. They are best obtained in colour, as the pinks of various names differ but slightly from each other. The colours usually obtainable are white, blush, light pink, deep pink, and deep rose. There is no double crimson as yet, and the variety known as the Double Yellow Scotch is a variety of Rosa lutea and not of R. spinosissima. The single may be obtained in similar shades of colour to the above, but in addition there are some rich reds and buff and fawn colours. The Scotch Roses have produced one hybrid, Stanwell Perpetual, a good garden Rose and one of the first to flower and the last to fade.

Single Roses.—These are popular Roses, and in early June many of them fill the garden with colour and fragrance. They are charming especially in the wild garden, where the ample space they crave for can be afforded them. Single Roses resent the pruning knife, thinning out of weakly and dead growths being all that the majority of kinds require. As Pillar Roses they are most attractive, and isolated bushes upon the lawn are effective. In whatever way they are grown, give them plenty of room, and do not attempt to alter their naturally graceful growth. Take as an example the charming wild Rose, with its arch-like branches clothed with fragrant blossoms. It is pleasing to see that this our common hedge Rose is already under the influence of hybridisation, producing some novelties in the way of colours that are destined to be of great use. The number of Single Roses is bewildering, but many are uninteresting except to botanists. The following is a selection of those proved to be the most attractive: Acicularis, very vigorous, with large rosy pink flowers. Alpina, very early, purplish crimson flowers followed by long pendulous orange red heps in autumn. Austrian Copper, the most beautiful single rose grown. The flowers are coppery red inside, with dull gold outside, and very little pruning is required. Austrian Yellow, fine golden yellow blossoms, very effective. Bardou Job, very large flowers of a crimson and black colour. A superb Rose, especially for pillars, and blooms also in the autumn. Carmine Pillar, a vigorous Rose with flowers of delightful colour. Gloire des Rosomanes, a fine autumn Rose, crimson, semi-double, and of climbing habit. Hebe's Lip is a large white flower edged with carmine. It is a beautiful variety. Janet's Pride, white, shaded and striped with rose. This Rose may be grown as a hedge, and the leaves are scented like the Sweet Briar.

Lord Penzance's Hybrid Sweet Briars are of great value, as they produce brilliantly-coloured flowers, with fragrant foliage. They form huge pillars, are excellent as hedge plants, and seem likely to displace the old Sweet Briar for this purpose. Sixteen varieties were sent out, but few are of much value. As these Hybrids will be fully described under the heading of Sweet Briars, further reference to them here is needless. Their profusion of flowers is delightful to see.

Macartney alba simplex has beautiful white flowers, but requires a wall. Macrantha has immense white flowers, with yellow stamens. It is very vigorous, and one of the best single Roses. Moschata alba, white, tinged with pink, large handsome trusses. Paul's Single White, very showy, with large paper white flowers. The habit of growth is climbing. Polyantha (multiflora), immense growths, with small Blackberry-like blossoms. Pomifera produces fruit in appearance like Gooseberries, and of a crimson and orange shade. Pissardi, a good autumn Rose of pearly white colour. It is nearly always in flower. Rugosa, or Japanese Rose—the white and rose-coloured forms are well known. They produce pods of immense size, and highly attractive. These Roses develop with age into large shrubs, and succeed in town gardens. The Single Scotch type of Rose is very early, of dense habit, and forms luxuriant bushes when covered with the numerous flowers of several shades of colour. Wichuriana is of quite recent introduction, and creeps along the ground like Ivy. It has glossy foliage and white flowers. Many hybrids are being raised from it, and these will probably become as popular as the species. R. berberidifolia Hardi and R. lucida are delightful, especially the last, with its low growth, crimson heps, and shining foliage.

HIMALAYAN SINGLE ROSE.

The single Roses form one of the most charming groups of the family, and their fruits or heps are often of much beauty, colouring the garden when the flowers have flown. Of course, the many beautiful wild Roses are single, and may be roughly divided into two groups, the one more bushy in growth than the other. The climbing kinds are well adapted for pergolas, which are becoming so popular in English gardens, and their long slender shoots are wreathed in flowers in early summer, with a display sometimes in the autumn. Mr. Bean, writing in the *Garden* about the propagation of the wild Roses, mentions that "layering is the surest method. I do not remember that it has failed with any species or variety on which I have tried it. For such Roses as R. lutea (the Austrian Briar group) it is the only way to readily get them on their own roots, for this and some others of the Roses mentioned below are not easy to raise from cuttings. Still, on the other hand, a good number can be increased by cuttings. The best time to put

them in is during July or early August, using the better-ripened portions of the current season's shoots. They like a very gentle bottom heat. Seeds, of course, are produced by many species, and can be used, but where several species are grown together they are very liable to hybridise, and some of the best do not ripen seed here. There are some species, as, for example, the Scotch Rose and its varieties, R. lucida, R. carolina, etc., which can, by merely dividing the plants, be increased quickly enough to meet the needs of most gardens." In the notes already given the finer Single Roses have been mentioned, but a few deserve fuller consideration. Of the climbing kinds, those conspicuous for their rambling growth, one named Moschata nivea should be more popular in gardens. It may be used to cover a fence, pergola support, or form a hedge, as its growth is hardy and vigorous. Late in July the clusters of flowers appear in profusion, but unfortunately there is no autumn display. It is not uncommon to see thirty expanded flowers and buds in a single cluster, and as the buds are of a charming pink colour, one can well understand that the Rose in flowering time is of unusual beauty; the expanded bloom is white, faintly touched with pink, and the deep yellow anthers add to its effectiveness, whilst they are sweetly scented. Then of importance amongst the climbing wild Roses is Rosa polyantha, or R. multiflora as it should be more correctly named. This is a delightful Rose in every way, flowering profusely in the summer, and is so vigorous and hardy that a bank is quickly clothed. When the long shoots are in full bloom, the fountain of white is delightful. The Crimson Rambler belongs to the multiflora group, and another Rose, which has for one of its parents R. multiflora, the other being the Hybrid Perpetual General Jacqueminot, is called the Dawson Rose, which has very charming semi-double flowers of a delicate rose tint. R. Wichuriana is little known at present, but will probably become in time fairly common. It is a Japanese species, and has been called the "creeping Rose" because of its prostrate habit, forming quite a carpet of growth. The flowers are snow white, produced in clusters, and the leaves are glossy, having quite a varnished appearance. The Prairie Rose (Rosa setigera) is a useful garden flower, of very strong growth, with conspicuously bold leaflets. July and August is its flowering time. Fortunately it blooms late for wild Roses, namely, the latter part of July and in August, when the large rich rose flowers are welcome.

Amongst the kinds of bushy growth are many interesting Roses, many of which, however, have been referred to already at considerable length. To grow all the beautiful Roses is almost impossible in one garden, and it would not be desirable, but as no flower is fairer, a large selection should be made for their colour, fragrance, and showy heps.

Sweet Briars (*Rosa rubiginosa*).—This fragrant shrub is drenched with perfume, which is poured forth freely after a warm rain. The precious virtue of this, the Eglantine, is well known on warm summer evenings, when the whole air is filled with its fragrance. Until the advent of the beautiful hybrids raised by Lord Penzance there were no varieties of any merit. The kind known as Double Scarlet is a poor, miserable rosy colour, and the fragrance scarcely perceptible. We get also beauty in the autumn from the scarlet heps of the common kind. The plants are chiefly used to form hedges, but should be cut down now and then to preserve a certain trimness. They look well sprawling about the wild garden. The common Sweet Briar is in danger of being eclipsed by the splendid hybrid varieties. These have been obtained by Lord Penzance after many years of patient crossing with the Hybrid Perpetuals, the Austrian Copper, and other types. An error of judgment was undoubtedly committed in bringing into the world sixteen named varieties, for it must be admitted that a strong family likeness prevails amongst them, and probably in a few years not more than six of this throng

GATHERING WILD ROSES.

will survive in popular estimation. Of these six the best is undoubtedly Lady Penzance. One of its parents was the beautiful Austrian Copper, and it partakes to a large extent in beauty of colouring of this exquisite single Rose. Anne of Gierstein is a rich crimson, a rampant grower, splendid for arches, pillars, and pergolas. Amy Robsart, a soft pink, follows next in order of merit, and grows freely; Julia Mannering, pearly pink; Jeannie Deans, crimson, and semi-double; Rose Bradwardine, clear rose. These, then, are the six best kinds. They are suitable for hedges, and make beautiful edging plants if their growths are pegged down, and they may be grown in large towns or smoky districts. It must be admitted that they have been somewhat over-estimated, but no one will regret finding room for at least one specimen of each of the six kinds named.

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THE ROSE GARDEN, HOLME LACY, HEREFORDSHIRE.

"COUNTRY LIFE."

A BASKET OF ROSES.

EXHIBITION ROSES.

By Edward Mawley, F.R.H.S., F.R.Met.Soc., Hon. Secretary National Rose Society.

"Would Jove appoint some flower to reign
In matchless beauty on the plain,
The Rose (mankind will all agree),
The Rose the Queen of Flowers should be."—*Sappho.*

In order to form an adequate idea as to the perfection to which any florists' flower has been brought, a visit should be paid to an exhibition devoted exclusively to that flower. For instance, it is generally acknowledged that the Rose is the "Queen of Flowers," but it is only by going to a thoroughly representative Rose show, like that held annually by the National Rose Society at the Crystal Palace, that one can fully appreciate why it should have been accorded such a proud position in the first instance, and why it should have retained that position virtually unchallenged for centuries. At an exhibition like this the various stands of "Garden" or Decorative Roses will, no doubt, first command attention by their charming tints, and the bold way in which the flowers of each variety are massed together and raised above the general level of the other exhibits. The dainty blossoms thus displayed are always most attractive, but after all they are as it were only the children—the immature representatives—of the Rose, and consequently few of them will bear critical examination. They are mostly under-sized, and either have but a scanty supply of petals, or those petals are irregularly arranged. No; to see our Floral Queen in all her beauty we must pass on to the numerous boxes of "exhibition" Roses—as the largest and choicest varieties of the Hybrid Perpetuals, the Hybrid Teas, and the Teas and Noisettes are styled—this title having been given them when they were the only Roses considered worthy of a place at a Rose show.

It is here, notwithstanding the stiff and formal manner in which the blooms are

presented to our view, that we shall begin to understand why that matchless flower, the Rose, should have been crowned Queen, and at the same time realise how great a debt of gratitude we owe to the Rose hybridist, for the exhibition kinds of the present day are practically the outcome of his patient toil during the last forty or fifty years. He has as yet given us no blue or black Rose, but on the other hand most other tints will be found more or less in evidence, and this, too, accompanied by much delicacy of texture and refinement of form, without that precise formality which characterises most other florists' flowers. If in the past the Rose was considered worthy to take precedence of all other flowers, how much more must this be the case in the present day, when at no previous time in its history has there existed such a surprising wealth of choice kinds to select from. Where, for instance, in their different tints can be equalled elsewhere in the floral kingdom perfect exhibition specimens of any of the following kinds? Beginning with the lightest shades, we first come to Niphetos, the whitest of all the exhibition Roses, followed closely by The Bride, Innocente Pirola, Muriel Grahame, and that delightful new Tea-scented Rose, White Maman Cochet. Then in various shades of

HYBRID TEA ROSE (Grand Duc Adolphe de Luxemburg).

yellow we have Marie Van Houtte, Maréchal Niel, and Comtesse de Nadaillac. Among the choicest pinks may be mentioned Maman Cochet, Bridesmaid, Mme. G. Luizet, Mrs. R. G. Sharman-Crawford, and Mrs. W. J. Grant. Curiously enough, pure rose-coloured Roses are by no means common; but while we possess Suzanne M. Rodocanachi, saved from oblivion by the late Mr. T. W. Girdlestone, we need never complain that this tint has no striking representative. Crimsons and carmines are plentiful enough. Among the choicest of these may be named A. K. Williams, Alfred Colomb, Duchess of Bedford, and Victor Hugo. Duke of Edinburgh still remains the nearest approach to a scarlet that we yet have in this section, while Charles Lefebvre, Horace Vernet, and Louis Van Houtte serve to uphold the dignity of the dark crimson and maroon varieties.

After a careful inspection of the foregoing and innumerable other treasures of the Rose world at a show or in a large nursery, who would not wish to grow specimens as beautiful in his own garden. Now, this can readily be done, if only, as Dean Hole says in his fascinating "Book about Roses," he who expresses such a wish has but "beautiful Roses in his heart"—is really in earnest in that desire. As a further incentive, it may with confidence be stated that

in no other part of the world can these exhibition Roses be cultivated with such complete success as in the British Isles. Little wonder, then, that we should have adopted the Rose as our national emblem.

Believe me, there are few more pleasurable or lasting recreations than growing Roses for exhibition. I say designedly Roses for exhibition instead of exhibition Roses, because, although a great deal has been said and written about cultivating such varieties as I have mentioned simply for the decoration of the garden, I have not often, in a somewhat extended experience, come across Rose plants which were really well cultivated and with their various requirements properly attended to unless intended for exhibition either at a local or more important show. There are, I know, a good many such enthusiasts, but they are by no means common. The reason no doubt is that this class of Rose requires high cultivation in order that its beauties may be fully developed. This being the case, no sooner, as a rule, does an amateur attain a measure of success in the art of Rose growing than he at once wishes to measure his skill against that of other cultivators. Then only let him be fairly successful in his first efforts at exhibiting, and the desire to increase his collection and improve his methods of culture and of staging his blooms naturally follows. The fact is there is no exhibition flower which appeals to the amateur like the Rose. It is a plant he can cultivate, on a moderate scale and with a moderate amount of leisure, entirely with his own hands. On a larger scale this may be done with the help of his gardener or even with unskilled assistance, he himself performing all the more delicate operations of planting and pruning, or of thinning, shading, and cutting the blooms. It entices him into his garden with daily increasing interest as the summer advances, and yet allows him to take his annual holiday after the first flowering is over without feeling that his pet plants will be in any serious danger during his absence. One has only to visit a Rose show during the morning hours in order to see quite a small army of amateur exhibitors—lawyers, clergymen, doctors, men of business, or what not—busily engaged in preparing their flowers for the exhibition table, whereas at most other shows the work of staging in the amateur classes is left almost entirely to the gardeners.

Let us now consider the cultural requirements of our national flower, and see how best these may be met, whether the blooms be required for show or for the decoration of the home or garden.

Soil and Situation.—Roses grow best in a somewhat stiff and deep loam of good quality—such a soil, for instance, as would favour the production of a good crop of corn—while the subsoil should also be of a cool and retentive nature. There is, however, little practical advantage in knowing this, as the ordinary amateur has seldom any choice in the selection of the scene of his future operations, and has to grow his Roses either in his own garden or on some plot of ground adjoining it. Nevertheless, there is this consolation, that although there are undoubtedly certain soils and certain climatic conditions which are better suited to the growth of Roses than others, there are, on the other hand, few places in the British Isles where exhibition blooms cannot be successfully grown. Let an experienced rosarian find himself in almost any part of the country, and on almost any soil, and he will soon prove himself a formidable competitor at any exhibition where Roses are made a prominent feature. This shows that cultural skill and unremitting attention to the wants of the plants are the chief requirements in the production of fine flowers. In the immediate neighbourhood of large towns, and especially manufacturing towns, it is almost hopeless to attempt the cultivation of the Rose, as there are few plants so sensitive to a smoke-laden atmosphere. But even in such adverse positions enthusiastic rosarians are here and there to be found who manage to overcome to a great extent the difficulties of their surroundings.

The site of the Rose garden should be an open yet sheltered one. That is to say, well away from the roots and shade of trees, and yet not too exposed. Adjoining many country gardens there is often a small paddock or other piece of old pasture-land. If such be available, the amateur will do well to have his Rose beds made in its virgin soil.

PREPARATION OF THE BEDS.—Too much care cannot be devoted to the preparation of these beds, whether they be in the garden or elsewhere, for the future success of the plants very greatly depends upon this being properly done. If the soil be a good deep loam, it should be well trenched, and a liberal dressing of farmyard manure and half-inch bones incorporated with it. Poor and light soils will be much improved by the addition of some turfy loam, as well as the manure and bones. Heavy ground, if the subsoil be also very retentive, will require draining in the first instance, for although Roses are very partial to a cool and moist bottom, they, like most other plants, will not thrive in that which is water-logged. But should the soil be stiff, and yet not so clayey as to require draining, the beds will be greatly improved if some burnt earth be mixed with it, as this will serve to keep the ground porous and aerated. For this class of soil horse manure is preferable to either farmyard or cow manure. Let the beds, which should be 5ft. wide, so as to hold three rows of plants, be ready, if possible, by the end of the summer, so that the autumn rains may have a chance of settling the soil in them before the planting time arrives in November. The length of these beds can be easily calculated, knowing they are required to accommodate three rows of plants, and that the distance between the Roses is to be 18in.

MERVEILLE DE LYON.

THE SELECTION OF VARIETIES.—The beds having been carefully prepared as previously described, it will be next advisable to decide on the sorts to be grown in them, and the number of plants of each variety that will be required. The selection becomes a little more simple when we learn that exhibition Roses belong entirely to one or other of the two following classes: (1) The Hybrid Perpetuals, with which may be grouped the Hybrid Teas; and (2) the Teas and Noisettes.

If required for exhibition, the selection will depend upon the number of blooms the amateur intends to show. It may at first sight appear surprising that, in order to stage successfully from six to nine blooms, it will be necessary to cultivate altogether from 300 to 500 plants; to show twelve blooms, from about 800 to 1,000 plants; and to show eighteen or twenty-four blooms, from 1,500 to 2,000 plants. But it must be borne in mind that the six, twelve, or twenty-four blooms, as the case may be, have to be cut on a single day, that only choice specimens are of any service, that they must be staged in perfect condition on

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"COUNTRY LIFE."

the following morning, often after a long journey, and that each bloom set up must be a different variety from any of its fellows. I would strongly advise the beginner to start with, say, 350 plants, which, with careful attention to their requirements, will allow him to compete with a good chance of success in the smaller classes at any of the leading Rose shows in the country. By the time he has won his spurs in these small classes he will have learnt what Roses do best in his own locality, and may be safely trusted to alter in any way he may see fit the following selection, which, however, in the first instance ought to prove a very strong and effective one, the varieties named in it having appeared in recent years more frequently in winning stands than any others.

SELECTION OF 350 HYBRID PERPETUALS AND HYBRID TEAS FOR EXHIBITION.—Twelve plants of each of the following: A. K. Williams, Caroline Testout (H.T.), Her Majesty, Kaiserin Augusta Victoria (H.T.), La France (H.T.), Mme. G. Luizet, Marquise Litta (H.T.), Mrs. John Laing, Mrs. R. G. Sharman-Crawford, Mrs. W. J. Grant (H.T.), Suzanne M. Rodocanachi, and Ulrich Brunner.

Six plants of Alfred Colomb, Captain Hayward, Charles Lefebvre, Dupuy Jamain, Earl of Dufferin, Gustave Piganeau, Helen Keller, Horace Vernet, Marchioness of Londonderry, Marie Baumann, Merveille de Lyon, and Prince Arthur.

TEAS AND NOISETTES.—Ten plants of Bridesmaid, Catherine Mermet, Comtesse de Nadaillac, Innocente Pirola, Mme. Cusin, Mme. Hoste, Maman Cochet, Marie Van Houtte, Muriel Grahame, Souvenir de S. A. Prince, and The Bride.

MURIEL GRAHAME.

Six plants of Caroline Kuster (N.), Hon. Edith Gifford, Madame de Watteville, and Souvenir d'un Ami.

When ordering these Roses from the nurseries, it will be advisable to stipulate that they be dwarf or bush plants, on either the Briar cutting or seedling Briar stocks, as the Manetti stock is less satisfactory and enduring on most soils. If the locality be one in which the wild Briars grow vigorously in the hedgerows, instead of having all dwarf plants half Standards may in some cases be substituted. Arranged at intervals down the centre of each bed, these half Standards will considerably improve the appearance of the Rose garden when the plants are in flower, besides which the Hybrid Teas and Tea-scented Roses often thrive better on this stock than on any other.

The order for the plants should, if possible, be sent in during October, as it is

important that the plants be received as early in November as possible, so that they may obtain some hold of the soil in their new quarters before the winter sets in. Roses may, however, be planted at any time between the beginning of November and the end of March, but when the weather is at all suitable November planting is much to be preferred.

HYBRID TEA ROSE (Aurora).

PLANTING.—It has been previously stated that the preparation of the beds is a matter of special importance, but good planting can only be placed second to it, the future well-being of the Rose very greatly depending upon this operation being properly carried out. When the bundles of Roses arrive from the nurseries they should be unpacked with care, in order that none of the shoots of the plants or their roots be bruised or otherwise injured. When unpacked it will be well to moisten the roots by dipping them in water. The Roses should then be heeled in in some convenient spot in the garden, keeping the varieties separate, so that when wanted they can readily be found without disturbing the others. In heeling them in particular care should be taken that all the roots are completely covered.

If the soil in the beds be in a suitable condition no time should be lost in getting the Roses planted, but if saturated with wet it will be necessary to wait until the superfluous moisture has passed out of the ground. The plants, as before stated, should be 18in. apart in the rows. Knowing this, it will be easy to arrange beforehand the place each variety is intended to occupy. As the roots must at no time be allowed to become dry before planting, it will be well to transfer only a few plants at a time from the spot where they have been heeled in to the neighbourhood of the beds, and to cover them at once with a mat, or other material, to check evaporation. When planting, a hole should be dug about a foot square, and sufficiently deep to allow the junction of the stock and scion to be about an inch below the level of the bed. Then removing a plant from beneath the mat it should be held in the centre of the hole, while the planter spreads out the roots horizontally, at the same time distributing them as evenly as possible over the bottom of it. Crumble some fine soil over these roots, and work it in carefully among them, then add more soil, and when about 3in. thick tread it lightly down. This fine soil should come from some other part of the garden, as the roots of Roses when first planted should not be brought in direct contact with the manure in the beds. Next fill in the hole, and tread the ground firmly down round the plant. Firm planting is one of the greatest secrets of successful Rose growing, as it enables the plants to become more readily rooted than if the soil be left in any way loose.

The half Standards should be treated in the same way as the Dwarfs, the only difference being that a stake should be firmly driven into the centre of each hole before inserting the roots of the Rose. To this stake the Standard should be afterwards secured, in order to prevent it from being rocked by high winds. Standard Roses are often planted too deeply. They should, however, never be inserted deeper than they will be seen to have been previously planted in the nursery from which they came; about 6in. or 8in. deep is quite sufficient. All Roses should have permanent labels attached to them, or placed in front of them as soon as planted.

PROTECTION OF TEA ROSES FROM FROST.—As many of the Tea Roses are tender, and liable to be killed during severe winters, the soil should be drawn over the centres of the dwarf

plants to the height of 3in. or 4in. This will be found an efficient protection, for although the upper part of these Roses may be destroyed by frost, the covering of earth will preserve the crowns of the plants from injury, and fresh growths will spring up from the base after the dead shoots have been cut away at pruning time. Standard Tea Roses are not so easily protected, but much may be done by placing a firm stake to each Standard and tying the shoots to it, afterwards covering them with a slight thatching of straw or bracken. This will not only serve to protect them from frost, but will also prevent rain or snow settling in the heads, which, if followed by intense cold, is always so much more dangerous than when the shoots are kept dry.

PRUNING.—This naturally divides itself into two distinct operations: (1) Removing the useless shoots; (2) Shortening back those shoots that remain. In the first place, all old, decayed, and weakly shoots should be cut out entirely with a sharp pruning knife, also the pithy growths, however strong. This having been done, the pruning proper is effected by cutting back the sturdy, well-ripened shoots that are left. To the beginner the ruthless way in which an exhibitor decapitates his Hybrid Perpetuals appears little short of murderous, for an exhibitor thinks nothing of cutting down his plants to within a few inches of the ground. And why is this? Because he knows that the harder he cuts his plants the stronger will be the shoots that proceed from the few remaining leaf buds. The Hybrid Teas should be less severely pruned. In the case of the Teas the knife need only be sparingly used, just shortening back to half their length the shoots that remain after the dead and very pithy ones have been removed. If the blooms be not required for exhibition, the shoots may be left rather longer than above directed, especially in the case of the Hybrid Perpetuals. For whatever purposes exhibition Roses are grown, the dead, the twiggy, and unripened or pithy shoots should be cut clean out, also any wood more than two years old. However long or however short the remaining shoots be left, care should be taken that the cut be made just above a dormant eye making outwards. After a severe winter it will be only necessary to remove the injured growths, and cut back the few remaining shoots until sound wood be met with—that is to say, where the pith of these shoots ceases to be discoloured, even if necessary below the surface of the beds. As to the time of pruning, this will depend to a certain extent on the locality, whether an early or late one, but as a general rule this operation should be carried out at intervals during March for the Hybrid Perpetuals and Hybrid Teas, leaving the Teas and Noisettes to be dealt with in April.

LA FRANCE.

INSECT PESTS.—No sooner do the young shoots appear on the pruned plants and begin to show a few leaves than insect pests of all kinds set about trying to destroy them. The first to appear is usually the Rose maggot, accompanied by various caterpillars. These enemies secrete themselves in the foliage, and would if not prevented soon destroy many of the infant flower buds. There is only one remedy for such marauders, and that is to go carefully over the plants every few days, remove them with the hand, and destroy them.

A little later on comes the Rose aphis, or green-fly. This pest should never be allowed to become numerous, but be searched for and destroyed in the same way as the Rose maggot. If the plants are inspected frequently, it is surprising how easily even such tiny creatures as green-fly can be kept in check with the thumb and finger alone. It is when they are allowed to obtain a footing that this simple remedy fails to prove sufficient. In such cases sharp syringing with clear water is advisable, or, if still stronger measures be necessary, instead of clear water use one of the numerous insecticides sold for the purpose, taking care to dilute it in strict accordance with the directions printed on the bottles.

Of all the fungoid enemies of the Rose, mildew is undoubtedly the most troublesome and persistent in its attacks. If, however, it be taken in hand early enough it can always be kept in check with flowers of sulphur. A simple method of distributing it is to pour a small quantity into a muslin bag and dust the sulphur over the affected parts of the plants, a calm evening being the best time for the purpose. This plan if persevered in will prevent the mildew spreading, as it rapidly will if left alone, over the whole collection. Certain Roses, like Her Majesty, are especially liable to mildew, and should on that account be planted together in a separate part of the Rose garden.

Orange fungus, or red rust, is another fungus to the attacks of which Roses are liable, particularly on certain soils and in certain seasons. There is no known remedy for this enemy, but fortunately it generally makes its appearance after the first flowering is over. It appears to do no permanent harm to the plants, but by causing the foliage to fall prematurely it greatly reduces the supply of autumn Roses. Strangely enough, it does not affect the Tea-scented varieties, but is often very troublesome among the Hybrid Perpetuals.

THINNING AND DISBUDDING.—There is little rest for the exhibitor when once the plants are in active growth, for in addition to keeping in check the various insect and other pests, it will be necessary to remove all the young shoots which have an inward tendency and are likely to crowd the interior of the plants. Later on, when the flower buds are formed, the two smaller side buds will have to be removed, leaving only the central one to produce a flower.

A ROSE STUDY.

WATERING AND HOEING.—From the time the buds appear at the end of the shoots the plants should be well watered once a week, if the weather be at all dry, with weak liquid manure, and the surface of the beds loosened with a hoe on the following day. If such frequent watering be impracticable, each plant should receive once for all a copious supply of clear water, and the beds be then covered with a mulching of half-decayed manure about 3in. thick.

I need not here enter into the questions of protecting the finest flowers from rain and sun, of the best time in the day to cut the blooms for a show, of the sizes of Rose-boxes, etc., having already devoted sufficient space to the discussion of the art of Rose growing from an exhibitor's point of view. It is, however, always well in the first instance to have before one the highest standard of culture, in order to comprehend fully the requirements of any plant we may be about to grow—even if we are ourselves only able to meet those requirements halfway.

I am well aware that in an ordinary garden especial care cannot be given to every kind of flower in it, even though that flower be Queen Rosa. Still, such a choice plant as

A HALF STANDARD ROSE (W. A. Richardson).

the Rose may at least claim that its most pressing wants shall receive due attention. For instance, from the foregoing instructions, it will be gathered that Roses can only be grown with success if properly planted in well-prepared and rich soil. Now this is after all their most pressing need, for Roses so planted will continue to grow and flower, at all events fairly well, for years, however much they may be afterwards neglected. More disappointment has, I feel sure, arisen from indifferent planting in unprepared soil than from any other cause that could well be named. The nurseryman is censured for supplying such "bad plants," or the natural soil of the garden is at fault, or the climate, or what not, whereas I should not be far short of the truth if I said that in ninety-nine cases out of a hundred it is the indifferent planting alone that is to blame. Indifferent pruning is also in such gardens, I am afraid, the rule rather than the exception. And yet what can be easier than to prune an exhibition Rose, where good flowers and not the symmetry of the plant is the first consideration. In fact, it matters little how long or how short the shoots are left, provided all the old, dead, and weak growths are clean cut out. Another point in which most growers fail is in selecting unsuitable varieties for ordinary garden cultivation. Whereas exhibition Roses may for our present purpose be divided into two distinct classes, viz.: (1) Those adapted for an exhibitor's garden only; (2) Those which can be easily grown by the non-exhibitor as well. The following selection can be confidently recommended to the non-exhibitor as the groundwork of his collection.

Selection of Exhibition Roses for Ordinary Garden Cultivation.

Hybrid Perpetuals.—White: There is as yet no really good white Hybrid Perpetual; Merveille de Lyon and Margaret Dickson are, however, the best we have. Pink: Mrs. John Laing, the most dependable of all the Hybrid Perpetuals; Mrs. R. G. Sharman-Crawford, rather subject to mildew, but otherwise a most charming and free-flowering variety; Marie Finger, a most taking shade of salmon pink. Medium red and rose: Ulrich Brunner, a Rose of grand growth and constitution; Suzanne M. Rodocanachi, matchless in its particular colour—glowing rose colour; Dupuy Jamain, very dependable, and a good grower. Crimson: A. K. Williams, the most perfectly formed of all the Hybrid Perpetuals, and where it succeeds a most desirable variety; Marie Baumann, still one of the most reliable of the soft crimson varieties, rather subject to mildew; Fisher Holmes, also good; Captain Hayward, a fine shade of crimson-scarlet. Dark crimson: Charles Lefebvre, still unequalled in its class; Prince Arthur, a deep-coloured sport from General Jacqueminot; Prince C. de Rohan, the most dependable of the very dark varieties.

Hybrid Teas.—White: Kaiserin Augusta Victoria, almost a Tea Rose. Pink: La France, nearly always in flower; Caroline Testout and Viscountess Folkestone, both very distinct, and in all respects charming. Medium red: Marquise Litta, makes excellent growth, and is quite distinct in colour.

Teas and Noisettes.—White: Innocente Pirola, Hon. Edith Gifford, Souvenir de

S. A. Prince, and White Maman Cochet. Blush and pink: Maman Cochet and Souvenir d'un Ami. Yellow: Mme. Hoste, Marie Van Houtte, Caroline Kuster (N.), and Anna Ollivier.

There are many choice varieties besides those named, but few which will thrive as well with ordinary treatment. The summer culture, under such circumstances (which is after all of far less importance than judicious planting, pruning, and selection of varieties), should consist in keeping within reasonable limits the attacks of the Rose's numerous insect and other enemies, in occasional heavy waterings during dry seasons, and in the removal of all flowers as they fade. The beds need not be as formal as in an exhibitor's garden, but may be made any shape desired, provided easy access can be obtained to the inner row of plants. Wherever possible, however, Roses should have beds to themselves, and not be planted with other flowers. Each year these beds should receive a good dressing of manure, which may be either lightly forked in during the spring or left on the surface as a mulching. In the latter case a sprinkling of soil over the mulching will be advisable.

As Mr. Mawley points out in his article, and he writes with authority as one of the honorary secretaries of the National Rose Society, exhibiting Roses is a pleasurable pastime, partaken of for pure love of the flower. The Rose exhibitor and the raiser of varieties for show have accomplished a great work, not in merely popularising the Rose for this purpose, but in creating a general interest in the family. This is reflected in the gardens of England, in the beds of dwarf plants of the most beautiful varieties, and in the woodland, where the climbing kinds ramble in their own ways. There can be no doubt that the exhibition has served a purpose other than encouraging the culture of show blooms only, and of late years many classes have been added in which decorative Roses alone may be exhibited. The National Rose Society certainly deserves the support of all interested in our national flower.

The illustration given of a Rose border shows one way of using the queen of all flowers. It is not alone for exhibition, even for the pergola and garden arch, that the Rose is welcome, but also, of course, in the flower garden proper, even in the mixed border, or as a border by itself.

A ROSEWALK AT WICKHAM COURT.

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BROME HALL: WHERE THE WATER-LILIES GROW.

"COUNTRY LIFE."

DAFFODILS IN THE GRASS AT HUNTERCOMBE MANOR, MAIDENHEAD, BERKSHIRE.

FLOWER GARDENING IN THE GRASS.

DAFFODILS fluttering in the lush meadows of our English counties, or the Snake's head Fritillary rising modestly above the grass in some Oxfordshire mead, teach us certain truths. The true flower gardener must sit at the feet of Nature and seek to discover her hidden mysteries, her life, whether of the heavens or the earth, which she dapples with dainty jewels for her followers to fling around their homesteads. No wild, hysterical scattering of flowers without reason, but a judicious selection of the fittest things to lighten the meadow, hide away in the distant woodland, or group in the shrubbery, here, there, and everywhere, artlessly and without apparent plan, yet in very truth with a set system in the mind's eye. Native flowers, and others from sunnier lands than ours, may be used in many charming ways when the grass is not mown before the leaves of the bulb have ripened. But if no meadow-land creeps up to the pleasure grounds, flower gardening of a simple kind may be enjoyed, planting Scilla, Crocuses, Solomon's Seal, Snowdrops, Daffodils, Winter Aconite, Tulips, and Chionodoxas in little groups, perhaps, in some recess in the shrub margin or at the base of an old tree. Here the delicate blue Anemone Robinsoniana is happily placed; its frail flower opens wide in the awakening day, and the bulbs increase freely in a cool, well-drained soil. Little groups around a tree or sheltered by surrounding shrubs are good pictures in spring, as pleasing as the native kind, sprinkling the shady hedgerow and copse with tender pink.

It is in the springtime of the year that the flowers of mead and hedgerow expand, as if to welcome the warmer, sunnier days. Before the sun, however, can really filter through the woodland, the Snowdrop whitens the earth with its drifts of blossom, a mantle of flowers in February, before the first Daffodil has ventured out of its brown sheath. The Winter Aconite will establish itself in some soils, but is uncertain. Where it extends without assistance the flower gardener is fortunate, for in the spring the yellow blossom in its quaint collar of green gives a fresh charm to the pleasure ground and shrubbery.

But chief reliance must be placed upon the Daffodils, the garden host that comes with

March—even before—and continues to appear, in one or other of its forms, until the gleaming silvery white of the Poet's Narcissus is seen no more. Where the soil, a cool loam, suits the Daffodils, it is wise to establish them everywhere. One never tires of the flowers, so fresh in the spring sun, or seen in deeper shade in the cool retreat of copse and shrubbery. The Star Narcissi, chiefly of the Incomparabilis group, should be freely used, but the bicolors and Trumpet Daffodils may be established also, finishing the season with the Narcissus poeticus.

How beautiful is a meadow of Poet's Narcissus in the early May, as sweet in England as in the hill meadows of the Pyrenees, and lasting for some weeks in cool seasons. Thin groups are more enjoyable than thick-set masses, so thick that one may imagine the planter was thinking more of the beds upon the lawn than the meadow, where Nature makes open groups, irregular, without set form, artless, winding colonies, as if patches of white foam had been blown hither and thither. In a hundred English gardens the possibilities of creating pictures of flowers in the grass are great, and in time the bulbs will become naturalised, no longer requiring further attention than to wait until the foliage has died down before mowing. When a meadow of Daffodils, or, indeed, of any flower, is mown over before the leaves have finished growth, the bulbs gradually disappear from sheer weakness through this yearly disturbance.

Those who have no meadow-lands to plant in this way should still use the Daffodil freely, practising another form of wild gardening, if such it may be called. Daffodils rarely disappoint; they seek shade as well as sunshine, and flower as freshly in the shrubbery margin as in the open bed upon the lawn. Plant them by woodland walk and fringe of copse—anywhere colour is desired in the early spring.

BLUEBELLS.

Flowers found wild in meadows represent families that may be used sometimes with freedom in the meadow. To despoil the native flora for the sake of beautifying the garden is sinful. There is no necessity to disturb the peace of the meadow and wayside, but grow them in some reserve place, or purchase them from those who make, so to say, farms of these meadow flowers. The Fritillary, or Snake's-head, in its infinite variety is full of graceful charm, the large nodding flowers appearing above the grass, and there is much change of colour, sometimes almost pure white, or purple, chequered with darker or paler shades. This Snake's-head is a flower so happily placed in grass that it should be established freely, if not in the meadow then in distinct groups upon the fringes of the pleasure grounds, or in nooks in the shrubbery, where one may enjoy the quaintly poised and coloured flowers. The Muscaris, or Grape Hyacinths, to use their English name, seem a race little cared for, though many of the flowers are blue as a summer sky. But they are a success in shady places, upon rough banks and in thin grass. M. conicum, which has very deep blue flowers, is as rich and strong as any of them, the bulbs increasing fast, and in time forming a thick mat, surfaced with fragrant bloom in spring. It is always well to select a few good kinds and give

them a proper chance, rather than select any pretty colour that takes one's fancy without considering the strength of the plant. White, delicate rose, soft blue, purple, and rich blue, with shades of each one, are present in this family.

Blue, too, as deep as the Gentian almost, is the Scilla, to which group belongs the Wood Hyacinth or Bluebell (S. nutans) and the Spanish Bluebell (S. campanulata). Both these species should be well grown in English gardens. The Bluebell, a sea of soft colour in the copse and woodland in May, has white and rose forms, which may be introduced into the meadow for variety. Even stronger is the Spanish Scilla, and its white and soft rose varieties bulbs of wonderful vigour, spreading freely in almost entire shade, save the light that glints through the tree branches. In May the flowers appear in profusion, and last some weeks in fresh beauty. In sunshine and shade this Spanish Bluebell will increase freely, and its varieties are almost as vigorous.

AUTUMN CROCUSES.

As dainty as the Daffodil is the Snowflake of spring and late summer, Leucojum æstivum and autumnale respectively, tall Snowdrop-like flowers of free growth in good soils. The spring Snowflake is prettily placed at the base of fruit trees in an orchard or grassy acre near the house in which the Apple is planted for its pinky bloom, and Daffodils caress the brown trunks. At the foot put the Snowflake also, both its spring and summer kinds—Snowdrops, in truth, held on tall graceful stems.

Where no meadows are available to make Mary's meadows withal, a small stretch of grass will give many charming effects when planted with flowers that delight in the green sward. Here the Tulips, T. sylvestris, suaveolens, Clusiana, and the slenderer kinds, will bloom, mingling with meadow Saxifrage (S. granulata fl.-pl.), S. Camposi, and Scilla—or perhaps Ornithogalum nutans has been used to make clouds of soft green and grey, as grey as the early dawn, and this plant, when it enjoys the soil and position, will make a colony of some extent if not hindered. Crocuses of course are so brilliant that they must be naturalised in the grass. No flower of the early year is so enjoyable, or gives such rich carpets of colour, yellow, orange, purple, and white, laid over the grass-land in the early year when the midday sun is strong enough to open their petals wide and stain still deeper the green turf. This brave family is scarcely used in the best ways in gardens. Lining a border with Crocuses is correct, but it is in broad masses, in groups in the grass, on the verges of the lawn, or under trees, that the Crocus is most thoroughly enjoyed. This is following the ways of Nature, who scatters the flower in the meadows of Europe, as she does the Bluebell in the English copse and wood. Of the rarer species little need be written, but the true autumn Crocus (C. speciosus) is a beautiful September flower to establish just beyond the spread of tree branches. A warm sun opens the petals to disclose the orange centre against purple-blue. Colchicum autumnale, in its single and double forms, C. speciosum, and C. Parkinsoni, are worth establishing in the grass—the best way of using flowers that are happy in mead and lawn.

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HERBACEOUS CALCEOLARIAS.

THE GREENHOUSE AND ITS FLOWERS.

BY a greenhouse is meant a glass structure for the cultivation of plants that are too tender to stand the winter in the open ground, and at the same time do not require very much heat. A minimum temperature of 40deg., rising 5deg. to 10deg. during the day, should be maintained throughout the winter, and as spring advances and the sun gains power, an additional 10deg. may be allowed in the daytime. In erecting a greenhouse, its shape, size, and position will of course depend upon the space it is to occupy, but where possible it should be a span roofed structure, as the light is then admitted on all sides, and consequently the plants grow symmetrically. Very often the only position available is close to a wall or dwelling-house, in which case a lean-to greenhouse is built—that is, one in which the rafters slope direct from the wall at the back to the front of the structure. A house of this description has one disadvantage, as the plants contained in it grow one-sided, but on the other hand it does not occupy the space needed for a span roofed building. Where a moderately high wall already exists, another form of house, partaking of the characters of both, is often used. This is known as the hip roof or half span, which has full length rafters in front, and at the back short ones, extending from the top of the wall to the apex of the roof. All of these lean-to houses should, if possible, face due south or nearly so, but a span roofed structure is best running due north and south, as it gets a maximum of light, and the summer's sun at mid-day does not shine full on the glass.

Ventilation is very important, and in a span roofed erection provision should be made for it along the highest part of the roof, while the lights at the sides must be arranged to open or shut at will. Besides this, when the hot-water pipes extend around the outside of the structure a few spaces in the brickwork which can be closed by a small trap are of service, since in cold weather, when the pipes are hot, these traps may be opened, and thus cause a circulation of air without lowering the temperature, as the

cold air from the outside passes over the hot-water pipes before entering the house. Ventilating the upper part of the roof was at one time generally done by means of sliding sashes, but of late years sashes that work with a lever have become general.

The staging of a greenhouse will depend upon its size, and the purposes for which it is intended. In the case of a house 10ft. wide a stage 3ft. 6in. wide on either side, leaving the central path a yard in width, is a very good arrangement. Where the house is much wider the centre may be occupied with plants, leaving a path all round. If the plants are small, a stage must be erected in the middle, but if large, they may be grouped on the floor level. Another way is to plant out such subjects as Camellias in the centre of the house, but in that case a bed must be prepared for their reception. A lean-to house may have an ordinary flat stage on the front, but at the back arrange it in a step-like manner, one tier above another. In this case, watering the plants is more difficult than in a span roofed structure. The stages may be made of different materials, large slates on iron bearers being particularly durable, but the expense is against their general use, and wooden stages are almost universally employed: If made of good material and well painted they will last for many years. The surface of the stages should be covered to the depth of half an inch with sea shingle, consisting largely of cockle shells, so much used for walks. It serves to maintain a uniform state of moisture about the roots. Shading is necessary during the summer, or rather many of the flowering plants will be benefited by a certain amount of protection from the full rays of the sun from April to October. Shading is of two kinds—firstly, permanent, and secondly, that which may be drawn up, when not wanted, by means of a roller. The latter is in every way more satisfactory than the other, as the plants are not unnecessarily deprived of light—a very important consideration. Canvas of various kinds may be employed for shading purposes, while special preparations are also used. For permanent shading, one of the best is Summer Cloud, which may be obtained from most dealers, with directions for use.

THE CONSERVATORY AT BELTON HOUSE, GRANTHAM.

The plants that may be grown in a greenhouse are so varied that no particular instructions can be given for any one kind, but a few general remarks will apply equally to all. Insect pests must be especially kept down, and for this purpose there is nothing

better than the XL All compound, a preparation of Nicotine, which, while fatal to all insects, will not injure the flowers. During the summer, too, use the syringe freely, especially among the climbing plants, but it must be kept away from the flowers. Damping down—that is, wetting the paths underneath the stages and all vacant spots—is also of great service, as it tends to maintain a humid atmosphere very beneficial to the plants. In the winter too great an amount of moisture must be avoided, and a free circulation of air allowed whenever possible. A great many of the plants that are wintered in the greenhouse may be placed out of doors during the summer, when the structure is available for other subjects that bloom at that period but pass the winter in a more or less dormant state.

With regard to the structure itself, it should every third year at least be thoroughly overhauled, all defects made good, and the whole given two coats of paint, by which means it will last a lifetime. Provision should be made for storing the rain water in a tank within the house, as it is then always at a suitable temperature for watering the plants, and for this purpose rain water, when it can be obtained, is preferable to any other. The construction of a greenhouse is a very simple matter, and ready-made erections cost little, too, but structures of an ornamental character are not always the most useful. The very high-pitched roof, elaborate top-ventilation, and fanciful design so frequently seen amongst conservatories and greenhouses attached to the modern villa are absolute death-traps to the plants. More often sickly plants result not from indifferent cultivation so much as poorly ventilated and constructed houses, and it is money saved to go to a good horticultural builder, and ask him to put up a plain, simple, and solid structure in which the plants can have plenty of light and stand no chance of being injured through want of proper ventilation.

THE GREENHOUSES AT STREATHAM HALL, EXETER

Another point of great importance is not to make a living museum of the greenhouse. It is folly to attempt to grow everything enumerated in the alphabetical list in this single structure, because, of course, indoor plants differ as greatly in growth as those of the mixed border. Nor is it wise to cover the roof with a thick growth of climbing plants, which simply promote lanky stems and colourless flowers upon the things below. By no means dispense entirely with climbers, merely restrict them in growth and numbers. The

Blue Plumbago, climbing Fuchsias, or the deep purple Lasiandra macrantha are climbers one may well possess for their graceful growth and flower colouring. In the alphabetical list a small selection of climbers is given, all of much beauty and interest.

Beneath the stages Ferns may be established, and if Zonal Pelargoniums are grown for the winter it is astonishing how bright the greenhouse may be kept with a well chosen selection of these popular flowers. The indoor garden, or greenhouse, as it is usually called, may in truth be made an interesting abode for flowers sent to us from abroad and raised by hybridising in our own land. Amateurs frequently make mistakes in heating their greenhouses, so the general remarks may well conclude with reference to this matter.

HEATING GREENHOUSES.—This is an important subject for amateur gardeners in particular. If things work smoothly, 1ft. of boiler surface will heat about 30ft. of 4in. pipes. All glasshouses, if more than 20ft. long, should be heated by a boiler and hot-water pipes. The most serviceable boiler is the check end saddle, although for small houses the Paragon is not without merit, and it can be set in the brickwork at the end of the house. But the difficulty with these and other similar boilers is their small capacity for fuel. They require frequent attention, and the fuel must be broken up small. Too often, however, the experience of the one boiler system, where several houses have to be heated—some of which may be a little distance from the boiler—is not favourable. There is generally too much friction in the system to be economical. In all cases the boiler should be large enough to perform its work in severe weather, and there is no economy in stinting the pipes in proportion to the work required. Whatever boiler be used, the proper setting is important if the full amount of work is to be obtained from it, especially as regards the size of the flues. When the setting is left to a bricklayer, the flues are frequently too small. No flue, not even for a small boiler, should be less than 5in. wide, and for boilers capable of heating 600ft. of pipes the flues should be from 6in. to 7in. in diameter. They should also be thoroughly well built, and the corners made smooth, to lessen the friction as much as possible. Brush out the flues frequently with the flue brush, and clear with the hoe, as a boiler coated with soot cannot perform its duties satisfactorily. The shaft or chimney should be high enough to secure a steady draught, so as to consume all the fuel thoroughly and leave the heat round the boiler. Slow combustion is the correct principle to go upon, and this requires space in flues and chimney, with the damper never out, except for a short time when the fire is burning up. Good stokers are rare, and it is difficult to induce stokers, especially boys, to consider how the fuel may be economised.

Small houses may often be economically heated by gas, which may cost rather more than coke, but, of course, gives little trouble; when a fire is required quickly, lighting a fire and raking out ashes is dirty work, and unless the apparatus is kept clean the results are unsatisfactory. It is best to put the fixing of a gas boiler in the hands of a gas engineer who thoroughly understands his work.

Heating by oil lamps or stoves will suffice for small houses so long as personal attention can be given to the cleaning, trimming, and lighting of the lamp or stove, but when left to young servants trouble soon comes, in the shape of evil odours, smoke, and scorched plants. It is necessary, in dealing with oil lamps or stoves, to keep in mind the old adage that if you want a thing done well you must do it yourself.

It may be considered incorrect to praise in any way the old-fashioned flues, but in several places they are carrying on good and economical work, burning up all the cinders and waste matters about the house, the sort of fuel that would be useless in a small boiler.

The greenhouse is frequently a source of infinite pleasure, and may be made use of, in a measure, as a store place for tender plants brought in from the summer garden, especially where the indoor garden, so to say, is confined to a single structure. Ferns and window or room plants in general may be removed thither to recover, after repotting in

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particular, when a little artificial warmth is desirable. Room gardening is scarcely a pleasurable pastime unless one can remove the plants to a hospital when sickness overtakes them.

Indoor gardening in many of those structures attached to the modern villa is fraught with vexation and disappointment, because the houses are not adapted for the growth of even moderately vigorous plants. Light is essential, and for this reason, when the greenhouse is placed away from the residence it must not be put near to trees or anything to over shadow it and deprive the inmates of sun and air. It is because light is so necessary that a span roofed structure is recommended, open on all sides. A greenhouse filled with a carefully selected group of plants may be kept bright throughout the year. In it may be grown a host of bulbous plants for the spring, to which reference is made in the alphabetical descriptions of indoor flowers. Daffodils should be grown in variety; the bulbs are cheap, and very certain, hence the beautiful star varieties, the big trumpet-shaped Daffodils, sweetly-scented Jonquils, and others may be grown freely, fresh and bright harbingers of those that will in due course gladden the garden out of doors. Snowdrops, Scillas, Chionodoxas, Fritillaries, Lilies, and many other things are easily managed in a greenhouse, whilst, of course, the brilliant Zonal Pelargoniums, or "Geraniums" as they are popularly called, will brighten the place throughout the winter months. When the greenhouse is well stocked with flowers it is easy to keep the rooms gay, as the Daffodils, or whatever the plants may be, can be brought into the house when required. Then, too, how delightful is it to see the famous Maréchal Niel Rose clambering over the rafters, or waxy bells of the Lapageria hanging in profusion, near perhaps the delicious blue of the Plumbago. The good gardener will in a greenhouse merely heated to keep out frost ensure a brilliant display in the winter and early spring, commencing again in its fulness in the time of the Chrysanthemum. During the summer one seeks the lawns and borders, and is concerned far less with glasshouse gardening, but in the winter this is different. It is then that the indoor flowers appeal strongly to all who love to possess beautiful things around them. When the proper varieties are chosen an abundance of flowers is easily

THE LARGE CONSERVATORY, SYON HOUSE, MIDDLESEX.

EXOTIC FLOWERS IN A CORRIDOR.

obtained. Glass-house gardening is not a pursuit beset with difficulties. Failures first arise through neglect of ordinary details — suppression of insect foes and ignoring the rules of careful ventilation and watering. It is the first principles that must be correctly carried out, the common-place matters of potting for example, and many failures may be traced to carelessness or ignorance of this simple practice. Indoor flowers of the more common kinds are so easily grown that it is hard to understand why failures should occur when a beginner has mastered the mere rudiments of gardening.

Abutilons.—These valuable plants consist for the most part of highly ornamental shrubs, with drooping flowers more or less bell-shaped. They are all of easy culture, and may be readily propagated from cuttings of the young shoots put in during the spring months in heat. The principal species, all of which are natives of South America, are :

A. Darwini.—A compact plant, with reddish crimson flowers, introduced from Brazil in 1871. There is a variety of this called tessellatum, in which the leaves are curiously variegated with creamy yellow.

A. insigne is a much stronger plant than the last, with peculiarly rough leaves, and widely expanded blossoms of a purplish crimson with blackish veins.

A. megapotamicum.—Though small, the red and yellow blossoms of this are borne throughout the year, and it is in addition one of the hardiest of all. This is essentially a climber, and it is best seen trained to a roof; indeed, such a position is suitable for nearly all the Abutilons, owing to the pendulous nature of the flowers.

A. striatum.—This is a rapid grower, with handsome lobed leaves, while the flowers are of a bright orange yellow veined with red.

Besides these there is a large number of hybrid varieties, in which many shades of colour are represented. They include—White : Boule de Neige, Seraph. Red : Brilliant, Sanglant, Royal Scarlet. Yellow : Golden Fleece, very charming, covering the greenhouse roof, Chrysostephanum. Pink : Anna Crozy, King of Roses. Purplish : The Premier, Emperor ; and with variegated foliage : Thompsoni, Eclipse, Sellowianum marmoratum, Souvenir de Bonn, and Sowitzi.

Abutilons are very easily grown, few greenhouse plants more so, and their bright flowers are always welcome for decorations. Sometimes one desires to cover a wall with them, and this is not difficult ; but in this case, if the wall to be thus clothed is of any extent, it is well to plant out the Abutilons in the border, which must be well drained with broken bricks or similar material and filled up with good loam. Free drainage is essential, as the plants during the summer will require much water. When grown in pots, plenty of drainage is also desirable, with a loamy soil in which some well-decayed leaf mould has been mixed. The most beautiful of all varieties, especially for covering a wall, is Boule de Neige ; its pure white flowers are invaluable for decorations, even for wreaths and bouquets, for this purpose the anthers being removed and the petals bent back.

Many of the Abutilons are of more account for their colouring than the beauty of their foliage. Souvenir de Bonn is one of these, with lobed leaves of distinct colouring, green with a broad margin of white. Another of the section less known than this variety is Sowitzi, in which there is more white in the leaf, hence the plant is not so robust. A. Thompsoni, A. Sellowianum variegatum, A. Darwini tessellatum, Nævium marmoratum, and the variegated form of A. vexillarium are also worth mention for their leaf colouring. These variegated kinds are used in the summer garden ; but whilst one appreciates variety, an overdose of white or yellow variegated foliage is not pleasant. Moderation is especially necessary when things of such striking character are used.

Acacia.—This is a very extensive family, numbering some hundreds of species, nearly all of which have yellow flowers. The majority are natives of Australia, and a few kinds that will flower freely in a small state are very popular in this country. Cuttings of these do not strike very readily, but seeds of some kinds may often be obtained, and they germinate freely in heat. A few good kinds for the greenhouse are the following :

A. armata, which flowers with equal freedom whether 1ft. or 6ft. high. The small leaves, after the manner of a Myrtle, are deep green, while the globular blossoms, about the size of peas, are of a rich golden yellow. This is one of the most distinct of the whole family, the foliage intense green against the yellow blooms, and is a very neat plant grown in pots; indeed, it is far better for this purpose than planting out in the border. Acacias are seldom seen nowadays, which is a pity, when such kinds as A. armata are so readily grown and bright in colour.

A. dealbata.—This is known as the Silver Wattle tree, and is one of the most vigorous of the entire family. It is useless for a small greenhouse because of its wonderfully free growth, but when planted out in a large conservatory, where it can have free play, its great beauty is revealed, feathery masses of Fern-like foliage, hidden almost in spring with clouds of golden flowers. In its Australian home it is one of the most beautiful pictures in the scenery, and along the Riviera it forms delightful groups. The graceful branches are cut and sent to the English markets under the name of Mimosa.

A. Drummondi.—The leaves of this are of a rich green hue, whilst the lemon-coloured blossoms are borne in elongated spikes, just like little bottle brushes. It is particularly suitable for flowering in a small state.

A. grandis.—A sturdy little bush, with pinnate leaves, which are freely clothed with hairs, and globular flowers of a rich golden yellow.

A. lineata.—This has small narrow leaves and pale yellow blossoms. They are borne in great profusion, and it is altogether a neat, pretty little plant.

A. longifolia.—One of the larger kinds, with simple leaves 6in. long and half an inch wide. It forms a large bush, and when laden with its cylindrical-shaped spikes of pale yellow blossoms is very handsome.

A. platyptera.—This has peculiarly winged stems, quite different from any of the others, and its golden flowers expand in the autumn, whereas all the rest mentioned bloom in the spring. Small plants of this in bloom are very showy. It flowers in quite a small state.

A. pulchella.—The branches of this are very slender, but the side shoots are pushed out so freely as to form a dense bush. The leaves are pinnate, while the flowers are of a rich yellow. The elegant arrangement of the minor twigs renders this one of the most graceful of all the smaller Acacias.

A. Riceana.—A rambling plant suitable for training to the roof of a greenhouse, in which position the slender shoots hang down for a long distance, and when studded with spikes of pale yellow blossoms they are very beautiful. The leaves are narrow and pointed.

Achimenes. These comprise a very pretty group of soft-wooded plants, which flower throughout the summer, and pass the winter in a dormant state. Of late years, however, the Achimenes have been little seen, though why such flowers should fall practically out of cultivation it is not easy to tell, for their culture is not difficult, and vigorous plants in full bloom are wonderfully bright, the colours ranging from pure white to deep purple. The beginner would not require a large selection, and the following are amongst the most handsome: Carminata, Lady Lyttelton, Ambroise Verschaffelt, Dazzle, Mauve Queen, Longiflora and its white variety, and Rose Queen. Achimenes require rather more heat than the ordinary greenhouse affords. Whilst the tubers are at rest in winter the soil must be kept quite dry, and in early spring, when growth commences again, shake them free from soil and repot in a good light compost. Several tubers must be grouped together to render the plants effective. It is possible by starting the tubers at various periods of the year to secure a longer succession of flowers than could be obtained by having only one batch of plants, and, if an increase of stock is desired, it is simply necessary to break the tubers into pieces. Each piece will soon become established. Those who delight in these beautiful flowers, and there are still a few gardens left in which they are grown, commence about February, when the first flowers open in May. After turning the tubers carefully out of the pots in which they have rested during the winter, upon some shelf or under a plant staging away from frost, put them into small pans or boxes filled with light soil, made up chiefly of leaf mould. Transfer them to a propagating pit, with a temperature of from 55deg. to 60deg., and when 2in. in height put eight or ten of them in a 6in. pot. Use for soil a mixture composed of light loam and peat, or the latter may be used with leaf mould added. A light yet not poor compost is essential, and to these may be added sharp silver sand and thoroughly dried cow manure. After potting, place them in a house kept at a temperature varying between the figures mentioned above, and keep the air moist, without wetting the foliage, the moist atmosphere holding red spider, which frequently attacks the plants, in check. Once this pest gets established it is not easy to destroy. Shade during very hot sunny weather in the middle of the day, a light scrim shading being most suitable, and put thin bamboo stakes to the stems when it is seen that support is necessary.

A warm greenhouse is, therefore, more suitable to their requirements than a cool structure, in which, at any rate during their early stages, they will not thrive. But when the flower buds appear keep the house cooler until they can be brought into the conservatory and greenhouse. As the plants go out of flower, give less water until it is stopped altogether, and store in a dry place. Although Achimenes make delightful little pot plants, their fullest beauty is revealed when they are grown in baskets and suspended in the conservatory. In this form of culture there are no great difficulties to surmount, and a mass of bloom is the result. It is a pity such handsome flowers as the Achimenes are almost lost to cultivation. One supposes it is the result of ever-changing fashion. Probably in the near future Achimenes, Tydæas, and allied plants will be grown as largely as in the old days, when there was scarcely an exhibition at which they were not represented.

African Lily.—*See* Agapanthus.

Agapanthus.—One associates the Agapanthus mainly, perhaps, with its use as a tub plant to stand out in the garden during the summer, but it is a greenhouse flower really, and, if it cannot be used for tubs, may be grown easily under glass. The chief species is A. umbellatus, which is a native of South Africa, and may be trusted in the open air in the extreme Southern Counties of England. Large masses of this, in pots or tubs, may remain for years without disturbance, save occasional top dressings and liberal watering in summer, varied with liquid manure. But over-potting is fatal to a free display of flowers. Only when the receptacle is crammed with roots can a rich display of the handsome spikes be expected. Of its varieties the pure white albus is as precious as any, and there are other forms, one with double flowers (flore-pleno), but this is of little account. The big-flowered Giganteus is seldom seen, and it does not seem to have come up to expectations. Mooreanus is a very charming kind, smaller than Umbellatus, and of a pretty bluish shade. Even when out of flower Agapanthuses possess considerable beauty, by reason of their graceful fresh green leaves. The best way to increase them is by division of the crowns in spring. Remove the soil from the roots, and then one can see where to divide. The plants soon recover with a little warmth to assist them. Insects do not seem to care much for the Agapanthus. Green-fly is sometimes troublesome, but this is easily got rid of by fumigation.

Aloysia citriodora (*Sweet Verbena*).—This, which is popularly-known as the Lemon-scented Verbena, is a general favourite, not for the beauty of its blossoms, but for its fragrant leaves. It may be grown as a wall plant in mild districts, and if injured during the winter quickly recovers. Ordinary potting compost suits it well, and cuttings of the young growing shoots put in during the spring and treated as a Fuchsia strike root readily. In all cold climates the greenhouse is the place for it, hence it is referred to here, although mentioned elsewhere in the book.

Ardisia.—Berried plants in the greenhouse afford a pleasing variety to the flowering subjects, and for this reason the Ardisias are very popular. The finest is A. crenulata, with rich deep green glossy foliage and a profusion of bright scarlet berries which remain on for months. It is sometimes described as a stove plant, but, although it comes from the West Indies, a warm greenhouse is generally suitable. Increase by seed sown early in the year in a temperature of about 70deg. Fill the seed-pan with a peaty soil, and when the seedlings are fit to be potted, transfer them singly to small pots, thence potting on in the usual way, until 6in. size is reached, which will be ample, as a rule. When in berry the plants may be used in rooms.

Balsam.—This is a quaint flower of many pleasing shades, the petals forming quite a rosette, and it is surprising that the plants are not more generally grown in the greenhouse. At one time there was an elaborate system of stopping growth, but this is unnecessary, the wiser plan being to allow the plants to grow naturally. As a rule, one sowing of seed will suffice—namely, in the spring, March—and the seed will germinate readily when the pan or pot in which it is sown is placed upon a gentle hot-bed. When the seedlings are large enough, pot on, until early in June they may be planted out in the open bed, unless pot culture is desired throughout. Pot on until they are in 8in. size, and use at all times a good soil—loam mixed with decayed manure and sharp silver sand. Keep the plants near the glass to promote a dwarf growth. The flowers appear upon the main stem, and make a pleasing display when the plants are in vigorous health. Balsam culture is so simple that the beginner in gardening may practise it with success. One of the chief points is to get first-class seed. The chief strain or race of Balsams is known as the Camellia-flowered, from the Camellia-like form of the pretty rosettes. This type produces flowers

BALSAM.

of large size, very double, and of several shades of colour, ranging from pure white to deep red, in some instances distinct names being bestowed, such as Rosy Queen or Violet Queen. Considerable difference in height exists, the taller plants reaching 18in., whilst the dwarf or miniature-flowered are only 9in. It is the miniature group that is recommended especially for bedding, and in the summer garden the Balsams are welcome for their variety of colours and bushy growth. They should not be planted too freely, as other things are showier and less apt to suffer from cold rains and winds.

Begonias.—It is agreeable to know that the Begonia family is becoming popular, particularly the kinds that require a greenhouse. A host of beautiful winter-flowering species, varieties, and hybrids are available, but

SINGLE BEGONIA.

even the more recent hybrids, brilliant in colour and long-lasting though they be, are not grown so freely as one would expect, considering their attractiveness and easy culture. The winter-flowering Begonias are certainly neglected. Why, it is difficult to tell, for the majority are wonderfully free, bearing clusters of flowers that may be used when cut, and are attractive upon the plant. Then there are the hybrids, those in particular raised by Messrs. Veitch and Sons, by using the species Socotrana, the result being a delightful set, bright in colour, and able to resist the fogs of winter. Gloire de Sceaux and Gloire de Lorraine, two of the finest kinds raised of recent years, have assisted to rouse some general interest in this greatly neglected family, and it is safe to say that these will be grown largely in the near future for market. Doubtless many other hybrids will be raised soon, but there are sufficient beautiful winter and other Begonias to make our plant houses bright with colour during the dull season of the year. The Begonia family forms an extensive group of plants, the members of which may, owing to their distinctive characters, be grouped under several heads. Thus there is the summer-flowering tuberous-rooted class which is now so popular, the winter-blooming with fibrous roots, the numerous forms of B. Rex, remarkable for their beautifully marked leaves, the dwarf kinds of B. semperflorens, now much used for bedding, and lastly, several of the original species which cannot be classed under any of the above headings. Tuberous Begonias have of late years become very popular for bedding, as well as for greenhouse decoration, one great point in their favour being the fact that they are dormant during the winter, when they may be stored in a cellar or anywhere else free from frost, provided extremes of drought or moisture are guarded against. This circumstance tends to make them popular, as glass structures are generally full to overflowing in the winter. These Begonias may be propagated by cuttings taken in the spring after growth has commenced, putting them singly into small well-drained pots of sandy soil, and keeping them in a close propagating case till rooted. This method of increase, which is used for the propagation of individual plants, is not followed so much as formerly, as seedlings are now generally raised. Large bulbs will sometimes push up two or three or even more shoots, and as soon as they start, the tuber may, if needed, be cut up into as many pieces as there are shoots, and being potted they will grow

away without a check, provided the cutting up is carefully done. Seed must be sown early in the year, and if there is a gentle hot-bed at hand to start it, so much the better. Whether sown in pots or pans the latter should be well drained with crocks, leaving space for 2in. of soil on the top. This may consist of loam and leaf mould in equal parts, with a liberal admixture of silver sand. This being pressed down moderately firm and level, and watered through a fine rose, the seed must be thinly scattered thereon, and a square of glass laid over the pot till germination takes place. The young plants must then be gradually inured to the ordinary air of the greenhouse, and pricked off, which is done by dibbling them into other pots prepared as for seed sowing. They should then be put about one-third of an inch apart. Directly the leaves touch they must be potted into small pots, using the same compost, and as they make headway larger pots should be provided. Pots 5in. in diameter are a good size for the first season. Some of the seedlings will improve considerably when grown on the second year.

Winter-flowering Begonias.—Many of the original species and hybrids raised from them flower during the winter, especially if they are grown on freely throughout the summer with that object in view. To develop the flowers properly the warmest part of the greenhouse should be chosen for them. These Begonias are increased by cuttings of the young growing shoots taken in the spring, and treated after the manner of a Fuchsia. Some of the best are: Adonis, carmine rose; Ascotensis, pink; Carrieri, white; Digswelliana, pink; Dregei, white; Ensign, rose; Fuchsioides, bright red; Gloire de Lorraine, rich pink, a beautiful plant, that will flower through autumn, winter, and spring; Gloire de Sceaux, handsome bronzy leaves, and rich reddish pink blossoms; Haageana, blush; John Heale, carmine; Knowsleyana, whitish; Metallica, silvery pink; Mrs. Heale, carmine red; Paul Bruant, rich rose; Semperflorens gigantea rosea; Lynchiana, bright red; Weltoniensis, pink; and Winter Cheer, rich crimson.

DOUBLE BEGONIA.

B. Rex and its varieties require during the winter a temperature above that of a greenhouse, but in this structure established plants will succeed perfectly in the summer, at which time they are particularly valuable for grouping. Their propagation and other particulars are dealt with under the head of Foliage Plants for the Stove. The dwarf forms of B. semperflorens, which are used for bedding, are remarkable for the rich crimson hue the leaves acquire when fully exposed to the rays of the sun. Of original species not noted above may be mentioned, B. coccinea, red; B. corallina, coral red; B. Evansiana, pink; B. heracleifolia, pink; B. manicata, blush; B. socotrana, bright rose; B. Sutherlandi, orange.

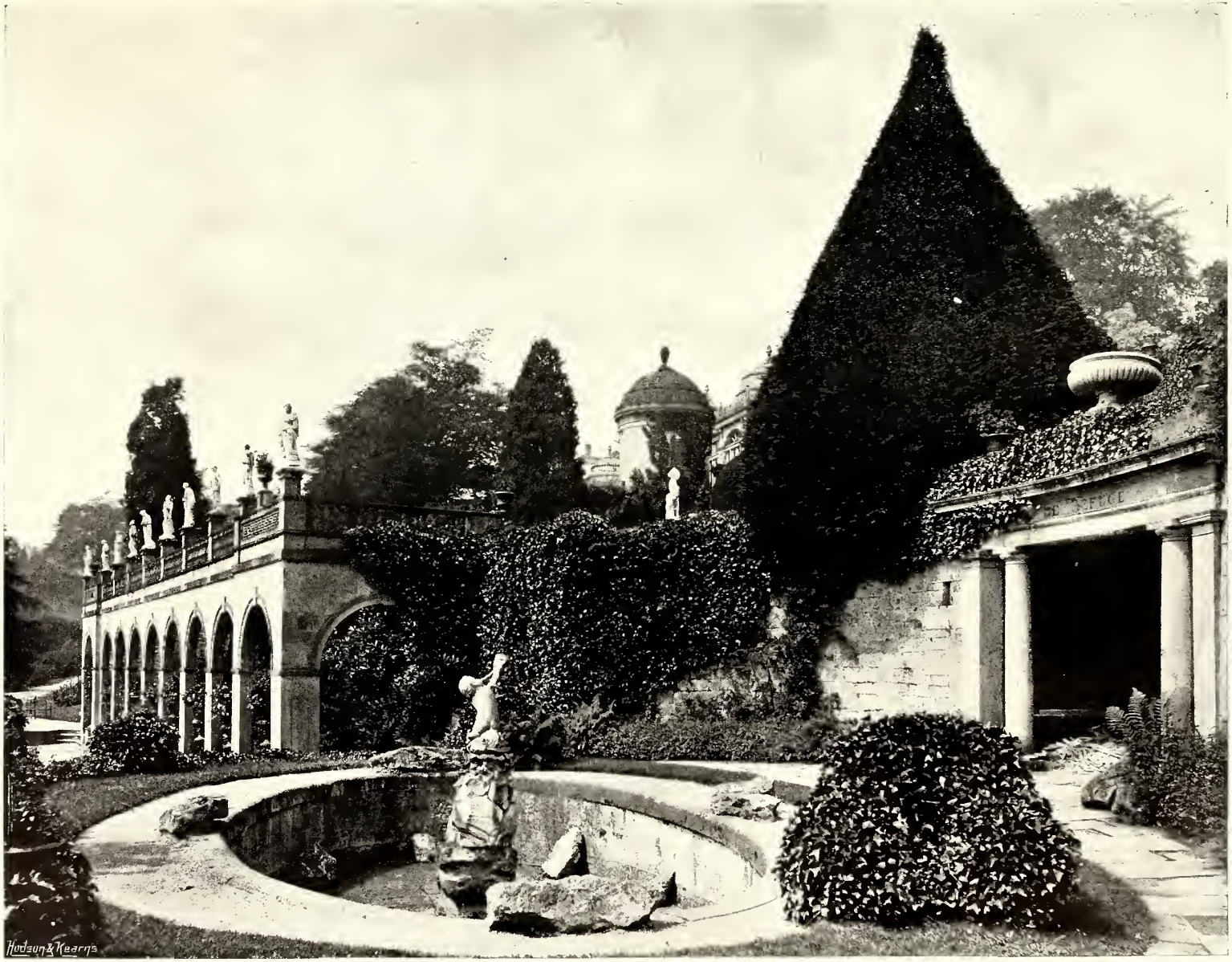
To show how handsome this family is, not a single kind mentioned above is in any way ineffective. Every one possesses considerable beauty, some being more easily grown than others—Weltoniensis, for example, being even suitable for window culture. There is such a wealth of beauty in this family, from the familiar tuberous Begonia of the summer garden, but suitable, be it remembered, for the adornment of the greenhouse earlier in the year, to the big-leaved, warmth-loving B. manicata, that if the whole collection were grown one would not tire of the flowers.

Bougainvillea.—The Bougainvilleas are of a loose rambling nature, and hence are suitable for clothing the roof, furnishing the end of a glass structure, or a similar position. They may also be grown as specimens, but in that case train them around a trellis. Though extremely showy when in bloom, the flowers themselves are small and inconspicuous; but they are surrounded by bright-coloured bracts, which unless closely examined appear to be the true flowers. When treated as climbers they are generally planted out; but whether such a mode of culture is followed, or they are grown in pots, they must have a period of rest in the winter, during which far less water should be given. There are two or three species and several intermediate forms. The best for pot culture, and the most floriferous, is B. glabra, and particularly its variety Sanderiana, an intense colour; while the stronger-growing B. spectabilis is preferable where a large space has to be covered.

Bouvardia.—A very popular class of little greenhouse shrubs, nearly all of which are natives of Mexico. The original species are very attractive, but are now greatly surpassed by many of the hybrids raised from them. They are increased by cuttings of the young shoots, taken in the spring, and put into gentle bottom heat till rooted. Then, if the plants are grown on freely during the summer, being pinched occasionally to make them sturdy, they will be by autumn neat little bushes bristling with flower buds, and in this state may often be seen in the florists' shops of London. A soil composed chiefly of fibrous loam, with peat, leaf mould, and sharp silver sand added, is suitable. The cut flowers, too, are in considerable demand for bouquets, button-holes, etc. A selection of the best comprises—Single flowers: Dazzler, rich scarlet; Hogarth, light scarlet; Humboldti corymbiflora, very long tubes, pure white, deliciously fragrant; Maiden's Blush, blush; Mrs. Green, salmon; President Cleveland, intense scarlet, the best of this tint; Priory Beauty, pale pink; Queen of Roses, deep rose; Vulcan, scarlet; and Vreelandi, white. With double flowers: Alfred Neuner, white; Hogarth flore-pleno, scarlet; and President Garfield, pink.

Browallia.—Nearly all the Browallias are natives of South America, and one species, the pretty blue B. elata, has been called the Forget-me-not of the Andes. This and the nearly allied B. speciosa may be treated as half-hardy annuals, while B. Jamesoni, which forms quite a bush, is of a bright orange colour and flowers profusely for months together. The most useful, however, of the Browallias is B. speciosa major, which is easily raised from seed, and seems always in bloom, growing about 2ft. in height, and being smothered with bright violet-shaded flowers relieved by a white throat. It is so easily grown that in every small greenhouse there should be one or more plants.

Calceolarias.—The Slipperwort is one of those quaint old-fashioned flowers not likely to pass out of general cultivation. It would be a loss if our greenhouses and



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"COUNTRY LIFE."

conservatories were bereft of these gorgeous flowers, with their big, rich-coloured pouches, surfaces of blossom of great effectiveness in decorations. The Calceolarias of the greenhouse are hybrids—that is, the present race has been raised by intercrossing, the same as in the case of the Primulas, Persian Cyclamens, and other indoor flowers. There are two great classes of Calceolaria, those known as herbaceous and the shrubby section; the herbaceous are used for flowering under glass, while the others may be planted out in beds for the summer months. As these classes are very distinct from one another, they require quite different treatment. Herbaceous Calceolarias should be raised from seed sown at various times, say, May, June, and July, but the rule with the best growers is to sow about the middle of June, the seedlings from these flowering in the following summer. Sowing Calceolaria seed requires great care, for the reason that the seed is very fine, and unless carefully distributed over the surface of the soil it will be thick in one place, with very little in another. Make the soil moist before sowing by holding the pan or pot, or whatever the receptacle may be, in a pail of water, and letting the water percolate up through the hole in the bottom. When the seed is sown, place a sheet of glass over the pan, and then transfer it to the greenhouse, choosing a moist, shady place. When the seedlings are large enough to handle, prick them off into other pots, and from these they may go individually to the thumb size. It is essential not to let Calceolarias become dry at any time in their growth, and also shade from bright sun, especially after potting, whilst air and a cool temperature are at all times required. There must be no attempt to force the plants, else the result will be failure. Keep a close watch for green-fly, which is partial to the succulent leaves, and fumigate gently with tobacco paper. To obtain those noble plants seen at the exhibitions is not altogether easy; but if one does not seek extraordinary results, Herbaceous Calceolarias are easy to manage. Certainly few indoor flowers can rival these in colour, and the selfs are particularly beautiful, especially the clear golden yellow, soft lemon, and shades of the same. Guard against aphis, the product usually of bad treatment, give ample light and air, and never overwater, else the plants will rot at the base of the stem. For ordinary greenhouses, the Calceolarias should not be potted into more than 7in. pots. Every nurseryman who grows greenhouse flowers has rich strains of Herbaceous Calceolarias—Messrs. Sutton, Carter, and others—and a variety very beautiful for its soft colour is Cloth of Gold. There are, however, distinct groups to be obtained, such as the dwarf, James's Prize, which fills the houses of Mr. James, at Farnham Royal, near Slough, in Calceolaria time. The plants are remarkable for their dwarf, sturdy, spreading growth, and huge heads of flowers, represented by many lovely hues. Besides the herbaceous and shrubby Calceolarias of the ordinary type, there are certain species of great interest and uncommon beauty. These are as follows:

C. alba.—This is a charming white-flowered Calceolaria, one of the daintiest of the whole family, and reintroduced; but it was originally sent from Chili in 1844. It is a shrubby plant, growing about 2ft. in height, and the pretty white flower clusters are produced on slender stems. A correspondent writing of it in a contemporary says: "This species is one of the most dainty and distinct of all the small-flowered kinds, and it makes a charming pot plant as well as grown in a sandy compost of peat and loam. It has been somewhat usual to predict of any distinct species that it will be likely to lend itself to alteration or improvement in the hands of the hybridiser; but I hope that this elegant and satisfying plant will long remain an exception to this rule, for it is quite beautiful and distinct enough as Nature made it in its native Chilian habitat." This, like the remainder of the shrubby species, may be easily raised, either from seed or by striking cuttings.

C. amplexicaulis.—This is a well-known Calceolaria, more familiar as a bedding plant than for the greenhouse. But it is a bright and handsome flower for indoors, and its lemon colour is very pleasing. It is less liable to be attacked with disease than the bedding kinds.

C. Burbidgei.—This is a very beautiful hybrid, raised in the Botanic Gardens at Dublin by crossing C. fuchsiæfolia with C. Pavoni. The plant is very vigorous, and a place where it may be seen in full beauty is in the greenhouse in the Royal Gardens, Kew, where the vigorous groups of it are conspicuous for their freedom in growth and flower too. It may be either planted out or grown in a pot, and will reach fully 8ft. in height, bearing an abundance of its soft yellow flowers from summer until the autumn.

C. fuchsiæfolia.—This is so-called because the plant in growth and leaf is strangely like the Fuchsia. This is a species well worth culture, and was introduced from Peru in the year 1878. Upon its upper shoots are produced clusters of clear yellow flowers. When autumn is with us this plant is very gay, and it will bloom into the winter. Shade is important, as when continually exposed to the full sun its leafage loses its fresh green colouring. Another name for it is C. deflexa.

C. violacea was introduced from Chili in 1853. It grows about 2ft. in height, and is one of the most distinct of the whole family, the purplish flowers being of a helmet-like shape. In the extreme Southern Counties, on warm, well-drained soils, this Calceolaria will stand the winter.

Many cultivators of indoor flowers pin their whole faith to the varieties and hybrids raised by fertilisation, forgetting that the species themselves are often as beautiful in every way. This is the case with the Calceolaria and Cineraria. C. alba and C. Burbidgei are both rare, but this is not because they are inferior to the varieties commonly cultivated. It would be a distinct advantage if more change were seen in the flowers of the greenhouse and conservatory, not relying upon a few stereotyped kinds, though these be of extreme beauty.

Calla.—*See* Richardia.

Camellias.—The Camellia is a native of China and Japan, and was introduced by Lord Petre about 1739. Mr. Fortune found it growing wild in the Central and Southern Provinces of China, generally in woods, partially shaded from sun by other trees, the shrubs or trees of Camellias often attaining a height of 30ft. to 40ft. Several species are found in China, but, excepting C. reticulata, none are so handsome as C. japonica, from which most of our double kinds have sprung.

Many fine plants are to be found outdoors in England, thus proving that a very cool treatment is best for the Camellia. In the Royal Gardens, Kew, it has been found that given a west aspect many kinds may be successfully wintered outdoors. Camellias succeed best in a house set apart entirely for them. They will stand as much as 7deg. or 8deg. of frost with impunity. A gentle heat is afforded during the winter, but at the same time abundance of air given, thus warding off the great danger of buds dropping off, which so often occurs in smoky districts. They should be turned out of doors in June, as soon as growth is completed, and placed under the shelter of Poplar or similar trees, with the side branches cut away so that shelter be afforded but not drip. It will thus be seen that to grow them in pots and tubs is best, so that this removal outdoors, so beneficial to the plants, may be resorted to. They are kept outdoors until October, and then placed in their winter quarters. In August the plants are repotted, using as a compost three parts of best yellow loam of a fibrous nature, one part peat, adding to this a little sand to lighten it, and some charcoal to keep all sweet. A few ¼-in. bones are a usual addition. After removal to winter quarters afford as much air as possible, according to the weather, and as buds swell weak doses of liquid manure should be given. A safe stimulant is five gallons of stable drainings to fifty gallons of water. Never let the ball become dry, and to secure this good soakings of water are preferable to sprinklings. The buds must be thinned where very thick. When the flowering season is over, the glass must be heavily shaded and the house kept moderately close, syringing the plants twice a day

and affording plenty of water to the roots. This treatment corresponds to that in which the plants naturally revel in their native habitats.

Pruning.—If this be required to keep the plants shapely, it should be done before new growth commences. Do not prune too severely—merely sufficient to balance the plant, and discourage the removal of wood when the blossoms are required.

Enemies of Camellias are aphis and scale. Fumigation will soon dispel the former if commenced before they gain a stronghold, and Gishurst's compound will destroy the latter.

Propagation of Camellias is usually accomplished by grafting, and in this country August is the best month. The Single Red is used as a stock. Home-grown plants are recommended before those of foreign growers. The latter are generally grown under such rapid conditions that they soon look sickly when they have been in the hands of the buyer for a brief period.

The best varieties are as follows—Reds and crimsons: Beali, C. H. Hovey, Chandleri, C. M. Hovey, Corallina, Donckelaari, Eugene Massina, Eximea, Imbricata, L'Insubria, Leeana superba, Mme. Lebois, Manara, Mathotiana, Rafia, Reine des Fleurs. Whites: Alba plena, Candidissima, Duchesse de Berri, Fimbriata, Innocenza, Jose Marques Loureiro, Saudade de Camillo Aureliano, Lavinia Maggi, Montironi, Ninfa Egeria, Princess Charlotte. Alba plena is as good as any. Blush: Comtessa de Hainaut, Cup of Beauty, Jubilee, La Reine, Lady Hume's Blush, Mme. A. Verschaffelt, Mrs. Cope, Princeza Real, Prima Donna, Reine des Beautes. Pinks: Beauty of Waltham, Camillo Aureliano, Adelina Benvenuti, Augustina superba, Baron de Vriere, Contessa Woronzoff, Countess of Derby, Mme. de Strekaloff, M. d'Offoy, Principessa Rospigliosi, The Duchess. Rose and deep Pinks: Barao de Mogofores, Commendatore Betti, Comtesse Paolini, Maggi, Comtesse Bontourlin, Conspicua, Duarte d'Oliveiro, Duchess of York, Elegans, Exquisite, Henri Favre, L'Avenir, Lucrezia Gazzarrini, Marchioness of Exeter, Reticulata, Storyi, Valtavaredo, Wilderi.

Any or all of these may be chosen. There are no poor kinds, but as the list may bewilder beginners it will probably be of some assistance to mention the finest varieties. Select from amongst the reds and crimsons C. H. Hovey, Donckelaari, Mathotiana, and Imbricata; of whites, alba plena—which is more grown, and deservedly so, than any other Camellia—Candidissima, and Fimbriata; of blush, Cup of Beauty and Lady Hume's Blush; whilst of pinks choose Beauty of Waltham, Adelina Benvenuti and The Duchess; and of rose, Conspicua, Duchess of York, Exquisite, and Commendatore Betti.

CAMELLIAS.

C. reticulata.—This is one of the noblest species of all indoor flowers, and very rare. Its name is seen in many nurserymen's catalogues, but the plant itself, in spite of its magnificent flowers, is uncommon. This species is a native of China, from whence it was introduced to the Royal Horticultural Society's Gardens by a captain in the service of the East India Company in 1820. One of the finest specimens of it in this country is in the Temperate House at Kew, where it is planted out, and has reached nearly 20ft. in height. Every year this plant blooms, and as the flowers are about 6in. across, one can well imagine its appearance when it is in full beauty. Their colour is rich rose, set off by a cluster of golden stamens, and, unlike the Camellias familiar in most greenhouses, the flower is not formal, but wavy and delightfully irregular.

C. Sasanqua.—A very pleasing shrub, native of China and Japan, very free-flowering, and with flowers of varied colour, white in the true species, but under cultivation rose pink and allied shades occur. "Sasan-kuwa" is the name given to this Camellia in Japan.

The Tea plant is a Camellia known as C. Thea, but is of no value in the garden. It is, of course, of immense economic importance, but if one desires to grow the plant for the sake of its associations a cool greenhouse will suffice, with treatment similar to that required for Camellias in general. The leaves are very deep green, and the flowers pure white. Northern India is probably the native country of the Tea plant, not China.

There are other Camellias, but the varieties and species named are the most ornamental. Such kinds as C. Euryoides and C. roseflora are of small importance.

Canna.—This noble race of tender plants has been described in the chapter concerning "Tender Plants for the Summer Garden," but under glass the flowers are more profuse even than in the open garden, where they are exposed in some years to cold winds and rains. In such years flowers are few out of doors, and then one must rely upon the plants under glass, whilst, of course, a greenhouse is the place to raise the seedlings for the purpose of selecting those kinds that show some advance upon varieties already in existence. When grown under glass plenty of water is necessary during the summer season, varied occasionally with liquid manure, and a good soil composed of fibrous loam mixed with a moderate quantity of well-decayed manure. An abundance of light and air is necessary, and constant syringing is beneficial.

A HOUSE OF CANNAS.

There is now a large number of varieties to select from, some self coloured, also splashed and striped, whilst the leaves differ in shades of green, some almost rich chocolate. In the chapter referred to the Canna is dealt with at considerable length. Cannas are not difficult to grow in pots, even in a small greenhouse, and when in flower few indoor plants are brighter.

Celosia.—Included in this family are the Cockscomb and the numerous feathery forms of C. pyramidalis, which are now so much used for bedding during the summer months. Some of these are of brilliant hues, the colour varying from straw to crimson, through various intermediate shades of yellow, orange, and scarlet, while magenta and purple are also represented. All of the above are readily raised from seed sown in the spring in gentle heat, and the young plants so obtained must be grown on freely without check. There is a quaint charm about these, which is certainly enhanced when the plants are used to break up flower beds. The colours are remarkably rich.

Celsia Arcturus and C. cretica are two easily-grown plants, with spikes of yellow blossoms. C. cretica, which flowers in summer and autumn, will reach a height of 4ft. to 5ft., with blossoms 1½in. in diameter, while C. Arcturus is much smaller in all its parts, and more branching. Both produce seeds freely, which should be sown in spring in gentle heat, and when the seedlings are large enough to handle, dibble them thinly into pots or pans of fine soil. After this they must be put into small pots, and shifted into larger ones as they require it. C. Arcturus will flower well in pots 5in. and 6in. in diameter, while in the case of C. cretica, 6in. and 8in. pots are required.

Cineraria.—Where flowering plants are in demand, Cinerarias are generally grown, as they supply a great wealth of colour quickly. In their best forms these garden varieties of Cineraria are fine sturdy plants, not much more than 1ft. high, while the head of flowers is quite as much across. The individual blooms are large, and the petals overlap in such a way as to almost form a circular flower. There is a great variety of colour amongst them, ranging from white to red and purple, through various intermediate shades, while a particularly striking form has flowers of an intense purple-blue, a colour little represented among greenhouse plants. There is also a group of more recent hybrids obtained by crossing some of the original species, such as C. aurita, C. cruenta, and C. multiflora. These are of great value for greenhouse decoration, and are quite dissimilar from the ordinary forms; for they grow about 3ft. high, and produce their bright-coloured starry flowers in light and elegant clusters. For supplying cut blooms they are very useful. These hybrid Cinerarias are one of the most valuable acquisitions of the century. A group of plants in full bloom is very beautiful, the tall stems burdened with small flowers individually, but in the aggregate almost as showy as those of the older type of Cineraria. There is a delightful gracefulness and distinctness about them, the colours, too, very pure, from white through soft rose to deep purple, some prettily tipped with colour. It is indeed impossible to convey, in words, an idea of their grace and fresh beauty, and they are sufficiently tall, 3ft. and even more, to group in the greenhouse or conservatory with foliage and other plants. These hybrids will most certainly be much grown in the future, and one of the parents, C. aurita, is in itself very charming; the flowers are about the size of a penny, and of a rosy hue, tipped with white, whilst the leaves are of a pretty glaucous shade. Many years ago this species was grown in the Royal Gardens, Kew, and it is also seen under the name of Senecio. It is more pleasing to those who like free-growing things than the stiff florists' plants. C. cruenta is also worth growing, a tall, free, vigorous species of rich colour. A few varieties have double blossoms, but though very pretty they are not such general favourites as the single-flowered forms. Cinerarias are principally raised from seed, which should be sown in April and May for early winter, and a couple of months later for succession. May is, however, the best month for the sowing, and this time is recommended. The April seedlings will bloom in

the following early winter. The seed is small, and the pots or pans prepared for its reception must be well drained, and filled to within an inch of the rims with good light compost, sifted moderately fine. Sow the seed on this, and cover with a slight sprinkling of the same soil, when, in a gentle heat, the young plants will soon make an appearance. When large enough they must be potted into small pots, using two thirds loam to one third well-decayed manure and sand. A light, airy position is necessary to ensure a good sturdy regular growth. When sufficiently advanced the young plants must be shifted into the pots in which they are to flower, those 5in. and 6in. in diameter being suitable.

The double-flowered varieties are increased by offsets—that is, the small shoots that are pushed out around the base of the plant. They must be taken off, potted into sandy soil, and kept in a close propagating case in a gentle heat till rooted. Few greenhouse flowers are so readily raised as these, and the seedlings when of sufficient size may be transferred from the seedling pan to thumb pots, when a cool frame will suffice, shading the young plants from hot suns, and giving gentle sprinklings with a syringe. When they have become established, which will be in the course of a fortnight or so, reduce the temperature, as artificial heat unduly used is the quickest way to bring about failure. Remember also that Cinerarias will not stand being pot-bound. When once the thumb pots are filled with roots transfer to a larger size, say, one potting, then into the 32 pots, which will be quite large enough for all ordinary growers. It is wise to stand the plants out of doors during the months of August and September, as this will promote a hardy growth. Remove suckers, and when the flower buds appear give manure water, weak at first, and gradually increase the strength, but guard against an overdose. Many plants are killed through not using caution in applying liquid stimulants, which if given too strong burn the roots. Cinerarias are unfortunately prey for many insect pests, of which, of course, green-fly is one. This may be destroyed by gentle tobacco fumigations, and mildew, another enemy of the Cineraria, is held in check by dusting with flowers of sulphur any plant upon which the pest is detected. Dust underneath and above the foliage. A soft brush will do much to get rid of green-fly, if taken in time.

LUCULIA GRATISSIMA.

Citrus.—The orange family all have deliciously fragrant flowers and ornamental fruit, added to which they give but little trouble when once good thriving specimens are obtained. They succeed best in a turfy loam, with a liberal admixture of well-decayed manure and silver sand. As they stand for some years without repotting, when that operation is performed drainage and other matters must be carefully attended to. They may be stood in a sheltered spot out of doors during the summer months.

Clethra arborea (*Lily of the Valley Tree*) is quite a small tree, which produces its spikes of Lily of the Valley-like flowers in July and August. The cultural requirements detailed for Citrus will suit this perfectly, except that there must be a mixture of peat in the soil.

Clianthus.—Dampier's Glory Pea, as C. Dampieri is called, is one of the most gorgeous flowers in cultivation. Unfortunately, it is also one of the most difficult to succeed with. The roots are so impatient of being disturbed that the seed should be sown in heat singly in small pots, and when potting into larger pots the roots must not be interfered with in any way. The flowers, which are borne in clusters, are somewhat like an enlarged and elongated Sweet Pea, the colour being a brilliant red with a conspicuous black blotch in the centre. The whole flower shines as if varnished. A mixture of loam, peat, and sand forms a very suitable compost. There is a variety (Marginata) in which the flowers are white, edged with red, and spotted black.

C. puniceus is a more vigorous plant, and is well suited for pillars and roofs in a conservatory. In this the flowers, which are freely borne in early summer, are light scarlet.

Coronilla glauca, an old occupant of our gardens, has prettily divided leaves of a glaucous tint, something like those of the Rue, and throughout the summer the entire bush is studded with rounded heads of bright yellow sweet-scented blossoms. It strikes freely from cuttings, and will succeed in any ordinary potting compost.

Cuphea.—A pretty little shrubby class, natives of Mexico, nearly all of which have tubular blossoms of different shades of red and yellow. Some of them are used for bedding out during the summer, particularly C. platycentra.

Cyclamen persicum (*Persian Cyclamen*).—In the original species the flower is white tipped with crimson at the base, but there are now numerous garden forms differing widely from each other and from the type. Pure white blossoms occur amongst them, and various shades of pink and red, even to intense crimson, are now represented. There seems an endless series of Persian Cyclamen flowers, varying not merely in colour but in

size, too, hence there are such names as the Giant Cyclamens, distinguishing titles which are necessary, as the varieties differ conspicuously from each other. The Cyclamen is as useful as any flower of the greenhouse, and how different are the present-day kinds to those one knew not many years ago, when the plants were straggling, the flower stems weakly, and the petals themselves not of that robust, waxy character seen at present. The flowers are very useful to cut for indoor decorations, and last many days as fresh as when upon the plant. One may select from whites as pure as snow, deep rose, purple, white with crimson base, and intense crimson. A fault, however, of the dull crimson and purple shades is that the colour dies away to an objectionable magenta tone, but when fresh their intense hues are very effective. The Papilio strain will probably become popular; there is a certain fascination in their fringed petals, a character quite permanent, as far as one has seen. The seed may be sown at various times of the year—in October or early November for a spring display, and in July or August for a winter bloom.

The seed should be sown very thinly in a compost of loam one half, peat and leaf mould one eighth each, and one fourth of thoroughly decayed cow manure, with a little coarse sand. Pass this through a sieve with a quarter-inch mesh; cover the seed to a depth of one-fourth of an inch; keep moist and dark in a greenhouse temperature if sown in spring, and in a shaded pit or frame if sown during July or August. Do not be hasty in discarding a pan of seed after a few seedlings have been taken from it, as some of the seeds take from two to three months or more to germinate. As soon as the seedlings have formed a tiny bulb, lift them upon the point of a label, being careful to remove roots and bulb intact. Unless one sows thinly, this is not an easy matter. Place into "thumbs," using the same compost as above. Water overhead through a fine rose, and be careful to use quite clear water, or the handsome foliage will be disfigured. This point applies all through their culture. Dirty water soon causes a sediment upon the leaves, especially in the axils, and this will have a very bad effect upon the health of the plants. They must be kept shaded from bright sun during summer, and should never be exposed to it during the six midday hours. When they have flowered, do not dry off so completely as was the practice a few years back, but gradually withhold water, and shake out soil from their roots as far as possible when partly dormant. Repot into a compost as advised for the seedlings, but add more of the dry cow dung and a little old mortar rubble. Never more than just bury the bulb or corm. Pot very firmly, and keep them as cool as possible during the summer. They may be fully exposed to gentle showers, and the dews of August and September, giving shade again during the hottest parts of the day. If removed to a greenhouse shelf by the end of September, and stood upon some moist cocoa-nut fibre, or upon any cool bottom close to the glass, with plenty of air and light, they will flower freely all the winter and spring. They can be helped at this stage with liquid manure once a week or so. Frost must not touch them. From 50deg. to 60deg. is a good temperature during winter. If green-fly attacks them, either syringe with clear water or fumigate gently. After the flowering season is over they may be kept moderately dry and started into growth again in the spring.

PERSIAN CYCLAMEN

Daphne indica.—This is a universal favourite, owing to the delicious fragrance of its blossoms, which are produced in winter. It is a neat-growing evergreen shrub, with dark green leaves and little terminal clusters of bright pink blossoms. There is also a variety with white flowers. This Daphne is very particular in its requirements, and succeeds best in a mixture of loam, peat, and sand. A fairly shady position, too, is necessary for it. Rubra is a deep-coloured variety.

Datura.—The huge white trumpet-shaped blooms of D. arborea, known also as Brugmansia arborea, are very striking, and planted out in a conservatory it forms quite a tree that will produce hundreds of flowers. It blooms, as a rule, throughout the greater part of the summer, and well on into the autumn. In D. sanguinea the flowers are of an orange-red colour, and in D. chlorantha flore-pleno pale yellow and double. A new kind, D. cornucopiæ, which flowers freely treated as an annual, has large semi-double blossoms, white, edged and marbled with purple. Given good rich soil the Daturas are all of easy culture.

Erythrina Crista-galli, known as the Coral tree, is very distinct from anything else. It forms a stout root-stock, from whence are pushed up numerous annual shoots that reach a height of 4ft. to 6ft., and are furnished with trifoliate leaves of a bright shining green, with a few scattered prickles on the stalks. The flowers with which the upper parts of the shoots are terminated are somewhat Pea-shaped, thick in texture, and of a deep scarlet hue. It flowers towards the latter part of the summer.

Eupatorium.—This is a free-flowering race, some of which are valuable for winter blooming. The best for this purpose are E. riparium and E. Weinmannianum, both of which bear crowded clusters of white flowers. Two other species—E. atrorubens, purplish red, and E. ianthinum, in which the flowers are of a lighter hue—flower early in the spring. The two last mentioned are like gigantic Ageratums. They are all easily increased by seeds or cuttings in heat in spring.

Francoa (*Maiden's Wreath*).—Two kinds, both natives of Chili, are popular for the greenhouse. They are both of easy culture, and readily propagated by seeds or division. The flowers are borne in long slender spikes. In F. appendiculata the flowers are pinkish red with a deeper blotch, while F. ramosa is white, or sometimes slightly tinged. Very useful for mixing in groups.

Fuchsia.—Many of the original species or natural varieties are very beautiful, and besides these a vast number of

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garden forms are in cultivation. Fuchsias are extremely useful in many ways, for they may be grown in the shape of little bushes 18in. high, or as huge plants either in bush or pyramid shape. The pendulous nature of the blossoms adapts them for the roof of a greenhouse or conservatory, while if bedded out during the summer they form an object of beauty till autumn is well advanced. A few kinds are sufficiently hardy to stand the winter without protection, as if cut to the ground they quickly recover. The original species include F. bacillaris, boliviensis, corymbiflora, dependens, fulgens, globosa, gracilis, macrostemma, microphylla, procumbens, spectabilis, splendens, thymifolia, and triphylla. A selection of the garden forms comprises—Single dark: Elegance, President, General Roberts, Royal Purple, Resplendent, Lord Lyons, Wave of Life, Lord Byron, Lord Elcho. Double dark: A. de Neuville, De Cherville, Comte Leon Tolstoi, Champion of the World, Avalanche, Marvellous, Phenomenal. With white tube and sepals: Beauty of Trowbridge, Lustre, Lady Heytesbury, Guiding Star, Rose of Castile, Mrs. Marshall, Princess May. White corolla: Delight, Cannell's Gem, De Goncourt, Flocon de Neige. Double white corolla: Ballet Girl, Berliner Kind, Molesworth, Miss Lucy Finnis, Madame Jules Chretien. It is a very easy matter to strike cuttings of moderately ripe shoots in spring, and grow the plants on, using loam, leaf mould, and silver sand for soil. The cuttings will root quickly and readily in a brisk heat, bottom or otherwise.

Gloxinia.—A very pretty group of tuberous-rooted plants that pass the winter in a state of rest (when they must be kept quite dry), recommence growth in the spring, and flower throughout the summer months. They do well in a mixture of loam, well-decayed leaf mould, and manure, and can be easily propagated by taking the leaves and inserting them as cuttings. At one time this method was generally followed, but now seedlings are usually preferred. The seed must be sown in heat in February, choosing a light sandy soil for the purpose, and as soon as the young plants are large enough to handle they should be pricked off. If potted on as required, and grown without any check, they will flower well as summer advances. A pinch of seed from a good source will give a great variety of charming blossoms.

Habrothamnus.—This is a vigorous, loose-growing class of shrubs particularly suitable for furnishing the pillars or walls of a conservatory, and in similar positions. Where space is allowed for their development they will flower nearly throughout the year, even during the winter months. H. elegans, purplish red, H. fasiculatus, red, H. Newelli, crimson, and H. aurantiacus, orange, are the best. They are all sometimes included in the genus Cestrum.

GLOXINIA.

Hedychium (*Garland-flowers*).—Many of the Hedychiums require more heat than a greenhouse, but one species, H. Gardnerianum, is essentially a plant for that structure. It forms a mass of stout underground stems, from whence are pushed up sturdy Bamboo-like shoots, that reach a height of from 4ft. to 5ft., and are terminated by erect spikes of yellow sweet-scented blossoms. This is more satisfactory when planted out than in pots.

Heliotropes (*Cherry Pie*).—The fragrance of its flowers renders H. peruvianum, known as the Cherry Pie, a general favourite either for bedding out or for the greenhouse, in which structure it is very useful for clothing walls and pillars. There are several varieties, a good light kind being White Lady, and a companion dark form President Garfield. All easily raised by cuttings in spring, which strike readily in a propagating frame, much in the same way as one would strike the Fuchsia.

Himantophyllum.—The showiest kind is H. miniatum, and at the same time many of the later varieties are vastly superior to the type. They all produce a number of oppositely arranged strap-shaped leaves, of a deep green hue, and the flower spike, which is pushed up from the centre of the plant, is terminated by a large globular head of blossoms. They are all more or less of a buff or orange tint, some being much brighter than others. Two other species, H. cyrtanthiflorum and H. Gardeni, are in the same way, but less ornamental than the preceding. The Himantophyllums are also known under the name of Clivia.

Humea elegans.—A very striking biennial plant, native of Australia. The large rough leaves are peculiarly scented, and the small red flowers, which are disposed in loose plume-like masses, occupy the upper part of the plant. It will reach a height of 6ft. to 8ft., more than half of which is occupied by the flowers. It is easily raised from seed.

Hydrangea.—In the milder districts, especially along the sea coast, the common Hydrangea is quite hardy, but in any case it is a valuable greenhouse plant. It will attain the dimensions of a large bush, but a favourite way of growing it in pots is with one short stem carrying a huge

head of bloom. To obtain these, the very stoutest shoots, such as would be sure to flower if left on the plant, are chosen for cuttings. They all strike root very readily. The natural colour of the Hydrangea is pink, but in some soils the blossoms change to blue, and the same end may be artificially attained by watering the plants with a weak solution of alum water. Besides the ordinary kind there is stellata prolifera, in which the sterile blooms are double; variegata, with variegated leaves; and H. paniculata grandiflora, with huge pyramidal-shaped heads of cream-coloured flowers. This last is hardy, but is also much used for greenhouse decoration.

HYDRANGEA.

Impatiens.—This is a large family, including stove and hardy as well as greenhouse kinds. Of these latter, the most generally cultivated is the Balsam (I. Balsamina), of which there are various coloured forms, with both single and double flowers. To ensure good plants the seed should be sown in the spring, in heat, and the young plants grown on freely in light rich soil. I. Sultani is a rather upright-growing, soft-wooded plant that can be propagated from cuttings. It will flower nearly throughout the year, the flowers being of a light scarlet tint. There is also a variety with salmon and another with carmine blossoms.

Lagerstrœmia indica is a tree-like shrub, which, if kept somewhat dry during the winter to thoroughly ripen the wood, will at about July be studded with large panicles of bright pink blossoms, the petals of which are much crisped, thus adding to the elegant character of the specimen. There is a variety (alba) in which the flowers are white. These Lagerstrœmias will remain in health for years, and flower well without being repotted. Large specimens may be kept in tubs.

Lantana.—Dwarf shrubby plants that produce their flattened clusters of flowers in great profusion. There are many species, but the finest are the numerous garden hybrids that have been raised therefrom. Numerous shades of colour are represented amongst them, there being white, yellow, pink, scarlet, and crimson flowers, as well as many intermediate tints. In a greenhouse they will flower throughout the summer, and are also useful for bedding out. They all strike freely from cuttings in the spring, and need only ordinary soil.

Lasiandra macrantha, with rich violet-purple blossoms 5in. across, is a magnificent roof or pillar plant, and the variety floribunda, which is of dwarfer habit, will bloom freely as a neat bush. It may be planted out in the border.

Libonia floribunda.—A densely branched little shrub, with small oval leaves, and tubular blossoms, scarlet, tipped with yellow, that are borne during the winter months; it needs the same treatment as a Bouvardia.

Lobelia.—There are many species of this, the most useful for greenhouse decoration being L. speciosa, the looser forms of which are suitable for the draping of stages, hanging baskets, etc. The compact varieties are largely used for bedding out. May be propagated either by cuttings or seeds. Miss Hope, a white variety, is a delightful basket plant.

Lotus.—One member of this genus, L. Jacobæus, has prettily divided silky leaves and clusters of small Pea-shaped flowers which are almost black. L. peliorhynchus should be suspended, as in this way the shoots hang down for a couple of feet, and are towards the points crowded with scarlet flowers.

Luculia.—An evergreen shrub that needs to be planted out in a greenhouse, where, given the same treatment as a Camellia, it will late in the autumn produce large Hydrangea-like heads of deliciously fragrant pink blossoms. Cuttings are very difficult to strike, and seedlings need careful treatment during their earlier stages.

Mackaya bella.—A shrub 6ft. high, from Natal, that in April and May bears a profusion of Pentstemon-like flowers, of a pale lilac veined with purple.

Marguerites.—The Marguerite or Paris Daisy is frequently grown in pots in the greenhouse, as well as for planting out for the summer. There is the ordinary white form, and the pretty yellow Etoile d'Or. It is a very simple matter to raise them from cuttings, which should be struck in ordinary soil in the spring, selecting moderately ripened side shoots. Cut just under a joint, remove the lower pair of leaves, and let the cuttings be about 3in. long. Put them into pots well drained, and give gentle warmth. When rooted pot off singly, and it is advisable to nip out the points of each shoot so as to promote a sturdy bushy growth. Pot on as the roots obtain full possession of the soil, and when approaching the flowering stage weak liquid manure is helpful. The soil to use for general pottings should be made up chiefly of good fibrous loam mixed with a little well-decayed manure,

leaf mould, and sharp silver sand. The Paris Daisy has one great enemy, namely, the Celery-fly. This eats away the inside of the leaf, and may be readily detected. There is only one real remedy, namely, to pinch the pests, when seen, between the finger and thumb, or to pick them out. Insecticides are of little value. The golden rule is never to let this enemy make headway. Chrysanthemum frutescens is its botanical name.

Mignonette for Winter.—It was formerly supposed that the Tree Mignonette was a distinct variety, and was struck from cuttings to make certain the true kind was obtained. Any variety of Mignonette may, however, be grown into a tree-like form, as it is a matter of culture. An essential point, however, is to secure a good strain. All the best growers save their own seeds from selected plants, and though one is accustomed to regard Mignonette as an annual, it assumes a perennial character when planted out under glass.

The way to secure Tree Mignonette is to sow the seeds in March or April, in small pots, putting three or four seeds in the centre of each pot, which should be placed in a warm frame, such as that devoted to Cucumbers. As soon as the plants appear move them to a light, airy house or frame, and pull up all except the most vigorous in the centre of each pot. Shift into larger pots as soon as the soil is occupied with roots, and give small shifts, never permitting the plants to become pot-bound until they have had their final shift into the pots in which they are to flower. These may be from 7in. to 9in. in diameter, according to the vigour of the plants. As regards training, either pyramidal or standard form may be adopted. In the former case a stake is placed to the main shoot, and the side ones are encouraged to grow out. All flowers should be pinched off. A well-grown pyramidal Mignonette by the autumn may be 3ft. to 4ft. in height, and half as much through. In training a standard the main stem is led up and all side shoots pinched back to the first pair of leaves, which are left for a time to help strengthen the main stem, but they will ultimately be removed when the plants require this assistance no longer. When the leader has reached the requisite height, stop it, and encourage the side shoots to send out laterals to make a round, well-balanced head, a circular wire being fixed to the stake at the top to support the branches. Liquid manure may be supplied, as soon as the pots are filled with roots, to promote size in the flowers. Mignonette must have good soil, and firm potting is necessary to gain the best results. Good loam two thirds, and one third of two year old cow manure with a little charcoal dust, such as is found at the bottom of heaps, and sand enough to keep the soil open, form an excellent compost. A little bone meal may be given at the last shift, and as soon as the plants flower give liquid manure twice a week. After the weather is warm and settled, in June, the plants may stand in a sheltered place out of doors where the wind cannot break the shoots. Place the plants, however, under cover before the rains and frosts of autumn occur.

Mignonette in 5in. and 6in. pots.—Mignonette is very useful for autumn and winter flowering when grown in the sized pots mentioned. Procure seeds of a good strain, such as a well-selected stock of the variety Machet. Make the first sowing for autumn flowering in July, and prepare the pots well, taking care that the best compost only is obtained, especially as regards the loam. Ram it firmly into the pots, not trusting to the fingers, rather using a blunt stick. Fill the pots to within an inch of the rim. Press level, and sow the seeds thinly, covering lightly with finely-sifted sandy soil. If the soil be dry, water before sowing, and scatter the seed evenly over the damp surface. Place the pots in a cold pit until the seeds germinate, then ventilate freely, and as soon as the plants are sufficiently strong, pull up all except five in the smaller-sized pots, and seven in the 6in. ones. If the soil has been made firm the plants will be dwarf and sturdy. Sow again in August, September, or October, and for spring blooming sow in January, in heat. During winter the plants must have a light position in a fairly warm greenhouse.

Myrtus (*the Myrtle*).—A well-known and popular evergreen that is hardy in particularly favoured spots in this country, and forms quite a feature along some parts of the Mediterranean Coast. The white flowers with their prominent stamens are very beautiful. Besides the common kind there is a dwarfer form with narrow leaves. Cuttings will root if taken about midsummer, put in a close frame, and shaded from the sun.

Nerium Oleander (*the Oleander*) is a loose-growing, Willow-like shrub that flowers during the summer months. There are many varieties, varying in colour from white to crimson, with both single and double blossoms. The Oleander is a general favourite in the South of Europe, and in this country it may be kept in large pots or tubs, as is often done in the case of the Camellia. It flowers in the summer. Cuttings root readily either in sandy soil or in water, even in a window, but a greenhouse or propagating pit is better. Oleanders require plenty of water, especially during the summer.

Oxalis.—This is an extensive group, many of the members of which are low-growing, Clover-like plants, with bright showy blossoms of different colours. Several of them form underground tubers, which in one or two cases have been used as vegetables. A selection of the best would include Oxalis Bowiei, loose clusters of bright rosy red flowers 1½in. across; O. cernua, yellow, and its double-flowered form, O. cernua flore-pleno; O. Deppei, reddish purple; O. enneaphylla, white; O. rosea, rose; O. variabilis, white, flushed red. The whole of them are of easy culture, and increased rapidly by division.

Pelargonium.—Nearly all the Pelargoniums are, in a wild state, natives of South Africa, and some of them are very beautiful. As decorative plants, however, these native species are greatly inferior to the numerous garden hybrids raised therefrom, and which are now divided into several distinct groups. All of them are readily propagated from cuttings, put in at any time except late in the autumn and in winter, and the principal points in their culture are to maintain a free circulation of air around them and to keep the foliage free from aphides or green-fly, which quickly injure the plants. The different sections of Pelargoniums are:

Zonal, which includes those commonly known as Geraniums. They are much used for bedding out during the summer, and embrace all shades, from white to crimson.

Double Zonal.—These resemble the last, except that the flowers are double, and, being stronger growers than the single kinds, they are not so useful for bedding out, but as pot plants in the greenhouse they are much used. There are variegated leaved forms of both these sections.

Show.—The varieties grouped under this head are sometimes called large-flowered Pelargoniums. The three lower petals are plain and unspotted, while the two upper ones are blotched with maroon, thus forming a very regular flower.

Decorative.—This also includes those to which the terms Regal, French, and Spotted have been applied, as no line can be drawn between the different groups. The flowers resemble those of the show kinds, but are less regular in shape and marking, the lower petals frequently being heavily spotted. The decorative class is that so largely grown for market.

Fancy.—The Fancy varieties are characterised by smaller flowers than any of the above, but as a set-off they are borne in great profusion.

Ivy-leaved.—The loose, procumbent habit of most of these eminently fits them for many purposes, such as hanging baskets, furnishing balconies and window-sills, and in the summer for planting in vases in the garden. Both single and double flowers occur in this class, but some of those with double blossoms, though charming for pot culture, are rather too stiff for the purposes above mentioned.

As regards varieties, it would be better to consult the catalogue of some specialist, such as Messrs. Cannell, of Swanley, Kent, or Messrs. Pearson, of Nottingham.

There is such a host of Pelargoniums of all kinds that it is not easy to make a selection that will be generally approved of, and anyone undertaking their culture seriously should see a collection before making a commencement. The scarlet Raspail Improved is of course indispensable, a free, bright-flowered variety in pots, and Henry Jacoby too, the kind grown so largely out of doors for summer bedding.

The Pelargonium is such an important flower in many ways that reference is made to it at considerable length. An excellent grower of these flowers, Mr. Shoesmith, of Woking, in an interesting paper read by him some time ago, mentioned the following facts as indispensable if one is to succeed with this brilliant family. The remarks with reference to "Geraniums" for winter flowering should be made careful note of, for it is in the winter that one may keep this structure gay with a variety of colours, and the whole routine of culture is extremely simple. Mr. Shoesmith gave the following important details of culture:

Propagation.—This is a matter that is not attended with any difficulty during summer and early autumn. I may say propagating from cuttings is the plan generally adopted, raising plants from seeds being confined to obtaining new and improved varieties. I am not particular about the size of the cuttings used, but pay more attention to the growth being well hardened. Many items of culture have become orthodox because no one has attempted any other way. Thus with regard to drying Geranium cuttings, and, again, by being careful to cut immediately under a joint. Now, in practice I find this subject, as well as most soft-wooded plants, root readily from any portion of the stem, and therefore cutting to a joint is unnecessary. The gain is considerable; because when we are dealing with a choice variety, two cuttings may often be obtained in the place of one trimmed in the usual way. The chief cause of failing to root Pelargonium cuttings is that they are liable to rot before the process of callusing has taken place. To prevent this when cuttings are put in early in the season, I tie each to a piece of thin stick, so that I may fasten the cutting to the earth, only allowing the base of the same to just touch it. A batch of 2,000 cuttings was put in in this way during January, and I lost less than half-a-dozen in 100. So early in the year I would favour a slight bottom heat, but in this case a surface of fine soil was put on a bed from which Tomatoes were removed, and the cuttings just resting on the soil as mentioned, placing them about 3in. apart. Later in the spring it is not necessary for one to go to so much trouble in the matter. I simply take a cutting off and plant it anywhere in the soil. Pelargoniums may also be struck singly in small pots or thickly placed in larger ones, also in boxes or the like, and stood on shelves. The only danger here is that they may become too dry without one noticing that condition. There is said to be enough sap in a Geranium cutting to root the same without the aid of water. That may be so, but I usually sprinkle the leaves on sunny days. If the cuttings are rooted out of pots, as suggested, take care to pot them the moment rooting has taken place, or the plants will soon run up spindly and soft. I will not detail autumn propagation, as that is so well understood, but I would advise continual striking, so that one has always young successive batches.

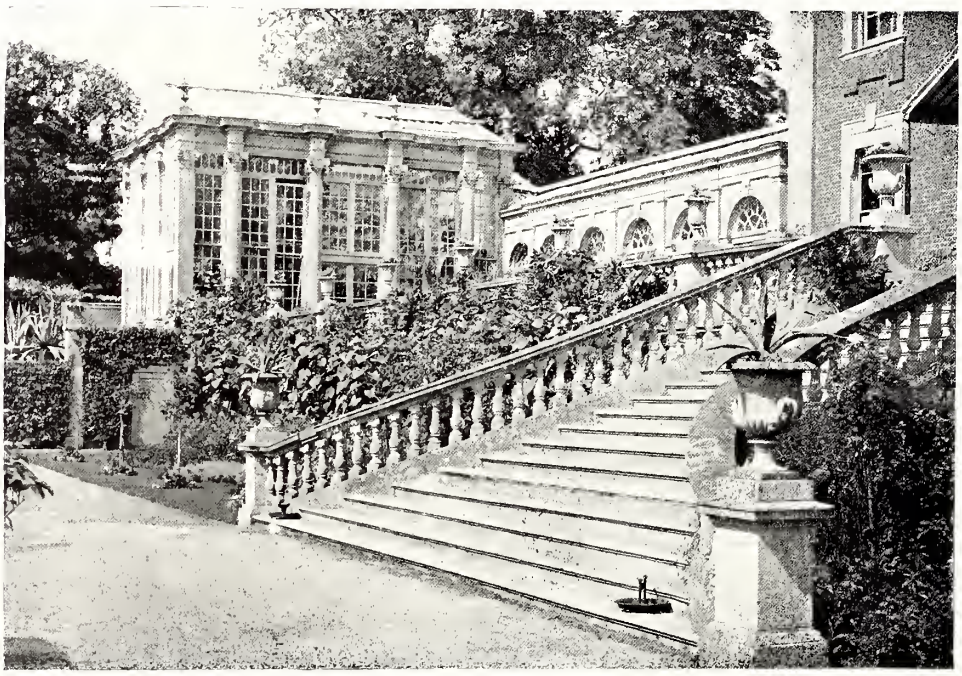
PELARGONIUM.

Complicated mixtures of soil are not at all necessary. If I had loam, a little grit and bone meal, I should have all I needed for Pelargonium culture. Excellent results may also be obtained by the use of the old partly worn-out compost that Chrysanthemums have been grown in the previous year. It is a common fault to find these plants in a soil rich in animal manures, which in this case, I am sure, leads to the growth of leaves and soft wood. I have in my mind's eye some remarkable specimen plants which were being prepared for an exhibition. This was some years ago, and they have remained to me as choice examples of how not to do it. In the first place they were potted into 12in. pots loosely. The compost was of the richest description. In summer a spot outside that was fairly well shaded by trees was selected. They, of course, had abundance of stimulants, and I should say when finished for competition each plant was a mass of large healthy green leaves some 4ft. high and nearly as much in diameter, but blossoms were sadly needed to make them at all presentable. Now, my idea of a well-grown Zonal Pelargonium is abundance of bloom and comparatively few leaves.

Plants in small pots are very showy when well grown. They form useful objects for conservatory or room decoration. A sight I shall not readily forget was a greenhouse filled with miniature specimens in 4in. pots with huge trusses, only one on each plant. This was a few years back in the garden of a gentleman known for his skill in raising choice Fuchsias—Mr. Banks, of Deal. Individual pips and trusses were here cared for with that same pride with which we know many florists of the old school regard Auriculas or Carnations. I will, however, take the 4½in. pot as the limit for flowering small plants, and it is wonderful what a blaze of colour we may obtain from specimens in this size. They will need but one shift from the small size in which the plants have been placed as soon as rooted. Over the hole put one fair-sized piece of crock, and then cover this with a good handful of quarter-inch bones, using such ordinary soil as I have indicated. Firm potting is most essential. The temperature of an airy greenhouse is one in which the plants will flourish satisfactorily, and stand them as near the glass as convenient. Before the shoots have a chance to run up tall pinch out the points, also the flower buds for a time, until you get a bushy specimen with four or so short, sturdy growths. Meantime, watering must

not, of course, be neglected. The Pelargonium will take abundance of moisture at the roots, but I do not favour sprinkling overhead after the cuttings have rooted. In stopping the shoots, I ought perhaps to mention now a fact we may easily note by observation. The plant naturally in growing makes one joint with a leaf on either side; the next is a flower bud and one leaf. Again, above that comes a leaf-joint, and so on. Therefore we must be careful, if a bushy growth is desirable, not to top the shoot at the joint where the flower truss forms. But for the fine development of individual trusses of bloom we should snip out the tiny growth immediately above the flower, so as to arrest the further growth of leaves. When nice little bushes are obtained I would allow all flower buds to remain on the plant, and then—the pots by this time being well filled with roots—feed with something of a stimulating nature. I find any fertiliser containing an abundance of ammonia best for Zonal Pelargoniums. Peruvian guano is first-rate. Soot water is also excellent, but this should be clear, and I would not advise the use of any manure that clogs the soil, such as thick liquid from cow manure and the like. Shade when in bloom is necessary. When the plants have passed their best they may be stood in the sun for a few days to harden, and then cut back to make useful material for growing into large specimens another year. Later batches should also be ready to take their place, it being possible by this means to have bloom the whole year.

Winter Flowering.—This phase is not the least important of all, and as a plant to provide bright, cheerful colours during the dull months of the year the Zonal Geranium is unsurpassed. It is a matter of special culture and a proper selection of varieties. I prefer spring-struck plants to start with, and the rules as to soil and firm potting are equally applicable in this case. Do not overpot. The 5in. pots are generally large enough. In no case would I use those above 6in. in diameter. From May to the middle of September the plants may be stood in an open sunny spot outside. Placed on boards along the sides of kitchen garden walks is often a very convenient position. Due attention must be given to watering, stopping, and removing all flower buds when in a young state. As the blooms take a considerable time to develop, especially late in the season, I would discontinue taking away flower trusses after the early part of the last month already mentioned. The winter quarters must be satisfactory, with sufficient heat to expel damp as well as favour growth. A temperature of about 55deg. is required. All light available should be allowed where these plants stand, and the closer they are to the glass, provided all is dry, the better the colours will come out. In some instances, where Zonal Pelargoniums in winter are a speciality, the cultivator has hot-water pipes fixed immediately under the glass above the blossom. This plan, however, is not likely to be followed generally, nor do I think it necessary. The greatest enemy to Geranium blooms in winter is thick fog, and it is next to impossible to grow such with success in or close to large towns, where the air is charged with smoke from a multitude of chimneys. Pure country air and the medium temperature named make matters tolerably easy. Care is required in watering. As little as possible should be allowed among the plants, and the work ought to be done during the morning. Care, again, must be exercised in air-giving, so as to avoid draughts as much as possible. It is easy to overdo the roots with stimulants in the winter months. This item, therefore, should be watched. Many varieties, in fact, bloom better in winter without any feeding, more especially the whites and other light shades. Single varieties as well as doubles are used, the former being the more showy, but less useful for cutting, as the petals are so easily shattered. To prevent this, liquid gum is dropped into the centre of each pip. If this be done and the stems placed in water directly they are cut, the blossom lasts a considerable time. Gumming the petals applies to single varieties at all times of the year, and for show especially the blooms would soon present a miserable appearance, after being shaken by the necessary removal, if this matter were neglected.



THE CONSERVATORY AT VEN HOUSE, MILBORNE PORT, SOMERSETSHIRE

Apart from flowering plants, during dull, sunless months Pelargoniums should in all cases be kept quiet. We should endeavour to prevent much top-growth by having a low temperature consistent with keeping out frost. The roots may be on the dry side, but not so parched as to kill them. If such practice be followed, those plants that require heading back will have abundance of hardened cuttings to provide material for an early start in propagating a stock.

Diseases and Insects.—Fortunately Zonal Pelargo-

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niums are not troubled with anything in the way of insect pests worth speaking of, but there are a few diseases, brought about by the careless grower in most cases. Take spot in the leaf. I seldom note this on a plant which has not been over-watered. My remedy is to remove such a plant and put the pot on its side, neglecting it entirely for a week or two. The soil will then get thoroughly dry and sweetened. With care in watering afterwards, the plant may in nine cases out of ten be brought round and again made to grow freely. Then there is decay at the base of the stem. This, I fancy, is often caused by faulty watering. Although it occurs with me sometimes, I am very careful when potting to avoid it somewhat by placing the stem well up in the centre, not burying it deeply, as is sometimes done. And when water is given, do not pour it right on to the stem. It is just as easy to pour it near the inside of the pot's rim.

Varieties.—Selection of the best varieties for a particular purpose always appears to me a phase not less important than culture with regard to Pelargoniums or any flower. For example, we find well-cultivated plants of winter-flowering Geraniums composed of sorts like Henry Jacoby, John Gibbons, and even commoner kinds. These are good free-flowering varieties, I admit, but why not have in their place sorts as rich in colouring and infinitely superior in form, substance, size of pip, and truss?

One remarkable fact is this. The Zonal Pelargonium has within the past few years been quietly altered and improved by a few enthusiasts with no special society to foster their efforts. The Rose, the Chrysanthemum, Auricula, Carnation, Dahlia, Pansy, and I know not what, have societies devoted to their exhibition and improvement, but the Pelargonium has none. It had. This, however, died some time ago, and has never been restored. Yet, as I say, the Cannells, Pearsons, and one or two others have during the past ten years given us unquestionably superior sorts. Indeed, in looking through old lists whilst preparing these notes, I may say that very few of the best varieties were in commerce half-a-dozen years ago.

It is somewhat curious that one raiser may obtain a good break in a particular shade of colour, whilst his neighbour may surpass him in another. I find that in salmon shades Messrs. Cannell are responsible for, in my opinion, the best, namely, Mrs. Routh, T. W. Lawton, A. F. Wooten, Mrs. Robert Cannell, and others. In lovely shades of cerise, salmon scarlet, and the like, Messrs. Pearson claim remarkably fine ones—witness, Kitty, Phyllis, Enid, Olivia, O. W. Holmes, and so on. The late Mr. Miller gave us whites of fine form and size in Niagara and Duchess of York among others. The crimsons, too, of this raiser are grand; Souv. de S. B. Miller and Volcanie occur to me. Here and there a kind of exceptional merit springs up, but the three men I have mentioned raised the greater portion of up-to-date sorts. How many seedlings are required to obtain one good variety is unknown to me. Probably one person gets a strain that will produce more improved varieties among a hundred plants than another would in a thousand. There cannot be any rule to this.

Petunias.—These gay flowers have been referred to at some length in dealing with plants for bedding, and they are very easily managed, being usually increased by seed in the case of the single varieties, and the double ones by cuttings. The double forms seem to be the least popular, and this is not surprising, as the flowers are lumpy, and the colours none too pure, but the singles are freer and in every way more decorative. It is not wise to grow many plants in the neighbourhood of large smoky towns, as the clammy nature of the foliage is against them, the leaves catching impurities from the air, which one cannot wash off. Of late years much improvement has taken place in this family. One can choose from a rich selection of colours, especially amongst the single varieties, some self, others blotched and striped, whilst many are charmingly fringed. It would serve little purpose to give all the names of the varieties to be found in catalogues, but by consulting the seed lists of

THE GRACEFUL STARRY CINERARIAS.

PETUNIA.

such firms as Sutton, Carter, Laing, Veitch, or Kelway, one may easily choose those kinds likely to please most lovers of flowers. The big flowers are less free than the smaller and neater blooms, which make a braver display. The following rules will serve for the cultivation of the Petunias from seed. When growing for pots, sow the seed late in January, in a shallow pan or pot, sowing very thinly on quite an even soil surface. Cover lightly with silver sand, and use for the general compost a soil made up of loam one part, double the quantity of well-decayed leaf mould, and sufficient sharp silver sand to lighten it thoroughly. Place the pan or pot in a temperature of 60deg., sprinkle the surface lightly with water, or the seeds will be washed out, and when large and strong enough prick out into other pans, transferring from these some time in April in 60 pots, potting on in the usual way, as the pots become full of roots, until the 48 size is reached. It is necessary to give slight shade after repottings, but do not coddle the plants in any way, and, when well established, the greenhouse will suit them, giving plenty of air at all times.

Pleroma.—This is a beautiful class of small-growing shrubs, principally natives of the Andean region of South America. The flowers of most are large, and of a purple or violet colour, but the plants are difficult to grow, need a shady position, and a soil principally composed of sandy peat.

Plumbago.—The light porcelain blue flowers of P. capensis are always greatly admired, whether the plant be trained to the roof or pillars of a greenhouse, grown as a bush therein, or planted out of doors during the summer, for all of which purposes it is well adapted. The Plumbago is more fully described in the chapter upon Climbers.

Primula, Chinese.—No greenhouse is complete without the beautiful Chinese Primulas, or Primroses, raised from Primula prœnitens, and a witness to the wonderful skill of the hybridist. For many years the hybridist or raiser of new forms has been striving to produce a race in which the flower stems are sturdy and borne well above the leaves, the individual blooms large, robust, and of fine colour. All this has been obtained, in truth it seems difficult to surpass the splendid acquisitions already secured, but of late years the double-flowered group has undergone a great change. This is a charming race, with infinitely greater freedom and vigour, and more easily cultivated than the double forms raised by the late Mr. Gilbert, which were always troublesome to manage. The newer forms are perfectly double, little rosettes, as varied in colour almost as the single kinds, rose, heliotrope, white, pink, and deep purple-blue, as near to blue as one can well get, but a true blue, of the same beautiful colour as the Gentian of the Alps, has yet to be raised. Nothing displays the perseverance of the raiser more than obtaining this purple-blue shade. One remembers the first departure, a slaty, none too pleasant shade, but improvement came, until a remarkable and effective colour has been obtained by diligent selection. As in the case of the Persian Cyclamens, no varietal names are given. For these one must refer the reader to the catalogues of those who make the Chinese Primula a speciality, Sutton, Veitch, Carter, Cannell, and others. The way to raise Chinese Primulas is by seed, and to secure a succession of flowers make two sowings, one in June and a second a month later, with, if desired, still another in July. Sow in the following compost: two parts turfy loam, one of leaf mould, and one of well-decayed cow manure, adding a dash of sharp sand to keep the whole open. This compost should be passed through a fine sieve or riddle, placing the coarser parts at the bottom of the pan, which should be fairly well drained. Make the surface perfectly level and firm, water well through a fine rose, and sow the seed very thinly. Some do not cover the seeds, but a very light dusting of dry cocoa-nut fibre refuse, shaken over the pan and allowed to fall through a fine sieve held 1ft. or 2ft. above, is an excellent covering. A sheet of glass should be placed over the pan, and the whole kept dark in a greenhouse temperature upon a cool bottom. As the seed germinates, light and air may be gradually admitted, but no direct sunshine. From the first avoid watering as far as possible, and yet be careful the roots never suffer from want of moisture. For this purpose a cool bottom that is moist without being actually wet, such as a cool frame or pit in a partially shaded position, is much the best after the seedlings are potted off. This should be done as soon as they can be handled, using a small pot known as "thumb." Keep them as close to the glass as possible, and shift on into 5in. or 5½in. pots directly roots emerge through the drainage hole. After potting, give one good sprinkling, shading and keeping close for a few days until they have recovered from root disturbance. If a hot sun be permitted to touch them just after repotting, or they are allowed to become dry at any time, irreparable mischief will be done. They may stay in the cool frame or pit until the end of September, when they should be brought into a temperature of 50deg. to 60deg. Stand upon a cool bottom close to the glass. It is a good plan to make a shallow tray of the shelf they occupy, and have a layer of 1in. or so of cocoa-nut fibre in this; this will prevent sudden drought, perhaps the most fatal item in their culture.

In potting, be careful not to soil the foliage in any way. Once made dirty, it is impossible to cleanse such downy and sticky leaves; besides this, the foliage is handsome in itself, and the removal of even one or two leaves often makes an uneven-looking plant. An excellent compost is made of the same materials as recommended for the other shifts.

Other Primulas may be grown in pots also, and the true Auricula (P. Auricula), though, of course, quite hardy, is very pretty under glass, whilst excellent for the greenhouse or frame is P. cortusoides Sieboldi, a native of Japan, and represented by a large number of varieties, all of which are pleasing to see in the greenhouse about April. This kind is described in the hardy plant chapters under the heading of Primula, so further reference to it is

unnecessary here. P. floribunda is a bright golden yellow species, which blooms almost throughout the year, and is very easily raised from seed. Fogs, however, are fatal to it, even when slight, so that in the neighbourhood of large towns it is hardly wise to grow this flower. But even when a stock is killed it is easy to raise another from seed. P. verticillata sinensis, which flowers in the spring, has its yellow flowers arrayed in whorls, which open in succession; the leaves are covered with a curious mealy powder. This is a very bright kind. The two following kinds are set out especially as being of unusual value in the greenhouse.

P. obconica.—This is the species about which so much discussion takes place occasionally, because of the injurious nature of the hairs to some sensitive skins. Exaggerated statements are made, no doubt, some declaring that it produces erysipelas and other dread diseases, but this is probably sheer imagination. The leaves, however, do when they come into contact with some skins set up a violent irritation and produce unpleasant results for a time, and in such cases of course the leaves and flowers must not be handled. P. obconica is so useful, however, that wherever possible it should be grown, and it remains in flower for several months. Seed is easily raised in the spring, and the seedlings when potted and grown on in the greenhouse during the summer flower profusely. Use soil similar to that recommended for the Chinese Primrose. Seedlings vary greatly, some being larger and richer in colour than others, but the pretty lilac tint is always pleasing, even when very pale. It is interesting to raise seed obtained from a fine strain, as then one may make a selection of the seedlings, choosing those that are very fine to grow on for future use.

PRIMULA OBCONICA.

P. stellata, or the Star Primrose, is a flower that should be grown freely by everyone. It is quite a departure, and a relief in a measure from the stiffer types to which one has been accustomed. It blooms profusely, the slender stems being thrown up freely from the leafy base, and bearing innumerable flowers of delicate colours; the flowers are not small, although not of that fine shape characteristic of other types. It is, however, free in every way, flowering and growth, a delightful plant for decorations or to cut for vases and bowls; the stem will develop to quite 2ft. in height, branching out, and making a perfect bower of blossom. White, rose, and other shades are represented, and as regards culture follow the same rules as given for the management of P. sinensis, of which Stellata is undoubtedly a form.

Protea.—This is an extensive class of greenhouse shrubs, natives of South Africa, which fifty years ago were very popular in British gardens, but nowadays are rarely seen. They differ considerably from each other in size, for some form large bushes, and bear their striking flowers on the ends of the branches, while others again are of a low, spreading style of growth. The soil best suited for them s principally sandy peat, with the addition of a little loam. They need a light airy greenhouse, and during the summer may be placed out of doors. Watering must be carefully done at all seasons, as though an excess of moisture is very detrimental to their welfare, continued drought is just as bad. By far the most striking of the Proteas is P. cynaroides, which forms a bold bush from 4ft. to 6ft. high, usually consisting of several unbranched shoots, pushed up from near the base of the plant. These shoots, which are very stout, are clothed with dark green leathery leaves, and on the points the blossoms are borne. They are of a pale flesh colour, and are produced in one huge terminal head, surrounded by large bracts, the whole being in shape like a large Globe Artichoke. They expand in spring and early summer, and remain fresh a long time.

Other kinds are: P. acaulis, 2ft. high, flowers purple; P. cordata, 1ft., red; P. formosa, 6ft., violet; P. grandiflora, 10ft., white; P. longifolia, 2ft., brownish; P. mellifera, 6ft., pink; P. speciosa, 6ft., white.

Rhododendron.—The plants known in gardens as Indian Azaleas are by botanists referred to the genus Rhododendron, and as they require much the same treatment, the Azaleas will be herein included under the same head. They are particularly valuable for the embellishment of the greenhouse during March and April, and if a few simple facts are borne in mind they are not at all difficult to cultivate. The compost for Azaleas should consist of sandy peat, and in potting it should be pressed down very firmly. The drainage must also be carefully attended to, for the plants will (especially when large) remain in the same pot for years, and keep in good health. After flowering they must be well syringed and encouraged to grow freely, weak soot water occasionally being good for them. Then when the growth is completed, which will be about midsummer,

or a little later, they may be placed out of doors till the autumn, and then again taken into the greenhouse. While an excess of water should be guarded against, they must, on the other hand, never be allowed to get too dry, as the roots are very fine and delicate, and quickly suffer from excessive drought.

The Himalayan Rhododendrons—that is, the different species natives of that region—are in some instances really gorgeous; but as many of them attain quite tree-like dimensions there are few structures sufficiently large for their development. The best are: R. arboreum, rosy red; R. Aucklandi, white; R. barbatum, crimson; R. campanulatum, lilac; R. campylocarpum, pale yellow; R. cilatum, rosy purple; R. Dalhousiæ, lemon; R. Edgeworthi, white; R. Falconeri, blush; R. fulgens, crimson; R. grande, white; R. Jenkinsi, white; R. Nuttalli, pale rose; R. Thomsoni, blood red; R. Veitchianum, white.

Numerous hybrids have been raised between the above, in which light-coloured flowers greatly predominate. They will flower in a much smaller state than most of the original species, and for greenhouse decoration about March and April they are unsurpassed. Hybrids of this section are: Countess of Haddington, Countess of Sefton, Exoniense, Duchess of Sutherland, Lady Skelmersdale, Lady Alice Fitzwilliam, and Princess Alice.

Another group, which are known as the Javanese, tube-flowering, or perpetual-blooming Rhododendrons, have become very popular of late years. They are characterised by smooth leaves and narrow tube-shaped blossoms. These varieties grow and flower throughout the year, but to induce them to bloom during winter a minimum temperature of 50deg. is desirable. Some of the best are: Baroness Henry Schroeder, blush; Brilliant, scarlet; Ceres, buff yellow; Favourite, rose; jasminiflorum carminatum, carmine; Lord Wolseley, orange yellow; Princess Alexandra, white; Princess Royal, pink; Souvenir de J. H. Mangles, orange; Triumphans, crimson-scarlet.

RICHARDIA ELLIOTTI NA.

Richardia africana (*Arum Lily*), known also as Calla æthiopica and the Lily of the Nile, is a popular greenhouse plant that will flower at different times of the year, according to the treatment given it. Plenty of moisture is necessary during the growing season. Of the Arum Lily there is a variety gigantea, larger than the type, and one compacta, less in stature, while a third, Little Gem, is quite a miniature, being only about 1ft. high, and very useful for cutting or decoration. R. Elliottiana and R. Pentlandi are two new kinds with golden spathes. These go to rest at the end of the summer, and remain dormant till nearly Christmas, when they start into growth, and flower in spring and early summer. These golden spathed Arums when first shown a few years ago created something approaching a sensation, the spathes being of a pure golden colour, whilst one bears of other departures, namely, a rose spathed kind, and it would not be surprising if quite a series of forms appeared, as one never knows how successful the hybridist may be. Arum Lilies are very easily grown, and their noble ivory spathes are always welcome, especially for bold decorations, such as for churches, and in wreaths, too, they are much used. Growers differ somewhat in their treatment of the plants. One recommends planting out in trenches in the summer, another growing them entirely in pots. Rapid summer growth, at any rate, is a mistake, and when planted out the soil should not be very rich. As a rule gardeners are content to leave them in the pots, and those with small gardens and little spare time upon their hands to go into elaborate systems of culture will find pot culture the easier plan. The plants must be thoroughly well ripened—that is essential; give sufficient water to prevent them suffering, and in the autumn the crowns may be divided, or transferred to pots of larger size; then, with a little warmth, new growth will commence and flower spathes be produced in rich abundance. It is wise to give very little water in the summer months, because from experience one finds that clumps lifted with plenty of succulent green leaves are not so satisfactory as those more hardened and robust. After flowering in late spring stand them out in a place sheltered from keen winds, and gradually reduce the water supply. A well-known grower of these, writing in a horticultural journal, mentions that "by the first week in June the plants, pots and all, are laid upon their sides or stacked in a heap. In this way during June and July they are not permitted to have any water at all. Early in August the plants are

stood up, and if no rain comes by the middle of that month a good watering is given, more with a view to soften the soil prior to repotting than aught else. At this time a solid spiral crown 2in. or 3in. long is all the life visible above the corm. Repotting is done about the middle of August, one to three corms, according to size, being placed in an 8in. pot. Annual repotting is much to be preferred, and the bulk of the old soil is removed, regardless of any old roots that remain. A fairly rich compost is given with soot and bone meal added, and firm potting always indulged in. The plants are housed by the middle of September, by which time the first good leaves are unfolding, and by the end of the month splendid spathes are obtained. It is always a pleasure to see the clean, firm, vigorous growth these plants make compared with the gross, lank, and flabby leaves and stem of those planted out all the summer. The crop of spathes is also largely increased by the drying off." Labour is of course saved by this simple and successful system. In the Southern Counties of England, Devonshire and Cornwall, and Ireland in particular, the Arum Lilies flower abundantly by pond and lake sides.

Salvia.—There is quite a host of Salvias (among others being the common Sage), some of which are hardy, and others require a greenhouse. These last include some very showy flowers that are at their best in the autumn, and afford a pleasing variety to the Chrysanthemums which are so conspicuous at that season. They are: Salvia Bethelli, pink; S. boliviana, scarlet; S. gesneræflora, scarlet; S. ianthina, violet-purple; S. Pitcheri, blue; S. rutilans, red; S. splendens, scarlet. All are easily raised from cuttings of fairly-ripened shoots in spring, and potted on, much as one would the Fuchsia. Of late years the Salvias have been little grown, but it is difficult to understand why flowers so brilliant in every way during the winter months are not more considered.

Schizanthus.—A free-growing class of annuals with pretty butterfly-like flowers. They will grow well in the open ground, but are also very useful for greenhouse decoration. Raised from seed sown in heat in spring.

Solanum.—The showiest species, from a flowering point of view, is the climbing S. jasminoides, but the berries of S. capsicastrum, which are about the size of small cherries, and bright red when ripe, render this the most popular of all the Solanums. These berries will remain fresh and bright throughout the entire winter. Raised from seeds sown in the spring.

Sparmannia africana.—This is a rapid-growing bush, quickly reaching a height of 10ft. to 12ft., with large rough heart-shaped leaves, and clusters of white flowers, lit up in the centre with yellow and purple. A very easily grown plant, always in bloom.

Statice profusa bears numerous branched spikes of blossoms during the summer. It needs a mixture of loam, peat, and sand, and must be very carefully watered in the winter. Others are S. floribunda and S. Holfordi. They are propagated from cuttings, but are somewhat difficult to root.

Swainsonia.—A very pretty class of plants of a half shrubby character, with clusters of large Pea-shaped flowers, varying in colour from deep reddish pink to white. They are borne principally during the summer months. The best are S. galegifolia and S. Greyana. Both can be readily raised from seeds.

Torenia.—Procumbent-growing plants that are well suited for growing in suspended baskets and similar purposes. If the seed is sown early in the spring the plants will flower throughout the summer and autumn. T. Bailloni has yellow flowers, and in T. Fournieri they are violet-purple.

Tydæa.—Also known as Isoloma, and very pretty flowering plants; at their best during autumn and winter. The tubular-shaped blossoms have a widely-expanded mouth, which in some varieties is very quaintly marked with dark crimson on a yellowish ground. They are readily increased by division of their little tubers.

Verbena.—Though generally used for bedding out during the summer, the Verbenas are very bright ornaments for the greenhouse at that season.

Veronica.—Many of the shrubby Veronicas, hybrids principally from New Zealand species, are sufficiently hardy to stand the winter in particularly favoured spots along the South Coast, but where this is not the case they are very valuable for the embellishment of the greenhouse or conservatory. They are readily struck from cuttings, and neat little bushy plants so obtained will flower freely. Some of the best are: Bolide, red; Celestial, light blue; Eveline, rosy lilac; Imperialis, reddish purple; Jardin Fleurie, rich magenta red; Marie Antoinette, pink; Purple Queen, purple; and Reine des Blanches, white.

A HOUSE OF CHINESE PRIMULAS.

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CARNATIONS IN VARIETY

THE CARNATION AND PICOTEE.

By James Douglas, Edenside, Great Bookham.

I TAKE for a motto for this article the lines of Shakespeare—"The fairest flowers of the season are our Carnations." Nearly 300 years ago these words were written, and at that time the Carnation was grown well in English gardens. We do not produce larger double Carnations in our gardens in these days than those figured in Gerarde's "Herbal" in 1598, or in Parkinson's "Paradisus" some thirty years later; moreover, Gerarde informs his readers that he was the first to grow Carnations with flowers of a yellow colour, these being introduced to London gardens through a merchant, named Nicholas Leete, from Constantinople, which is evidence that the cultivation of the Carnation was widespread. The yellow ground Picotee and Carnation was cultivated in England early in the seventeenth century, as we learn from Parkinson's "Paradisus." Doubtless neither the form of the flowers nor the markings on the petals would pass muster in a meeting of experts in these days; but the rapid development of the Carnation as a garden flower in England is well attested in the pages of the old authorities. The Carnation therefore may well be considered to be one of the finest of garden flowers. It would be easy to verify this claim from the days of Elizabeth down to the end of the present century, but no useful purpose would be served by parading the writings of old authors or quoting the names of flowers no longer in existence. The Carnation is now held in as great esteem as ever it was, and valued by all who love flowers for their sweetness and beauty. Carnations are mostly of delicate perfume, and are also very attractive in the garden by reason of their rich and varied colours, and the list has been greatly added to during the last few years. I have been an admirer and grower of the Carnation for over forty years, and during that period there have been many changes in fashion. At one time there was

scarcely room to be found in the flower garden for Carnations; they were crowded out into some out-of-the-way corner of the kitchen garden, and I have even known a gardener apologise for growing them at all, with the remark that they were useful as cut flowers. The same gardener pointed with pride to scores of beds filled with scarlet Geraniums, yellow Calceolarias, purple, rose, and scarlet Verbenas, and even pounded bricks and stones of different colours were laid down to fill the beds, while the Carnations were biding their time in some obscure corner. As the gardeners were fully occupied with the culture of the tender bedders at the dictate of fashion, the culture and propagation of the Carnation was neglected. The layers were not attended to, and as a result the plants became less robust in constitution, many choice varieties passed out of existence, and others reverted to a semi-wild condition. Another cause was the preference shown by some growers for what are termed show Carnations, that is, the Bizarres, Flakes, and Picotees. This section of the Carnation is better adapted for pot culture than to form masses of colour in the open garden. That this type can be well grown and flowered in the open garden is beyond question, but they require a properly-prepared flower bed and the skilful hand of the trained florist. The florist still holds to these as the highest, and, indeed, only type of the Carnation worthy of his attention; and many of the most pleasant hours of my floral experience have been passed in listening to and joining in the conversation of such expert growers as the late Mr. Charles Turner of Slough, the late Mr. E. S. Dodwell, and two who are happily with us, Mr. Ben Simonite of Sheffield, and the Rev. F. D. Horner of Burton-in-Lonsdale. Such men as these never allowed their love for the Carnation to decline even in the most degenerate days, and to them we owe in a measure the beautiful varieties now in cultivation, for be it known that many of the self-coloured varieties produced ten years ago or more were seedlings from Flakes, Bizarres, or Picotees. I have raised scores of beautiful self-coloured flowers from all these classes. One of the best was a large, rich, purple-coloured flower of fine form, named Purple Emperor. The parent of this Carnation was Her Majesty, a Picotee; the flowers of this variety are pure white, except that the margin of the petals are marked with a line of purple colour; the line is as if a hair or fine wire were drawn round the margin of each. This purple colour was developed fully on every petal. Rose-margined Picotees will produce selfs of a rose colour, and red or scarlet-edged Picotees will all produce self-coloured flowers as in the margin. In like manner will the Flakes and Bizarres give self-coloured flowers from seed of all the colours contained in them, maroon, scarlet, crimson, pink, purple, rose, etc. I have made this statement because a great number of amateur cultivators of the Carnation have an idea that if they obtain seed from a variety of Carnation the seedlings produced from such seed will be reproductions of the parent plant; this, of course, is wrong, and it is as well to mention it.

BALMORAL.

BORDER KINDS.—The great charm to many in growing Carnations is to have flower beds filled with them. Now to grow Carnations well they must have good soil, or the plants will not produce flowers or layers for another season. The soil must be well drained, so that the surplus water may pass freely away in autumn and winter. Unless this is the case the plants are liable to be attacked by "spot"

GARVILLE GEM.

and other fungoid diseases. With good, well-drained soil, prepared early in the autumn, there is no difficulty in producing fine flowers in the season. The Carnations for beds or masses of colour are the selfs. The colours may be mixed, or beds may be made of one colour only. What could be more beautiful or chaste than an entire bed of white Carnations? There are now so many colours in self Carnations that every taste may be gratified; moreover, a selection may be made of the more vigorous growers. Carnation growers are indebted to Mr. Martin R. Smith, V.M.H., of Hayes, Kent, for producing a series of hardy border Carnations far in advance of any others. I will name two of the best border Carnations in their colours. The best white ones are Trojan and The Briton; of yellow, Miss Audrey Campbell and Andromeda; the best scarlet, Isinglass and Mrs. McRae; crimson, Nox and Boreas; blush, Nautch Girl and Waterwitch; pale pink, The Burn and Mrs. Gascoigne; deep pink or rose, Queen of Scots and Asphodel; dark red, Bella Donna and Boadicea; apricot or buff colour, Mrs. Reynolds Hole was at one time the best, but is now superseded by Midas and Prince of Orange; Haidee and Columbus are the most beautiful lavender-coloured varieties.

The yellow ground Picotees and Carnations are also charming border flowers. Six of the true Picotees are His Excellency, Empress Eugenie, Mrs. Tremayne, Dervish, Mr. Nigel, and Mohican. Of the fancy Carnation type choose Hidalgo, Yolande, Brodick, Monarch, Zingara, and Mrs. G. A. Reynolds. There are others almost equally good, but I have made the above selection after carefully choosing them under my own eye; they grow well out of doors, and the flowers do not split the calyces.

IMPORTANCE OF SEEDLINGS.—For the open garden I strongly recommend seedlings. If the seed is saved from the best varieties at present in cultivation the produce is sure to give satisfaction, but the cultivator must not expect all the flowers to be as good as the parents, or even all double. There will be from 10 to 15 per cent. with single flowers, all the others having double flowers, some as good or even better than the parents, but the majority will be of uncertain quality. Much depends upon the time of sowing the seed for producing a profusion of bloom. The middle of March is suitable, or any time towards the end of that month; the seed will germinate in a hothouse well within a week from the time of sowing, and the seedlings should be pricked out in boxes as soon as large enough, and be planted out in June or July in good soil where they are to flower. Let the plants be 15in. asunder, and 2ft. between the rows. Under this treatment each plant will develop into a large specimen producing 100 to 200 blossoms. One of the greatest charms of floriculture is watching the development of the seedlings, and few amateurs with the floral instinct developed can resist the temptation of having a good bed of seedlings annually.

Seedlings are not nearly so particular in regard to soil as named varieties. The seedling is more robust, and, given the same cultural conditions, grows more vigorously. It is always best to dig or trench the ground for Carnations some time before it is required; this admits of the soil being aerated. The plants should be put out after a good shower of rain. Planted in June or July they get well hold before the winter, and require no further attention

than to be kept free from weeds by a liberal use of the Dutch hoe. Good kitchen garden soil answers well for seedlings, no addition of loam being needed, but if the soil is not rich I trench it 18in. deep at least, put a layer of manure at the bottom, and another layer 6in. or 8in. below the surface. This treatment of the soil enables the plants to bear up bravely during a hot, dry season, as the roots penetrate deeply after the feeding material. A warning is necessary to those unacquainted with the nature of soils; it will not do to trench up soil to the top that has not been there before. New subsoil is not adapted to grow anything until it has been well turned over two or three times and mixed with decayed manure, and twelve months would be required to get it into fairly good condition. Named varieties of Carnations are planted out in October or even as late as November if the weather is favourable. Layers planted out at this season are always vigorous the following year, and produce more layers than spring-planted Carnations from pots. There is an advantage in planting out from flower-pots in March or April, losses being reduced to a minimum, and if the plants have been well kept during the winter they never fail to succeed. After planting give a light dressing of decayed manure over the surface of the ground; it keeps the roots in better condition, and they start more freely into growth. Carnations must not be left to themselves after planting. Those put out in the late autumn months may be assailed by slugs and the leather-coated grubs. The slugs and snails may be destroyed or, at least, kept from the plants by sprinkling soot over the surface of the ground; it is a good fertiliser for Carnations as well, and thus answers two purposes. The grubs in their tough outer casing are impervious either to powdered lime or soot, but as they usually feed at night a good lamp and a patient watchman will soon thin their numbers. In spring the Carnation maggot, Hyelemia nigrescens, is an unwelcome addition to our Carnation pests; it gets into the heart of the plant, and unless prevented would soon destroy it. The only way is to get a needle and dig the maggot out as soon as evidence of its existence can be found. In its winged state it greatly resembles the house-fly, and can be captured depositing its eggs on the leaves of the Carnation. It is found about the plants in April. Small seedlings as soon as they are planted out are assailed by it, and suffer more than the named varieties.

PROPAGATION OF BORDER CARNATIONS.—This is best done by layering, and the time chosen as soon as the flowers are over. Strip the lower leaves away from the plants intended to be layered, and with a sharp knife cut through a joint, peg the layer into the ground at the incision, and place some fine sandy soil around them. They soon form roots, and are ready to be removed from the parent plants some time in September, generally about the end of that month. If the layers have to be planted out the strongest and best of them should be selected, and plant them out as they are taken from the plants. The layers must be put into the ground as deep as the first pair of leaves; those intended to be planted in the spring should be potted up into small flower-pots. I use what are termed in the trade middle 60's. Any particularly strong layer may be planted in a large 60. Keeping the young plants over the winter is not generally understood. Amateurs are too anxious to preserve them in good condition; they are afraid to allow a touch of frost to reach them, and the plants are frequently injured by kind treatment. For instance, the

DUKE OF ORLEANS.

plants will do better in a garden frame than in a heated greenhouse. In the greenhouse they are drawn up and weakened for want of light and air, whereas in a frame the lights can be entirely drawn off in fine weather. Cold and frosts are not injurious, and they can have plenty of air and light by having the lights well tilted in wet weather.

CARNATION TREATMENT MONTH BY MONTH.—It may be well to give the details of the work for out of doors Carnations during a period of twelve months, beginning, say, in

JANUARY.—In that month the plants may be frozen into the ground. If so, hares or rabbits will be the only pests that will attack them. But if the weather is mild, slugs and the leather-coated grubs may be active. In changeable weather, such as alternate frosts and thaws, the plants are sometimes thrown a little out of the ground; if so, see that they are gently pressed in again.

FEBRUARY.—This month is much like January. The weather is varied by frosts and thaws, and the same attention is necessary.

MARCH.—When the weather is favourable about the end of this month the plants that have been wintered in garden frames may be set out in the beds or borders prepared for them, putting the plants deep enough into the ground, and about 14in. asunder. Sow Carnation seed in flower-pots or seed-pans. The seed will, if good, germinate freely in a hothouse temperature of 60deg., but more slowly in a greenhouse. When the plants appear above ground carry the seed-pans into a greenhouse or garden frame. When the seed-leaves are fully developed, the young plants may be pricked out into boxes, or into a garden frame. In fine weather hoe the ground between the rows of Carnations that were planted out in the autumn, and make good any losses from plants wintered in frames.

LADY ARDILAUN.

APRIL.—The same treatment may be continued. Examine the plants carefully for the Carnation maggot, and endeavour to capture the small black fly, which much resembles the house-fly, as it is now depositing its eggs on the leaves. Any maggots in an active state should be destroyed.

MAY.—The plants will now be growing freely, and sticks should be placed to them about the end of the month. When this is done, stir up the ground well between the rows with the Dutch hoe, and if dry weather sets in mulch the surface of the ground with decayed stable manure, and in light soils it may be necessary to water. In heavy soil caution is necessary, and it may be well not to apply water thus early in the season.

JUNE.—Growth will now be well advanced, and in this month buds are formed. Those who wish for large, handsome blooms thin out the buds to three on each plant, and as the stems lengthen they must be tied to the sticks. In dry, hot weather syringe the plants freely at night. This keeps off thrips and the aphis tribe. Keeping the plants growing freely by judicious watering when necessary is a great aid to healthy development.

JULY.—In this month Carnations will be in flower, and those flowers that have a tendency to burst their calyces should have india-rubber bands put round them, and the stems should have a final tying to the sticks. In ordinary seasons the flowers are developed late in the month, but sometimes not fully so until the first week in August. About the end of July, or early in August, the work of layering may be begun. This process is now

well known and is very simple. The lower leaves are removed from the side growths, a notch is made through a joint, and the layer is pegged into some fine sandy soil, placed round the plant for the purpose.

AUGUST. — Continue to layer the Carnations, and also plant out the seedlings. The work for this month is much the same as last.

SEPTEMBER.—About the end of the month the layers, if well rooted, must be taken from the parent plants, and as soon as possible afterwards they may be planted in the beds or borders which should have been prepared for them. The plants intended to be wintered in frames should be potted into small flower-pots, and it is as well to shade them for a few days until they become established.

OCTOBER.—Continue to remove the layers from the plants, and still plant out or pot them up. The ground between the rows of seedlings ought to be hoed if necessary to allow the rainfall to pass freely into the ground, and to keep it sweet.

NOVEMBER and DECEMBER are both months when the Carnation grower may have a period of rest from his labours. All the young plants, whether in flower-pots or planted out in the open ground, will merely require looking over occasionally. Fallen leaves from trees accumulate round the plants, are a shelter for slugs, and if not removed cause decay. Those in flower-pots require careful attention to watering; none should be applied unless the plants really need it. Admit air freely to the frames, but shelter the plants from wet.

THE CARNATION AS A GREENHOUSE FLOWER.

THERE are several sections of the Carnation cultivated as greenhouse plants: (1) The border Carnation; (2) the Tree or perpetual-flowering Carnations; (3) the Malmaison Carnation.

1. THE BORDER CARNATION.—All the varieties that flower in summer—say in July and August—out of doors are border Carnations, and these include self-coloured varieties. Fancies are such as are striped on a yellow or white ground, Flakes and Bizarres, yellow and white

A HOUSE OF CARNATIONS BELONGING TO MR. MARTIN SMITH.

ground Picotees. Carnation fanciers have a greenhouse in which to place their plants when in flower. The treatment of this section of the Carnation is very simple, and success may readily be obtained by attending to the details of the work at the right time. The plants are grown in flower-pots, measuring 7½in. and 8½in. across; the measurement is taken about 1in. below the rim. In the trade they are termed 24's and 16's. The plants are grown through the winter in garden frames in 60-sized flower-pots; two layers are potted into the larger 60's, and one into the smaller sizes. March and April are the best months in which to repot the plants into the pots in which they are to bloom. The best potting material is compounded of four parts fibrous loam, one of leaf mould, and one of decayed stable manure, and, instead of sand, use some mortar rubbish to mix with the soil. Use clean flower-pots, and drain them well by putting in an inch or more of potsherds in the bottom of the pots; some fibrous material placed over the drainage prevents the finer particles of soil from mixing with it. Plant three layers in the larger and two in the smaller flower-pots, and as they are repotted they may be put in the garden frames for three or four weeks. Do not be in a hurry to water them; if the weather is unfavourable they may not require any for two weeks. Any time after the middle of April the plants may be arranged in an open position out of doors; if sheltered from the east and north, so much the better. Some care is necessary in applying water to them until roots have been freely formed. The plants need the sticks to be placed to them soon after they are put out. The taller-growing varieties require 3ft. sticks, others 2ft. 6in.; but one stick will do for two plants. As the flower stems increase in height they require looking over occasionally, and must be fastened to the sticks before they are injured or broken by the wind. They remain out of doors until the flower buds show colour, when they must be taken into the greenhouse and arranged on the stage, with the blooms near the glass roof. All the ventilators ought to be open night and day. The flower buds are generally attacked by thrips, and this pest disfigures the blooms greatly, and it is found sometimes within the calyx before the blooms show their colour, therefore as soon as the house is filled with plants, fumigate with tobacco smoke. Even the fully-opened blooms are not in the least injured by the smoke, which destroys the thrips and any green-fly that may be upon the Carnations. I find the most effectual fumigating material is Richards's XL All. It certainly does excel the old-fashioned clumsy method of tearing up tobacco paper or rag, and burning it in the house. It may be as well to fumigate the house two or even three times to make sure that all insect pests are quite destroyed. The flowering period is from the middle of July until the middle of August, and in the North of England and Scotland about two weeks later. The flowers must be shaded from bright sunshine by a movable canvas, which rolls up and down by the use of pulleys. One side of the canvas or screen is fixed to a lath, and the other to a roller. It can be rolled up easily, but the pulleys need not be used unless the house is over 50ft. in length. The rollers should project beyond the house at each end about 6in., and a grooved disc

PICOTEE, FAVOURITE.

fixed on the end, to which a cord is attached; the shading can be run up and down very readily on this principle. As soon as the flowering period is over, layering must be proceeded with. Some of the surface soil must be removed, replacing it with some loam and leaf mould; this should be sifted, as the fine material only ought to be used. Layering has been frequently described. The lower leaves must be stripped from the growths at the base of the stem; with a layering knife, cut into the stem below a joint, and cut upwards through the joint. Pull the layer down, and peg it firmly into the soil at the cut part. Layering is done about the first week in August, and the layers may be removed from the parent plant after the middle of September, when they may be planted in small flower-pots for the winter.

The amateur who really cares for his plants will look over them almost daily, and will soon ascertain what attention they need during the winter. The main point is to see that the frames are well ventilated, so that the air may pass freely over the plants. Watering is also important. No wonder if spot is prevalent in some collections when one sees the plants saturated with wet, and no care is taken to keep the leaves dry in the dark days of winter. Water should be applied carefully to the plants that need it, and not to any that are not really dry at the roots. Spot is not very destructive to the plants; they grow out of this disease as the plants start growing in the spring months.

THE TREE OR PERPETUAL-FLOWERING CARNATION.—The value of this type of Carnation consists in its flowering freely in the autumn, winter, and spring months. The border Carnations and the Malmaisons cannot be treated so as to get them into flower in autumn and winter, whereas it is natural for this type to do so. The treatment of the plants all through is different, but there is no difficulty in obtaining good flowering plants. The border and show Carnations, whether growing in flower-pots or planted out, pass out of bloom by the middle of August. About the end of that month the Tree Carnations begin to bloom, and with good management flowers can be obtained through the winter and spring months, until the Malmaisons come into flower early in May, or even in April. Of course, to do this a heated greenhouse is a desideratum. The Tree Carnations are propagated by slips or cuttings. The first lot should be put in about the second week in January, and at that time the greenhouse should be kept at a minimum temperature of 55deg. There should also be a propagating frame in the house, with some bottom heat, say about 85deg. The plunging material may be leaf mould, cocoa-nut fibre refuse, or spent bark from a tan-yard. The smaller side growths, slipped off, form roots more readily than the thicker growths. Five or six slips are inserted in a small pot, using sandy loam and leaf mould, and a thin layer of sand may be spread on the surface; insert the slips firmly, and plunge the pots to the rim in the material inside the propagating case. They soon form roots, and this can readily be determined by the growth they make; as soon as the slips are well rooted, pot them off singly into small flower-pots, and to form nice bushy plants stop their upward growth by pinching out the centre with the fingers. The plants must be kept in this heated house until they have made some growth, when they may be taken

DUCHESS OF CONSUELO.

into an ordinary greenhouse or garden frame, so that they may be inured to a lower temperature and a freer current of air. This is an important point with the Carnation in all the classes; a close atmosphere always causes weak growth, and also makes the plants a more easy prey to insect pests. As the season advances the plants will grow rapidly, and they require to be repotted as soon as the small flower-pots are fairly well filled with roots. They need repotting twice after the first potting off from the cutting pots, and the largest size used are 32's, or 6in. diameter, measuring inside a little below the rim. As soon as the weather is favourable the plants are placed out in the open air; they make a cleaner and sturdier growth outside, but should be removed into the greenhouse as soon as the buds show the colour of the flowers. The pestilent thrips are sure to be upon leaf and bud, therefore fumigating is quite necessary to the production of good bloom. No measure of success can be attained in the cultivation of the Carnation (or, indeed, of any other plant) unless insect pests are kept in check. It is best to fumigate even if no traces of the parasites are visible. Plants to bloom in succession to the

A CARNATION HOUSE AT GREAT BOOKHAM.

earliest are obtained by putting in cuttings later; indeed, it is best to continue putting in the cuttings as late as the end of April, and in this way the succession of bloom is obtained. The potting soil is the same for all classes of Carnations, and it is best to repot very firmly, and always drain the pots well. The plants will not flower well during the winter months unless the temperature is kept up to about 55deg. A dryish atmosphere is also best. The flowers expand better in the dry atmosphere, but this is more conducive to the increase of insect pests, and fumigation at intervals of three or four weeks is necessary. Most of the varieties flower freely, indeed, almost too freely, and if large flowers are wanted the side flower buds should be pinched out. Given the essentials of cleanliness, free air, and light, there is no difficulty in obtaining plenty of beautiful Carnations all through the autumn, winter, and spring months.

MALMAISON CARNATIONS.—This is quite a distinct class of Carnation from any of the others. The growth is very robust, and the flowers exceptionally large. They are adapted for greenhouse culture only, as the large, handsome flowers do not open freely in England out of

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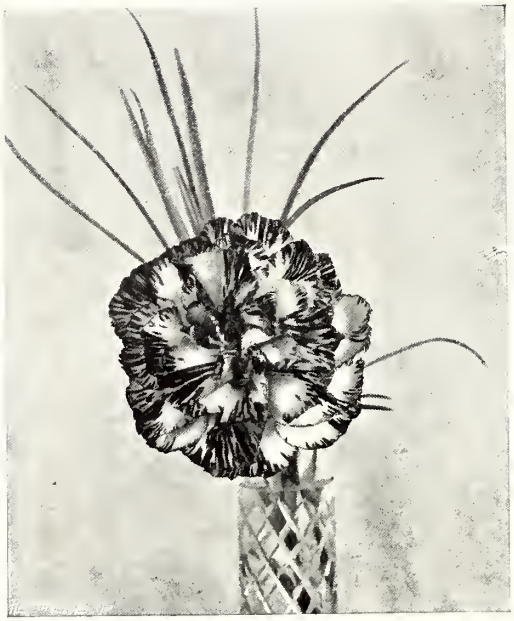


DALGETTY.

doors. Many amateurs fail in cultivating the Malmaisons successfully, but like all other plants they need the right kind of treatment at the right time. The plants can be propagated both by cuttings and layers. If by cuttings, these may be put in during the spring months whenever they can be obtained. The growths nearest the base of the stems can be layered, those higher up the stems, which cannot readily be got down, are taken off as cuttings. The cuttings form roots in about three weeks, and when they are inured to the freer air of the greenhouse they may be potted off singly into small flower-pots. The layers are taken in June or July, before they are ready on the border or show varieties. As the plants are required to be in bloom as early as possible, the sooner the cuttings or the layers are struck the better. They should be ready to be potted into their flowering pots in September or October. They will do well in 32's—that is, 6in. flower-pots. Drain them well and repot very firmly, using good yellow fibrous loam, with a fourth part decayed manure; a little fibrous peat added is excellent to keep the compost open, or leaf mould may be used. None of the Carnations will bear forcing in a high temperature, and to grow the Malmaisons to a high degree of perfection they should be kept in a dry atmosphere and a moderate minimum temperature of about 50deg. during winter. When the temperature is low and the atmosphere moist, the leaves may become infested with spot, which disfigures them, and is injurious to the health of the plants. Of course the plants will do well in an unheated house if the atmosphere is moderately dry in winter, and plants grown in such a house will produce their flowers in succession to the earlier ones. The main points in their culture is to get the plants near the roof glass. Keep them free from all insect pests by fumigating, and from the disease to which Malmaisons are liable—that is, the "rust."

If "rust" appears on the leaves, the best way is to cut off the diseased parts before the fungus is fully developed. When the coffee-coloured spores have been distributed amongst the plants serious mischief may be apprehended. In its early stages this troublesome disease is easily cured; the fungus develops between the membranes of the leaves, and ultimately bursts out indiscriminately on the upper or under surface, but the careful cultivator will remove the affected leaves before this happens, and in this way will soon get rid of the disease. "Spot" is another disease affecting Carnations; its scientific name is Uredo dianthi, but it does not seem to be infectious, and is only troublesome in winter, and attacks certain varieties. The plants will grow out of it in the spring; if the leaves are bad with it they may be cut off. It may be well to append a list of the best varieties.

CARNATIONS OF BEAUTIFUL FORMS.

SHOW CARNATIONS.—Bizarres—Scarlet: Admiral Curzon, Dr. Hogg, Duke of York,

Joseph Crossland, Robert Houlgrave, Robert Lord. Crimson: Bruce Findlay, J. S. Hedderley, Master Fred, Phœbe. Pink and purple: Harmony, Melody, Sarah Payne, Squire Penson, W. Skirving. Flakes—Purple: Charles Henwood, Florence Nightingale, James Douglas, Mayor of Nottingham. Scarlet: Alisemond, Guardsman, John Bull, Matador, Miss Constance Grahame, Sportsman. Rose: John Keet, Mrs. Rowan, Rob Roy, Thalia, Tim Bobbin.

MADAME THERRY.

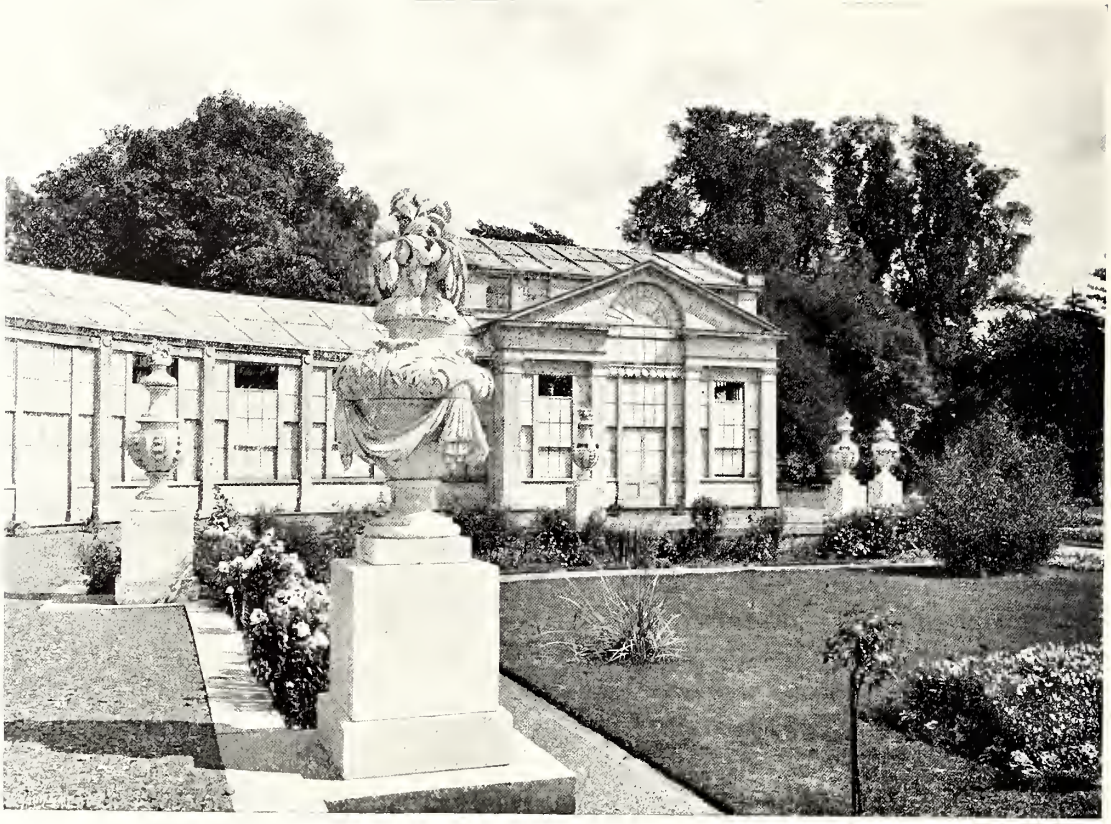
White Ground Picotees — Red edged: Brunette, Ganymede, John Smith, Mrs. Bower, Mrs. Gorton, Princess of Wales, Thomas William. Purple edged: Ann Lord, Calypso, Jessie, Mrs. Chancellor, Muriel, Nymph, Polly Brazil, Silvia. Rose and scarlet edged: Constance Heron, Daisy, Edith D'Ombrain, Ethel, Fortrose, Favourite, Little Phil, Mrs. Sharpe, Miss Flowdy.

Yellow Ground Picotees — Badminton, Borderer, Dervish, Empress Eugénie, Heather Bell, Ladas, Mr. Nigel, Mrs. Douglas, Mrs. Tremayne, Mohican, Stanley Wrightson, Wanderer.

The best Tree Carnations are: Comus, white; Countess of Warwick, crimson; Deutche Braut, white; Duke of York, dark crimson; Mdlle. Terese Franco, pink; Miss Joliffe, pink; Primrose Day, yellow; Regalia, rose pink; Uriah Pike, crimson; William Robinson, scarlet; Winter Cheer, scarlet; Sardis, clear pink.

Malmaison Carnations.—The old blush pink and crimson varieties are well known. The following have been raised by Mr. Martin R. Smith: Calypso, rose; Horace Hutchinson, scarlet; Lady Grimston, pinkish white, rose marking; Lord Rosebery, dark rose; Lord Welby, crimson; Mrs. Martin Smith, rose; Nell Gwynne, white; Princess May, deep rose; The Churchwarden, crimson; Prime Minister, scarlet, very free in growth.

THE TERRACE WALK AT BROME HALL.



CONSERVATORY AT SYON HOUSE, MIDDLESEX.

BULBS FOR THE GREENHOUSE.

GREENHOUSE bulbs may be divided into two classes, firstly, those that require a certain amount of protection to enable them to withstand the winter, and secondly, those that, though quite hardy, flower naturally early in the year, and are largely used for decorations under glass. To this latter section belong the Hyacinth, Tulip, Narcissus, etc.

For most bulbous plants a period of absolute rest is required, and this is accomplished either by turning them out of their pots and keeping them on a dry shelf, or allowing them to remain in their pots and withholding water altogether. After having rested some time they must be repotted, and at first only a little water should be given, but as the plants develop they will require more. When the flowering season is over they will not need so much water, and it must be gradually discontinued till the leaves die off.

Following is a select list of Greenhouse Bulbs:

Allium neapolitanum.—A hardy bulb bearing rounded heads of pure white blossoms on stems about 18in. high. The bulbs are small, and if eight or nine are put in pots 6in. in diameter they form pretty objects in the greenhouse during the spring months. The bulbs should be potted early in the autumn, placed out of doors till the pots are filled with roots, and as the season advances taken into a light, airy part of the greenhouse, where they will flower early in the year. Large quantities of cut flowers of this Allium are imported into this country from the South of France every season.

Amaryllis, also known as Hippeastrum. This is a gorgeous class of bulbous plants, with flowers varying in colour from white to deep crimson, the orange scarlet shades being particularly brilliant. Most of those now in cultivation are of hybrid origin, and have been obtained by the intercrossing of about half-a-dozen species, all of which are natives of Brazil and surrounding countries. The various hybrid forms of Amaryllis flower during the early months of the year, and the seed, which as a rule ripens about July and August, affords a ready means of raising them in quantity. The seed may be sown in pots or shallow pans, whichever is at hand; but the pans are the more convenient. In any case thorough drainage by means of broken crocks must be ensured. A suitable compost for the seeds consists of good yellow loam and leaf mould in equal parts, the whole being passed through a sieve with ½in. mesh. To the above a good sprinkling of silver sand must be added. The pots or pans having been filled to within ½in. of the rim with the compost pressed down moderately firm, the seed may be sown thinly thereon, and covered by a sprinkling about

¼in. deep of the same compost. Placed in a cool part of the stove or the warmest part of the greenhouse, the young plants will soon push their grass-like leaves above the soil, and may be sufficiently advanced to put singly into small pots early in the autumn. If, however, they are not large enough at that period it is best to leave them undisturbed till the spring. In potting the same compost as that recommended for sowing the seed may be used. Kept in a greenhouse, or during the summer in a frame, the young plants will grow freely, and when strong enough must be put in larger pots, at which time the soil need not be sifted. During the first winter the plants should only be kept moderately dry, not sufficient to cause the leaves to die off, but when larger they must pass the winter in a totally dormant state. The most vigorous bulbs may flower in about two and a-half years from sowing the seed, and the majority of them the following season. Pots from 5in. to 7in. in diameter are the most suitable size in which to flower these different forms of Amaryllis. After the period of blooming is over the plants must, as before, be regularly supplied with water in order to develop the foliage, and this should be kept up till the leaves show signs of dying off, when the water supply must be gradually diminished, and by autumn discontinued altogether. Kept during the winter on a shelf or some similar position in the greenhouse, they should quite early in the new year be shaken out of their old soil, and repotted, placing the bulbs at such a depth that they are about two-thirds covered with soil. Then given a temperature somewhat higher than that of an ordinary greenhouse they will soon flower, but if kept to this last-named structure they do not bloom till about April. There are many named varieties which must be propagated by division, but the raising of seedlings is the usual method of increasing these hybrid forms of Amaryllis. The colours of the hybrid Amaryllis or Hippeastrum are very varied—crimson, rose, and innumerable shades. A splendid race indeed.

Anomatheca cruenta.—A pretty little South African bulbous plant with branching flower spike that well overtops the tender green sword-shaped leaves, the whole being not more than 1ft. high. The flowers, which are nearly 1in. across, are of a carmine red, blotched with a deeper tint. It is readily increased by division of the bulbs (which are no bigger than a large Pea), or by seed; that sown early in the spring will produce seedlings that will flower the same year, towards the end of the summer. Grown in masses in pots or pans this Anomatheca is very attractive, while in a sheltered border it will do well out of doors.

Antholyza æthiopica. — An Iris-like plant with branching spikes of blossoms somewhat after the manner of a small Gladiolus, but scarlet and green in colour. It reaches a height of 3ft. to 4ft., flowers in the summer, and should be kept dry during the winter, and potted early in the year.

Babiana.—A pretty race of plants natives of South Africa, with Crocus-like bulbs, and spikes of bright-coloured blossoms, usually at their best in May and June. The flowers, which are nearly 2in. in diameter, are in most varieties of a purplish shade. Babianas are largely grown in the Channel Islands, and are sold at a very cheap rate, reaching here during the autumn months. The bulbs should be potted as soon as possible in a well-drained soil consisting of equal parts of loam and leaf mould, with a liberal admixture of sand. About six bulbs in a pot 5in. in diameter will make an effective specimen. After potting they may be kept in a frame for a time, being on the approach of severe weather taken into the greenhouse. A selection of the best would include: Atro-cyanea, purplish blue; plicata, violet, marked yellow; purpurea, purple; rubro-cyanea, red and blue; sambucina, white, with purple spots; and stricta, purplish blue. Babianas in many gardens may be grown in warm borders out of doors.

Brunsvigia Josephinæ. — A large bulb with strap-shaped leaves. It pushes up a stout spike 1yd. or so in height, crowned by a massive head of bright crimson Amaryllis-like blossoms. It is a native of South Africa, where several other species are found, but this is the only kind worth general cultivation. The treatment recommended for Amaryllis will suit this.

Chionodoxas.—C. Luciliæ, C. grandiflora, and C. sardensis are all pretty little early-flowering spring bulbs, that make the outdoor garden gay with their pleasing blue blossoms, while if potted in the autumn, putting eight or ten bulbs in a 5-in. pot, standing them out of doors till bad weather sets in, and then taking them into the greenhouse, they will flower there quite early in the year, thus anticipating their usual flowering season by a considerable period, and at that time they are much admired.

Convallaria majalis is the universally grown Lily of the Valley, that, though scarcely a bulb, and perfectly hardy, is so much employed for greenhouse decoration that it is entitled to a place here. There is now such a demand for it that some of the extensive cultivators keep enormous quantities of the flowering crowns in large refrigerators, so that they remain dormant long after the period at which they would have flowered out of doors. Thus by retarding some and forcing others, Lily of the Valley flowers may be had throughout the year. For early forcing the German-grown roots, known as Berlin Crowns, should be employed, and when potted they must be plunged in a bottom heat of about 75deg., with a corresponding top temperature. The crowns, which may be allowed to protrude about ½in. out of the soil, must be covered with moss or cocoa-nut refuse, in order to keep them in an even state of moisture, which greatly assists the forcing process. In this way they may be had in bloom about Christmas, and as the season advances the flowers develop with much less trouble. In the case of retarded crowns all that need be done is to pot them, give plenty of water, and gradually inure to the light.

Crinum.—An extensive family of large-growing bulbous plants, a few of which are hardy, while many require the temperature of the stove. The greenhouse kinds are: C. Moorei, huge club-shaped bulbs, and heads of large blush-tinted blossoms borne in August. C. Powelli, a hybrid with deeper-coloured flowers than the preceding. The variety alba is white. These Crinums may be grown in pots, tubs, or planted out, but in any case they should not be disturbed at the roots more than is absolutely necessary.

Crocosmia imperialis.—The sword-shaped leaves of this are erect in growth, while the branching spike reaches a height of about 1yd. The flowers, which are over 2in. in diameter, are of a deep brilliant orange tint, thus rendering it about July one of the most noticeable plants in the greenhouse. The bulbs should be potted soon after Christmas, taking care not to injure the long underground stems that this Crocosmia produces. It is a native of South Africa, and is at present not grown so much as it deserves to be.

Cyrtanthus.—A useful class of plants that will flower freely under much the same conditions as a Pelargonium. They are all small growers (reaching a height of about 1ft.), except C. obliquus, which is three times that size. The bulbs are about as big as a Snowdrop, and should be grouped in well-drained pots or pans. They are soon increased by means of offsets, but will keep in good health and flower freely even when the bulbs are closely packed together. The foliage is evergreen, and the plants should at no time of the year be subject to the drying off process. The small-growing kinds flower early in the spring, and again at midsummer, or soon after. A selection of the best would include: C. angustifolius; the tubular-shaped blossoms of this are of an orange red colour, and borne, several together, on a stem about 1ft. high. C. lutescens, like the last, but with pale yellow flowers. C. Macowani, in the same way, but the flowers are crimson. C. M'Keni, pure white, in shape like the last. C obliquus, a large bulb, a good specimen of which will need a pot at least 6in in diameter; the flowers, which are borne in an umbel on the upper part of a stem 1yd. high, are about 3in. long, tubular in shape, of a wax-like texture, and curiously marked with yellow, red, and green.

Eucomis punctata.—A strong-growing bulb, pushing up a number of long, wavy, strap-shaped leaves, arranged in more or less of a vasiform manner. The flower spike, that reaches a height of 2ft. to 3ft., has the upper half closely packed with small greenish flowers, spotted with brown. It is not showy, but very interesting. There are several kinds, but all are much in the same way.

Freesias.—These beautiful South African bulbous plants are now general favourites, the flowers being deliciously fragrant. Immense numbers are sent to this country every year from the Channel Islands, Bermuda, and the South of France. Though not the largest, the Channel Island bulbs can be most depended upon to flower well,

FREESIA REFRACTA ALBA.

and consequently they are generally preferred to the others. They reach here during the month of August, and should be potted at once, putting eight bulbs in a pot 5in. in diameter and a dozen in one of 6in. The compost should consist of two-thirds good loam to one-third leaf mould and a little silver sand. In potting put the bulbs at such a depth that they are covered with about ¾in. of soil. Place them then in a frame with plenty of air, this protection being only necessary to ward off heavy rains. The soil must be kept slightly moist till the plants make their appearance, after which it may be increased, but an excess of moisture must be avoided in all stages. As autumn advances the plants must be taken into the greenhouse, choosing as light and airy a position as possible for them. Plants so treated will bloom about March, but with more heat they can be had in flower earlier, though the blossoms have not so much substance as those that develop in the greenhouse. After the flowering period is over the plants must be regularly watered till the foliage shows signs of decay, when water should be gradually withheld, and the pots stood on a shelf in order to thoroughly ripen the bulbs. They must then be kept quite dry, and about the end of July or early in August turned out of their pots and the bulbs sorted over, when they may be potted in the way described. The variety generally grown is known as F. refracta alba, but there is little or no difference between this and the typical F. refracta, while F. Leichtlini is yellowish; but these characters are very variable.

Gladiolus.—The section of Gladiolus known as early flowering, which are characterised by dwarf habit and great profusion of bloom, as well as the delicate marking of the blossoms, are extremely valuable for greenhouse decoration. Half-a-dozen bulbs in a 6in pot, or larger if needed, will form effective displays. They should be potted in the autumn, placed in a frame, and when well rooted removed to the greenhouse. The best varieties are: Adonis, orange scarlet, blotched white; Colvillei, rosy purple; Colvillei alba, known also as The Bride, pure white; Delicatissima, white, blotched crimson; Duke of Albany, purplish scarlet; Emperor William, brilliant scarlet, blotched white; Fairy Queen, blush, blotched crimson; Mary Anderson, blush, marked with lemon and red; Prince Albert, salmon scarlet, blotched white; Princess Royal, salmon rose, white blotch; Queen Victoria, deep red, marked white; Rosy Gem, rose, marked blush.

Hæmanthus (*Blood-flowers*).—A showy class of South African bulbs that need a season of absolute rest to flower them well. Some members of the genus require more heat than that of a greenhouse for their successful culture, the best of those that will succeed in this structure being H. albiflos, white; H. coccineus, scarlet; H. insignis, orange scarlet; and H. tigrinus, crimson.

Hippeastrum.—*See* Amaryllis.

Hyacinthus (*the Hyacinth*).—Though perfectly hardy, the Hyacinth is grown for the embellishment of the greenhouse during the early spring months. The bulbs which reach this country early in the autumn should be potted in a mixture of one-third each of loam, leaf mould, and well-decayed manure, with a little sand, and at such a depth that the upper part of the bulb is ½in. below the

HYACINTHS.

surface of the soil. Good bulbs are best potted singly in pots 5in. in diameter, though grouping of various kinds in pots, pans, or boxes may be indulged in. After the bulbs are potted they should be stood on a bed of ashes in the open ground, and a thorough watering given to them. Then the whole of the pots must be covered to a depth of 2in. with ashes or cocoa-nut refuse, in which they can remain till well rooted, being examined occasionally to ascertain their rate of progress. When the young leaves break through the soil this covering must be removed, and the pots taken into a cold frame or warmer structure, according to the time they are required to flower. The miniature pure white Roman Hyacinths grown in Italy

and the South of France reach this country in July, and if soon potted will flower with little trouble in November and December, when they are particularly valuable. The bulbs of these are small, and should be put three in a pot or grouped in some way.

A selection of the best Hyacinths is herewith given: Single Red: Baron Van Tuyll, Cavaignac, Challenger, Charles Dickens, Countess of Rosebery, Duchess of Albany, General Pelissier, Gigantea, King of the Belgians, Koh-i-Noor, La Superbe, Lord Wellington, Macaulay, Norma, Queen of Hyacinths, Robert Steiger, Von Schiller, Vurbaak. Double Red: Bouquet Royal, Empress of India, Grand Conquerant, Lord Beaconsfield, Lord Wellington, Noble Par Merite, Prince of Orange, Princess Louise, Sans Souci, The First, Venus de Medicis. Single White: Alba maxima, Avalanche, British Queen, Duke of Clarence, Grand Vainquer, Grande Vedette, Grandeur a Merveille, King of the Whites, La Grandesse, L'Innocence, Madame Van der Hoop, Miss Nightingale, Mont Blanc, Queen Victoria, Snowflake, White Perfection. Double White: Bouquet Royal, La Grande Duchesse, La Tour d'Auvergne, L'Adorable, Lord Derby, Prince of Waterloo, Princess Louise. Single Blue: Argus, Captain Boyton, Celestial, Charles Dickens, Czar Peter, Duke of York, General Gordon, General Havelock, Grand Lilas, Grand Maitre, King of the Blacks, Leonidas, Lord Derby, Prince of Wales, Sir E. Landseer, William I. Double Blue: Blocksberg, Charles Dickens, Crown Prince of Sweden, Duke of Norfolk, Laurens Koster, Lord Raglan, Prince Albert, Sir Joseph Paxton, Thomas Moore. Single Yellow: Anna Carolina, Bird of Paradise, City of Haarlem, Ida, King of the Yellows, Obelisk, Primrose Perfection, Sovereign, Sybil. There are a few double yellows, but they are unsatisfactory.

Ixias.—Cape bulbs that are almost hardy if planted in a warm, well-drained border, but at the same time they form beautiful objects in the greenhouse in April and May. The wiry upright stems reach a height of 18in. to 2ft., the upper half being studded with very showy blossoms over 1in. in diameter. The Crocus-like bulbs should be potted half-a-dozen or so in a 5in. pot, in a compost consisting of loam, leaf mould, and sand. They should be potted in early autumn, and grown on in a cool part of the greenhouse. The different Ixias are very useful in a cut state. The varieties vary in colour from white to crimson, and in most of them the centre of the flower is of quite a distinct colour from the rest. In one variety, viridiflora, the flowers are of a beautiful metallic green, with a black centre.

IXIA.

Lachenalia.—A large class of small-growing bulbs, some of which are extremely beautiful and very popular, while many are of only botanical interest. They are best potted in August in the soil above recommended for the Ixias, and like them should be put several in a pot. After this is done, and the pots placed in the greenhouse and kept fairly moist, the young leaves will soon push above ground, and the plants will continue to grow throughout the winter, flowering early in the spring. The Lachenalias are also suitable for growing in suspended pots or baskets. The best kinds are: L. aurea, yellow; L. Nelsoni, rich golden yellow; L. pendula, red and yellow; and L. tricolor, green, red, and yellow. L. Nelsoni should be preferred to the others.

LACHENALIA.

Lilium.—The Lily family is an extensive one, but the number of those suitable for growing in pots for the greenhouse is limited, yet some of the most beautiful occur amongst them. The best are L. auratum and its varieties platyphyllum with huge saucer-shaped blooms, rubro-vittatum, which has a crimson band down the centre of each petal, and Wittei, in which the flowers are of a clear unspotted white with golden bands. L. longiflorum and its varieties, of which the best known is Harrisi, which is usually grown under the name of Lilium Harrisi, and as such is the most popular of all Lilies. L. nepalense, greenish yellow, marked purple. L. speciosum, known also as L. lancifolium. Of this there are many forms, the best being album, white; Krætzeri, white; Melpomene, rich crimson; roseum, pink; rubrum, pink, spotted red; and L. sulphureum, large trumpet-shaped creamy yellow blossoms.

Lilies should be potted as early as possible, but imported bulbs of some kinds reach this country much

sooner than others. Thus we get Harrisi, from Bermuda, as early as August, while most of the others mentioned, which come from Japan, do not reach here till November, or later. A compost of two-thirds loam to one-third leaf mould, and some sand, will suit all these Lilies, which should be potted at such a depth that there is 1in. of soil above the bulb, while space must be left at the top for copious watering and, if possible, a little top-dressing. Pots 5in. and 6in. in diameter are good sizes for single bulbs. When potted they should be placed in a cold frame and given but little water till the shoots appear above ground, when the supply of moisture must be increased. They need plenty of air and protection from severe frosts, while if a few at a time are taken into the greenhouse a succession of bloom is thereby ensured. Aphides or green-fly are very troublesome in the case of some Lilies, particularly Harrisi, and must be kept down by using some of the many insecticides now in vogue.

Lycoris aurea.—A Chinese bulb that requires to be grown on freely during the winter and spring, then given a period of absolute rest, and when started in early autumn will push up its flower spikes. The blossoms, which are borne in a cluster on a stem about 18 n. high, are of a rich golden colour. A few plants of this are very showy.

Montbretia.—A numerous class nearly related to Crocosmia, the flowers of the different varieties varying from yellow to crimson. If potted about Christmas, and half-a-dozen bulbs or so are put in a 6in. pot, they form a pretty midsummer feature in the greenhouse.

Narcissus (*Daffodils*).—Many of these are very popular, and readily lend themselves to gentle forcing. The easiest to force are the forms of Polyanthus Narcissi, including such well-known kinds as Double Roman, Paper White, Early Snowflake, Bazleman major, Grand Monarque, States General, etc. Except that they should be put three in a pot, or grouped in some way, these Narcissi may be treated much as recommended for Hyacinths. The Chinese Fairy Lily, Joss Flower, or Flower of the Gods, is a Narcissus of this section, which will flower in a bowl of water if a few stones are placed around the bulb to hold it securely in position.

The Daffodil section of Narcissus may be flowered in pots, and very pretty they are in the greenhouse, but as heat quickly injures them they are best allowed to remain in a cold frame till the flower buds are showing, when they may be taken into the greenhouse. As regards varieties to be grown there is no lack, for practically all kinds may be thus cultivated, even the white Poet's Narcissus and its beautiful double forms. Especially suitable for this method of culture is Johnstoni Queen of Spain, whilst all the Incomparabilis or Star Narcissi may be grown thus. Burbidgei, Sir Watkin, Barri conspicuus, Frank Miles, Autocrat, the noble Horsfieldi, the large bicolor Trumpet Daffodil, Bicolor, and a host of others. Daffodils and the Poet's Narcissi respond so readily to pot treatment that one may select almost any kind without fear of failure. It is, indeed, under glass early in the year that one welcomes these fresh-coloured flowers of the spring. Remember that anything like forcing is unavailing; it means failure, and the finest flowers are usually obtained when the pots with the bulbs in them are left plunged in ashes until the middle of January, then there will be a rich display in March; but, of course, as a succession is desirable one cannot lay down a hard and fast rule as to when to introduce the plants into the greenhouse. The earlier flowers are required so much more the heat necessary, but a temperature above 45deg. must not be given. Pot up the bulbs early, and give water liberally when growth begins. It is to be hoped that the Daffodils in their beautiful variety will be grown more for the greenhouse than has hitherto been the case, and if there is no greenhouse the bulbs may be brought on in a cold frame. Potfuls are always welcome for the house.

Nerine.—To this genus belongs the Guernsey Lily Nerine sarniensis, and several other very desirable kinds. The Nerines are brilliant flowers, which strange to relate have never gained the affections of flower gardeners. It is difficult to account for the neglect of certain races of plants, and undue attention bestowed upon other things far less worthy of it. The Nerines are utterly unlike any other class of bulbs. The flower stems appear without the leaves; but the wonderful beauty of the flowers themselves, their glittering tints, and, when well grown, freedom too, should surely make them popular, whilst they appear in October, when few greenhouse flowers, save the Chrysanthemum, are in perfection. One must not forget also that the hybridist has been working to extend the variety of colours, and Mr. Elwes has accomplished unusual results, he having received a year or two ago no less than seven awards of merit from the Royal Horticultural Society for new hybrids. It is to be hoped that these splendid kinds will come into general cultivation. There are a number of well-known species and varieties, such as the scarlet corusca and its variety major; flexuosa and f. major, pink; the vermilion Fothergilli; rosea, rose; sarniensis, carmine red; undulata, rose carmine; and the little pinkish waxy-petalled crispa. N. elegans and N. Manselli are two very beautiful kinds, the last-mentioned in particular. Of course it is a matter of opinion as to which is the finest of the Nerines, as tastes differ, but those who know not this group are advised to commence first with N. Fothergilli, N. sarniensis, N. corusca major, N. Manselli, and N. elegans. The fact that the Nerines are autumn flowering increases their value. Their culture is not difficult, but care is required to flower them well. Their leaves are pushed up directly after the flowers are over, and growth goes on during the winter and spring, when the foliage dies off. After this they must be well exposed to the sun, giving no water until the middle of August, in order to thoroughly ripen the bulbs. Use for soil yellow loam with a little well-decayed leaf mould added to it, and a fair amount of sharp silver sand. The object of having a particularly fresh soil, likely to remain sweet for a long time, is to remove all necessity for potting the bulbs often. Nerines must not be frequently disturbed, and an abundance of flowers is produced when the bulbs are packed thickly together in the pots. Give a light position in the greenhouse when growth is being made, namely, in winter and spring, and during the resting season a sunny shelf is a good place for the pots, as the bulbs must be properly ripened. A sunny frame will also suffice if the pots are not exposed to rains. It is an easy matter, however, to give a little ventilation by tilting up the light.

Scilla.—An extensive family, several members of which require the protection of a greenhouse, while some of the hardy kinds, notably S. sibirica, if treated as recommended for Chionodoxa, will flower under glass in an equally satisfactory manner.

Sparaxis.—A class of bulbous plants very much resembling the Ixias, but of somewhat dwarfer growth. For culture *see* Ixia.

Sprekelia formosissima (*Jacobea Lily*).—An Amaryllis-like bulb which if potted early in the year will flower about June. The stem reaches a height of 1ft. and the flowers are of an intense deep crimson, a very striking colour.

Tritonia.—A numerous class somewhat in the way of the Babianas, but instead of the purplish tints of these last the Tritonias are mostly different shades of yellow and red. The cultural requirements of both are the same.

Tuberose, The (*Polianthes tuberosa*).—Of late years this strongly-perfumed flower has been largely grown and its culture better understood. Immense quantities of bulbs are sent to this country from America, reaching here about the end of the year. The double-flowered Pearl variety is the most popular, and the first consignments usually arrive from America early in December. The African Tuberose comes to hand in October, but this variety is not so much grown as the American, although where flowers are required all the year round a few of the African kind may be potted on and plunged in a genial hot-bed to obtain early flowers. Very little water is required until the leaves appear, as the bulbs absorb sufficient moisture from the plunging material at first, but

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as soon as the plants are growing freely more water should be given. When the flower spikes appear weak liquid manure will be helpful.

Those who have no forcing pit may grow the Pearl equally as well in a greenhouse temperature, or even in a sunny window, and the later-potted bulbs in May will succeed plunged in cocoa-nut fibre refuse in the open air. Remove them indoors when the flowers appear. Any soil that will grow other bulbs may be used for Tuberoses. A very good mixture consists of half loam and the other portion old cow manure and leaf mould freely mixed with sharp silver sand. As soon as the bulbs arrive, the first batch, according to requirements, should be potted, one bulb in a 5in. pot or three bulbs in each 6in. pot. Drain the pots well, and bury the bulbs to the neck in the soil, which should be pressed down firmly. Remove before potting all offsets which grow out round the bulbs, as if left they weaken the main leaves and flowers. Until growth begins plunge the pots under the stage in the greenhouse, and bring them to the light as soon as growth commences. If early flowers are required, plunge the bulbs in a hot-bed; but they will bloom as well in the greenhouse, only, of course, not so quickly. Pot a few every month to obtain a succession of flowers throughout the season. The last potting may take place in May, and the bulbs be grown under quite cool treatment. Indeed, Tuberoses may be hastened into flower or retarded as desired. Put a neat stick to each spike and grow the plants in a light position. After flowering throw the bulbs away, as they are of no further use for another year, and they are very cheap, especially if purchased by the hundred. If large specimens are required for the conservatory, pot first into what are called large-sized pots, and when the spikes appear a few inches above the leaves make up the specimens by placing five or more in 7in. or larger pots, according to requirements. It is necessary to start them in this way, so as to get the plants in flower at the same time. It need scarcely be remarked that the flowers are useful in particular for bouquets and choice decorations, but their perfume is too fulsome when they are used in quantity upon the table.

Tulipa (*the Tulip*).—Immense numbers of Tulips are sent here from Holland, and they are largely employed both for bedding out and for greenhouse decoration. For the latter purpose they may be treated much as recommended in the case of Hyacinths, except that about half-a-dozen bulbs should be put in one pot. A selection of the best varieties is as follows: Duc Van Thol in its different coloured forms, all of which are dwarf and flower very early; Belle Alliance, scarlet; Bride of Haarlem, white, flaked crimson; Canary Bird, yellow; Cottage Maid, pink, marked white; Duchesse de Parma, orange red, margined yellow; Dussart, crimson; Grand Duchess, white; Keizer Kroon, scarlet, edged yellow; King of the Yellows, deep yellow; La Tendresse, rose; L'Immaculée, pure white; Pottebakker, scarlet, white, and yellow; Queen of the Netherlands, rose; Queen of the Violets, light purple; Roi Pepin, white, flaked crimson; Rose Grisdelin, pink and white; Scarlet Beauty, scarlet; Thomas Moore, orange; Van der Neer, purplish violet; White Swan, pure white.

All the above are single, the following being double flowers: Duke of York, rose, edged white; Imperator Rubrorum, scarlet-crimson; La Precoce, white; Murillo, rose; Princess Alexandra, red, edged yellow; Raphael, rose; Tournesol, red and yellow; Velvet Gem, bronzy crimson.

Urceolina aurea, also known as U. pendula. A pretty bulbous plant from the Andean regions of South America. The leaves are heart-shaped, while the flower stem, which reaches a height of 18in., is terminated by an umbel of drooping, urn-shaped blossoms. These blooms are about 2in. long, distinctly marked with yellow and green, and of a thick wax-like texture. Flowers in the summer and autumn.

Vallota purpurea (*Scarborough Lily*).—When in full flower—that is, in August and September—this South African bulb is one of the showiest features in the greenhouse. The large reddish scarlet flowers are borne in good-sized umbels, and as established masses soon push up several spikes a brilliant show is obtained. After flowering, the growth is perfected, and when this is finished the soil should be kept moderately dry, but no absolute rest must be given. Established plants will stand for years without repotting and flower all the better for it.

Watsonia.—A genus of bulbous plants much resembling some forms of Gladiolus, and needing much the same treatment. The most notable are: W. angusta, orange scarlet; W. humilis, rose; W. marginata, pink; W. O'Brieni, white. They will succeed out of doors in warm soils and sheltered positions.

Zephyranthes.—Some of these are difficult to grow, but two species are valuable for the embellishment of the greenhouse. They are: Z. candida, white, flowers in August, and Z. carinata, rose, in June. Both should be grouped in pots or pans, and once established seldom need repotting.

THE MANOR HOUSE, GREAT TANGLEY, SURREY.

CLIMBING PLANTS.

CLIMBING PLANTS FOR THE GREENHOUSE.

A GREENHOUSE without a judicious selection of climbing plants loses greatly in interest and charm. In this group many of the most beautiful of all indoor flowers occur, plants not only graceful in growth and bearing a profusion of bright flowers, but frequently filled with sweet perfume. Too many creepers are a mistake, for they darken the house, and therefore prevent the light from reaching the pot plants underneath, which naturally become much drawn. Greenhouse climbers are not sufficiently considered in gardens—less of late years than formerly, when it was no uncommon sight to see Fuchsias hanging their trails of blossom from the rafters, or Maréchal Niel Roses diffusing their sweetness around. Some gardeners care little for climbers for the greenhouse, one reason being that they encourage greatly insect pests, mealy bug in particular, which spread in time to the plants underneath. This is true when the climbers are not carefully attended to, and growth must not be so dense as to shade injuriously the things upon the stages. Climbers flower with great freedom when in vigorous health, and the flowers may be cut for the house, to use in many pretty ways. There is, however, another side to the question of shading. Climbers provide a natural shade during the summer months, and the growth of plants is a thousand times preferable to mixtures of whiting or even roller blinds. A well-known gardener writing in a horticultural journal with respect to permanent shade, stated that "it was not a good system to adopt as a rule, be it as regards colour either white or green, or in preparations of lime, whiting, or any special mixture. It is more of an eyesore than anything else, and is not sound in practice by reason of the variable character of our climate. By means of climbers, what would otherwise appear of

ungainly character in many a house may be turned to the best account; bare walls can be draped with true climbers, or be covered with plants of spreading habit. Many of the old-fashioned greenhouses with their sides of considerable depth may be much improved by training climbers over a part at least of the bare space. Our forefathers seemed to have a craze for height when designing their horticultural erections; fortunately the present-day builders avoid this, and with better results. Other old houses, especially conservatories, as we now call them—but they are not strictly what this word implies in its true meaning—can be so arranged with climbers as to add to the effect. I am thinking now of those houses with heavy mullioned windows and bare walls, all of which can be treated with climbers to a good purpose."

Climbing plants as a rule, particularly those that are required to cover a considerable space, succeed better permanently if planted out than when grown in pots, and in most structures a border may be prepared for the purpose. As there is a tendency for the shoots to become entangled unless attended to in this respect, the climbers should when planted be carefully trained in position, until the allotted space is covered, when the shoots may be allowed to develop their true grace, as in this way the prominent characteristics of each are brought out. In the case of any subjects that require cutting back this should be done immediately the flowering season is over.

The best Greenhouse Climbers are:

Asparagus.—A beautiful family of plants that has attained a considerable amount of popularity of late years. They are chiefly remarkable for their extremely delicate frond-like branches, from which circumstance they are often called the Asparagus Fern, though they are in no way related to the Fern family. A mixture of loam, peat or leaf mould, and sand will suit them well. When the plants are large they often seed freely, and in this way they can be readily propagated in heat. The best are: A. plumosus, thickly clothed with delicate pointed leaves; A. plumosus nanus, with more flattened, frond-like branches than the last; and A. plumosus tenuissimus, even more delicate than either, forming light fluffy shoots of the richest green. A. retrofractus arboreus, a much stronger grower, with hard grey stems, and needle-like leaves from 1½in. to 2in. in length, and of a bright green colour. These leaves are arranged in tufts along the minor branchlets. A. Sprengeri, the leaves of which are broader than the others, and of a rich grass green tint. It is a valuable climber, and is also very ornamental when mounted on a pedestal, as the branches then droop all round and are covered with crimson fruits. The Asparagus family is of great value for cutting, so much so that the foliage has in a measure taken the place of Fern fronds, as they are far more lasting.

ASPARAGUS SPRENGERI.

Bignonia.—These are all vigorous climbers that need a sunny position to flower them well. B. capreolata, orange red, summer; B. Cherere, orange, summer; and B. speciosa, purple, spring, are the best.

Bomarea.—A family nearly related to the hardy Alstrœmeria, from which they are distinguished by their climbing habit. All bear clusters of drooping bell-shaped blossoms. They need the warmest part of the greenhouse, and are rather more particular in their requirements than most climbers. A selection is herewith

given: B. Carderi, pink; B. frondea, yellow; B. oligantha, reddish orange; B. patococensis, crimson.

Clematis indivisa.—The starry white blossoms of this New Zealand evergreen Clematis are borne in the greatest profusion in early spring. There is a variety, lobata, that differs only in its lobed leaves. Both of them are among the finest climbers for the greenhouse or conservatory, and will succeed well in a border if well drained.

Cobæa scandens.—One of the most vigorous of all climbers, bearing large purple bell-shaped blossoms throughout the summer months. Sown in the spring, the young plants will cover a considerable space the same season. There is a variety in which the leaves are beautifully variegated.

Eccremocarpus (*Calampelis*) **scabra.**—This has prettily divided leaves and spikes of orange-coloured blossoms, borne in summer and autumn. In mild climates it will succeed out of doors.

Ficus, The.—F. falcata, F. minima, and F. repens are useful little climbers that attach themselves to a wall after the manner of Ivy. A damp shady wall, instead of being an eyesore, may by means of these Ficus be transformed into an unbroken mass of tiny deep green leaves.

Hardenbergia.—A group consisting of two species—H. Comptoniana, with three or five leaflets, and H. monophylla, in which the leaves are not divided. Both have dense clusters of small purple Pea-shaped blossoms, produced in the spring.

Hibbertia dentata.—This is a bright yellow climber with leaves about 3in. in length, oblong, of a deep green when mature, but of a pretty bronzy tint when young. The flowers, which are 2in. in diameter, are borne during the first three months of the year.

Ipomæa. — An extensive genus related to Convolvulus, some members of which are hardy, others require a stove, while a few will succeed in the greenhouse. They are: I. Jalapa, pink; I. purga, purplish rose; I. Quamoclit, red; I. versicolor, orange.

Jasminum.—Of the Jasmines there are J. grandiflorum, somewhat like the common hardy kind but looser in growth and with larger flowers, which are tinged on the exterior with purple—the deliciously fragrant blossoms of this occur more or less throughout the year—and J. odoratissimum, from Madeira, producing golden yellow blossoms during the summer, and very fragrant.

Kennedya.—Nearly related to Hardenbergia, but with larger flowers and fewer in a cluster. The two best are K. Marryattæ, with light scarlet flowers borne from January to June, and K. rubicunda, dark red flowers, in April and May.

Lapageria. — The Lapagerias are among the most beautiful of all greenhouse climbers, their wax-like bell-shaped blossoms being seen to very great advantage when clothing a roof or conservatory wall. To succeed in their culture the plants should be placed in a bed prepared for their reception. The soil should be removed to a depth of 3ft., and at least 1ft. of drainage material placed in the bottom. Over this may be spread a layer of turves with the grassy side downwards, and on this a compost consisting of peat, sand, rough charcoal, and a little brick rubble, the whole being pressed down moderately firm. If good healthy plants are chosen they will in such soil grow away rapidly, and soon cover a considerable space. The Lapageria dislikes exposure to full sunshine, so that it must be grown in a shaded structure, and during the summer freely syringed. Slugs are partial to the young growths just as they are pushing through the soil.

L. alba has pure white flowers, while in L. rosea they are of a reddish rose tint. Some varieties of this last are much superior in colour and size of flower to others, the best being known as Nash Court Variety and superba.

Mandevilla suaveolens.—A deciduous climber of quick growth that during the summer bears a profusion of large pure white fragrant Convolvulus-like blossoms.

Manettia.—This family consists of several species, by far the best being M. bicolor, with small bright green lanceolate leaves and tubular blossoms, scarlet, tipped with yellow. It will flower nearly all the year round.

Maurandya Barclayana.—This is best treated as an annual. Sow the seed in a gentle hot-bed in the spring, and if grown on freely the plants will produce their purple Foxglove-like flowers throughout the summer.

Myrsiphyllum asparagoides. — A slender climber with small heart-shaped leaves of a bright shining green. It is the plant commonly known as Smilax, whose long sprays clothed with their pretty leaves are so much used in table decorations.

Passiflora (*Passion-flower*).—An extensive group of climbing plants of vigorous growth, with ornamental foliage and a great profusion of beautiful flowers. Several of

PASSIFLORA CONSTANCE ELLIOT

them require a stove, but many will thrive in a greenhouse, the best of them being: Campbelli, purple; cœrulea, blue; cœrulea Constance Elliot, white; cœrulea racemosa, red; Lawsoni, light purple; and Imperatrice Eugenie, reddish purple. Should be planted in a border.

Plumbagos.—The Plumbago capensis is one of the most charming of all climbers for the greenhouse, and will succeed in structures heated just sufficiently to keep out frost. It bears flower clusters of a pretty blue colour, and so profusely that when in full beauty a plant is surfaced with blossom. The Plumbago need hardly be described, as it is familiar in most gardens, but some may not grow or know it. The variety alba has white flowers. Cuttings may be readily struck in the spring, and require a temperature of about 60deg., placing them in pots filled with ordinary soil for cuttings in the usual way. When the cuttings are ready—and put no more than five or six in a 5in. pot—remove to the house and put a hand-light over them to promote quick rooting. When rooted transfer singly to 3in. pots, and keep rather close until established. After this give air abundantly, for the Plumbago must not be coddled in any way. They may be grown on in pots or planted out; the latter method is, perhaps, the best, thoroughly well draining the border. During the winter reduce the supply of water considerably.

Rhodochiton volubile.—A slender yet free-growing climber whose dark red-coloured flowers protrude from a widely-expanded calyx, thus giving it a very distinct appearance. The flowers are produced in great profusion throughout the summer months, when the slender shoots are wreathed for a considerable distance with them.

Rhynchospermum jasminoides.—White Jasmine-like sweet-scented blossoms, borne during the summer.

Ruscus androgynus.—One of the most vigorous of all greenhouse climbers, bearing a profusion of long pinnate leaves of a stout leathery texture and of a deep green colour. It is suitable for planting in draughty places, as harsh dry winds have little effect upon it. This Ruscus is used with good effect at the Crystal Palace, where it climbs up the pillars and roof. The flowers are inconspicuous.

Solanum jasminoides.—A most prolific flowerer, the clusters of blossoms, which are white slightly tinged with blue, being borne in great profusion from spring to autumn. In the South of England this succeeds out of doors. It is no uncommon sight to see cottages in Devonshire and Cornwall wreathed in it.

Sollya heterophylla and S. parviflora. — Two slender twining plants with narrow deep green leaves, and a profusion of small drooping bell-shaped blossoms of a pleasing shade of bright blue.

Tacsonia.—Nearly related to Passiflora, but some have even more showy blossoms. They hang down supported by very long flower stalks, hence are on a roof seen to very great advantage. A selection would include: Exoniensis, rich carmine pink; mollissima, pink; Smytheana, light red; Van Volxemi, scarlet, shaded violet.

Tecoma.—All these need to be thoroughly exposed to the sun to induce them to flower, and when this is the case they are remarkably showy. The best are: T. capensis, orange scarlet; T. jasminoides, white, red throat; T. Smithi, orange; and T. stans, yellow.

Thunbergia alata is a beautiful annual climbing plant of which there are several varieties, the showiest of them being those forms in which the flowers are some shade of yellow, with a dark centre. Sow in spring in gentle heat, and grow on quickly afterwards.

Tropæolum.—There are two quite distinct classes of Tropæolum, both of which form good climbing plants for the greenhouse. The first has tuberous roots and throws up annual shoots, which flower, and after that the tuber has a period of rest. To this section belong T. azureum, blue; T. brachyceras, yellow; T. Jarratti, scarlet and yellow; and T. tricolorum, red and black. The second class consists of forms of the Nasturtium which are valuable for winter blooming. Good kinds are Ball of Fire, scarlet; Clapham Park, orange; and Hermine Grasshoff, double, orange scarlet.

A CURIOUS ARBOUR, ELVASTON CASTLE, DERBYSHIRE.

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MADAME PAUL LACROIX.

THE CHRYSANTHEMUM—ITS HISTORY AND PROGRESS.

THIS is a flower of autumn and winter. It brings bright colouring to the greenhouse and conservatory when the Roses have flown and the garden wears an aspect of decay. One treasures the Chrysanthemum, the "Autumn Queen" as it is fancifully christened, and certainly without its handsome flowers of a hundred tints the indoor garden would lose in beauty and interest. It is a flower of the East, a national emblem of sunny Japan, and the "Rose," indeed, of China and the land of Cherry Blossom and Iris. For many centuries the Chrysanthemum has been cultivated with skill in the Japanese garden, and the yearly Chrysanthemum fête in the Imperial grounds is an occasion for national rejoicings. Mr. Alfred Parsons, A.R.A., the well-known flower painter, in his charming book on "Notes in Japan," makes interesting reference to the flowers. On p. 178 one reads: "The first really fine Chrysanthemums I saw were in Yokohama, when I got back there early in November. I was disappointed to find that they were in temporary sheds, put up to protect them from rain and sun, and not in masses out of doors as I expected to see them; but they were excellently grown, and in the softened light of the oil-paper shades their colours showed to great advantage. The plants are treated much as they are with us, raised in pots from cuttings taken in the spring, and encouraged with plenty of manure until the buds are formed; before flowering they are removed from their pots and planted out in bold groups of colour in the beds which have been prepared for them. Some plants are reduced to a single stem, on which only one enormous blossom is allowed to develop; these are generally arranged in a line, with each flower tied stiffly to a horizontal bamboo support, and the effect is very sad; but the excellence of the

gardeners is best shown in growing large bushes, which have been known to carry as many as 400 flowers of medium size, all in perfect condition, on the same day. An English gardener who had visited every show within reach of Tokyo, including the Emperor's celebrated collection in the palace grounds, told me that he had seen no individual blossoms equal to the best dozen or so at a first-rate London exhibition, but that these great plants with their hundreds of flowers were triumphs of horticulture. The most curious examples of Chrysanthemum growing were to be seen in the Dangozaka quarters of Tokyo. The long, hilly street is bordered on each side with gardens enclosed with high bamboo fences, and in every one, by paying three rin, you could see groups of life-size figures mainly covered with Chrysanthemum leaves and flowers. They represented scenes from history, the drama, or Buddhist mythology, and were constructed with frameworks of bamboo, inside which the flower-pots were concealed, the shoots being brought through the openings and trained over the outer surface. The heads and hands were made of painted wood, and swords and other accessories were added to make them more life-like; the draperies of living leaves and flowers were skilfully arranged in large folds, and, as in most of the popular shows, they depicted the costumes of Daimio and Samurai of the past. At each entrance I was given a sort of playbill, a roughly painted broadsheet with a woodcut and a description of the different groups serving as an advertisement of the gardener's establishment."

This description of the Chrysanthemum in Japan serves to show that the gloriously-coloured flower we hold dear in Britain is cultivated in a way similar to our own methods. A few years ago specimen growing was a fashion here, but the big, formal plants, as regularly shaped as if carved out of huge turnips or modelled in wax, are no longer seen in large numbers, and their departure occasions in the minds of the majority of flower gardeners no regret. Chrysanthemum culture has been raised in Great Britain, as in Japan and America, to a high "art"—that is, of course, for exhibition, and each year varieties are bred of wonderful colour and startling size, improvements in some measure, it is to be presumed, upon the thousands that have been passed by in the rush for mere dimensions. It seems strange to compare the huge show blooms with the modest little type, introduced from China, for there is no reason to doubt that this plant is a true native of China, from whence it was introduced into Japan. The species first opened its eyelids in the Royal Gardens, Kew, in the year 1790, plants having been sent from China in the previous year to a French nurseryman at Marseilles, Blancard by name. In Chinese literature reference is made to the Chrysanthemum by Confucius, the great philosopher, who called the flower Li-ki. Probably the blossoms which inspired Confucius were not the noble examples of the hybridists' art that now adorn our show boards and greenhouses, but it is interesting to know that the Chrysanthemum is one of the most ancient of garden flowers upon the world's surface. Although the plant was probably introduced into England before the date previously mentioned, as Sabine in 1764 mentions a variety in existence in the apothecaries' gardens at Chelsea, yet this died, so that the history of the plant in England commences practically with the flowering of the species at Kew. Three plants were introduced by Blancard, two of which succumbed, and the survivor, the old purple Chrysanthemum as it is called, was the species to give birth to the present race. Those who are interested in the family may like to know that the first illustration of it was given in the "Botanical Magazine" of 1796, and represents a flower of much charm.

Chrysanthemums quickly became known to gardeners, and many raisers set to work to extend and improve existing varieties by hybridisation, for in 1824 we know that twenty-seven varieties were in the Horticultural Gardens at Chiswick. Books began to appear upon the cult of the Chrysanthemum; but it was not until 1846, when Robert Fortune, who was at that time collecting for the Horticultural Society, sent over from China the Chusan Daisy, that a national interest, so to say, was beginning to arise. Fortune sent the

little Chusan Daisy, so named from its native isle of Chusan and its Daisy-like formation. This was the commencement of the pretty Pompon group. The work of the hybridist was now being revealed, for the incurved varieties had been moulded into the form in which we see them at the present day, globular, regular, and painfully formal, and other types began to be heard of, such as the pretty little Anemone Pompons and reflexed varieties.

It was, however, when Mr. Robert Fortune, on his second visit to Japan in 1861, sent over the Japanese varieties that Chrysanthemum culture in this land became in a measure popular, and one may imagine that the strange and picturesque flowers created an intense interest, flowers utterly unlike anything hitherto seen, and setting at defiance all the rules that governed the laws laid down by the florists of old. They were indeed a shock, big masses of petals, rugged and gloriously coloured, as unconventional as the incurved varieties were prim and formal. Such men, however, as Mr. Standish and the celebrated Adam Forsyth saw in these weird flowers from Japan great possibilities, and forthwith commenced to enlarge the group. The race extended, until this section constitutes the principal feature at all exhibitions, whilst for the greenhouse and for cutting none excel them in freedom or range of beautiful colours.

The National Chrysanthemum Society has accomplished much work in promoting the culture of the plant. There is hardly a town in the British Isles that does not hold an annual exhibition, and in America and France great enthusiasm is displayed in exhibiting and raising new varieties. The foundation-stone of the National Chrysanthemum Society was laid in 1847, the society then being known as the Stoke Newington; but with an increasing popular interest in the flower naturally its sphere of action extended, until it was named the Borough of Hackney Society, the forerunner of the organisation which holds its yearly exhibitions at the Royal Aquarium. Records exist of exhibitions held at Birmingham and Swansea in 1836, but probably only pot specimens were shown, not cut flowers.

EARLY-FLOWERING CHRYSANTHEMUMS.

One section has never made conspicuous headway against the Japanese varieties, namely, the incurved, and this is not surprising, as the freer flowers of the later acquisitions appealed to the great body politic, never ardently in love with flowers as formal as a glass ball. It is interesting, however, to see in the show stands the Queen of England variety, which was introduced into commerce as long ago as 1847, and is still an exhibition flower, in spite of the many seedlings raised of recent years. Each year something distinct is noticed amongst the novelties, until one wonders whether there can be a limit to the range of colours or form of the flower. It seems impossible; still the list of new varieties lengthens, some of beautiful colour, others the reverse, some, too, with petals curled in or spread out in a silky mass. It will be remembered that the introduction of a hairy Chrysanthemum from Japan created something approaching a *furore*, and this variety, Mrs. Alpheus Hardy by name, inaugurated a new division, and in this way the various groups have had their birth. Some of our finest varieties have come to us direct from Japan, the glorious crimson

E. Molyneux as an example, but of late years British and French growers, the British in particular, have devoted their energies with excellent results to raising seedlings.

The exhibitions of the present day are in many ways vastly more interesting than those of a few years ago, when the Chrysanthemum was grown merely for show in regular boxes, with nothing to reveal the picturesqueness and gracefulness of the flower grown in something like a natural way. A departure has been made in groups, which are freer and more artistic, foliage plants being used in their formation, and we know from many bold stands that the big blooms are wonderfully handsome and effective shown in tall vases.

It must be remembered that although the exhibition stimulates a national interest in the plant, at home and across the seas to New Zealand and Australia, cementing that brotherhood we hold so precious, yet to regard the flower merely for show is a mistake. It gilds the dark months of the year with colour and brings sunshine into the little greenhouses of the amateur, no matter whether in a smoke-begrimed London suburb or in the pure country air. The annual displays in the London parks testify as to the utter indifference of the plant to evil atmospheres, whilst through seedling raising and sports the season has been greatly extended, flowers being with us even into the early months of the year, when for decoration they are of course invaluable.

THE CHRYSANTHEMUM AS A CLIMBER

No decorative flower of the winter surpasses this Eastern favourite, the Japanese and delightful single varieties in particular, which produce sprays of dainty blossoms of many colours, white as pure as snow, crimson, golden yellow, and other tints. One can possess too much of even this magnificent flower, and sometimes regret that the Scarlet Salvias and other winter favourites dear to our forefathers have been pushed aside. Unless the grower wishes to distinguish himself at the exhibition, Chrysanthemum culture is simple; it is when the buds have to be retained and an elaborate system of stopping and other particulars are required that growing the plants becomes something in the nature of a fine art.

Chrysanthemums are being improved greatly for the open air in early September and October. Later acquisitions reveal a more extended series of colours, and in time the plant will probably be grown in a greater variety of ways to embellish the garden when, may be, the early frosts have turned the tender exotics to corruption. Exhibitions may decline in favour, for fashion is fickle, but the flower is too useful to disappear from the English garden, or, indeed, from the gardens of the world.

THE FOUNTAIN GARDEN, WORTH PARK.

CULTURE OF CHRYSANTHEMUMS FOR EXHIBITION.

By Edwin Beckett.

THE FIRST STEPS.—To deal with the question of culture in a thoroughly practical manner it is of the highest importance to begin quite at the beginning. This period should be somewhere about the declining days of November and the earlier part of December. At this time the plants that have produced their flower display are ready to be cut down. Preparing the old stools in this way develops fresh new growths from which the stock of cuttings for next season's plants are to be propagated. It is curious to notice that the plants of different varieties vary considerably in their constitution, and while one sort may develop quite a large number of new and desirable shoots, others often fail entirely, at least for some time, to produce anything except poor, weakly, and sickly growths, useless to perpetuate the variety, however handsome the blooms may have been the previous season. Others, too, are very shy in the production of cuttings, and, because many of these sorts are indispensable for exhibition, means have to be taken to encourage growths to develop. Plants which have been too liberally supplied with plant foods in the form of liquid manure, etc., develop a tendency to get into a bad and unhealthy condition, which renders them incapable of producing healthy stock for propagating. For this reason, where time can be spared and accommodation provided shake out the plants from their flowering pots, reduce the ball of earth, and either repot into some light gritty compost, using pots about 6in. in diameter, or plunge them without pots into a bed of similar compost on the bench of a cool greenhouse or heated pit-frame. In following out this plan, considerable space is gained in the amount of room occupied by the plants, and in a short time, providing the atmosphere is made suitable, first by a copious supply of water overhead and at the roots, and then keeping the structure somewhat close at first, healthy shoots are soon emitted, these, too, of

a kind which will make ideal cuttings. To some this may seem much unnecessary trouble, but this method of preparing the plants to produce cuttings ensures the perpetuation of healthy stock. With newer and more expensive novelties the method of preparation just laid down has much to commend it. Of course, thousands of growers simply cut down their old plants and propagate from the new growths as soon as they develop. In many cases, too, this has answered well, but owing to the unsatisfactory condition of many collections of plants when the flowering season is over, it is unwise to use such plants for stock purposes. A suitable temperature at this season is one that varies from 40deg. to 55deg. The foregoing remarks apply to each kind of Chrysanthemum. The completion of this work brings one to the period when propagation should be commenced. Cuttings may be inserted at any time from the early days of December until the end of January, and in some cases even later. It is well to begin first with known late varieties, and those it is the desire of the exhibitor to see represented by neat and even blooms from buds secured rather late in the succeeding summer, and known as second "crown" or late "crown" buds. Cuttings should be from 2½in. to 3in. in length, and when being detached from the old stools, taken from the surface at considerable distance from the remains of the old main stem. As a rule these, when rooted, make a free growth, whereas cuttings from the old stem, or in close proximity thereto, invariably develop a bud during the propagating period, and thus completely upset the growers' calculations. The cuttings are made by cutting straight through the stem with a sharp knife, immediately below a joint, formed by a junction of the leaf with the stem; also trim off the leaf and insert the cutting in the compost specially prepared for its reception. A suitable compost may be made up of the following ingredients: Equal parts of good light loam, such as that taken from an old pasture, and leaf mould, and add to this a sufficient quantity of sand to render the compost porous after a good watering, say an eighth part of coarse silver sand. These ingredients should be well mixed and passed through a sieve with ½in. mesh, and if prepared a few days before the compost is needed, and then turned occasionally, the equal distribution of each soil is ensured and the compost also sweetened. A good method of striking the cuttings is to use deep "thumb" pots, and to place one cutting in each pot. In all cases the pots should be scrupulously clean, otherwise when turning out the plants later for repotting the soil will adhere to the sides and probably injure the tender young roots. Propagating each cutting singly, as described, enables the grower to repot easily the young plants later, and avoid any check being experienced. Those who have little space under glass may insert a number of cuttings early in the year around the edge of a 3in. pot. In this way they root readily enough, but care must be taken to pot them up singly immediately they become rooted, otherwise the tender roots become entangled and broken. Shallow wooden boxes also are used where a large number of plants are raised. These are generally 15in. long by 10in. wide and 2in. deep. Insert the cuttings in rows, about 2in. apart, and about the same distance between each cutting. The pots and boxes should be crocked with care to ensure proper drainage, otherwise all one's labour will be in

A DECORATIVE VARIETY.

vain. Use broken potsherds as crocks, and these, too, should be quite clean; arrange the large pieces concave side downwards to cover the larger hole or holes, followed by a layer of smaller pieces, laid in carefully. A piece of fibrous or turfy loam or some of the rougher siftings of the compost should be placed over the crocks, and then the compost itself may follow. Place this in lightly, and also lightly press it by rapping the pot smartly upon the potting bench. Fill in to the top, striking a level surface, and afterwards place a pinch of sand in the centre of the surface soil. With a dibber or cedar-wood pencil, using the blunt end, of course, make a hole to receive the cutting, in this way carrying down a portion of the sand. On this the base of the cutting should rest; as a rule about 1½in. of the cutting should be embedded, and special pains taken to ensure the soil being pressed in at the base. This should be supplemented by a rap on the potting bench, thus settling the soil evenly all round. Before proceeding with the next batch of cuttings label the first lot, writing the name carefully and stating the date of the operation. When inserting a number of cuttings around the edge of a small pot inside, do not place them too close to one another, and also see that each one is made firm.

When propagation is completed for the time being, water the cuttings overhead with water from a fine-rosed can, and allow the receptacles to drain for some time; the cuttings should have the soil around them lightly pressed, as the watering is apt to carry the soil away from the base.

Several ways of treating the cuttings during the rooting process have been adopted at one time or another, but the only satisfactory method of treatment is that of placing a small frame, or erecting a temporary one on the greenhouse bench. This should be placed as near the glass as possible, and an even temperature of about 40deg. at night to 45deg. by day maintained. Place the pots or boxes on a bottom of moist ashes, or plunge them in cocoa-nut fibre refuse. The latter is to be preferred, as it keeps the pots and soil moist, and one need not use the water-can. This is an important matter during the winter. Arrange the pots so that the cuttings can be looked over with ease, as it may be necessary to remove them sometimes, and also to detach decaying leaves. The frame should not be closed absolutely. Indeed, so long as the cuttings can be kept from drooping, admit air. Place laths over temporary frames, and on these sheets of glass. Under such conditions the cuttings should root within a period of from a month to six weeks. During this time the under-side of the glass covering to the frame is frequently covered with condensed moisture, and to avoid the cuttings damping off wipe this away.

Cuttings of the bulk of the Japanese sorts should be inserted during December, those sorts having a tendency to flower rather earlier than the others, as well as the October-flowering varieties, not being propagated until January. This also applies to the Reflexed, Large Anemone, and Japanese Anemone races. In the case of the incurved sorts insert the cuttings during January, although there are a few sorts which would benefit by slightly earlier attention.

The beautiful Pompon varieties, which embrace the chaste blossoms of the Anemone Pompons, as well as other varied characteristics of the same type of flower, may be propagated during January and February, and some of the early-flowering varieties even as late as March.

The single Chrysanthemums are divided into two sections, one known as large-flowering, and the other as small-flowering. They are very pretty when set up in sprays for exhibition, and to get a display for the November and December shows. A safe period over which their propagation may extend is from January to March, the latter date answering well for a December display. The hairy-petalled varieties, which come under the heading of Japanese kinds, may be propagated during December and January, choosing the latter part of the first month for preference.

POTTING.—Upon a careful examination of the cuttings it will be noticed, in course of

Copyright. *A VIEW FROM THE FIRST TERRACE, LINTON PARK, MAIDSTONE.* "C.L."

time, that fresh growth has been made, and to prove whether the cuttings are rooted, shake the soil out of the pot, when the roots should be seen making their way round the ball of earth. At this time, remove the young plants to another frame in the greenhouse, which should be more freely ventilated, and more air admitted each day, in this way gradually inuring them to the more airy conditions prevailing in the greenhouse itself. When the young plants can bear full exposure in the frames, they should be removed to shelves arranged near the glass. Progress should be rapid from this time forth, and the young plants will soon have filled their first pots with roots. To prevent a check, the plants which were rooted in "thumb" pots should be repotted into others, 3½in. in diameter, while those rooted in large numbers around the edges of pots, and those also in boxes, should each be potted up singly into pots 3in. in diameter.

The work daily becomes more interesting, and the one aim should be to keep the young plants growing sturdily. A suitable compost for this first repotting should contain the following ingredients: Three parts fibrous loam, one part leaf mould, one part rotten manure, a liberal quantity of coarse silver sand, a dusting of either wood ashes or crushed charcoal, and a similar sprinkling of bone meal. Mix these ingredients before using, and when the plants are being repotted, pot with increasing firmness, working the soil down between the ball of earth and the pot with a stout label or anything of a similar character. As the plants are repotted, return them to the frames or shelves in the greenhouse, and when they have recovered from the check which naturally takes place during the last-mentioned operation, remove them to a frame in a warm aspect of the garden. This cool treatment is just what is needed at this early period of the year, but to prevent any disastrous consequences arising through sharp frosts, plunge the pots in cocoa-nut fibre refuse, and also embed the frame in any long litter, such as bracken or straw. At night mats must be placed over the glass, and not removed until the temperature is free from frost. Should frost prevail during the day, the mats should be utilised then. With the approach of more genial weather, the frames outdoors may be ventilated, gradually at first, until later in the season remove the frame-lights entirely. The grower's common-sense must determine the quantity of air to give.

AN EXHIBITION.

Within a period of from six weeks to two months the same plants will again need repotting. No stated date can be given for the different repottings to be carried out. The

condition of the plants must determine when this work shall be done, and one can tell this by an examination of the roots. When the roots are found to be working well round the ball of earth, then repot. The more robust and vigorous rooting kinds will be ready earlier than the delicate plants, Nature in this way spreading the work over a long period, and thus ensuring each plant getting its proper share of attention.

A richer compost should be prepared for the next repotting, as the amount of food required is greater as the plant progresses. Fibrous loam is on all occasions essential, and of this material take four parts, and a sixth part of wood ashes or crushed charcoal. To enrich the above, add a sprinkling each of bone meal and Clay's Fertiliser, and a mere dusting of soot. Add sufficient coarse sand to ensure proper drainage, and see that these ingredients are thoroughly mixed. The compost should be ready several days before it is required, and turn the heap over each day to sweeten it. In the meantime, wash and crock the pots in readiness, and pay special attention to the latter. Too much care cannot be bestowed upon the arrangement of the drainage, for failure in this respect may absolutely spoil one's prospect of success.

Observe the same rule in testing the readiness of the plants for this shift. Those in pots 3½in. in diameter should be placed in others measuring 6in. across, and those of the smaller size into pots 5in. in diameter. This rule may be followed with all kinds. When repotting again, cover the crocks with the rough pieces of the compost, and, after a handful of soil has been made firm in the bottom, remove the crocks from the plant to be repotted, and then spread the roots out, resting the ball of soil on the bottom. Fill in all round with the soil, carefully ramming this down rather firmly with a suitable piece of wood. A few raps on the potting bench will also settle the soil. Just cover the surface of the ball of the plant, and after inserting the label proceed with the next plant. When completed, remove the plants to a cold frame and keep them rather close for a few days. Afterwards gradually give more air, and then remove the frame-lights altogether.

SUMMER QUARTERS.—By the third or last week in April, according to the weather at this season, the plants should be placed on ashes or boards outside. Choose a warm and sheltered position, and at first stand them in square blocks. In a short time they should be spaced out, giving each one sufficient room to develop its ample foliage. In this way sturdy growth is encouraged, and a splendid batch of plants perfected.

It is well at all times to give each Chrysanthemum plenty of room, both inside the frames and outside too. Overcrowding invariably hinders the proper development of the plant. It is wise at this time to choose a site in which the plants are to stand throughout the summer. If possible select a sheltered, yet open, position. Standing room with a southern aspect, is a desirable position, with rows running from north to south, and in such a position the plants obtain the beneficial influence of the sun during the day, an important consideration in the case of the Japanese varieties.

Incurved varieties seem to appreciate a less warm aspect, and are benefited by being placed where they may obtain partial shade during the warmest hours of the hot summer day. To keep the plants secure during boisterous weather, have an upright post at each end of the row, and stretch two rows of stout cord, one at 3ft. and the other 5ft. from the ground. Additional support should be given by adding other posts here and there along the rows. Allow a space between each row of from 4ft. to 5ft., this usually being ample. The plants may also be arranged along the edge of the kitchen garden paths in all cases where accommodation is difficult to obtain.

FINAL REPOTTING.—This brings us to an important detail of culture, namely, the last repotting, generally known as "final potting." Prepare compost similar to that recommended on the last occasion, and add a 6in. potful of Thompson's plant manure, one of ½in. bones, and one of finely-broken charcoal to every two bushels. Break the loam into pieces about the size of walnuts, and mix thoroughly. A word with reference to the size of pots for

INCURVED.

this shift may not be out of place. Plants in pots 6in. in diameter should be repotted into those 9½in. across, and those in 5in. pots into others of 8½in. size. Pots vary considerably; one may differ to the extent of ½in. from another, and on this account the measurements must be taken somewhat approximately. Place the drainage in with increasing care, covering the crocks with a layer of ½in. bones, and, as before, with the rougher part of the compost or turfy loam. When shaking out the plants from their smaller pots, observe the greatest care, removing the crocks and settling the base of the ball of soil on a layer of new material. The surface of the ball of soil should be quite 1½in. below the rim of the new pot, and if this does not seem possible, reduce the soil in the bottom of the pot accordingly. Fill in all round gradually, ramming the compost with a wedge-shaped stick 15in. in length. Finish off neatly, taking care not to ram the surface of the old ball of soil, or serious injury may ensue. Label each plant when finished, and stand them on ashes in blocks about four deep, as in this way they may be easily examined. Unless the weather is very warm no water will be needed for some hours, but when this is given the plants should have a thorough soaking. When they are progressing, a neat stake should be placed in the soil, and the main stem lightly but securely tied to this. All is then ready for placing them in the rows, and that the plants may make an agreeable display, even when growing, arrange them in order of height. By following this rule, overshadowing is avoided. There should be a distance between each plant of 15in. or more, and this will leave sufficient room to tie out the growths later. For some time the watering must be done with care, and only given when the soil is dry, its condition being ascertained by rapping the plant with the knuckles or some substitute. When a ringing response is given out water may be applied, a dull sound or thud denoting moist soil. No regular period for watering, therefore, can be laid down. On the afternoons of hot days the plants derive considerable benefit by a thorough syringing overhead with clear water.

JAPANESE INCURVED.

LIQUID MANURES.—Feeding is the next consideration, but plant foods, in the form of liquid manure, must not be applied until the pots are full of roots and the more easily assimilated foods in the potting compost used up. When this has taken place, soot water may be first applied, and prepared by placing a bushel of soot in a sack and soaking this for a few days in 100 gallons of water. Water on alternate days with this preparation at first, and afterwards every week or ten days regularly, until animal or patent manures may be used in its place. Sheep manure and that from the stable and cow sheds, placed in a bag and treated similarly, are each safe and reliable. A week each of the last-mentioned manures forms a welcome change, which appears to be relished by the plants. There are many guanos and patent manures, each of which has its good qualities, and these may be used occasionally with advantage, and in accordance with instructions accompanying the supplies. Nitrate of soda is a splendid stimulant during the growing period, but should never be applied at a greater rate than half an ounce to a gallon of clear water, and the same may be said regarding sulphate of ammonia, which is slower in action, and is useful to hurry on the buds later, adding colour also to the flowers. Feeding with liquid manures may be carried on throughout the summer and autumn, and until the flowers are about one-third

expanded. Then the doses must be made much weaker, until in the end clear water only should be used.

BUDS.—We must retrace our steps now to a period in the life of the plant when it is usual for the single stem to break out into several new growths. This usually takes place during May; sometimes, however, earlier, and the reverse. The plants branch out into new growths owing to the foundation of a bud in the point of the shoot. This bud is called the break bud, because the plant breaks into new growths immediately the bud is formed. It is usual to retain the three strongest of these new shoots after the break bud has been first rubbed out. These shoots in about three months each produce a bud at the apex of their growth, the bud in this case being described as the first crown bud. Naturally late-flowering Chrysanthemums are usually flowered on this bud, and in such cases the buds are secured—that is to say, they are retained, and the new fresh green small shoots surrounding the bud are detached, so that the bud is left absolutely alone. These buds should form during August, and the resulting flowers will then be in first-class condition early in November. Unfortunately, the greater number of the finest varieties are not seen at their best when first crown buds are retained. First crown buds often develop blooms of great size, but devoid of grace, beauty, and colour. On this account special means should be taken to induce the plants to produce second crown buds sufficiently early for the flowers to expand fully by the early days of November. Second crown buds are those which form about a month to six weeks later than the first crown buds, and can be only obtained when the first crown bud is rubbed out, and the strongest succeeding shoots on each stem grown on. In the case of plants intended to bloom on second crown buds, it is necessary to take them in hand earlier. The bulk of the Japanese, Incurved, Reflexed, and Anemone sorts may be flowered on second crown buds, these usually developing flowers of perfect form and high colour, although they are somewhat smaller than those resulting from a first crown bud selection. Good colour and form are always preferred to mere size. To effect this purpose, pinch out the point of the shoots at any time between the last week in March and the second week in April, unless the plants make the break naturally about this time, and grow on steadily the new shoots, to the number of three or four. The second set of buds forming at the apex of these growths, and this usually occurs about August, probably the middle to the latter part of the month, should be retained, and the young shoots surrounding the bud rubbed out. This is rather an intricate matter to describe, yet the foregoing remarks should assist those unacquainted with this important aspect of Chrysanthemum culture.

JAPANESE VARIETY.

For general guidance it may be as well to state here that buds forming during August, of whatever kind, no matter whether they be first or second crown buds, should always be retained. An ideal time for the majority of varieties is during the third week in August, and buds selected at this period usually flower evenly. The pretty little Pompons and single sorts are seen to advantage when flowered on terminal buds, this kind of bud being the last to develop on the plant, and denoting the termination of the plant's growth. These buds form in clusters, and it is usual to select the largest and best-shaped bud. These small-flowered sorts should carry at least a dozen flowers. This must be remembered early in the season, and a sufficient number of shoots retained. Throughout the summer and early autumn, regularly and carefully tie the shoots, or rather loop them, to the stakes inserted in the pots for their support. Never tie the shoot tightly, but always allow a little play for the wind. Also never tie too near the head of

the shoot, as this is very brittle, and will easily snap off, but leave at least 8in. to 10in. free. When the buds have been retained, as previously described, it is important that the growths be kept in an upright position, as this materially assists in their even development. Failure to observe this small detail may result in many blooms opening irregularly. Watch the tying of the shoots particularly during August and September, boisterous winds often giving trouble at this period.

Green and black flies are sometimes troublesome, but they may be exterminated by dusting with tobacco powder. Earwigs at all times, particularly during the summer and early autumn, are a source of trouble, eating out the points of the tender shoots, often, too, just when the buds are about to form. These pests may be trapped in various ways. Hay or paper put into a small pot, which should be placed in an inverted position on the top of the stakes, may reward the grower with a rich haul in the mornings. Short bean stalks and match boxes, in fact anything in which the earwigs can secrete themselves when daylight appears, answer well. Caterpillars, too, often cause anxiety, and must be carefully looked for, those of a green colour frequently escaping observation.

HOUSING THE PLANTS.—The plants should be placed in the glass structures, which should previously have been cleaned and sweetened for their reception, by the end of September in low-lying districts, and a week later in high and dry situations, unless the weather before that time indicates the approach of frost. If before these dates any of the buds are very early, and show colour, place the plants under glass, and shade lightly. Adopt a system of arrangement indoors by making one large group of plants, with the tallest ones at the back, sloping down to the shortest in front in lean-to houses, and in the case of span-roofed glass structures arrange a group in the centre, with a path running round it, and arrange those plants of a medium height, and also the shortest ones, round the sides of these glasshouses. In this way the display is at all times easily seen, and the visits each day become more interesting. Do not overcrowd the plants, but give each ample room to open its blossoms without interfering with the one next to it. When the plants are too crowded, the question of watering becomes a serious matter. At the time of housing, any plants affected with mildew should be dusted with flowers of sulphur, especially the under-sides, and old and seared leaves removed at the same time. Weeds also should be removed from the surface of the soil, on which dust

KATHLEEN ROGERS

Clay's Fertiliser or any other approved plant food. Watering must be done with the greatest care now, and excessive moisture on the floor mopped up. Give free ventilation, both door and windows being kept open on fine days. As the days get shorter, the air colder, and fogs and damp prevail, the hot-water pipes should be kept warm, and the temperature maintained at about 50deg. Less ventilation will be required at this time.

A BOLD DISPLAY.

It is advisable to place incurved varieties in a house by themselves in which cooler atmospheric conditions prevail. Plenty of room should be given to each plant, as ties are often removed from the long growths, and the fast-developing blooms allowed to hang head downwards. In this way a good globular form is promoted, and the art of "dressing" to a large extent dispensed with. It is the older type of the flower which needs dressing, those of recent introduction developing naturally in perfect form. To "dress" an incurved bloom the petals have to be arranged regularly all round the flower.

Badly-formed, irregular, and quilled florets are removed by forceps specially made for this purpose. The dressing is carried out with neat little tweezers, beautifully finished for this particular work. Japanese sorts rarely need any dressing beyond removing a badly-formed or decaying floret which probably interferes with the even development of the flowers.

Anemone flowers are sometimes improved by removing a few stray petals from the cushion-like disc in the centre, and also by arranging the guard florets, as these set off this type of the flower to conspicuous advantage. This dressing of the exhibition flowers should be accomplished on the plants, as far as possible, during development. No trace of manipulation can afterwards be seen. Shading the unfolding blooms from bright sunshine is a matter of importance, more especially in the case of the deeper and richer coloured varieties. When exposed to the sun they are apt to get blistered and scalded, and consequently useless for exhibition or any other purpose. The best way is to run tiffany or muslin on lines through rings on the inside of the greenhouse roof. This may be drawn across at will, and has many advantages over permanent shadings. The flowers for exhibition are arranged on green painted boards of various sizes to show six or a dozen blooms on each. Cups and tubes of various patterns for the different types of the flowers are used, all these things being obtained either from a Chrysanthemum specialist or vendor of horticultural sundries.

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UNDER A CHESTNUT TREE AT WEST DEAN PARK, CHICHESTER.

"COUNTRY LIFE."

CHRYSANTHEMUMS FOR THE GREENHOUSE AND CONSERVATORY.

IN the foregoing article the culture of Chrysanthemums for exhibition has been dealt with, or at least the methods by which the large blooms are perfected, and now the way to grow the plants for the greenhouse and conservatory has to be considered: also for supplying cut flowers during late autumn and early winter.

The propagation of decorative Chrysanthemums may be carried out at any time between December and March, and even later with some of the freer-growing varieties. If a batch of large plants is to be raised, insert the cuttings as early as possible in December, and so on throughout succeeding weeks and months the propagation may be continued, the prospect of getting large plants becoming less likely as the later period is reached. Of course, cuttings inserted during the latter part of January, February, and March will ultimately make pretty plants, but not so large as when the cuttings are struck earlier. When the

A HOUSE OF CHRYSANTHEMUMS.

cuttings have rooted, pot them off singly into pots 3in. in diameter, and encourage them to make sturdy growth by exposing them fully to the more airy conditions prevailing in the cool greenhouse, giving them a position on the shelves near the glass. The glass structure should at all times be carefully ventilated, and in this way the young plants are kept sturdy. The aim should be to keep the plants growing on steadily. The compost for the different repottings should be prepared in exactly the same way as in the case of plants to produce exhibition flowers, so that this aspect of their culture need not be referred to again. As soon as the young plants are established in the 3in. pots, and have attained a height of about 6in., pinch out the point of the shoots. This will promote the growth of several new shoots, which must be encouraged. This treatment is generally called "stopping" or "pinching," and by adopting this method of culture throughout the growing season plants of large proportions are obtained by the early autumn. When the new growths have each reached a length of about 6in., they should again, in turn, be pinched,

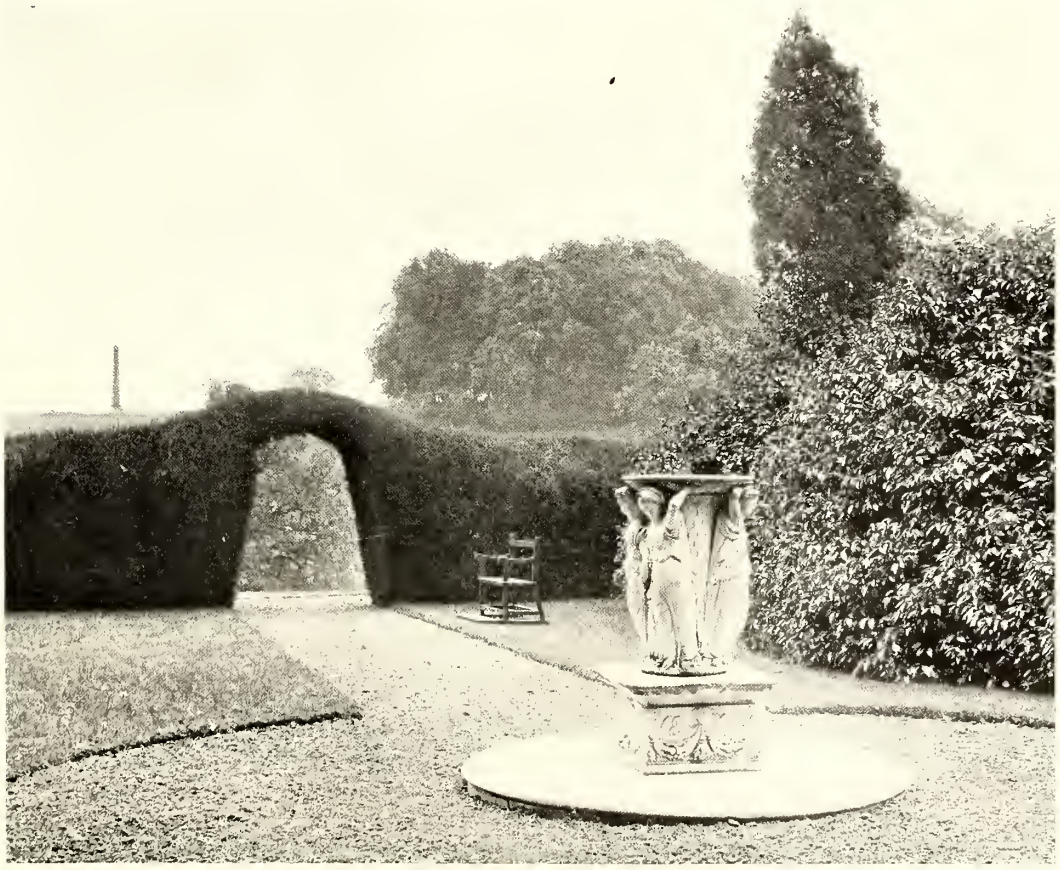
i.e., the tops of the shoots pinched out, and follow this rule until the last week in June; but after this date cease stopping. All growths forming after the date just mentioned must be left to develop buds, which should form in large numbers during August and September. In most cases the buds develop in clusters at the apex of each shoot, and are known as terminal buds, because they mark the termination of the plant's growth. If a profuse display of blossoms be desired, almost every bud may be left to develop, and in this way charming sprays of flowers in various stages of development may be obtained for decorations. On the other hand, if pretty individual blooms of fair size are preferred, retain the best-shaped and largest bud in the cluster, pinching off those of smaller size. During the spring and early summer repot the plants from time to time, never allowing them to get what is usually termed "pot-bound," that is getting the pots too full of roots, as after this the vigour of the plant will be lessened, unless shifted into larger pots. Pots 10in. in diameter will answer well to flower the plants in, at least for the larger specimens, while smaller plants will succeed in pots an inch less in diameter.

SOUVENIR D'UNE PETITE AMIE.

As the plants attain larger dimensions the branching growths will need the support of a few stout stakes, to which the shoots should be lightly looped, not tied tightly. In this way both sun and air will reach the growths, and sturdy plants be developed. During the summer months, and especially when the pots are filled with roots, watering must not be neglected. On dry days several copious supplies may sometimes be needed, and in the afternoon of hot days syringe overhead. Liquid manure must be constantly given when the buds are forming, and earlier if the pots are full of roots. Follow the practice of applying liquid manure frequently in small or weak doses, never over-dosing them, or months of hard work may be lost. Place the plants for the summer in an open situation where protection from strong south-westerly and westerly gales is provided. Stand the pots on boards or a thick layer of ashes, and as the season advances keep the growths lightly tied out.

By the last week in September the plants should be housed, and a freely-ventilated glass structure is the place for them. Avoid crowding as far as possible, and by following this rule the foliage will be retained on the plants, which will, therefore, present a better appearance. Other details of culture are similar to those advised for the treatment of exhibition varieties.

The following varieties form a useful group, embracing several types and those famous for their freedom of flowering. Japanese: Clinton Chalfont, golden yellow; Golden Elsie, golden yellow; Lady Selborne, white; Mlle. Lacroix, white; Mrs. Chas. E. Shea, light yellow; O. J. Quintus, mauve pink; Source d'Or, orange; Yellow Selborne, rich yellow; William Holmes, rich crimson; John Shrimpton, rich crimson; Annie Clibran, soft rose pink; Margot, salmon cerise; Viviand Morel, silvery pink; Mrs. Wm. Filkins, yellow, late; Golden Dart, rich buttercup yellow, late; and Golden Gem, bronze crimson, very late. Incurved: Mrs. Geo. Rundle, white; George Glenny, straw yellow; and Golden George Glenny, rich yellow. Anemones: Mrs. Caterer, white; Mme. Robert Owen, white; and Fabian de Mediana, lilac and blush. Pompons: William Westlake, yellow; William Kennedy, crimson amaranth; Snowdrop, small, white; Primrose League, small, pale yellow; Sœur Melanie, pure white, early; and Mlle. Elise Dordan, rose pink. Anemone Pompons: Antonius, golden yellow; Emily Rowbottom, lovely cream white; and Marie Stuart, pale lilac. To many the big flowers seen at exhibitions are ugly, almost monstrosities, produced by a system of feeding and stopping. Of course everyone is entitled to his own opinion, and certainly Chrysanthemums are more beautiful when grown simply for the greenhouse to display the truer growth of the plant, which is naturally remarkably free—sprays of blossom, not merely a single flower to one stem. All the varieties named in the above list are seen in true character when not severely disbudded. Source d'Or, for example, is a beautiful flower of an orange chestnut colour, and when associated with the rich browns and crimsons of the decaying foliage of many shrubs and trees, its colouring is intensified. Of course decorative varieties are not sufficiently large for exhibition, except in classes especially set apart for them, but those who simply require a gay greenhouse and conservatory in the late autumn know their great value.



A PATH TO MY LADY'S GARDEN, WROXTON ABBEY, BANBURY

BY THE LAKE AT BLENHEIM PARK, OXFORDSHIRE.

FOLIAGE PLANTS FOR THE GREENHOUSE.

THE useful greenhouse foliage plants are fewer than that of those that require a higher temperature, but still many of these last will be benefited if taken into the cooler structure during the summer, where they are particularly valuable in adding variety and lightness to large masses of flowers. Plants grown in the greenhouse can be taken into a dwelling-house for some time without injury. Greenhouse foliage plants, that is those which can be kept throughout the year in that structure, are:

Aralia Sieboldi.—A stout-growing plant with large Fig-like leaves of a leathery texture, a good indoor plant. There is also a variety which has leaves variegated with white. This is a useful room plant, and it succeeds out of doors in mild climates. It is very ornamental and easily grown.

Araucaria.—A family of large trees nearly related to the Fir family, some members of which are remarkable for their exceedingly symmetrical style of growth. The best are: A. Bidwilli, a bold-growing plant with deep green leaves ½in. wide, and tapering to a very sharp point; A. Cooki, flat-growing branches, with the minor branchlets drooping; A. Cunninghami, greyish green foliage, with irregularly disposed branches; A. excelsa, the most symmetrical of all, and a general favourite, being grown in thousands by some nurserymen. The branches are disposed in regularly arranged tiers, each branch, including the minor branchlets, being almost flat and frond-like. Except A. Bidwilli, the leaves of those mentioned are needle-shaped.

Arundo donax variegata.—A form of Reed that pushes up stems 6ft. high, clothed with leaves over 1ft. long and 2in wide, green and white striped.

Asparagus.—The different species referred to under the head of greenhouse climbers all make effective decorative plants when grown in small pots, that is anything less than 6in. in diameter.

Aspidistra lurida.—No other plant is more useful than this for the dwelling-house. There is a variety with variegated leaves. The Aspidistra is readily increased by division, which should be carried out in April or May.

Bambusa falcata.—An exceedingly graceful plant now much in demand. The long wand-like shoots are well furnished with minor branchlets, which in their turn are clothed with bright green leaves, thus forming a highly ornamental obje t.

Canna.—The different varieties of Canna now take high rank as flowering plants, yet regarded only from a foliage point of view they are very desirable. In colour the leaves vary from a light glaucous green to a deep brownish purple. Their culture was fully dealt with when considering plants for the sub-tropical garden.

Carex.—The Sedges which are included in the genus Carex are a very numerous class, and many of them are but weeds, yet the variegated forms are very pretty green-

house plants, especially C. elegans variegata. They require plenty of water in summer.

Coleus.—Well-known and easily-grown plants, some of the best varieties of which may be utilised for the embellishment of the greenhouse during the summer.

Coprosma Baueriana variegata.—A neat-growing evergreen bush with particularly shiny leaves, the centre of which is bright green with a broad margin of creamy white.

Cordyline.—The members of this genus are often spoken of as Dracænas, particularly those varieties that need a stove temperature. The largest growing is C. australis, which is equally effective whether 2ft. or 12ft. high. The variety Veitchi is distinguished from the type by its somewhat broader leaves and reddish leaf stalks. Smaller kinds, equally useful, are: C. Bruanti, C. congesta, and C. rubra.

Cyperus alternifolius is a well-known plant that forms quite a tuft. The bright green stems, from 18in. to 2ft. high, are terminated by a quantity of long narrow leaves, arranged in an umbellate manner. There is also a variegated leaved variety. C. laxus has broader leaves of a thinner texture than the preceding. The spikes of grass-like inflorescence which are freely produced are a notable feature of this kind.

Eucalyptus.—There are many species, but far and away the best is the Blue Gum (E. globulus), whose whitish leaves with their warm aromatic fragrance are well known. E. citriodora has a pleasing lemon-like perfume. These are easily raised from seed sown in gentle heat in the spring.

Eulalia.—A group of Grasses much employed for decorations. They reach a height of 6ft. or more, but excellent little specimens 1yd. high may be had. The variety alba lineata has the leaves variegated with white, in univittata the leaves are narrower, and the variegation is limited to a central band of white; while Zebrina has the creamy markings arranged transversely, thus presenting a singular appearance.

Eurya latifolia variegata.—A Camellia-like shrub with leaves marked with green, yellow, and pink, in varying proportions.

Ficus elastica.—The well-known India-rubber plant, which is such a favourite for dwelling-houses, the stout leathery leaves with their polished surface resisting draughts and dust well. It is a good greenhouse plant.

DWARF CANNAS.

Grevillea robusta.—An erect-growing plant with Fern-like leaves; it is often bedded out during the summer. Readily increased by seeds if fresh, but they quickly lose their vitality.

Isolepis gracilis.—Forms a dense tuft whose slender Rush-like leaves droop all around the pot in such manner as to completely hide it. It is extremely useful for draping the edges of stages or similar purposes.

Leucadendron argenteum.—This, the Silver Tree of South Africa, is a beautiful plant, the leaves being thickly clothed with silky hairs of a silvery whiteness, but it is seldom met with.

Ophiopogon spicatum variegatum, with white striped leaves, and O. Jaburan variegatum, in which they are marked with yellow, are a couple of dense-growing plants with Grass-like foliage of firm texture.

Panicum variegatum.—A free-growing creeping Grass valuable for hanging baskets, draping stages, and similar purposes. The leaves are freely striped with white, and when exposed to the sun tinged with pink.

Phalangium lineare aureo variegata and argenteo variegata are Grass-like plants with leaves nearly 1in. wide, variegated with yellow and white respectively.

Phormium (*New Zealand Flax*).—This forms a tuft of sword-like leaves from 3ft. to 5ft. long, and is very effective in a large structure. The common form—P. tenax—has deep green leaves, in atro-purpurea they are tinged with brown, while Veitchi has the foliage striped with green and yellow, and in Colensoi the centre of the leaf is green, broadly margined with white.

Ricinus (*Castor Oil Plant*).—The varieties of this are easily raised from seed sown in heat in the spring, and with their large divided leaves are very showy in the greenhouse.

Tradescantia zebrina.—A creeping plant of a fleshy nature whose leaves are coloured green and silvery grey with a purplish tinge, very useful for similar purposes to the Panicum.

Veronica Andersoni variegata.—A free-growing shrub with pointed leaves prettily variegated with white. The purple flowers are also very pretty.

Yucca aloifolia variegata.—A stately-growing plant forming a stout stem furnished with long rather narrow leaves, terminating in a sharp spine.

AZALEA.

HARD-WOODED PLANTS FOR THE GREENHOUSE.

THIS section of indoor flowers comprises many kinds, all more or less difficult to grow, and for this reason their cultivation is in a measure one of the fashions of a past age. Twenty or more years ago Heath, Epacris, Tretratheca, Pimelia, Phœnocoma, Hovea, Correa, Aphelexis, and things of similar nature were grown largely for the exhibition, to show as large specimens, marvellous productions, it must be confessed, of cultural skill, though not always handsome owing to their rigid form. Azaleas, Boronias, Heaths, especially the beautiful Erica hyemalis, Grevilleas, and Chorozemas are still grown in gardens of any pretensions, and the more important families are referred to in the alphabetical list. Hard-wooded plants are natives chiefly of Australia and South Africa, and although not distinguished for the brilliant colouring of the flowers, the majority are very free and prettily tinted, whilst a few, Boronia heterophylla as an example, are sufficiently attractive to grow largely for decorations.

Aphelexis.—A group of hard-wooded plants, usually considered more for the exhibition than the greenhouse, and seldom grown at the present day. A. macrantha purpurea is as handsome as any. Follow the general rules laid down for the culture of hard-wooded things in general, using the best peat and sharp silver sand for soil; crock the pots freely, and give water carefully. Aphelexis are not, however, plants for the beginner to try to grow.

Aotus gracillima.—This beautiful hard-wooded plant, from New Holland, is not often grown in the greenhouse, but when planted out in the border or grown in pots it is equally charming, the deep orange and crimson flowers being produced in rich profusion, whilst the growth of the plant is very graceful.

Azalea.—The Azaleas form one of the principal families of hard-wooded plants, and are still held in high esteem for exhibition, especially on the Continent, from whence comes the majority of the neat little bushes so bright in the greenhouse during the spring. Specimen plant growing, however, is a fashion of the past. Twenty years ago huge Azaleas were a feature of all the more important exhibitions, but in the present day they are seldom seen. It would hardly be sufficiently interesting to deal at length with the culture of the greenhouse or Indian Azalea, because in very few gardens are the plants raised from cuttings, the plants being usually grafted. At the present time the Azalea is grown to give cut flowers, and many an old specimen of Fielder's White, with gentle forcing, is one of the mainstays of the flower-basket in winter, as happily the plant does not in the least object to being cut about considerably. Azaleas, like hard-wooded plants in general, require very firm potting in a soil of sandy peat, and strict attention paid to watering throughout the year. Give air freely, and in the summer, if the plants are large, place them out with the Camellias in a fairly shaded place, and upon a layer of coal ashes, to prevent worms finding an entrance into the pots and disturbing the drainage. The object of standing them out in June, after

new growth has been made, is to ripen the wood. At this time look over the plants frequently, as there is great danger of the soil not getting sufficiently moistened. The delicate roots quickly suffer when the soil remains dry for any length of time, and especially avoid letting the sun strike directly on the side of the pot. There are many varieties of Azalea suitable for the greenhouse, but a few are necessary in most gardens, the chief being the white-flowered kinds for cutting. In some parts of the British Isles, where the climate is very favourable, such as in Cornwall and Devonshire, the greenhouse A. indica is sufficiently hardy to develop into large bushes out of doors. Amœnum is very bright under glass, but more so in the open ground; the flowers are of a curious hose-in-hose shape, that is, as if one bloom developed out of another. A. indica obtusum has pleasing red-coloured flowers. A. mollis is a delightful shrub either in pots or in the open ground, where unfortunately, however, the flowers are apt to get injured by late frosts. A. mollis is distinguished by flowers of large size and wonderful diversity of colouring. Few plants grown under glass are more fascinating than a good selection, the noble clusters of bloom ranging in colour from white through delicate shades of yellow, intense orange, to rose, salmon, and other tints. A. mollis is the same as A. sinense. There are many sections of Azaleas, described as hybrids and otherwise, and in some cases described as seedlings of mollis and sinensis, or hybrids between the two. As these two supposed distinct Azaleas are synonymous, it is misleading to give beginners an idea that they are distinct. Anthony Coster is a very fine variety, with large, evenly-shaped flowers of an intense yellow. The mollis Azalea and its varieties are very suitable for cutting, and if the shrubs are not forced too much the flowers last well in winter. Useful Azaleas for cutting are Fielder's White, the familiar indica alba, Deutsche Perle, and Narcissiflora. Where cut flowers are desired in quantity, an old bush of alba or Fielder's White will yield an abundance.

Boronias.—These are Australian plants, and comprise an interesting family—one of the most important of all the hard-wooded sections. Few flowers from Australia are of much value for our houses, but the Boronias are certainly an exception, B. heterophylla being as bright as anything one can possess. Boronias are of dwarf, elegant growth, and are very suitable for small plant-houses, hence those who cannot grow things of stronger growth may possess a collection. About fifty species are known, but few of great merit, these comprising the kinds especially mentioned. In their native heathlands the Boronias add beautiful colouring to the landscape, and form as picturesque and pleasing a picture as the Heather of our own country. As hard-wooded plants require similar treatment, lengthy description of culture is not necessary. When the growths are cut down, after the flowering time is over, make cuttings of the new shoots that result from giving warmth to the older plants. When the young shoots are about 1½in. long is the time to take them, treating them much in the same way as recommended in the case of the Ericas, merely using for soil peat and sharp silver sand, and placing the pots in a propagating pit, assisting quick rooting with the aid of a bell-glass. When rooted pot off singly into pots 2½in. across, and to develop a bushy growth pinch the points occasionally. Their general treatment is so similar to that of the Heaths that to deal further with their culture is merely repeating advice already given.

BORONIA HETEROPHYLLA.

B. elatior.—This is a well-known species from South-West Australia, which if not so free and bright as B. heterophylla is well worthy of cultivation. It is not so graceful, but the flowers are very rich in colour, rosy red, and borne in great abundance, whilst their fragrance is an additional virtue.

B. heterophylla is a delightful plant. This should be the first species of the family chosen, and although known so long ago as 1842, having been found by the traveller Drummond, it is only now becoming generally grown. It seemed to have been lost until that intrepid traveller, Miss Marianne North, whose name is perpetuated by her gallery of flower sketches in the Royal Gardens, Kew, sent home seeds from Western Australia. The seedlings flowered at Kew in 1886, and from thence plants were distributed, until now in the early spring few

groups of greenhouse favourites are without its bright colour. It is no exaggeration to place B. heterophylla amongst the most priceless of greenhouse plants, and it flowers very quickly, even the second year after the cuttings have rooted. The flowers are produced in small clusters, and so profusely that the narrow deep green leaves are almost hidden. Fortunately, though hard-wooded plants as a rule are frequently most troublesome to manage, B. heterophylla presents no great difficulties to overcome.

B. megastigma.—The species to grow after heterophylla is this, which possesses, it is true, little colour, but in the whole world of flowers it is doubtful if anything is more fragrant. A single plant in bloom, even a few cut flowering shoots, will scent a large house. Its growth is very thin, the shoots arching over gracefully, and lined with the brownish flowers, filled with strong and sweet perfume. As the growth is likely to become leggy if left alone, in the earlier stages of the plant pinch back the shoots frequently to prevent this. For the sake of its fragrance alone this species should be grown.

B. pinnata must be mentioned, although where there is only space for a small collection of greenhouse plants other things should be preferred. It is a very old friend, having been introduced over a century ago when hard-wooded plants were in high favour, especially during the time huge show specimens were fashionable. The flowers are rose purple, and sweetly scented.

B. polygalæfolia.—This has flowers of a lilac shade, and is more easily grown than any of the Boronias. It is worth growing where a small collection is desired, but is not so pleasing as heterophylla and megastigma.

Chorozemas.—These have not shared the same neglect as the majority of hard-wooded plants, and Chorozemas are too pretty to entirely forget. Many species and varieties may be found in catalogues, but the following are the most beautiful: C. Lowi is a bright-coloured kind of rather bushy growth, and with deep green leaves, reminding one of those of the Holly. C. flavum has yellow flowers, and C. cauditum is also attractive. C. Chandleri may be mentioned too. C. Henchmani is seldom seen, although very pleasing and distinct. The stronger-growing Chorozemas may be used as climbers trained to wires, and grown in pots, not planted out in the border. Chorozemas grow far more quickly than the majority of hard-wooded subjects, and enjoy a compost made up principally of peat mixed with sharp silver sand, and of course the pots must be very freely drained. Very charming specimens may be grown in large pots, and are sometimes trained over a wire balloon-like framework. The beginner is advised, in the case of all hard-wooded plants, to purchase healthy specimens and not to attempt to grow the plants from cuttings. These, however, in the case of the Chorozemas are not difficult to strike, taking them off with a heel attached in summer, and putting them round the sides of 6in. pots. Place them in a propagating house, and when rooted pot on in the usual way, pinching out the points of the shoots at first, otherwise the growth will become too long. Shade when the sun is too powerful, and after each potting keep the house close until the plants have recovered from the shift. The more vigorous Chorozemas are very pretty when the shoots are simply trained to sticks placed in the pots; the graceful growths are lined with flowers in the spring, and will remain in condition for some weeks. This way of training them is preferable to the more formal balloon-like support.

Correa.—Hard-wooded plants rarely seen in gardens, but possessing considerable attraction, as the flowers of such kinds as C. cardinalis and C. bicolor are very brightly coloured. The hybrid race originated by crossing C. speciosa and C. virens. Correas are not so troublesome to manage as many things belonging to the hard-wooded section of greenhouse plants, and they remain in flower for some months. Give peat and sharp silver sand as soil, and the compost must be good, as it is desirable not to disturb the ball of the old plant when repotting is carried out. Cuttings of young, moderately-ripened shoots resulting from cutting back a plant in February will strike freely, treating them in the usual way, that is, after they have rooted pot them off singly, and maintain a moist and shaded condition of things after each disturbance. When thoroughly established, it is not advisable to repot more than once in the course of the year, that to take place in spring. Beware of scale, which is such an unpleasant foe that if a young plant is discovered to be affected with it it should be destroyed. Once scale becomes established, it is impossible to cleanse the growths.

Ericas.—This is one of the most useful of all the hard-wooded families. The species and varieties are very numerous, and natives for the most part of the Cape of Good Hope. Of late years, unfortunately in some respects, hard-wooded plants have gone greatly out of favour. One no longer sees the big show specimens which were the subject of endless care and attention, for which one may be thankful, but the Heaths are useful decorative plants, which keep the greenhouse bright during the winter months. Individually the flowers are not showy, but collectively they make a brave display, their waxy character and charming tints being unlike the majority of things under glass during their season. It must ever be remembered, however, that Heaths are not everyone's plants. They are not as readily grown as the Pelargonium or Fuchsia, and for this reason should not be amongst the first things chosen by the beginner, whilst to propagate them successfully is a difficult task.

The soil should be peat, making it very firm, especially in the case of the slow-growing kinds. Also thoroughly drain the pots by placing over the hole in the bottom a large concave crock, filling up with smaller pieces. This draining of the pots is one of the most important operations in connection with their cultivation. It is essential to even moderate success that water should pass away freely. Mix some sharp silver sand with the compost, especially when growing varieties of slow growth, otherwise it will become sour and not congenial to the roots. When the Heaths are in full growth ample ventilation is necessary, but not until they are well established. When growth begins, pinch out the tips of the shoots and give freer ventilation. During the warm summer nights air may be given to the frame or greenhouse. At all times pay great attention to watering. Hard-wooded plants are more difficult than any other things to maintain in vigorous health, and mistakes in watering lead to disastrous results. Go over every plant almost, and never trust watering to inexperienced hands. Never place the plants away from the light, otherwise the shoots will become lank and flowerless. The best season to pot Heaths is about the end of February, and ram the soil hard, making it as firm as the old ball; if this is not done, when water is given it will run through the new compost and leave the centre dry.

When an increase of stock is desired, the way to proceed is to take cuttings of the points of young shoots in early August, and put them closely round the side of 5in. pots, which should be filled with fine peat and sharp silver sand, letting there be a layer of sand upon the surface. Moisten the cuttings occasionally with water, and transfer to a propagating pit, covering the pots with a hand-light to promote quick rooting. When rooted remove the glasses, and in spring pot them off singly into small pots, never forgetting that free drainage is essential. The soil for the first potting should be lighter than for subsequent shifts, and do not give water at once, not indeed until root growth begins. Let the young plants be kept close for a time after potting, but always stand them near the glass.

Although air is necessary, this does not signify cold draughts which result from opening side ventilators. When thoroughly established, a few weeks' exposure to the open air, say from about early August until September, will be beneficial, choosing a position where they will be under constant observation. Stand them upon a surface of coal ashes which will prevent worms from disturbing the drainage, and year by year the routine of culture will be similar.

It is impossible to give directions for the culture of every species, as they need somewhat individual treatment, but the general rules laid down will bring success. A few of the most beautiful kinds are the following: Æmula, pinkish flowers in summer, compact in growth; Aitoniana Turnbulli, summer, white pink-tinted flowers; Austiniana, red, white at apex, late summer; Candolleana, white and red, early summer; Cavendishiana, yellow, very free, one of the most effective of all the Heaths, likes a rather warmer atmosphere than the majority, especially after the flowers have faded; gracilis, reddish purple, autumn and winter flowering; Marnockiana, red and white; E. oblata, rose and white; Parmentieriana rosea, of a rosy shade; Propendens; Tricolor Wilsoni superba; Wilmoreana; and the Ventricosa group, especially V. Bothwelliana, flesh, V. coccinea minor, deep pink, V. magnifica, crimson; E. melanthera; and E. earnea.

E. hyemalis should, especially by the beginner, be preferred to all others. It is grown largely for the market, thousands of plants being sent to the large markets in 5in. pots in the winter. The type has purplish rose flowers, and in the variety alba, as suggested by the name, they are white. This is as readily grown as any, upon the system laid down in previous notes. Plants in 5in. pots are of sufficient size, and when well grown the leathery shoots are lined in the depth of winter with blossom. It is suitable for an ordinary greenhouse. Many of the Heaths once grown so largely in English gardens are never seen now, but E. hyemalis has always retained its hold upon the gardener for decoration in the winter.

ERICA CAVENDISHIANA.

Epacris.—This is a very charming race of hard-wooded plants, and popular in some gardens. The various kinds form suitable companions to the Heaths, as they may be grown under similar conditions. Fortunately their culture is not difficult, and the range of colouring is extensive, some snow white, others intense crimson, whilst soft rose, pink, and pink and white combined, are frequent. The slender flower spikes are of some value also for cutting, as this pruning they do not resent. Amongst the most charming varieties may be mentioned the following: Miniata splendens, white and scarlet; Vesta, pure white, flowers very quickly; and the forms of hyacinthina, such as the white candidissima, the richly-coloured fulgens, and carmine carminata; Mont Blanc, white; Lady Panmure, white and rose; Vesuvius, crimson; and Eclipse, bright red, with white apex to the flowers. When several kinds are grown there is a pleasing variety of tints. Cuttings of moderately ripened shoots will strike in summer, but not very quickly. Treat them in the way suggested for the Heaths, and their general requirements are similar, great care being taken to give water regularly and carefully. Whilst in the open air in summer, should rainy weather come place the pots upon their sides when a heavy downpour is anticipated, otherwise the soil will get too moist. Much depends upon the way in which hard-wooded plants are watered as to their health, nothing revealing the effect of either too dry or too wet compost more than these.

Eriostemon cuspidatus.—This is a very charming hard-wooded plant, and is happily not difficult to grow, the flowers when first expanded being of a pink tint, but this disappears with age. It is a species to plant out in the bed in the greenhouse, where there is space for such a feature as this, the soil to be largely composed of peat. E. scaber is also an attractive white flower.

Heaths.—*See* Ericas.

Leschenaultia biloba major.—No greenhouse plant has a flower of more beautiful blue colouring than this, but unfortunately its culture is so difficult that only those who are prepared for disappointment should attempt to grow it. The plants exhibited every spring by Messrs. Balchin and Sons, of Hassocks Gate, always attract attention. One cannot overlook a colour so fresh and bright as of this Leschenaultia. It belongs to the hard-wooded section, and much better advice cannot be given than that of the late Mr. Baines, one of the greatest cultivators of hard-wooded plants of the century. In his book concerning stove and greenhouse plants it is mentioned, in writing of the reasons why few grow this flower, that "There are several reasons to account for this . . . it is a short-lived plant, liable to get into bad condition, or go off, without any apparent cause. It requires different treatment from most other plants, and any attempt to grow it under the exact conditions that some natives of the same country want, will end in failure. Three principal things to observe are: In potting not a single root must be injured that can be avoided, not even by the removal of the crocks; in the winter it must not be allowed to remain long in a temperature lower than 45deg.; and it should never be stood in the open air. The first and last of these will cause the stunted condition that it often gets into, and from which it rarely recovers, and a lower temperature than that named will speedily lead to an attack of mildew, to which it is much subject. To ensure success it is necessary to have free-growing young plants to begin with—without this there is little prospect of success."

Metrosideros. — These are the Bottle-brush plants, so named from the curious form of the flowers, which in their arrangement resemble a brush. M. floribunda is the most familiar, and when in bloom its crimson colouring is welcome. The plants require a large house, as only when allowed to grow in a free way is their attractiveness revealed.

Polygala Dalmaisiana is a pretty purplish-flowered, hard-wooded plant from the Cape. Polygalas are not difficult to grow, and this species is the most welcome of the entire family. As is usual in the case of hard-wooded plants, peat should form the soil, mixed with sharp silver sand. Cuttings may be rooted with moderate freedom in the spring, taking them off about 3in. in length, and dibbling round the sides of 5in. or 6in. pots. Place in a propagating house, or a warm corner of the intermediate house, covering over with a bell-glass.

Tetrathecas.—A pretty family of light-coloured plants, which should be treated as recommended for hard-wooded things in general.

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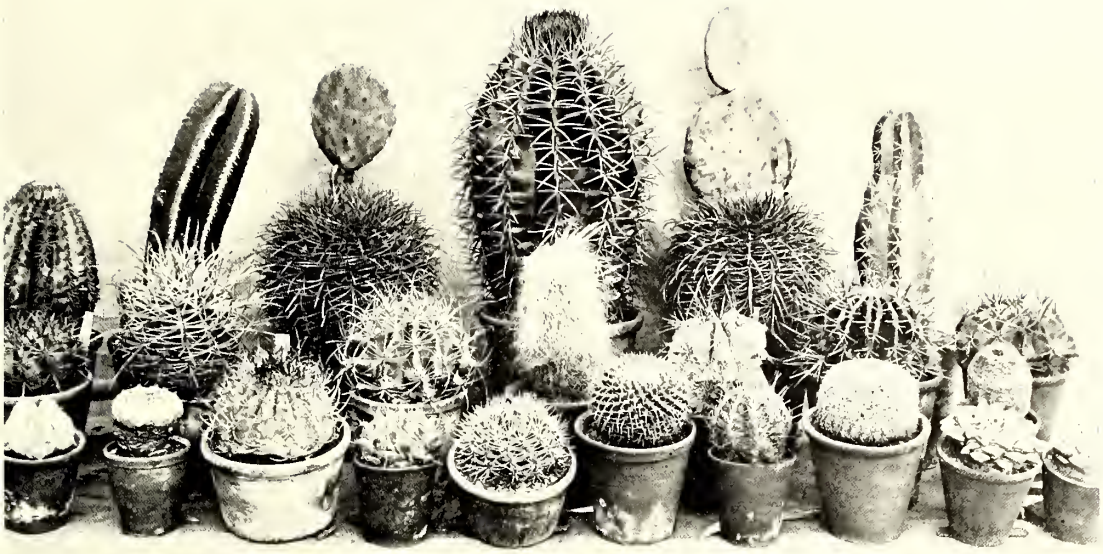

A GROUP OF CHOICE CACTI.

SUCCULENT PLANTS FOR THE GREENHOUSE.

THESE are a remarkable class of plants, capable of sustaining life for a long time without water. Most of them are natives of dry and arid regions, and under cultivation in this country the supply of water must at all times be carefully regulated, otherwise decay may set in. Some of them have bright and showy blossoms, while others are of very quaint and curious forms, the ribs and spines especially in some of the globular-shaped kinds being arranged with almost mathematical precision.

The principal classes of succulent plants are :

Agave.—Nearly all the species of Agave are natives of the New World, the best known being the American Aloe (A. americana), that forms a huge rosette, composed of numerous fleshy leaves, the strongest being on a fully-developed specimen nearly 6ft. long. A widespread fallacy in connection with this plant is that it takes a hundred years to flower, for vigorous examples will bloom in very much less time than that. Though an extensive genus, there are not many species of Agaves in general cultivation, but all are highly ornamental, and large specimens in pots or tubs are very useful for standing on balconies, terraces, etc., during the summer months. They are increased by suckers, which in some species is a very slow process.

Aloe.—Some of these are stemless, but many form quite bushes, furnished with thick fleshy leaves, more or less spotted, and arranged in a rosette. The flowers in some species are decidedly showy, bearing a great general resemblance to a spike of the Red-hot Poker plant (Kniphofia).

Cereus.—This is an extensive group of large grotesque shrubs, to which the general name of Cactus is frequently applied. The night-flowering Cactus (Cereus grandiflorus), which has at times been much talked about, is one of this group. The flowers of this are white.

Crassula.—The showiest member of this genus is C. coccinea, also known as Kalosanthes coccinea, which forms a charming object in the greenhouse during the summer. The tube-shaped scarlet flowers are borne in crowded heads at the points of the shoots.

Echeveria.—The name of Cotyledon is now frequently applied to most of those previously known as Echeverias. They are largely employed for bedding out during the summer months, the leaves in some being of a peculiarly metallic, and in others of a bluish, tint. One kind, E. fulgens, with nodding clusters of red and yellow flowers, is worthy of note for the sake of its blooms.

Echinocactus.—For the most part these are globular in shape, and densely covered with spines, which in some species assume huge proportions. The flowers, which are borne principally on the apex, are in most instances brightly coloured.

Epiphyllum truncatum.—While there is only one species, there are many garden varieties, all of which are very beautiful, and especially valuable from their flowering in midwinter. The colours vary from blush to violet, scarlet tints being also represented among them. The Epiphyllums have flattened stems, which are so weak that unless the plants are grown in suspended baskets they should be grafted standard high on to a near ally, Pereskia aculeata.

Gasteria.—Closely related to the Aloes, but as a rule dwarfer in growth. Some of them flower freely.

Mamillaria.—The most symmetrically-shaped of all the Cactus family, these arrest attention from this reason alone ; but the flowers are also pretty, and the berry-like fruits that succeed them impart another pleasing feature.

Mesembryanthemum. — Curious little half-shrubby plants, remarkable for the many and diverse forms assumed by the thick fleshy leaves. The flowers, which are a good deal like an enlarged Daisy, are in many species very showy, their colours being white, yellow, and various shades of red. They do not open well in dull weather. Increased readily by cuttings if not over-watered.

Opuntia.—Some of these form large bushes built up of thick flattened branches, on the edges of which the flowers are produced. Though exceedingly curious, they are less ornamental than many other succulents. Two, however, are of decided economic value, O. Ficus-indica, the Prickly Pear, and O. cochinellifera, on which the Cochineal insect is reared.

Phyllocactus.—This family embraces the showiest of all the Cacti, many of those at one time regarded as Cereus being now included with the Phyllocactus. One of the best known is P. speciosissimus, a common object in cottage windows in some districts. Many new varieties and hybrids have been brought out within the last few years, and among them are some with creamy white, pink, orange, and scarlet blossoms. Several, too, have a curious blending of vermilion and purple with a peculiar metallic lustre. The colouring of the flowers of the Phyllocacti is extremely brilliant. If only one group of succulents can be grown, choice should fall upon these, as they are of easy culture. The flowers may not last long in beauty, but a succession appears, and the colours range from white to self rose and glowing crimson.

Pilocereus.—Columnar plants, more or less hairy, of which the best known is the Old Man Cactus (P. senilis).

Stapelia.—Low-growing much-branched plants, many with square stems; these are remarkable from the curious thick, starfish-like flowers, which have a most foetid odour, exactly like carrion. Nearly all the succulents named require a soil composed of loam, brick rubbish, and sand.

FORCING SHRUBS FOR EARLY FLOWERING.

MANY of our hardy shrubs that flower naturally in the open ground early in the year are, when forced into bloom, useful for the greenhouse, as their charming flowers are much appreciated at the time when their outdoor brethren still wear a winter garb. There are two different ways of treating shrubs that are intended to be forced prematurely into bloom, firstly, lifting them from the open ground in the autumn, and potting them at once; and, secondly, keeping them altogether confined in pots, and forcing them year after year. This latter method, though preferable in some ways, gives greater trouble, as after the flowers are past the plants need just as much care as before, that is, they must after blooming be protected in such a way that the tender foliage will not be injured by cold cutting winds. After all danger in this respect is over, the plants should be plunged out of doors, in a spot fully exposed to the sun. During the summer attention must be given them in the matter of water, and an occasional dose of liquid manure will be of service. As shrubs treated in this way need constant attention, the method generally adopted is to lift them from the open ground, and pot them for flowering at Christmas, or in the early months of the New Year. A considerable amount of heat is necessary to get them in flower by Christmas, and owing to this the blossoms last for so short a time that, unless in exceptional cases, it is seldom attempted. In selecting plants in the open ground for forcing, preference should be given to those that have grown in a

AZALEA MOLLIS.

spot well exposed to sun and air, as such conditions are conducive to the formation of flower buds. Early potting must, as far as possible, be followed in the case of plants intended for forcing, as by so doing the roots will to a certain extent take possession of the new soil before they are required to be removed indoors. Thus a good general plan, whenever it can be followed out, is to pot the plants directly after the leaves have fallen. They must be carefully attended to in the matter of water, and, if possible, plunged in a bed of cocoa-nut fibre, as the roots are thereby retained in an even state of moisture, and at the same time protected from frost. About the middle of December some of the earliest, such as Deutzia gracilis, Azalea mollis, Staphylea colchica, and the pretty little Chinese Plum (Prunus sinensis), may be taken into the greenhouse where there is a night temperature of about 40deg., and in a fortnight or three weeks remove them into a structure with a temperature 10deg. higher. By this means they may be had in flower from the latter part of January onwards, and several other kinds may soon be added to them. Right on to March and April forced shrubs are much appreciated in the greenhouse, and as these latter flower with not one tithe of the trouble necessary to induce them to bloom at Christmas, such early forcing is seldom indulged in unless absolutely necessary. In forcing shrubs of all kinds the roots must be well supplied with water, and during bright days an occasional syringing will be of great service in hastening the development of the flower buds. As by March the sun commences to gain power, and the forced flowers are naturally more delicate than those that expand in the open ground, they should, if possible, at that time be shaded from bright sunshine, as then they will last much longer than if unprotected.

DEUTZIA GRACILIS.

Among the several shrubs available for forcing, the best are: Azaleas, of many kinds, particularly A. mollis, whose terra-cotta tinted blossoms are much admired; Rhododendrons, of different sorts; Deutzia gracilis, with charming white blossoms; Kalmia latifolia, leaves a good deal like those of a Rhododendron, with large clusters of beautiful pink saucer-shaped blooms; Almonds, Cherries, Peaches, Plums, particularly the little Chinese one that when not more than 18in. high has the branches closely packed with comparatively large double blossoms, in one kind white, and in the other slightly tinged with pink. Thorns, especially the double-flowered crimson, are very telling in the greenhouse a month or two before they flower out of doors, while much the same may be said of the long pendulous clusters of the Laburnum. Andromeda floribunda and A. japonica are two evergreen shrubs with spikes of waxy white Lily of the Valley-like flowers, which may with little trouble be had in bloom early, and are not only very beautiful, but lasting. To these may be added Staphylea colchica, with drooping heads of white

sweet-scented blossoms; the Lilacs, of which there are several kinds, all invaluable for this purpose, the best for small plants being the Persian, and the pure white Marie Legray; Spiræa confusa and S. Thunbergi, both with white Hawthorn-like blossoms; Forsythia suspensa and F. viridissima, whose golden flowers are borne in great profusion.

The Guelder Rose or Snowball Tree is very striking, and much the same may be said of Magnolia Lennei; Cytisus Andreanus, a Broom whose golden blossoms have large blotches of velvety crimson, is not often seen, but conforms readily to this treatment, and the Hydrangeas must also be included. The most generally grown for this purpose is H. paniculata grandiflora, whose large, massive, cream-coloured heads of blossom are much admired. This is seldom met with in flower before April, the first batch being taken indoors about the middle of March. In the case of plants intended for forcing, they should, when lifted for potting, not be pruned in any way, unless to remove an unsightly branch, as the flower buds are all formed, and consequently pruning would in all probability remove some of them. To this advice there is one exception, viz., the Hydrangea just mentioned, which should be cut back to a good stout bud, otherwise it will run up tall and weak. As the foregoing remarks show, forced plants add greatly to the attractions of the plant-house in the early months of the year when the garden outside is desolate. It must not be forgotten that forcing does not consist merely in driving plants into bloom by strong heat, as many things with gentle warmth may be made to yield their blossoms, which are stronger in colour when not subjected to a high temperature. Pleasant is it to enter a greenhouse or conservatory early in the year, when, may be, the earth is wreathed in snow, and to smell the sweet fragrance of Daffodil, Choisya, Staphylea, and other things forced into bloom, whilst the Lilac always appeals strongly to those who love flowers. In every warm house a few bushes of Lilac should be hastened into bloom, and made to give freely of those graceful clusters that fill the outside garden with perfume when the apple is tinted with pink and rose. Forcing is not difficult, and it repays one tenfold by the quantity of flowers produced, which to many are more precious early in the year than at any other season. There is nothing difficult in the process, and an old bush of Lilac or Azalea, properly prepared for the purpose, will be regarded as a safe mine of flower wealth when everyone seeks blossom to remind them of the spring to come. In small greenhouses, heated with a boiler or lamp even, a few bulbs may be hurried into flower.

DOUBLE-FLOWERED CHERRY.

THE SUNDIAL, ASHRIDGE PARK, GREAT BERKHAMSTED.

FLOWERS OF THE STOVE.

THE term "stove" is applied to a plant-house for the cultivation of those subjects that need a high temperature, under which head are included many of the showiest introductions from the tropics. Besides this, it is also very useful for forcing any greenhouse plants that are required to flower earlier than they otherwise would if allowed to remain in the cooler structure. During the winter a night temperature of from 55deg. to 60deg. should be maintained, and in the daytime, under the influence of sun heat, the thermometer may be allowed to rise another 10deg. or even 15deg. As the spring advances an increase of 5deg. may be made in the night temperature, and a little more in the daytime. In the summer a very small amount of artifical heat is needed during the hot weather, but enough must be given to prevent the thermometer falling below 65deg. during the night, while the day temperature may range from 70deg. to 80deg.

As most stove plants delight in a moist, humid atmosphere, and the hot-water pipes necessary to maintain heat have a drying tendency, various means are resorted to in order to counteract this. What are known as evaporating pans—that is, shallow iron troughs which fit on the hot-water pipes, and, being filled with water, give off a continual supply of moisture—are of great service. Damping down, as it is technically termed, should be done several times a day, according to the weather. This consists in sprinkling with water the floor underneath the stages, and any spot conveniently situated for the purpose, the object being to prevent the atmosphere becoming too dry. In the culture of some stove plants bottom heat is of great service, and this is effected by running one or two hot-water pipes along a shallow tank filled with water. Slates or tiles are placed over the tank, and then covered with a bed of cocoa-nut refuse, the sides being walled in so that no steam can escape that way. It therefore ascends, and, percolating through the cocoa-nut refuse, maintains a regular and moist bottom heat. The plants that require it

can then be plunged to the rim in this compost. In the high temperature of the stove insect pests quickly make headway if once they put in an appearance, so a sharp look-out should be kept for them. A free use of the syringe helps to keep them under, while the XL all vaporiser is fatal to all pests, except scale, which is best removed with soft soap and water applied with a sponge.

A large proportion of stove plants are remarkable for their handsome foliage, and as many of these in a native state grow under the shade of trees, it is evident that when they are grown in the stove careful attention in the matter of shading is absolutely necessary. The shading should be fixed on rollers, so that it can be drawn up when not required. The advice given in the case of the greenhouse to have the water-tank inside the structure applies with even greater force to the stove. Of late years the flowers and foliage plants requiring a very high temperature have ceased to be grown to anything approaching the extent they were, or before much attention was directed to the beautiful hardy perennials and shrubs of the pleasure grounds. The growth in popularity of the Orchid has assisted to materially lessen interest in stove plants, which are often difficult to cultivate, though of brilliant beauty. For this reason less space is devoted to them than would have been the case some years ago, when at every exhibition classes were provided for them, and valuable prizes awarded. Still, to ignore them would, of course, be a mistake, hence as much information concerning the various kinds as modern flower gardeners will desire is given.

FLOWERING PLANTS.

THE flowering plants that require the temperature of a stove are many in number, and among them are some brilliantly-coloured subjects, as well as others remarkable in different ways. Many may be grown in a cooler structure during the summer, but for the greater part of the year stove heat is necessary. Little can be said with regard to their culture, as such dissimilar forms exist amongst them, but generally speaking an ample supply of water both at the roots and overhead is needed during the growing season, and a somewhat less amount afterwards. With a well-assorted collection the stove may be kept gay at all seasons. The following are all good stove flowering plants, and there is no period of the year when some of them are not in bloom:

Acalypha Sanderiana.—The most startling novelty of 1898, bearing throughout the year from the axils of every leaf long pendulous spikes of blossoms, like lengths of carmine crimson chenille, reminding one of the long tassels of the Love-lies-bleeding. It strikes root without difficulty, and grows freely in ordinary potting compost. Manure water is very essential as the pots get full of roots.

Æschynanthus.—A class of rambling shrubs with opposite leaves and brilliantly-coloured blossoms, borne principally in the autumn months. They are produced in clusters at the points of the shoots, and are of a curved tubular shape after the manner of some of the Gesneras. Grown in hanging baskets they are seen to great advantage, while they succeed perfectly when clothing the dead trunk of a Tree Fern. Æ. fulgens, crimson; Æ. grandiflorus, crimson and orange; Æ. Lobbianus, deep scarlet; and Æ. speciosus, orange, are all good.

Alpinia nutans.—This is the most conspicuous in a small family, and pushes up from the base numerous cane-like shoots, sparingly clothed towards the lower part with leaves, which are more numerous at the top. The shoots are terminated by a nodding raceme of blossoms, white, marked with red and yellow.

Amasonia punicea.—A small erect-growing shrub with pointed leaves, from 3in. to 4in. long, and spikes of small yellow blossoms. These flowers are attended by comparatively large brownish red bracts, which are very attractive and uncommon. Its flowering season is not limited to any particular period of the year, the bracts remain fresh and bright for a long time.

Anthurium.—An extensive group of plants, the members of which are in many cases remarkable more for their foliage than flowers. Still, there are some beautiful flowering kinds, for which room must be found in any stove, however limited. The spathes of these Anthuriums are in shape a good deal like the common Lords and Ladies, consisting of a bright-coloured, shield-shaped bloom known as a spathe, from the centre of which protrudes a stiff horn-like substance called the spadix, and which contains the flowers proper. Good flowering kinds are: A. Andreanum, with a brilliant vermilion-coloured spathe, which is curiously corrugated. Some forms of this are much superior to others, and there is also a white variety. A. ferrierense, bright rosy red spathes. A. Scherzerianum, known as the Flamingo Flower, a very general favourite. The spathes of this are a brilliant scarlet, but there is also a white variety (album), and another (Rothschildianum) in which these two tints are blended in a curious manner. May and June is the usual season of blooming. These Anthuriums need to be potted in a mixture of peat and Sphagnum Moss with ample drainage to the pots. Copious supplies of water must be given during the growing season, and after flowering the whole of the soil should be shaken from the roots and the plants again potted, using the same kind of compost as before.

Anthuriums are readily increased by division, which must be done when repotting, or by seed, that takes about a year to ripen. They are covered with a glutinous substance, which may be removed by rubbing them up with some dry sand previous to sowing. For this purpose

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use the same kind of soil as for potting, and when sown the seeds should be lightly covered with it. If put in a close propagating case, or a pane of glass be laid over the pot, the seeds will soon germinate, and when large enough the seedlings may be potted off.

Aphelandra.—A quick-growing class of half-shrubby plants with bright-coloured blossoms, which are freely borne on quite small specimens. They are valuable for winter blooming. In some the foliage is very prettily marked. The best are: A. aurantiaca, orange; A. aurantiaca Rœzli, scarlet, silvery leaves; A. cristata, orange scarlet, large; A. Leopoldi, yellow; A. nitens, scarlet, olive green glossy leaves.

Billbergia.—Nearly related to the Pine Apple, and, like it, having for the most part strap-shaped leaves of a harsh texture, and more or less spiny. They succeed best in fibrous peat and sand, with good drainage and an ample supply of water. The flowers, which are borne in spikes pushed up from the centre of the tuft of leaves, are not only pretty in themselves but are attended by bright-coloured bracts. Good kinds are: B. amœna, B. Baraquiniana, B. Moreliana, B. nutans, B. roseo marginata, B. vittata, B. zebrina. The flowering period is principally during the spring and summer.

Centropogon Lucyanus.—A loose, soft-growing plant, that succeeds with ordinary treatment. The flowers, which are freely produced in clusters on the points of the long arching shoots, are tubular in shape, 2in. long, and of a bright rosy carmine colour. It is especially valuable from the fact that it flowers during late autumn and winter.

Costus.—There are about half-a-dozen species of Costus in cultivation, but only one that can be particularly recommended. This is C. igneus, a native of Bahia. It forms a fleshy root stock, from which soft stems are pushed up to a height of 2ft. They are terminated by a cone-like head, from whence numerous flowers are produced. The blooms, which are thin in texture and do not last long, make up for this by the succession that is kept up for weeks from one head. They are about 2in. in diameter, and of a rich fiery orange colour. Ordinary potting compost, with a liberal water supply, will suit it well.

Crossandra undulæfolia.—An upright-growing plant, reaching a height of 2ft., the blossoms, which are borne during the summer in many-flowered spikes at the points of the shoots, being of an orange salmon tint.

Cyrtodeira metallica.—This is a soft-growing, creeping plant, with hairy leaves, ovate in shape, and of an olive-green tint, the central portion of which more particularly is overspread with a metallic lustre. The flowers are scarlet, and freely borne during the summer months. This plant is very useful for growing in suspended baskets, for furnishing the surface of large pots or tubs, or for planting on rockwork in the shady part of the stove. It will grow well in any light compost. Other kinds much in the same way are C. chontalensis and C. fulgida, with lilac and crimson flowers respectively.

Eranthemum.—This family consists of quick-growing plants of simple culture, and contains many diverse forms. Several of them are of erect growth, with the flowers borne in spikes at the points of the shoots. E. Andersoni, white and purple; E. cinnabarinum, rosy red; E. Cooperi, white, dotted purple; E. pulchellum, rich bright blue, particularly valuable for winter; and E. tuberculatum, white, are all good.

Eucharis.—A class of bulbous plants, all of which are universal favourites. Far and away the most popular, however, is E. amazonica, or grandiflora, whose flowers are in such demand for bouquets, wreaths, and other purposes. It is grown in enormous quantities by some cultivators, the yield in cut flowers being very great, and the demand for them always good. The soil best suited for the Eucharis is about two-thirds good turfy loam to one-third well-decayed leaf mould, with a liberal sprinkling of silver sand, and nodules of charcoal about the size of Hazel nuts. The bulbs may be put singly in pots 5in. or 6in. in diameter, or large masses may be formed by putting several bulbs together, the size of the pot being of course increased. Under favourable conditions they will flower more or less throughout the year. When once established they are rather impatient of being disturbed at the roots, hence to avoid repotting the necessary stimulus in the shape of liquid manure should be occasionally applied. The best time for this is just as the flower spikes are visible. No course of drying-off is needed, but the water supply should be somewhat lessened for a time after the flowering period is over. Two or three crops are often borne in one year. Besides the species just mentioned, there are E. candida, E. Lowi, E. Mastersi, E. Sanderiana, and E. Stevensi. E. Burfordensis is a new hybrid and a charming white flower, very fragrant. It will probably become very popular, as it is free and in every way a welcome acquisition.

Euphorbia.—Two species are valuable flowering plants, one of them, E. jacquiniæflora, or fulgens as it is also called, being largely grown for winter blooming. This produces long slender wand-like shoots, clothed with deep green lanceolate leaves, and wreathed for some distance along the upper part with a profusion of bright orange scarlet flowers. To succeed in its culture this Euphorbia requires very careful treatment. After flowering, the plants should be kept moderately dry, and in a somewhat lower temperature till about May, when if taken into the stove growth will recommence, and when the young shoots are about 4in. long they may be taken off as cuttings. If three cuttings are inserted around the edge of a small pot, and sandy soil is used, they will soon root if in a propagating case. Great care must, however, be taken not to keep the case too close, and not to over-water the cuttings, otherwise they quickly decay. When rooted they must be inured to the air, and when sufficiently established shifted into pots 5in. in diameter, in which they will flower. Loam lightened by sand, mortar rubbish, and decayed leaf mould suits this Euphorbia well. The plants are benefited by being placed out of doors in a frame during the summer. Old plants that have flowered may be grown on the following season by cutting them back hard after a period of rest, and potting them as soon as the young shoots show themselves. E. splendens, the second species, is a rambling-growing plant, well suited for furnishing the roof or end of the stove providing it is thoroughly exposed to the sun. It is a rough spiny subject, and dangerous to handle. The bright red flowers are borne in great profusion throughout the spring.

Gardenia.—There are several Gardenias, but the kinds that are grown almost to the exclusion of the rest are the double forms of G. florida and G. radicans, the first-named especially being a general favourite. It forms a neat-growing bush, with deep green glossy leaves and pure white blossoms, which are highly fragrant.

According to the treatment given, the Gardenia will flower at different periods of the year, but in a general way the flowers are borne in greatest freedom towards the end of the summer and in early autumn. Briefly, its culture may be summed up in plenty of heat and moisture during the spring in order to encourage a liberal growth, then more air and sunshine to ripen the wood. Cuttings strike root readily in the spring, and they will flower freely when quite small.

Gesnera.—Beautiful flowering plants whose season of blooming is as a rule during the summer or even later, while a few may be had in flower in the winter. While all of them are remarkable for their showy blossoms, there are a few with very handsome foliage. Some of them are tuberous, while others form a mass of curious caterpillar-like roots. Both, however, die quite to the ground when dormant, and pass the season of rest in this state. When about to start them in the spring the tubers should be shaken entirely clear of the old soil, and potted in a light compost, such as equal parts of loam and leaf mould, with a good sprinkling of sand. G. cardinalis, scarlet; G. elliptica lutea, yellow; G. nægelioides, in different forms; G. exoniensis, large dark velvety leaves and orange scarlet flowers; and G. refulgens, with red blossoms and beautiful foliage, are all good.

Griffinia.—This genus contains some half-a-dozen species of bulbous plants that need much the same culture as a Eucharis. They are not at all common. G. hyacinthina, with blue flowers lit up with white, is the best known and the most amenable to cultivation.

Henfreya scandens.—A rare stove plant seldom seen outside botanic gardens, although its long loose clusters of white flowers terminating slender twining branches possess much beauty. The Henfreya is a delightful plant to train against a wall, pillar, or trellis in the hothouse, and clusters of flowers gathered and put into vases are pretty.

HENFREYA SCANDENS.

Hibiscus.—There are not many species of Hibiscus that require stove treatment, but one of them, H. rosa sinensis, is represented by numerous forms, which in many tropical countries are among the commonest of shrubs. They are all quick-growing subjects that need a constant use of the syringe to keep down red spider, which is often very troublesome. The ordinary form of H. rosa sinensis is single, but there are also several double-flowered varieties. A very distinct species is H. schizopetalus, a rambling-growing bush which may, if needed, be trained to a roof. The flowers are pendulous, and borne on particularly long stalks. They are about 3in. in diameter, of a brilliant orange red colour, with the petals so deeply cut and slashed as to give to the flower a very uncommon appearance. H. rosa sinensis may be grown in a greenhouse or even out of doors during the summer.

Impatiens.—This group, which includes the common Balsam (I. Balsamina), also contains many quick-growing, free-flowering species. The best are: I. Episcopi, rich purple; I. flaccida, light purple; I. flaccida alba, white; I. Hawkeri, red, shaded violet in the centre; I. Hookeriana, white, streaked crimson; I. Jerdoniæ, yellow and red; and I. Sultani, a well-known plant with rosy scarlet flowers. There are two distinct varieties of this—carminata, bright carmine, and salmonea, salmon. Except I. Jerdoniæ, they all need liberal treatment and a fairly open soil. This last-mentioned is a small succulent kind, and should be grown in a suspended basket near the roof, and kept dry during the winter.

Ixora.—These are for the most part compact-growing shrubs, the majority of which have neat rounded heads of blossoms, borne during the summer months. The principal tints represented among them are orange, salmon, and buff, but there are a few quite distinct therefrom. They all need the warmest part of the stove, and should be potted in a soil consisting of three parts good sandy peat to one part of loam. There are about 100 species, and innumerable garden varieties, a selection therefrom being given below: I. coccinea, orange red; I. Colei, white; I. crocata, orange; I. Dixiana, deep orange; I. floribunda, salmon red; I. macrothyrsa (Duffii), a tall-growing plant, with huge heads of crimson blossoms; I. odorata, yellowish white; I. Pilgrimi, orange scarlet; I. Prince of Orange, bright orange; I. princeps, buff; I. Westi, blush, changing to deep pink; and I. Williamsi, reddish salmon.

Justicia, or Jacobinia.—A showy class of shrubby plants of easy culture, for the most part of erect growth, and bearing large terminal heads of blossoms. J. carnea, pink; J. chrysostephana, yellow; J. coccinea, scarlet; and J. Ghiesbreghtiana, bright crimson, are the best.

Medinilla.—By far the finest member of this genus is M. magnifica, which forms a large sturdy-growing shrub, clothed with handsome ovate shiny green leaves. The flowers, borne generally about May, are produced in huge pendulous clusters at the points of the branches. They are of a pleasing shade of bright rosy pink, and last in beauty a long time. When in full bloom this well merits the specific name of magnifica. A second species, amabilis, has the flower clusters erect, and is therefore wanting in a good deal of the grace and beauty of the other. To flower the Medinilla well, the principal consideration is by liberal treatment to induce it to grow away freely after blooming, and then when growth is complete by giving air and a reasonable amount of sunshine to thoroughly ripen the wood.

Pentas carnea.—A neat little shrubby plant with bright green leaves, soft in texture, and rounded heads of flesh-coloured blossoms. It flowers, on and off, throughout the year, and is particularly valuable from the fact that the greatest quantity of blossoms are borne during the winter. The variety kermesina has carmine-tinted blossoms, but the plant is more delicate than the type.

Pitcairnia.—An extensive family of Bromeliaceous plants nearly related to Billbergia, with for the most part red blossoms, and large showy bracts of much the same tint. They bloom during the spring and summer months. A selection is as follows: P. aphelandræflora, P. corallina, and P. fulgens.

Plumbago rosea.—This West Indian species needs stove temperature, and a beautiful feature it forms during the flowering season, which is in the summer months. The flowers, borne in terminal spikes, are of a rosy scarlet colour, but there is a variety, coccinea, in which they are much brighter than those of the ordinary form.

Poinsettia pulcherrima, also known as Euphorbia pulcherrima, is a popular decorative plant, at its best during the winter months. The beauty consists not in the flowers themselves, which are small and inconspicuous, but in the large leaf-like bracts which surround them. They are of a bright scarlet colour, and arranged in a horizontal tier at the ends of the branches. The usual way is to grow the plant with a single stem, which is crowned with a huge head of its gorgeously-coloured bracts. There is a variety (alba) in which they are white, while the double form (plenissima) has an increased number of bracts. Plants are, as a rule, propagated each year from cuttings, which are yielded by those that have flowered. After their beauty is over the plants should be put in a warm greenhouse rather than a stove, and kept dry in order to give them a rest. They must, of course, be occasionally watered to prevent them becoming quite dried up. Then, towards the end of April, if more moisture both at the roots and overhead is given, the young shoots will soon be freely pushed out from different parts of the plants. As soon as the shoots are 4in. long they may be taken as cuttings, stripping them from the old wood and leaving what is commonly known as a heel at the base. They must then be inserted firmly into small pots of sandy soil, putting one cutting in each pot. If put in a close propagating case, and care is taken not to overwater them, they will soon root. Directly this happens the young plants must be inured to the ordinary atmosphere of the structure, and soon shifted into larger pots, which should be from 5in. to 6in. in diameter. A soil consisting of equal parts of loam and leaf mould with a sprinkling of sand will suit them well. During the summer the plants can be grown in a cold frame, but if a few are kept a little warmer they will flower earlier than the bulk. To prolong the season the cuttings may be put in at intervals of a fortnight or so, providing the last crop is taken about the middle of June. As the flowering pots get full of roots liberal doses of liquid manure may be given, for the size of the bracts is largely increased thereby. When grown in cold frames care must be taken to remove them to a warmer structure by the end of August, or earlier, according to the weather, as a chill will cause many of the leaves to turn yellow and drop.

Protea cynaroides.—This strange plant has been seldom illustrated, but it is interesting, though few possess it in their greenhouses or conservatories. It requires rather the cool stove or intermediate house than the true stove; the flowers are gathered in a bold head, the thick enveloping scales reminding one of the Globe Artichoke, but inside the head is a tassel of pink blossom.

PROTEA CYNAROIDES

Reinwardtia.—A near ally of the Linums, indeed it was at one time classed with the members of this last-named genus. There are two species, R. tetragynum, with pale yellow blossoms, and R. trigynum, in which they are of a much deeper tint. Both are free-growing plants of easy culture, from 1ft. to 2ft. high, and flowering during the winter months, from which circumstance they are particularly valuable.

Rivina.—Slender-growing plants whose blossoms, borne in racemes, are not at all conspicuous, but being succeeded by small berries, which are brightly coloured when ripe, the plants are in this stage very ornamental. R. humilis has bright red berries, and in R. flava they are yellow. They will remain on the plant throughout the greater part of the winter. Increased from seed sown in the spring, and the young plants given ordinary stove treatment, while in summer they may be kept cooler.

Rondeletia.—A large class of shrubs, natives principally of the West Indies and tropical America, all of which succeed with ordinary stove treatment. The flowers, which are borne in compact heads, are not unlike those of the Laurestinus, but of a different colour. A selection would include: R. amœna, pink, golden centre, spring and summer; R. cordata, pink, summer; R. speciosa (odorata), which flowers at different periods, and in the autumn is particularly attractive. The flowers of this are of a bright vermilion colour, while two good varieties of it are brilliantissima and major.

Ruellia.—Soft-wooded plants, most of which are of a somewhat upright style of growth. They all strike readily from cuttings in the spring, and grow freely in ordinary potting compost. The young plants must have their tops pinched out during the earlier stages of growth, in order to encourage the production of branches, as if this is not done they will run up tall and thin. Some of them are particularly valuable from the fact that they bloom during the winter months. The best are: R. Baikiei, scarlet, winter; R. Herbsti, purple, autumn; R. macrantha, rosy purple, winter; R. Portellæ, rose pink, autumn and winter; R. rosea, carmine rose, summer; R. solitaria, pale purplish lilac, winter.

Russelia juncea.—This forms a mass of twiggy Rush-like branches, while the leaves are but small and few in number. The tips of the shoots droop over in a graceful manner. The flowers, which are freely produced about midsummer, are tubular in shape, 1in. long, and bright scarlet in colour. When laden with blossom a plant of this Russelia forms a charming object. It succeeds in a mixture of equal parts of loam, leaf mould, and peat, with about half a part of sand. The drainage

must be thorough, as it needs a good supply of water during the growing season.

Saintpaulia ionantha. — A pretty little gesneraceous plant, that will flower for months together. It forms a dense rosette-like tuft of leaves from whence are pushed up rich purple flowers, about the size of a large Violet. This Saintpaulia may be increased by division, by inserting the leaves as cuttings, or by seed, which should be sown early in the spring. It is very minute, and needs no covering except a pane of glass laid over the pot or pan in which it is sown.

SAINTPAULIA IONANTHA.

Scutellaria Mocciniana.—A rather upright shrubby plant with ovate leaves, and terminal heads of showy blossoms. The individual blooms are about 1½in. long, and of curved tubular shape, while their colour is a brilliant scarlet, lit up with yellow at the mouth. They are borne throughout the summer and autumn months. It strikes readily from cuttings, and succeeds with ordinary treatment.

Siphocampylos Humboldtianus. — The showiest member of an extensive genus, whose scarlet tubular-shaped blossoms are borne more or less throughout the summer and autumn. Stove culture suits it well, but care must be taken not to overpot.

Strelitzia.—Musa-like plants, one species of which, S. Reginæ, is a valuable plant for the stove. The leaves, which are ovate in shape and about 1ft. in length, are borne on long stalks, so that the tuft of foliage reaches a height of 5ft. It blooms, as a rule, about May, the flower scape just overtopping the leaves. Several flowers are produced from one cluster, the individual blossoms suggesting the head of a bird. The colouring is very bright, being a brilliant orange and purple. It needs rather large pots, good loamy soil, and should not be disturbed at the roots more than is absolutely necessary. A little liquid manure occasionally is very beneficial.

Streptocarpus.—This family is placed here because it blooms in the winter in a high temperature. There are about half-a-dozen species, which have been crossed and intercrossed to such an extent that a new race has been formed. Most of them are of a compact habit, and produce their flowers in great profusion. The colour varies from white to purple, different intermediate tints, such as pink, magenta rose, light red, mauve, and violet-blue, being also represented. These Streptocarpi have proved to be of great use for the embellishment of the stove at various seasons, and of the greenhouse during the summer. The seed should be sown in the spring in pans of light soil, and if covered with a pane of glass they will, in the stove, soon commence to grow. Directly this happens the glass must be removed, and the pans stood on a shelf near the glass. When large enough to handle the seedlings must be pricked off into other pans, and in time potted singly in small pots. Equal parts of loam and leaf mould with a little sand will suit them well. The next shift will be into pots 4in. or 5in. in diameter, according to the vigour of the plants, and in these they will flower. Some individuals are more prolific than others, but many of them will bloom nearly throughout the year.

Tabernæmontana coronaria.—A shrub much like a Gardenia, with pure white, sweet-scented blossoms, borne during the summer. There is a double-flowered variety (flore-pleno) which is more popular than the single form. Should be given the same treatment as a Gardenia.

Tillandsia.—An extensive genus of Bromeliaceous plants, many of which are, if regarded only from a foliage point of view, very handsome, as their long strap-like leaves are arranged in a regular vasiform manner, while in addition the blossoms of some are remarkably showy. Their cultural requirements are the same as the Bilbergias. Particularly desirable forms are: T. carinata, yellow and red; T. crocata, saffron yellow; T. Duvaliana, scarlet, yellow, and green; T. Lindeni, bluish purple; T. Morreni, yellowish green; T. psittacina, red and yellow; T. splendens, yellow, fiery purple bracts; T. tessellata, handsome striped leaves. Many of these flower during the autumn and winter months.

Vinca.—Soft-wooded shrubby plants nearly related to our native Periwinkle. V. alba, white; V. alba oculata, white, with reddish eye; and V. rosea, pink, all need stove treatment, and in this structure they will flower from spring till autumn. The blooms, which are borne on the points of the shoots, are about 1in. across. The cultural requirements of these Vincas are not at all exacting.

FOLIAGE PLANTS.

A LARGE number of stove plants are remarkable for the great beauty of their foliage, in some instances owing to the shape and contour of the leaves, while in others it is the colouring that constitutes their chief attraction. Many of them have various shades and tints blended in an indescribable but pleasing manner, and in some the bright colours form a pleasing contrast. As in most cases the ornamental features of the leaves are retained throughout the year, foliage plants have a decided advantage over those grown for their flowers alone, as the last-named lose their attractiveness when the blossoms fade.

THE CACTUS HOUSE AT KEW.

Some classes of stove foliage plants are extremely popular, and are largely used for table decoration and as room plants. The most prominent among them for this purpose are the different members of Aralia, Begonia, Caladium, Croton, and Dracæna. When these, or in fact any plants that have been grown in a warm moist structure, are about to be taken into the dwelling-house for a time, they should be hardened off a little beforehand, as by so doing they will not receive so great a check as if taken at once from the stove. While the bulk of them do not require any special treatment, there are a few, notably the Bertolonias (known as Jewel Plants) and some of the Sonerilas, that succeed best when covered by a bell-glass or some corresponding protection. A list of the principal stove foliage plants, exclusive of Palms and Ferns, which are dealt with elsewhere, is here appended:

Acalypha.—Soft-growing shrubs, with curiously and irregularly variegated leaves, generally red and brown. The best are: A. Godseffiana, green edged, creamy yellow; A. Macfeeana, red, blotched crimson; A. macrophylla, reddish brown, paler blotches; A. musaica, bronzy green, marked red and yellow; A. tricolor, irregularly blotched and splashed with light red, crimson, and green.

Alocasia.—The Alocasias bear for the most part heart or shield shaped leaves, which are prettily marked in many diverse ways. Plenty of heat and moisture, and an open compost, consisting of rough peat, Sphagnum Moss, pieces of charcoal and sand, will suit them well. A. Chelsoni, A. Jenningsi, A. Lowi, A. macrorhiza variegata, A. metallica, A. Sedeni, A. Thibautiana, and A. zebrina are all good.

Ananassa sativa variegata is the variegated-leaved Pine Apple, which was boldly arching leaves, 2ft. or 3ft. long; they are of a bright green, heavily edged with yellow, which becomes tinged with red.

Anthurium.—While several forms of Anthurium are valuable as flowering plants, there are many others with very handsome foliage, prominent among them being A. cordifolium, large heart-shaped leaves of a bright shining green; A. crystallinum, velvety green, all the veins marked with silvery white; A. insigne, huge three-lobed leaves; A. Veitchi, leaves 2ft. to 4ft. long, and 1ft. wide at the broadest part; the principal veins are deeply sunk, thus giving to the leaf a wavy appearance; A. Waroqueanum, leaves as long as the last, but broader at the base and more pointed, rich velvety green, with lighter coloured midrib and veins. The same treatment as that recommended for Alocasia will suit the Anthuriums.

Aralia.—Upright-growing, sparely-branched plants, with prettily divided leaves. In a young state they are very popular for table decoration. The best are: A. Chabrieri, with long narrow deep green leaflets, and a reddish midrib; A. elegantissima, with much-divided leaves of an olive green tint; A. reticulata, with strap-shaped leaves of deep green, veined with a lighter hue; A. Veitchi, with nine to eleven leaflets, which are arranged like ribs of a fan—these leaflets are very narrow, wavy, and of a bronzy green. The variety gracillima is even more slender than the last. Of the above, A. Chabrieri and A. reticulata may be struck from cuttings, but the others are increased by grafting them on to young plants of A. reticulata. A mixture of loam, peat, and sand is very suitable for these Aralias.

Artocarpus Cannoni.—This is a free-growing shrub of easy culture, with lobed leaves of a rich bronzy crimson,

tinged with purple. It is very showy when associated with other plants, and quickly attains an effective size.

Begonia.—While many of the Begonias need only the protection of a greenhouse, there are several that must be regarded as stove plants, though most of them may be kept in the greenhouse during the summer. To this class belong B. Rex and its numerous varieties, which have large oblique leaves variegated in numerous ways. Generally the ground colour is of some shade of green, and this is marked more or less with silvery white, arranged in one large zone, or in spots, freckles, or blotches. Besides the varieties of B. Rex, other handsome-foliaged kinds are: Arthur Malet, Acerifolia, Decora, Eudoxa, Margaritacea, Naomi Malet, and Ricinefolia maculata. The forms of B. Rex, which are universal favourites, may be readily propagated by the leaves, all that is necessary being to take a mature leaf and lay it on a pan of sandy soil or a bed of cocoa-nut refuse. It may be secured in position with a peg or two, and if the principal veins are just cut through here and there with a sharp knife, young plants will be produced from the wounded portions, and when large enough they may be potted singly. Ordinary potting compost will suit them well. The propagation must be carried out in a stove temperature, and if in a close case so much the better.

Bertolonia.—Dwarf-growing plants of difficult culture, that need to be covered with a bell-glass to keep them in health. They should be potted in a mixture of equal parts of peat, leaf mould, Sphagnum Moss, and sand, and good drainage must be given. The exceeding beauty of their foliage forms the most prominent feature of the Bertolonias. B. Van Houttei, with olive green leaves spotted with rose; B. superbissima, dark green leaves with large bright pink spots; B. alba punctatissima, with a profusion of white dots; and B. punctatissima rosea, are charming.

Caladium.—An extensive class of beautiful foliage plants, with leaves a good deal the shape of an arrow-head, and coloured in various ways. Descriptions of a few are given just to show the great variety that exists among them: Assungay, large transparent leaves of a deep rose pink, edged green; Botafogo, red centre, yellowish margin; Cardinale, bright red, with crimson veins; Comte de Germiny, red, with crimson veins, mottled white, dwarf; F. W. Moore, bright crimson; Hebe, white ground, with pink veins and spots; Ibis rose, bright rose; Martha Laforge, a mixture of pink and green; Monsieur Leon Say, bronzy red, deep rose spots; Princess Beatrice, yellow centre, green edge; Silver Cloud, silvery white, pink veins; Tennyson, bright green, mottled white. The recognised garden varieties number some hundreds, and there is one of the original species which must be included in any selection, however choice. This is the little C. argyrites; its bright green leaves are heavily marked with pure silvery white. Caladiums all form a tuber, and pass the winter in an entirely dormant state, during which time they must be kept dry without being absolutely parched up. Then about February they may be shaken quite clear of the old soil, and repotted in a mixture of loam, leaf mould, and sand, at such a depth that the upper part of the tuber is from ½in. to 1in. below the surface of the soil. Placed in the stove, and kept slightly moist, the young leaves will soon make their appearance, when more water may be given, and the plants treated as the general run of the occupants of the stove. In the autumn, as they go to rest, water must be gradually discontinued. Propagation is effected by offsets, which are produced around the edge of the tuber.

Croton, botanically known as Codiæum. The members of this section of stove shrubs are remarkable for their handsome leaves, most of which are brightly coloured, while the singular form of some attracts notice. Apart from the conspicuous feature they form in the stove, many of them are very popular as table plants. They are not difficult to propagate and cultivate, providing good cuttings and plenty of heat and moisture are available. The cuttings should be taken about April or May, a length of 4in. to 6in. being a very suitable one; and a few of the bottom leaves having been removed, they should be inserted singly into small pots in a mixture of loam, peat, and sand. In a propagating case in the stove they will soon root, when more air must be given them; and by the time they are inured to the ordinary atmosphere of the structure, they may be shifted into larger pots. Two-thirds fibrous loam to one-third leaf mould, and a liberal sprinkling of sand, will suit established plants of Crotons. To develop the bright colouring to the fullest possible extent, as much light as possible, and a reasonable amount of direct sunshine, must be allowed them. The list of varieties is a very long one, a few of the best being here given: Aigburth Gem, Aigburthiensis, Angustifolius, Baron Frank Selliere, Baronne James de Rothschild, Chelsoni, Countess, Disraeli, Flamingo, Golden Ring, Magnificent, Newmani, Prince of Wales, Queen Victoria, Reidi, Ruberrimus, Thomsoni, Van Œrstedi, and Warreni.

Cyanophyllum magnificum.—A bold-growing plant, seen to the best advantage when confined to a single stem, under which conditions the broadly oval-shaped leaves, which taper to a point, will attain a length of 2ft. or more, and a width of nearly 1ft. The leaves are on the upper surface of a rich velvety green, with the midrib and principal veins ivory white, while the under-side is of a reddish purple colour. It succeeds in a mixture of loam, peat, leaf mould, and sand, in about equal proportions, and must be well drained, as a liberal supply of water is necessary. Can be increased either by cuttings of the shoots, or single eyes put in very sandy soil, in a close propagating case with bottom heat, but even then it does not strike readily.

Dieffenbachia (*Dumb Cane*).—Erect-growing Aroids, with spreading ovate leaves in most cases bright green, marked in various ways with white or creamy yellow. They are plants of noble port, and not difficult to cultivate, but caution must be observed in cutting them, as the juice is of an acrid, poisonous nature.

Dracæna.—Upright-growing and, with one exception, unbranched plants, clothed with large, handsome foliage, which in many varieties is very brightly coloured. While the leaves of many are of an olive green tint, the variegation is in most of them confined to various shades of red. They are propagated by cutting up the stem into lengths of about 2in., and laying them in a bed of cocoa-nut refuse with a gentle bottom heat, when young plants will soon be pushed up from the numerous joints. Loam and peat, with a little charcoal and sand, will suit these Dracænas. Good varieties are: Anerleyensis, Baptisti, Bansei, Cooperi, Ernesti, Excellent, Jamesi, Lord Wolseley, Mrs. Freake, Princess Charles of Denmark, Prince Manouk Bey, Terminalis, and The Sirdar. Besides these varieties, there are a few totally distinct therefrom, viz.: Doucette, with a great profusion of narrow leaves, arranged rosette fashion, green, edged white; Godseffiana, a branching bush, ovate leaves spotted cream; Goldieana, light green, marbled, and banded with dark green and silvery grey; Lindeni, massive drooping leaves, green banded gold; and Sanderiana, which has small leaves heavily margined with white.

Fittonia.—Trailing plants, with broadly ovate leaves from 3in. to 4in. long. In F. argyroneura the leaves are bright green, every vein thereon being traced with a network of silver. F. Pearcei is in the same way, with carmine veins. The Fittonias are charming subjects for draping the front of stages, for rockwork, or for similar purposes.

Heliconia.—Bold-growing, Canna-like plants, two forms of which are remarkable for the beautiful colouring of their leaves. They are H. aureo striata, in which all the principal veins are marked out with gold, and H. illustris, variegated in a similar manner, but with bright rosy red. Ordinary potting compost of a rather light nature, such as equal parts of loam and leaf mould, with some sand, is very suitable.

Leea amabilis.—A loose-growing plant with pinnate leaves, consisting of two or three pairs of leaflets, which are of a deep bronzy green tint, with a broad white stripe

down the centre. This extends in a less marked manner to the secondary veins. It requires a moist stove, and is altogether a plant of rather difficult culture.

Maranta, also known as Calathea. The members of this genus are numerous, and include among their number some of the most beautiful of all stove foliage plants, the leaves being marked in an almost indescribable manner with various tints. They all need good open soil, such as loam, leaf mould, and peat, in equal parts with half a part of sand. Repotting should take place every spring, and the old soil must be to a great extent removed. Drainage must be ample, as the plants need a liberal amount of water during the growing season. Bright sunshine is very injurious to them. The tubers of M. arundinacea furnish the arrowroot of commerce. A selection from the long list would include: M. arundinacea variegata, known also as Phrynium variegatum, M. albo lineata, M. Baraquini, M. illustris, M. Kerchoveana, M. leopardina, M. Lindeni, M. Makoyana, M. Massangeana, M. ornata, M. princeps, M. roseo-lineata, M. roseo-picta, M. Warscewiczi, and M. zebrina.

Monstera deliciosa. — A stout-growing Aroid with a somewhat creeping stem. The huge oval-shaped dark green leathery leaves are deeply cut and perforated with good-sized holes, thus presenting a most singular appearance. It grows quickly in a moist stove, and will mount up against a damp wall, to which the aerial roots cling. This Monstera is sometimes used for sub-tropical gardening during the summer, the leathery nature of the leaves standing it in good stead when so treated. Its fruit is very rich.

FINE FOLIAGE PLANTS AT KEW

Musa (*Banana*). — The Musas are all bold-growing subjects of rapid growth with long leaves. They need a rich soil, and ample water supply when growing freely. The Abyssinian Banana (M. Ensete) is often placed out of doors during the summer.

Pandanus (*Screw Pine*).—Trees and shrubs with, for the most part, long arching leaves, furnished more or less with spines. In a small state many of them are valuable decorative plants, the leaves being arranged in a very symmetrical manner. They succeed in a mixture of two-thirds loam to one-third leaf mould and sand. There are three variegated leaved forms, the best being P. Veitchi, with arching leaves about 2ft. long and of a bright shining green, deeply edged with white. P. Sanderi is much in the same way with yellowish markings, while P. javanicus variegatus is inferior to the other two. Good green-leaved kinds are P. graminifolius, P. ornatus, P. pacificus, P. utilis, and P. Vandermeerschi.

Peperomia.—A singular class of plants, some of which are of trailing habit, while others stand up erect. In most of them the foliage is mottled and marbled in a distinct manner. They are all of easy culture, and need a shady spot. Distinct kinds are: P. arifolia, P. brevipes, P. eburnea, P. maculosa, P. marmorata, and P. Saundersi.

Philodendron.—An extensive group of Aroids, most of which are of a climbing or creeping character. The leaves are more or less heart-shaped, and in some kinds prettily marked with different tints. They are of easy culture, heat and moisture being principally needed. The best are: P. gloriosum, dark green leaves and whitish veins, the young leaves silky; P. Mamei, leaves marked white; P. melanochrysum, dark green varnished surface; and P. verrucosum, light green, shaded with bronze, with maroon markings underneath, which show through to the upper part. P. Carderi and P. Lindeni are the same as P. verrucosum.

Phyllanthus.—Free-growing shrubby plants that need no particular culture. P. atropurpureus, the leaves of which are tinged with purple; P. Chantrieri, with long spreading foliage; P. nivosus, white variegated; and P. pallidifolius, are the best.

Phyllotænium Lindeni.—A bold-growing plant with large arrow-head-shaped leaves, supported on long stalks. The leaves are green, with the midrib and principal veins marked white. It succeeds with ordinary treatment.

Sonerila.—All these are for the most part compact-growing plants with handsome foliage, the leaves being generally striped, spotted, or freckled with white on a green ground. A selection of the best would include: S. margaritacea, S. m. Hendersoni, S. marmorata, S. metallica, S. superba, S. Madame Wallers, and S. Madame Alfred Mame. A compost of peat, Sphagnum Moss, and sand is suitable for them. They can be increased by cuttings, and sometimes by division.

Strobilanthes Dyerianus.—A pretty foliage plant of free growth and branching habit. The pointed leaves, which are 4in. to 6in. long and 2in. to 3in. wide, are of a bright metallic purple, veined and edged with deep green. It needs full exposure to light in order to develop the colour, which owing to its metallic lustre appears to be of different tints according to the standpoint from which it is viewed. During the summer this Strobilanthes may be grown in the greenhouse, or even used as a bedding plant. Cuttings strike very easily in the spring.

Theophrasta imperialis.—An upright shrub or tree generally confined to a single stem, which is furnished with huge leaves of a particularly harsh texture. In a well-developed specimen the leaves are quite 1yd. long and nearly 1ft. wide, deeply serrated at the edges. It may be struck from cuttings, but is difficult to increase.

STOVE CLIMBERS.

NO plant-house is complete without a judicious selection of climbers, and those that require a stove temperature are many and varied. One of the most popular is Stephanotis floribunda, the waxy white fragrant flowers of which are so much used when cut. A select list of climbers is as follows:

Allamanda.—Vigorous-growing rambling plants, that bear during the summer a great profusion of, for the most part, large golden yellow blossoms. In common with most other climbers, they succeed best when planted out in a prepared border, though they are often grown in pots, and trained round a trellis in bush form. A. cathartica, A. Chelsoni, and A. Schotti are all good, while A. grandiflora, which has blooms of a light yellow, must have a place with the best.

Aristolochia.—Robust climbers, remarkable for the most part for their quaintly-shaped and curiously-marked blossoms. The majority require a good-sized structure for their development, but there is one notable exception, viz., A. elegans, with heart-shaped glaucous leaves, and shell-like blossoms, about 4in. across, the ground colour of which is whitish, marked in an irregular manner with purplish brown. Its quaint yet pretty flowers are borne even in a small state. Among the other species of this extensive genus may be mentioned: A. gigas, known as the Pelican-flower, from the huge blossom when in a bud state bearing considerable resemblance to a bird hung up by the beak. When expanded it is more of a funnel shape, with a particularly long tail. A. Goldieana is a difficult plant to succeed with, and one that requires partially drying off in the winter. It is one of the most singular of all flowers, being in shape somewhat like the cap of a brewer's drayman, but larger, being nearly 1ft. across. The colour is yellowish, marked with chocolate. A. ornithocephala, greyish purple, a singular flower, somewhat of a bird's head shape; A. ringens, green and blackish purple; and A. tricaudata, purplish brown, each flower with three long tails.

Bignonia.—The Bignonias require a sunny position to flower them well, and the water supply should be lessened during the winter months. They bear flowers usually in clusters, and more or less of a Foxglove shape, the colour being variable. A selection would include: B. Chamberlayni, yellow; B. magnifica, crimson purple; B. Tweediana, yellow; and B. venusta, orange crimson. This last flowers in autumn and winter, the others principally during the summer.

Cissus discolor.—A free-growing climber, nearly related to the Vines; it has elongated heart-shaped leaves charmingly coloured with a blending of green, purple, red, and silver. It is readily struck from cuttings in the spring.

Clerodendron.—Useful twining plants, remarkable for the great profusion of their attractive blossoms, most of which are borne during the summer months. The flowers are produced in large crowded clusters. C. Balfouri, with bright red flowers protruding from pure white inflated calyces; C. speciosum, deep rose; and C. splendens, bright scarlet, are the best.

Clitoria ternata.—This climber, which is best treated as an annual, is remarkable for the intense rich blue of its pea-shaped blossoms. There is a form with white flowers, and another in which the two tints are blended together, but the rich blue kind is the more showy.

Dipladenia.—Some of the Dipladenias are among the finest of stove plants, the large widely-expanded blossoms being usually of some shade of rose or rosy red. They need a compost principally consisting of sandy peat, and good drainage must be ensured. A notable feature of some varieties is the manner in which the colour of the flower deepens after expansion. Dipladenias, like Allamandas, are often trained to a trellis in bush form.

Ficus.—Neat small-leaved evergreen climbers that will attach themselves to a wall after the manner of Ivy. Further details are given under the head of Greenhouse Climbers.

Gloriosa superba.—A tuberous-rooted plant which has elongated stems mounting upward by means of tendrils produced from the point of each leaf. It passes the winter in a dormant state, pushes up its succulent shoots in the spring, and as these grow away the blossoms are borne on the upper part towards the end of the summer. The flowers are in shape somewhat like a Turk's Cap Lily, but larger, and the petals reflex more abruptly. Their colour is a mixture of green, vivid orange, and bright red.

Hoya.—There are several species of Hoya, but they are not all of a climbing habit. Far and away the best of them is Hoya carnosa, known as the Wax-flower, the star-shaped blossoms being of a thick wax-like nature. The flowers are borne in rounded clusters, and are of a pinkish white tint. A mixture of loam, broken brickbats, and sand will suit it well. The clusters of flowers should not be cut, as a succession of blooms is kept up from one cluster.

Ipomæa.—Convolvulus-like plants, some of which do best treated as annuals, while others are of a more woody nature.

Jasminum Sambac.—The flowers of this evergreen climber are white, and very fragrant. There is a variety named flore-pleno with double blossoms. A thriving specimen of this Jasmine will flower, more or less, nearly throughout the year.

Passiflora.—A great many of the Passion-flowers will succeed in the greenhouse, the best of those that require a stove being: P. alata, crimson; P. Decaisneana, carmine; P. edulis, white tinged purple, fruit eatable; P. Kermesina, bright red; P. princeps or racemosa, bright scarlet; P. quadrangularis (The Granadilla), white and red, fruit oblong, about 6in. in length, much eaten in tropical countries; P. trifasciata, white, the leaves hairy purple midrib; P. Watsoni, purplish red.

Paullinia thalictrifolia.—A moderate-growing climber, thriving well in a mixture of loam, peat, and sand. The triangular-shaped leaves are almost as finely divided as a Maiden-hair Fern, so that a thriving specimen forms an exceedingly pretty feature. It is evergreen in character. There is a variety argentea just like the preceding, except that the leaflets are suffused with white.

Solanum Seaforthianum and S. Wendlandi.—The Solanum family is very large, containing many diverse forms, and including the universally-grown Potato (S. tuberosum). The two species above mentioned are worthy of a place among the best of stove climbers, the first, S. Seaforthianum, having prettily-divided

leaves about 6in. long and drooping clusters of deep lilac-coloured blossoms. S. Wendlandi is altogether a more vigorous plant than the other, the individual blooms being about 2in. in diameter and the flattened clusters 1ft. across. The colour of the flowers is a deep lilac-blue. They are borne in the summer.

Stephanotis floribunda.—This, which was introduced from Madagascar in 1829, is one of the most popular of all stove climbing plants, ts clusters of ivory white highly fragrant blossoms being admired by everyone. It is a free-growing climber that according to the treatment given may be had in bloom at different times of the year. It is not at all a difficult plant to propagate from cuttings of the short-jointed shoots taken off at a length of about 4in. in the spring and put into small pots of sandy soil, which should be plunged in a gentle bottom heat in the stove and covered with a small frame or bell-glass. When rooted they may be shifted on. If plants have an uninterrupted run at the roots they will grow vigorously, but seldom flower freely. Hence if planted out the space allotted to the roots should be portioned off. A suitable soil for the Stephanotis is a mixture of turfy loam and peat, with a liberal sprinkling of sand. The shoots should be trained near the glass, as such a position, being well exposed to the light, conduces greatly to the formation of flower buds. After the season of blooming is over, the plant may be kept somewhat dryer than usual at its roots for a few weeks before starting again. No pruning is needed to assist the production of flowers, but when sufficiently large the weak and exhausted wood may be cut out. The Stephanotis is particularly liable to the attacks of mealy bug, which may be destroyed by washing the plants with Gishurstine.

SOLANUM WENDLANDI.

Thunbergia.—The Thunbergias requiring a stove are for the most part vigorous-growing climbers that need a large structure and a fair amount of sunshine to flower them well.

CARNIVOROUS PLANTS.

THESE are strange plants that possess the power of entrapping insects, either by means of a glutinous substance or by the leaf shutting up and enclosing them. In others, again, the leaves develop into somewhat the shape of a horn, with the mouth uppermost, and the stiff hairs with which the throat is furnished all point downwards, so that though easy enough for an insect to enter its exit is rendered impossible. The most noted kinds are:

Darlingtonia californica, sometimes called the Cobra Plant, from the resemblance which the curiously-hooded leaves or pitchers bear to that venomous snake. They are green, mottled with white and veined red.

Dionæa muscipula (*Venus's Fly Trap*) has circular leaves, furnished around the edges with long hairs. On either side of the midrib, towards the centre, are three short bristles, and on either of these being touched the two lobes fly up like a trap, the long hairs at the edges interlocking with each other and thus effectually preventing the escape of any fly that may have caused the disturbance. When the insect is dead the leaf gradually reopens. This is plentiful in the marshes of Florida.

Drosera rotundifolia (our native Sundew) has its little round leaves studded with red hairs, each of which is furnished with a small drop of glutinous matter on the tip, so that directly a fly settles on the leaf it is made prisoner. A second species, D. dichotoma, is Australian.

Nepenthes (*Pitcher Plants*).—These are loose-growing shrubs, most of which have long leaves, beyond which the midrib extends, and serves to support a peculiar urn or pitcher, which forms the termination of the leaf. These pitchers are furnished with a lid which shut at first opens after a time. Hairs, bristles, and an excessively slippery portion around the mouth all prevent the escape of any insect that has fallen into the pitcher.

Sarracenia.—The Side Saddle Plants, as these are called, inhabit the swamps of Georgia and Florida, so that they need only the protection of a greenhouse. The pitchers are marked in many ways, but all are beautiful.

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A GROUP OF CATTLEYA LABIATA.

THE ORCHIDS.—AN INTRODUCTION.

THE wonderful family of flowers known to the world as Orchids possesses fascinating interest. A halo of romance seemed at one period of their history to surround these strangely-shaped and brilliantly-coloured flowers, but of late years Orchids have become more familiar, flaming Cattleyas, pure white Odontoglossums, and even the more grotesque forms composing groups at the exhibitions and the meetings of the Royal Horticultural Society, where a committee adjudicates upon new hybrids and species introduced from other lands and raised in the nurseries of Britain.

Orchids are the floral children of many lands, and in the quiet English mead dainty species are discovered, without the splendour of their exotic brethren, but interesting and charming, the purple of Orchis Mascula dyeing the moist meadows with colour, and occasionally the pretty Bee Orchis is discovered or the yellow-pouched Cypripedium Calceolus. Throughout the world, upon the high Alpine pastures where snow lays thick in winter, in the English mead and the tropical jungles, these flowers scatter their fragrance and resplendent colouring, assuming wonderful shapes, as if to attract insect agency to effect fertilisation and ensure offspring. The species, varieties, and hybrids form a great host, and the Orchid family increases as new productions are added through the skill of the hybridist. A record of the year's work upon the Orchid Committee of the Royal Horticultural Society serves to show that an intense interest is still manifested in the flowers, although one hears rumours of the "decline of the Orchid," as if the public were beginning to tire of its beautiful flowers and strange forms. But this is moonshine. Orchids are more popular at the present day than at any period of their history; the time of immense prices given for rare kinds may have passed by, but the love for this wonderful family is deepening and will become more widespread as the more easily-grown kinds decrease in price.

One of the most remarkable features of Orchid life is the resemblance certain

kinds assume to living things, called "mimicry." The Bee is represented in the velvety Bee Orchis (Ophrys apifera), and there are Fly, Man, and Frog Orchises, so named from their resemblance to the things indicated by the distinctive names. Sometimes one must tax the imagination considerably to discern any likeness between flower or fly, frog, or the human form, but generally the mimicry is startlingly real, even amongst the hardy species, but more so in the tropical Orchids, the Butterfly Orchids (Oncidium Papilio), the Dove Orchid (Peristeria elata), or the swan-like Cycnoches pentadactylon and moth-shaped Phalæmopsis. Poised upon slender stems, as if some gaudy butterfly with expanded wings, is the flower of Oncidium Papilio, and we believe the purpose of this great resemblance to living things is to coax the insects, or whatever the subject may be, to fertilise the flower—a wonderful provision of Nature to promote seed-bearing for the perpetuation of the species.

The beginner in Orchid culture, or those to whom the mysteries of plant life are a sealed book, would probably create a hundred families from the great Orchid genus, because of the strangely different form of the various species. There seems little affinity between a Cattleya and a Cycnoches, or between a Cypripedium and a Dendrobium, though close relationship exists, as disclosed by an examination of the flowers; but as that is of scientific interest only, it is not a subject for lengthy disquisition in this work. The most wonderful portion of an Orchid flower is the lip, or, as the botanist names it, the labellum, which assumes distinct shapes according to the genus to which the plant belongs. Thus in the Cypripedium, or Lady's Slipper, it is of a pouch-like form, in the Cattleya petal-like and the seat of colour, and, again, in the strange Angræcums prolonged into a slender spur. Sometimes it is attached so lightly to the main part of the flower that it moves with the slightest breath of air, and again it is cut up into delicate filaments, in each family some distinct form being revealed. Much of the colour in the flower is concentrated in the lip, and this diversity of form and resplendent colouring is Nature's way of securing fertilisation, colour signals to attract insect life to effect seed formation. Readers who wish to understand fertilisation of Orchids should consult Darwin's great work upon the subject, a work of intense interest to all who care to know the mysteries of the vegetable kingdom.

This leads one to write of hybridisation, for much of the popularity of the Orchid is due to new and wonderful crosses effected by the hybridist and shown at the meetings of the Royal Horticultural Society, which sometimes settles long-standing disputes as to the parentage of natural hybrids, that is, Orchids crossed by insect agency in their native haunts. The Orchid family is one of the most fascinating in the world of flowers; interesting not for their colour, form, or perfume alone, but for the wonderful ways adopted to effect fertilisation by insect life.

In these days plants imported from over the seas arrive almost as fresh as when shipped for transport to the English nurseries and auction rooms, but when Orchid cultivation and collecting were in their infancy losses were tremendous amongst the Epiphytes in particular, that is, those kinds which have their dwelling upon rocks or in the branches of trees, living upon the moisture in the atmosphere. Every species, everything, indeed, that was called an Orchid, was supposed to require tropical treatment, to be bathed in hot close air and perpetual moisture. We know, of course, that such treatment is absolutely wrong. Many species are almost hardy, natives of mountain-tops and on the fringe of the snow line, as in the case of many of the beautiful Odontoglossums. Although it is only within the last thirty years that Orchid culture has formed any strong part of English horticultural pursuits, species have been long known to science, and the Vanilla, amongst the first of those Orchids grown in an English hothouse, was known to Miller, as it is mentioned in the second edition of that author's "Dictionary of Gardening," published in 1768, with several Epidendrums. Miller states, writing of

Epidendrums, that "the plants cannot by any art yet known be cultivated in the ground; though, could they be brought to thrive, many of them produce very fine flowers of uncommon form."

The favourite cool-house Orchid (Phaius grandifolius) was introduced as far back as 1778 by Dr. Fothergill, and nine years later Epidendrum cochleatum flowered in the Royal Gardens at Kew, whilst in 1794 fifteen species of Epiphytal Orchids were sent over by Admiral Bligh and other officers from the West Indies. Epiphytal kinds now commenced to arrive more freely from abroad, but cultivators in England, through a want of knowledge of the strange plants, blundered sadly in their treatment. Case after case arrived, to quickly succumb to the wrong way of growing these leafless masses, and it was not until some of the collectors began to insist upon certain rules being followed that the death-rate was lowered.

The name of Messrs. Loddiges is familiar in the history of Orchid cultivation in these isles, and in 1812 we read that these famous nurserymen had a sale in their nursery at Hackney, when the many beautiful species introduced by these enterprising horticulturists were sold for considerable sums. Many genera or families now commenced to appear, as about this time Dr. Roxburgh sent from India the first Vanda, Dendrobium, and Aërides, three of the most charming of all Orchid groups for their sweet perfume, colour, and pleasing form. Yet home growers were still perplexed concerning the culture of these precious introductions, secured with much risk and sometimes suffering by such famous men as William Lobb, Gibson, and Ure-Skinneri, who all warned European cultivators not to grow the Orchids from temperate climates in stifling heat, a course followed by Dr. Lindley. He considered that a process of baking was desirable to promote vigour and an abundant display of flowers. Sir Joseph Hooker wrote true words when he described England as "the grave of tropical Orchids." But of course this deplorable condition of things was not likely to continue, for we know that Mr. (afterwards Sir) Joseph Paxton cultivated Orchids with success in the houses at Chatsworth. As time went on, glasshouses improved and were built especially for Orchid cultivation, unlike the big draughty structures fashionable in the early Victorian era.

LÆLIA PERRINI.

Collections of Orchids are numerous in the present day, and even the amateur may grow a few kinds with perfect success, as the habits of the plants are now thoroughly well understood. A few species and varieties well chosen for their beauty will contribute brilliant colouring to the plant-house, and prove useful also for cutting, as Orchid flowers are welcome in choice decorations, whilst they remain fresh for even

days, the Cypripediums in particular. Collectors are hunting still for the floral treasures of countries yet untravelled, and glorious species are introduced occasionally to startle the Orchidist, but naturally distinct kinds are less numerous now than in those days when the world of Orchids was untapped. Reliance for great novelties has been placed upon the hybridist who in his own glasshouse manufactures, by crossing, species likely to give a beautiful progeny.

ANGRÆCUM SESQUIPEDALE.

Many Orchid collectors obtained their treasures at the risk of life itself, and it is interesting to read in Veitch's manual of Orchidaceous plants of the labours of that celebrated traveller, George Ure-Skinneri, "by whose untiring energy and disinterestedness the most beautiful Orchids of Central America became denizens for the first time of the glasshouses of Great Britain." The following particulars, extracted chiefly from an address delivered before the Royal Horticultural Society in February, 1867, by the famous Mr. Bateman, will be read with interest. Mr. Bateman, one of the greatest of Orchid growers, wrote to Mr. Skinner, who, encouraged by an increasing interest displayed in the flowers of the tropics at home, "laboured incessantly to drag from their hiding-places the forest treasures of Guatemala and transfer them to the shores of his native land. In pursuit of this object there was no sacrifice he did not make, or a danger or hardship he did not brave. In sickness or in health, amid the calls of business or the perils of war, whether detained in quarantine on the shores of the Atlantic or shipwrecked on the rocks of the Pacific, he never suffered an opportunity to escape him of adding to the long array of his botanical discoveries . . . . it is sufficient to mention here Cattleya Skinneri and Lycaste Skinneri." It would be a long story to tell if one were to write of everyone who may be called pioneers in the art of Orchid culture and hybridisation—of the famous B. S. Williams, John Dominy, Seden, Sander, Veitch, and many others.

No halo of romance surrounds Orchid cultivation in the present day. The flowers that at one time were possessed by the few are now as familiar as other exotics, and the small grower with his well-kept greenhouse may have his Orchids too, Cypripedium insigne may be or the wondrously beautiful Dendrobium nobile. It is a glorious family of flowers; economically useless, perhaps, but surely making life happier by their presence. The notes that follow are written by one of the greatest Orchid growers of the day. Good advice to the beginner is to urge the importance of not cultivating species or varieties that try the patience and skill of professional growers, but to place faith, firstly, in perhaps twelve, more or less, according to space and requirements, of those kinds that will give bountifully of their flowers without undue exertion on the part of the possessor. When the culture of the more easily-managed kinds is mastered others may be added, and hence a collection of thriving plants will fill the glasshouse. Failure is not pleasant at any time; it is less so when death means a loss of many pounds, for if some kinds cost less than a shilling others are of considerable value.

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THE LAWN FOUNTAIN, BURFORD, DORKING

"COUNTRY LIFE."

THE ORCHID HOUSES AT BURFORD, DORKING.

CULTIVATION OF ORCHIDS.

By W. H. White, Orchid Grower to Sir Trevor Lawrence, Bart., President R.H.S.

MANY lovers of these beautiful plants are deterred from attempting their culture through a belief that they are difficult to grow, but this is not so, and I will endeavour by a few practical hints to show that Orchid growing is by no means hedged about with insurmountable difficulties. When ordinary care is exercised there is little fear of failure. Orchids, like other plants, will live and thrive when the conditions under which they are placed favour healthy development; the cultivator must strive to learn what these conditions are, and then fulfil them to the best of his ability. It is now generally recognised amongst experienced cultivators that it is not absolutely necessary to have a separate division or house for each section of Orchids, but where a large number of some particular species is grown, cultural requirements are more readily met when the plants are placed in a structure by themselves. Those who have a limited collection should grow the kinds which succeed under one set treatment. Those possessing only an ordinary plant stove or cool greenhouse need not despair of being able to grow Orchids, as in some portion of the house conditions almost identical with those here advised can be given. Where a large representative collection of Orchids is grown the only structures really necessary are the East Indian, or hottest house, Cattleya, or intermediate house, and the cool, or Odontoglossum house.

The East Indian House should be somewhat lofty, so as to allow room for suspending a number of plants from the roof. It should contain such species as Aërides, Saccolabiums, Angræcums, Phalænopsis (Moth Orchids), Bulbophyllums, Cirrhopetalums, Phaius, Galeandras, Peristeria elata (the Dove Orchid), Grammatophyllums, Cypripediums, Anæctochilus, and Eulophiella, all of which should occupy the shadiest part of the house, in fact, none of them should be exposed to strong sunshine at any time. Other species, as

Dendrobiums, Catasetums, Cycnoches (Swan Orchids), Calanthes, Schomburgkia, and Cyrtopodiums thrive best where given a moderate amount of light always. The following are well-known kinds: Aërides odoratum, A. suavissimum, A. Fieldingi, A. Schroderæ, A. quinquevulnerum, A. maculosum, A. Lobbi, A. Houlletianum, A. crispum, A. Larpentæ, A. virens, and A. Lawrenceæ, which all grow well in the ordinary flower-pot. The pots should be quite three-fourths filled with drainage materials, the remainder being freshly-gathered Sphagnum Moss. The large ivory white Angræcum sesquipedale and A. eburneum should be potted in the same manner, but the drawf-growing Angræcums, such as A. Ellisi, A. Kotschyi, A. metallicum, A. modestum, A. arcuatum, A. fastuosum, A. citratum, A. articulatum, A. Leonis, and A. pellucidum thrive best when grown in shallow pans or teak-wood baskets, and suspended close to the roof glass in dense shade. All of the Saccolabiums, S. Blumei, S. ampullaceum, S. curvifolium, S. giganteum, S. prœmorsum, S. guttatum, S. violaceum, S. retusum, S. miniatum, and the charming little S. Hendersoni, should be placed in shallow teak baskets, with clean-picked Sphagnum Moss and small crocks (about one half of each) to root in. These Saccolabiums may be suspended by the side of the small-growing Angræcums. The beautiful Renanthera Lowi and R. Storiei are most satisfactory in pots, using the same kind of compost. R. coccinea, R. matutina, Arachnanthe Cathcarti, and A. Clarkei, being of scandent growth, should be trained to a birch pole, or, perhaps better still, a narrow upright raft made of teak wood, around which the young roots cling tenaciously. When in full growth these plants require shade, but at the end of the growing season they should be placed in nearly full sunshine, in order to harden the new foliage and stems.

Phalænopsis are beautiful Orchids when well grown. All succeed best when planted in shallow baskets, with only a very thin layer of Sphagnum Moss to root in. The following kinds, P. Schilleriana, P. amabilis, P. grandiflora, P. Stuartiana, P. Sanderiana, P. leucorrhoda, P. casta, and P. Esmeralda, should be suspended on the shady side of the house, but at the same time they enjoy a moderate amount of light, while others, such as P. Marie, P. violacea, P. speciosa, P. intermedia Portei, P. tetraspis, P. Sumatrana, P. cornu-cervi, and P. Luddemanniana, prefer a closely-shaded position at all times. A similar position is necessary for such plants as Phaius tuberculosis, P. Wallichi, P. bicolor, P. Humbloti, P. Sanderianus, P. Cooksoni, P. Marthæ, P. Norman, Calanthe veratrifolia, C. masuca, P. Oweniæ, P. Domini, and Phaio-Calanthe Arnoldiæ. As they are strong rooting rather large pots are necessary, into which place about 3in. of crocks for drainage; the compost should consist of fibrous loam, leaf soil, and Sphagnum Moss in equal parts, with a large proportion of small crocks mixed with it to keep the material porous. Pot them as one would an ordinary greenhouse plant. Galeandra Devoniana, G. nivalis, Grammatophyllum speciosum, G. Measuresianum, and G. Ellisi will do thoroughly well either in pots or shallow pans, with equal parts of peat and Moss to root in. Stand them when growing where they will obtain plenty of light but no strong sunshine, whilst during the resting period they require as much sunlight as possible. The above-mentioned Orchids should be carefully attended to at all times as regards watering. Many anxious growers give their plants too much water after they have been repotted, thinking that by so doing growth and root action will be encouraged. The best and most practical way is to give water very sparingly until young roots are seen pushing their way through the compost, when the quantity should be gradually increased as each plant becomes properly re-established. When in full growth, the plants should be thoroughly watered when they become dry, taking care not to pour water into the centre of the plant or in the axils of the leaves, otherwise probably decay will set in. When the season's growth is completed, gradually withhold the water and apply no more direct to the plants than is absolutely necessary to prevent the leaves from shrivelling.

Taking the Cypripediums, or Ladies' Slippers, as a whole, they are among the easiest of the Orchids to cultivate. The most popular of the warm-growing kinds are C. Stonei, C. Sedeni, C. bellatulum, C. barbatum, C. Lawrenceanum, C. Morganiæ, C. Rothschildianum,

C. Schroderæ, C. albo-purpureum, C. grande, C. leucorrhodum, C. Curtisi, C. superbiens, C. Swanianum, C. superciliare, C. Calypso, C. Sanderianum, C. Harrisianum, C. œnanthum, C. niveum, C. concolor, C. Lawrebel, C. Godefroyæ, C. orphanum, C. T. B. Haywood, and C. Chamberlainianum. When repotting, it is neither necessary nor advisable to raise them above the rim of the pot, therefore keep the compost just below it, so as to render watering easy. The pots should be well drained and the soil consist of rough fibry peat in equal parts, adding some broken pieces of brick or crocks to keep it free and porous. The proper time to repot all Cypripediums is about a fortnight after they have gone out of bloom. When well rooted and growing freely they may be almost deluged with water the whole year round, and it is necessary to carefully protect them from strong sunshine at all seasons. Cypripediums do well standing down upon the side stage, and over them may be suspended such curious and interesting species as Bulbophyllums, Cirrhopetalums, Megacliniums, etc. It is impossible to enumerate the whole of the kinds belonging to the last-named families, but a few may be

A GROUP OF MILTONIAS, M. MORELIANA.

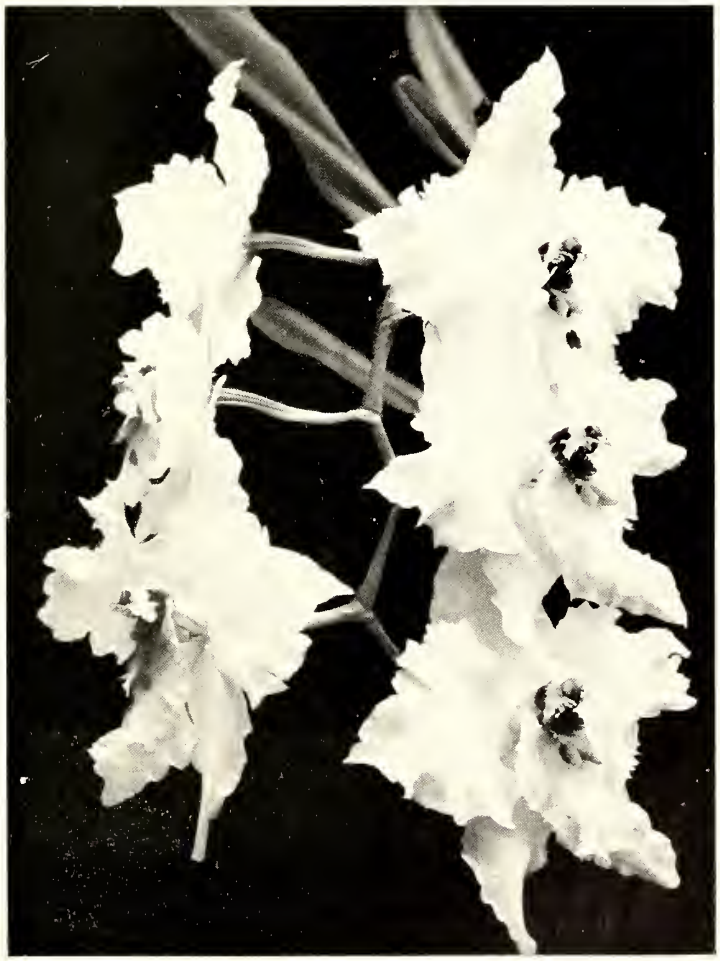
mentioned as being well worth adding to any collection: Bulbophyllum barbigerum, B. Lobbi, B. Siamense, B. Ericcsoni, B. grandiflorum, B. longisepalum, Cirrhopetalum ornatissimum, C. Rothschildianum, C. Cumingi, C. Mastersianum, C. Colletti, C. guttulatum, Megaclinium triste, M. minutum, etc. Grow the compact varieties in shallow pans, while for those which have a long creeping rhizome teak-wood baskets are preferable. They all root and grow freely in the ordinary Orchid compost. The following are the most beautiful species of Dendrobium: D. Wardianum, D. crassinode, D. Findleyanum, D. Pierardi, D. lituiflorum, D. primulinum, D. cretaceum, D. aureum, D. crepidatum, D. nodatum, D. Parishi, D. superbum, D. albo-sanguineum, and the numerous distinct varieties of D. nobile. A few of the lovely hybrids now in commerce may also be mentioned, such as D. Ainsworthi, D. micans, D. splendidissimum grandiflorum, D. melanodiscus, D. rainbow, D. Juno, D. cassiope, D. Clio, D. Leechianum, D. Aspasia, D. endocharis, D. Wiganæ, D. Dominii, D. Rolfæ, etc., which all thrive best on the sunny side of the house. Those with pendulous pseudo-bulbs should be

PLATYCLINIS GLUMACEA.

grown in small pans, with perforated holes around the sides, and suspended close up to the roof glass. Pots are more suitable for the upright-growing kinds, and may be stood down upon the ordinary stage. The stronger-growing kinds, which include D. Dalhouseianum, D. Calceolus, D. clavatum, D. binoculare, D. dixanthum, D. fimbriatum, D. moschatum, and D. Paxtoni, should be afforded a similar position. These Dendrobiums when in full growth require liberal supplies of water at the root, but when the new pseudo-bulbs are fully made up gradually diminish the quantity. In order to maintain a vigorous constitution it is necessary that each plant should make but one set of growths annually, and these growths should be thoroughly ripened. Therefore immediately a plant has completed its growth remove it from the house in which it has been growing, and place it in a far less shaded one where the atmosphere is drier and less close. No better place could be selected than a cool greenhouse, or, perhaps better still, a vinery from which the grapes have been gathered, where, as the leaves fall from the vines, the Orchids will have moderate shade at first, gradually passing to clear sunshine. Under such treatment the new growths become matured, and in the proper season bloom profusely. None of these Dendrobiums should be allowed to rest in a lower temperature than 50deg. During the resting period give little water. They should be carefully looked over periodically, and only those with pseudo-bulbs that show signs of shrivelling should be watered. Over-watering will weaken the growths. When the plants have had sufficient rest they will commence to show their flower buds, when they may be removed to an intermediate house temperature to flower. After the flowers fade new growths appear, and quickly commence to emit new roots from their base, whilst if a plant requires repotting, no better time could be chosen for the operation than this, and in repotting Dendrobiums care must be taken not to place them in very large pots, because if the roots get into a mass of sodden material they speedily decay. Therefore in all cases the pots or pans used must be small in proportion to the sizes of the plants, and they must be well drained, leaving space for about 2in. of compost, which should consist of fibrous peat and Sphagnum Moss in equal parts. When repotting it is important to make the compost quite firm, those with drooping stems being tied to the wire of the pan, using neat sticks for the upright-growing kinds. Such beautiful species as D. Phalænopsis, D. bigibbum, D. Bensoniæ, D. superbiens, D. secundum, D. taurinum, D. stratiotes, D. strebloceras, and D. Goldei should be placed near to the roof glass, where they may obtain plenty of sunlight, which is indispensable to success, and in the hottest position available. Small shallow pans that can be suspended, with a very thin layer of peat for the plants to root in, are excellent. During the height of the growing season an abundance of water both at the root and in the atmosphere is necessary. After the plants have flowered give them a long rest, placing them in a moderately dry house where the winter temperature is about 60deg. While at rest keep the compost rather dry, but not so dry as to cause the bulbs to shrivel. The evergreen section, such as D. thrysiflorum, D. densiflorum, D. Farmeri, D. Schroderæ, D. Griffithianum, D. palpebræ,

D. suavissimum, D. sulcatum, D. chrysotonum, and D. Guibertianum grow well in pots, the rare D. Harveyanum in a shallow pan, while D. Lowi and D. cruentum are happier upon blocks of wood, whitethorn being the most suitable. The whole of this section requires a warm moist temperature and rather shady position. The same remarks apply to the pretty D. Jenkensi, which should be fastened to a block of dry apple wood, the bark being taken off some time prior to use. D. Brymerianum, D. macrophyllum, D. chrysanthum, D. Falconeri and its distinct variety giganteum should be grown in an intermediate temperature the whole year round, while D. infundibulum, D. Jamesianum, D. linguefome, D. teretifolium, D. speciosum, and D. Kingianum should be grown in a sunny corner of the cool greenhouse.

Orchids which flower during winter are highly appreciated, and perhaps none more so than the deciduous Calanthes. Where a number of forms can be accommodated, a succession of bloom may be kept up for three or four months. All of the C. vestita section, comprising C. Veitchi, C. V. alba, C. Victoria Regina, C. Sedeni, C. Sandhurstiana, C. bella, C Burfordiense, C. Harrisi, C. rubro-oculata, C. luteo-oculata, and C. nivea, are the first to open their flowers in November, and with care last well into January. When these are past their best, C. Regnierii, C. Sanderiana, C. William Murray, C. Bryan, C Stevensi, C. Turneri, and C. nivalis commence to open and will continue to produce flowers until the end of March. To cultivate these Calanthes successfully the ordinary stove treatment, as far as atmospheric conditions are concerned, suits them admirably. Owing to the large quantities of water required when in full growth, the soil becomes completely worn out by the end of the growing season, therefore it is necessary to repot annually. The best time for repotting is when the new growths are a few inches high, or just before the young roots begin to push out. The whole of the soil should be shaken away from the old pseudo-bulbs, the dead roots shortened to about 1in., and the pots should be small, although, of course, of various sizes to suit the plants. As all Orchids require thorough drainage, about half the pot may be filled with crocks, over which place a thin layer of turfy loam or Sphagnum Moss. The soil is of great importance, and should be rich and retentive, consisting of one-half good fibrous loam, one-fourth oak-leaf soil (well decayed), and one - fourth finely - chopped Sphagnum Moss and coarse silver sand, the whole being well mixed together. When the pots are being filled up, shake down the soil firmly to about 1in. of the rim, then the pseudo-bulb should be placed on the surface, and be made



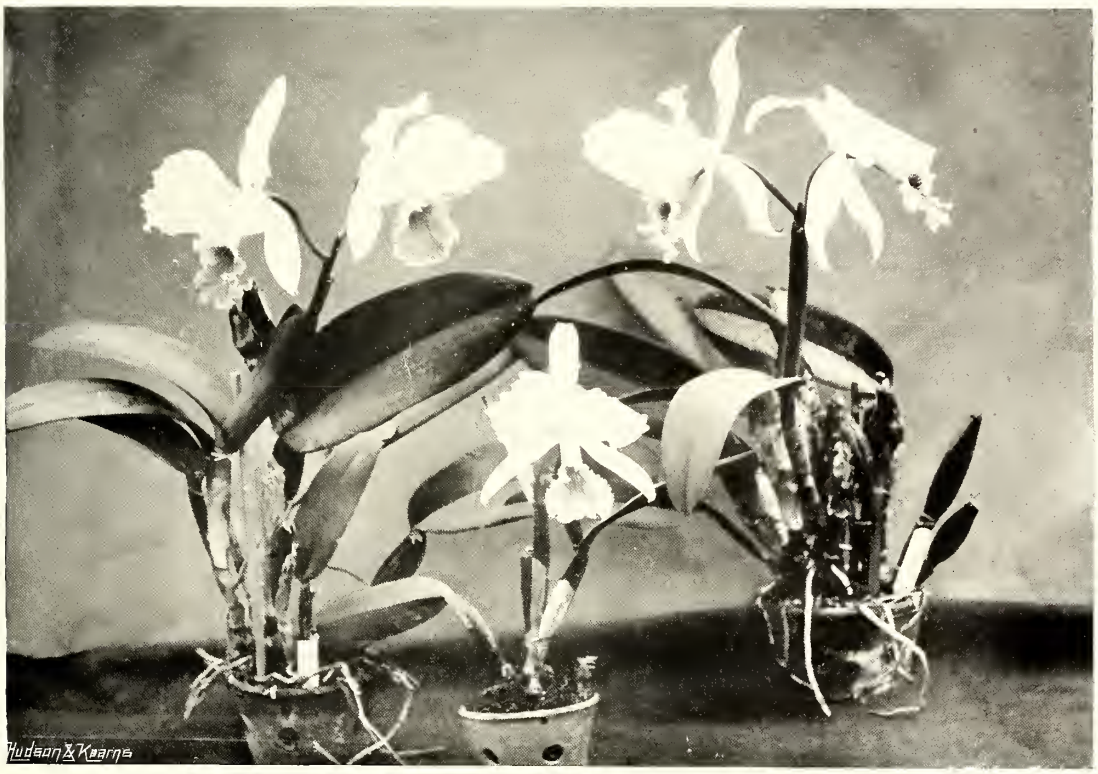
ODONTOGLOSSUM CRISPUM (ALEXANDRÆ.)

firm by pressing more soil upon the remnants of the root, at the same time just covering the base of the young growth. This will leave about half an inch of space to hold water.

After repotting the bulbs, stand the pots on the lightest side of the East Indian house or plant stove, and for the first few weeks give no water, merely damping between the pots twice or thrice every day, according to the weather. When the growths show signs of progressing, a little water may be given, and the quantity gradually increased until the plants are in full vigour, when an abundance is essential. In the height of the growing season an alternate watering with weak liquid cow manure will be beneficial, and tend to insure a good display of bloom. Towards the end of the year, when the first flowers commence to open, it is advisable to gradually lessen the amount of water, and by the time the foliage has disappeared it should be discontinued altogether. After the spikes are cut, the plants will be at rest, and may be arranged upon a dry shelf in the warm house, giving no water whilst in a dormant state. Thunia Marshalliæ, T. Bensoniæ, T. Brymeriana, T. Veitchi, T. candidissima, T. alba, and T. pulchra should be grown on the lightest side of the house in almost full sunshine. They need to be repotted annually, exactly as advised for the Calanthes. Place them with the tips of the bulbs nearly touching the roof glass, and give them an abundance of water during growth. When the flowers are over, stand the plants in a cool greenhouse, and expose them to full sunshine, so as to consolidate the long pseudo-bulbs. After the leaves have fallen, keep the plants quite dry at the root until growth recommences. Few groups of plants produce such remarkable and interesting flowers as the following: Catasetum Bungerothi, C. tabulare, C. scurra, C. barbatum, C. longifolium, C. spinosum, C. maculatum, C. discolor, C. Imshootianum, C. Clæsianum, Mormodes pardinum, M. buccinator, M. Rolfæ, M. Hookeræ, M. luxatum eburneum, Cycnoches versicolor, C. peruvianum, C. chlorochilom, C. Egertonianum, and C. pentadactylon. All these Orchids should be grown in small shallow pans having a wire handle attached, so as to bring the plants well up to the roof glass. This is an important point, as a maximum amount of light is essential to their welfare.

When the plants commence to grow shake them out of the old soil and repot afresh in a compost of peat and chopped Moss with a moderate quantity of small crocks mixed with it. Water should be afforded as recommended for the Calanthes, and the plants, being deciduous, must be kept thoroughly dry at the root during the long resting period. The handsome Oncidium Lanceanum, O. hæmatochilum, and O. guttatum should also be grown on the lightest side of the house. Basket culture seems to suit them admirably, using a mixture of rough peat and Moss for them to root in. These remarks apply also to the yellow-flowered Oncidium ampliatum, which should be removed to a cool part of the Cattleya house when at rest, and be kept rather dry at the root. When in bloom, Vanda teres and V. Hookeriana are always admired. To grow them successfully and secure an annual display of flowers special treatment is necessary. The principal requirements of both species are sunshine and moisture, especially during the growing period. A hot sunny corner of the plant stove would suit them, syringing well overhead several times a day during active growth. When insufficient water is given the terete leaves shrivel and fall off. During the dull days of winter the plants will not require so much water, but they should be syringed often enough to prevent the stems or leaves from shrivelling. Being tall-growing plants, some support is required, and a good method is to tie them to teak rods, around which the long roots entwine luxuriantly. The lower part of the rod should be inserted into a pot, and made firm with crocks, surfacing the drainage with a layer of living Sphagnum Moss. To economise space, from four to six stems may be grown in a 10in. pot, arranging the rods at even distances apart to allow a free circulation of air amongst the roots. Other Orchids of similar growth requiring the same means of support are: Camarotis purpurea, Trichoglottis fasciata, Angræcum Scottianum, Brassavola Perrini, B. stricta, and B. venosa. Like the preceding species they succeed in a high temperature,

but in more shade, otherwise give them much the same kind of treatment. The following beautiful species deserve a place in every Orchid collection: Bollea cœlestis, B. Schroderiana, B. Patini, Pescatorea Klabochorum, P. Sanderianum, P. Lehmanni, P. Dayana, P. cerina, Batemannia Burti, B. Wallisi, B. Colleyi, B. grandiflora, Huntleya Meleagris, H. candida, Warscewiczella Lindeni, W. Wendlandi, W. discolor, and W. cochlearis. All should be grown in well-drained pots or pans, using a compost of three parts Sphagnum Moss to one of peat. Raise them as high as possible above the rim of the pot, an essential point in their cultivation. During winter these plants should be placed at the coolest end of the East Indian house, but through the heat of summer the intermediate house is the best position for them. At all times the supply of water must be constant, and give them a position where they may be protected from sunshine. Zygopetalum Mackayi, Z. Sedeni, Z. crinitum, Z. rostratum, Z. brachypetalum, Z. Burkei, and Z. Clayi should also be grown in pots, using about equal parts of peat and Moss and



THREE DISTINCT VARIETIES OF CATTLEYA LABIATA.

a small quantity of rough loam and sand mixed well together for them to root in; a well-shaded position in the warm house will suit them. Z. maxillare Gautieri succeeds best upon a piece of tree-fern stem; it is a cool-growing species, and should be placed with the Odontoglossums. Such deciduous epiphytal Orchids as Chysis bractescens, C. aurea, C. Chelsoni, C. Sedeni, C. lævis, and C. limminghei may be grown in teak-wood baskets or shallow pans suspended close to the roof glass. As regards culture, they require exactly the same kind of treatment as previously recommended for the deciduous Dendrobes. Chysis generally bloom about March, and the flower spikes push up in conjunction with the young growth. When the plants begin to grow, water should be sparingly applied, but as soon as the flower spikes appear increase the quantity considerably. Immediately the flowers fade, the young breaks commence to emit new roots, and this is the best time to give more rooting space to plants that require it. Arundina bambusæfolia and A. chinense (syn. A. Philippi) when properly grown and well flowered are very pretty.

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THE GARDEN WALK, BULWICK PARK, NORTHAMPTONSHIRE.

"COUNTRY LIFE."

They require similar treatment to the deciduous Calanthes, but rather more shade. The same remarks apply also to the rare Eulophia guineensis, known by some as E. congoensis.

THE CATTLEYA, OR INTERMEDIATE, HOUSE must be a high, light structure, and should contain such plants as Cattleya Aclandiæ, C. Bowringiana, C. bicolor, C. Chocoensis, C. Dowiana and its beautiful variety aurea, C. Eldorado, C. gigas, C. Gaskelliana, C. guttata, C. Harrisoniæ, C. intermedia, C. labiata autumnalis, C. Lawrenceana, C. Loddigesi, C. Luddemanniana (syn. C. speciosissima), C. maxima, C. Mendeli, C. Mossiæ, C. Percivalliana, C. Regnelli, C. Schilleriana, C. Schröderæ, C. Skinneri and its rare variety alba, C. superba, C. Trianæ, C. Warneri, and C. Walkeriana. A few Cattleya hybrids may also be mentioned, such as C. Brymeriana, C. Chamberlainiana, G. Exoniensis, C. Hardyana, C. Lord Rothschild, C. Mantini nobilior, C. Parthenia, C. Pheidona, and C. Wendlandi. Cattleyas and Lælias are very closely allied, the only botanical difference being that in the Cattleya flower there are four pollen masses, whereas in the Lælias eight is the number. The great interest attached to these Orchids is due to the surprising beauty of the flowers, especially striking being the richness of colour on the labellum or lips, and in some kinds, as C Dowiana and C. D. aurea, the golden pencillings and markings are magnificent. Among the best of the Lælias, the following are all worthy of the best attention: L. crispa, L. cinnabarina, L. (Brassavola) Digbyana, L. Dormaniana, L. elegans, L. flava, L. grandis tenebrosa, L. harpophylla, L. lobata, L. Perrinii, L. P. alba, L. pumila, and L. purpurata. Exceptional interest has resulted by hybridisation. As both species cross so readily with each other, many new forms and shades of colour have been obtained, which in almost every case are nearly intermediate between the two parents employed. Space will not allow all, or nearly all, of the hybrids or their parents to be enumerated here, but it will suffice to mention some of the best known of this fascinating group. To denote the two parent genera the names are compounded together, viz., Lælio-Cattleya, and are: L.-C. Arnoldiana, L.-C. Amesiana, L.-C. Bella, L.-C. Blessensis, L.-C. Canhamiana, L.-C. Clive, L.-C. Dominiana, L.-C. Digbyana-Mossiæ, L.-C. eximia, L.-C. endora, L.-C. Henry Greenwood, L.-C. Hippolyta, L.-C. Ingrami, L.-C. Lady Wigan, L.-C. Nysa, L.-C. Pallas, L.-C. Phœbe, L.-C. Sedeni, L.-C. Veitchiana, L.-C. Warnhamense, L.-C. Wellsiana, etc. Cattleyas and Lælias are generally found growing under the same, or nearly similar, conditions in their native habitat; therefore their cultural requirements are identical. Pot culture is the most suitable, and it is well to bear in mind that in all cases pots proportionate to the size of the plants should be selected. Overpotting is a great evil, and as a rule the smaller the pot the stronger the safeguard against excess of moisture at the root. The drainage must be as free as possible, and should consist of broken crocks, filling the pots to at least two-thirds of their depth with this material, secured at the top by a thin layer of Sphagnum Moss. The plants, on being potted, should be raised a trifle above the rim, and the compost should be pressed firmly around the base. This may consist of fibrous peat and Sphagnum Moss in the proportion of two-thirds of the former to one-third of the latter, and well mixed together, with the addition of a moderate quantity of small crocks to ensure porosity. If the plants are large and heavy insert a few neat sticks in the pot, to which some of the pseudo-bulbs may be tied. The best time to repot Cattleyas or Lælias is when the latest growths commence to emit new roots from their base. These then quickly enter and appreciate the fresh compost. During the growing season the cultivator should be careful not to give water to plants about which there is uncertainty as to their actual condition at the root; the safest plan is to wait until each plant is "dry" before applying water, and then to give an abundance, as a good watering at moderate intervals is always preferable to constant saturation of the soil. When growth is completed, and the plants at rest, the amount of water should be gradually diminished until only sufficient is necessary to prevent shrivelling of the pseudo-bulbs. The distinct Cattleya citrina is one of the most remarkable of Cattleyas. Its growth always assumes a downward direction, and from the centre of the bulb and between the pale glaucous green leaves appear the flowers. They are of a golden yellow

colour, except the margin of the lip, which is white. This Orchid may be grown on blocks of wood or teak rafts, and fastened to them with copper wire; the blocks should be suspended with the leaves downwards. A cool part of the ordinary greenhouse is the most suitable position for this plant, and where it can receive the maximum light and air. The plant requires little water at the root, the greatest quantity being applied when the flower scapes are developing.

In a cool shady corner of this (Cattleya) house such stately plants as Vanda suavis, V. tricolor, and their varieties will grow freely. They should be potted and treated in the same manner as previously recommended for Aërides. The proper season for root disturbance, by repotting or top dressing, is during the month of October, as less foliage is likely to be lost than when the operation is carried out at any other time of the year. One of the essential requirements of these Vandas is a cool moist stage for them to stand upon, and where their immediate surroundings can be kept fairly moist at all times. V. cærulea may be grown successfully in teak cylinders or tall baskets, with charcoal and crocks surfaced with Sphagnum Moss to root in. Suspend the plant close up to one of the roof ventilators where good light and fresh air can be given. This Vanda has large pale blue flowers, and is held in high esteem byall Orchid growers. V. Sanderiana is undoubtedly a noble Orchid when in flower, and should be grown with the Aërides. After considerable experience of this plant, I find that it grows best when fastened to a teak raft without any soil whatever, and suspended close to the roof glass in a moist but shady position. Keep the raft and roots moist by syringing several times daily. The dwarf-growing Pleiones, or Indian Crocuses as they are sometimes called, are amongst the brightest and most distinct of all Orchids, and, as they produce a complete sheet of flowers all open on a plant at the same time, are effective for decorations generally. The kinds usually grown are P. maculata, the prettiest of the whole family, its pure white sepals and petals contrasting finely with the white, yellow, and magenta lip. P. Lagenaria has also always been in high repute amongst Orchid amateurs, its rose lilac flowers and lip with purple streaks and blotches and white margin being very pretty. Other desirable Pleiones are P. concolor, P. præcox, P. Wallichiana, and P. birmanica. These little plants may be grown in shallow pans, and suspended on the lightest side of the

DENDROBIUM DALHOUSEIANUM.

house. About half fill the pans with drainage, and the soil should consist of equal parts of loam, fibrous peat, Sphagnum Moss, and a little coarse silver sand. Being free rooting, the bulbs should be planted well above the level of the pan, say about 1½in. higher in the centre, gradually coming down to the level of the rim. After repotting a gentle watering should be given to settle the soil, and until the young growths commence to send up their leaves and roots are seen pushing through the soil the supply of water must be very limited, as if too much be given at this time the growths are liable to decay. When the plants become re-established they may receive a large quantity. Being deciduous, keep the plants rather dry after the leaves have fallen and until the flowers fade, when they will recommence to grow, and may then be repotted. P. humilis and P. Hookeriana, coming from a higher elevation, prefer a light and airy position in the coolest Orchid house, otherwise their requirements are identical with the others enumerated. The following Sobralias, S. macrantha, S. M. alba, S. xantholeuca, S. leucoxantha, S. virginalis, S. Ruckeri, S. Lucasiana, S. Lindeni, S. Liliastrum, S. albo-violacea, S. speciosissima, S. Veitchi, and S. Warscewiczi, are showy plants when in flower, and, although the individual blooms do not last long, rarely more than three or four days, are well worth growing. When they get strong a succession of flowers is provided that compensates for the individual blooms being short-lived, and there are few plants in the whole Orchid family that surpass the splendid colours they possess. All Sobralias are strong rooting, and require plenty of pot room; they are not particular as to soil, almost any kind of porous compost being suitable. Whilst growing, the plants must be plentifully supplied with water. Sobralias should have a light position, as near to the roof glass as possible, as if kept too shady they are liable to become drawn.

The same remarks apply to the tall-growing Epidendrums, of which the following are the most desirable: E. arachnoglossum, rich magenta-crimson; E. cinnabarinum, dense racemes of bright red flowers; E. elongatum, bright rose; E. Frederici Guilielmi, red-purple; E. O'Brienianum, a handsome hybrid, of strong growth, producing flowers of a uniform bright carmine; E. radicans, a general favourite, with panicles of bright orange scarlet flowers, which open in succession, for three or four months; E. Schomburgki, bright vermilion red; and E. xanthinum, with dense heads of bright yellow flowers that are sometimes tinged with orange. All these plants grow thoroughly well in well-drained pots, and they root

FORMS OF CYPRIPEDIUM.

CŒLOGYNE CRISTATA.

freely in three parts Sphagnum Moss to one part of peat. Such Epidendrums as E. atropurpureum, E. Endresi (a lovely species, the flowers pure white with the exception of a few violet spots on the lip and column), E. falcatum, E. inversum, E. nemorale, E. prismatocarpum, E. radiatum, E. Sceptrum, E. Stamfordianum, E. Wallisi, and the two pretty hybrids E Endresio-Wallisi and E. elegantulum, may also be planted in the same compost. The taller - growing Epidendrums should be placed in pots, and for the dwarfer kinds shallow pans that may be suspended to the roof are more suitable. E. vitellinum majus is a popular species, so desirable for the bright orange scarlet colour of its flowers. It should be grown in a rather light dry position, where it may obtain plenty of fresh air at all times. The beautiful white E. bicornutum requires hot treatment, and grows best in shallow baskets hanging up close to the roof glass.

One of the most beautiful of the Miltonias is M. vexillaria, a beauty so great as to earn for it the well-merited title of the "Queen of Orchids." There are many varieties of this species, the colour of the flowers varying from rose carmine to almost white. Its nearest relatives are M. Endresi, M. Roezli, and M. Phalænopsis, which are distinguished by their light greyish green foliage and large flat Pansy-like flowers. Other Miltonias which are quite distinct in appearance and in the colour of the flowers are M. bicolor, M. Binoti, M. candida grandiflora, M. cuneata, M. Clowesi, M. Moreliana, M. Peetersiana, M. Regnelli, M. Russelliana, M. Schroderiana, M. spectabilis, and M. Warscewiczi. As regards culture, those that have pallid pseudo-bulbs and foliage should be grown in a compost consisting principally of Sphagnum Moss (a little peat and sand may be added to it), while the potting material for the other species should be just the reverse. All of them will grow either in pots or pans, which should be filled to quite three-fourths of their depth with drainage. During growth Miltonias require a liberal supply of root moisture, but when at rest very little is needed. Repotting should be done immediately the plants begin to push up their new growths. During winter these plants should be grown in the coolest part of this house, but in very hot weather the temperature of the cool house agrees with them best, where they should have abundant light without actual sunshine. Platyclinis (Dendrochilon) filiformis when well flowered is very pleasing. Its elegant thread-like yellow racemes are very pretty. Although a native of the hot climate of the Philippine Islands, it will thrive luxuriantly when suspended in a shallow pan in a damp shady corner of this house. It must at all times be kept moist at the root, and requires abundance of water when the flower spikes appear. It flowers in July and August. The silvery spring-flowering P. glumacea, also P. Cobbiana and P. uncata, will flourish under the same conditions. One of the most beautiful of Mexican Odonteglossums is O. citrosmum, its long pendulous racemes being very attractive, and the varieties vary considerably from pure white to several distinct shades of rose, some of a pretty buff colour, and spotted with pale lilac. Owing to the drooping habit of the inflorescence, basket culture is most suitable for the plants, as when suspended from the rafters the flowers can be seen to the best advantage.

Only a very shallow compost is needed, and this should consist of equal parts of peat and Sphagnum.

The best time for rebasketing is immediately after the flowers fade. Water should be given frequently and liberally during the growing season, but when the plants are at rest keep the soil quite dry. Grow this species in the lightest position available in this house, and where it may obtain plenty of fresh air, especially at night. These cultural remarks apply also to the Mexican Lælia anceps, L. autumnalis, L. albida, L. furfuracea, L. Gouldiana, L. Marriottiana, L. majalis, etc., all of which should be wintered in a cool, rather dry greenhouse, where the average temperature is about 50deg. L. pumila and its varieties, Dayana, marginata, and præstans, should be suspended in small pans. Grow the plants during summer in the cool house, and in the winter with the Cattleyas. Where a number of the following Cœlogynes are grown, C. aspersa, C. barbata, C. cristata, C. corrugata, C. conferta, C. Cumingi, C. Forstermanni, C. fuliginosa, C. granulosa, C. Massangeana, C. ocellata, C. Sanderiana, C. sulphurea, and C. tomentosa, one or other of them will be in flower throughout a considerable portion of the year, and therefore will not all require repotting at the same time. The best time for this operation is when each plant is starting into new growth, and the ordinary compost of peat and Moss should be used. The well-known C. cristata and its varieties alba (holo leuca), Chatsworth, maxima, Lemoniana, etc., should have a moderate amount of rough turfy loam added to the compost. During the growing season Cœlogynes delight in copious waterings at long intervals, and a daily overhead syringing in fine weather will promote clean, strong, healthy growths; the plants like plenty of light, but not strong sunshine. Such Cypripediums as C. albo-purpureum, C. Arthurianum, C. Boxalli, C. Charlesworthi, C. caudatum, C. Domini, C. Fairieanum, C. hirsutissimum, C. insigne, C. Juno, C. Leeanum, C. purpuratum, C. Schlmi, C. Spicerianum, C. Statterianum, C. Sallieri, C. venustum, C. villosum, C. vexillarium, and C. Winnianum all appreciate a cool, moist, shady corner of this house. The butterfly Orchids, Oncidium Krameri and O. papilio, will grow in a light position in this house, and will thrive equally well either on a bare block of wood or, with a little peat and Sphagnum to root in, in pot or basket. The flowers of these Oncidiums are always highly appreciated, and the long stems will continue to send out flowers for a long period.

MILTONIA ROEZLI ALBA.

CATTLEYA LABIATA VERA.

As each bloom fades another opens, but those who study the future health of the plants should cut off each spike after it has produced four or five blooms. Grow Oncidiums, ampliatum, Cavendishianum, guttatum, hæmatochilum, Lanceanum, and luridum, either at the hottest end of this house or in a cool part of the East Indian house, choosing a position where it is shady and moist. Other kinds, as O. Altissimum, O. aurosum, O. Brunleesianum, O. chierophorum, O. flexuosum, O. incurvum, O. obryzatum, O. ornithorhynchum, O. phymatochilum, O. pulchellum, O. reflexum, O. sarcodes, O. sessile, O. triquetrum, and O. Warscewiczi, thrive best in a shady part of the intermediate house. O. bifolium, O. concolor, O. crispum, O. culcullatum, O. curtum, O. dasytyle, O. Forbesi, O. Gardneriana, O. hastatum, O. lamelligerum, O. loxense, O. macranthum, O. Marshallianum, O. nubigenum, O. Phalænopsis, O. prætextum, O. serratum, O. spilopterum, O. superbiens, O. tigrinum, and O. varicosum should be grown under the same conditions as the cool Odontoglossums. Experienced cultivators who have grown these Oncidiums know what splendid spikes of bloom may be obtained from the majority of the species enumerated, and they know, too, how easy it is for the plants to overflower themselves, after which they gradually but surely dwindle away. It is advisable, therefore, to cut away the spikes immediately the whole of the flowers are open. These spikes, if placed in the cool house with their ends in water, will retain their beauty for a considerable time. In the Stanhopea family we have a group of plants characterised by the remarkable and singular shape of their flowers. A few of the most beautiful are: S. Amesiana, S. devoniensis, S. eburnea, S. florida, S. insignis, S. Lowi, S. Mastersi, S. oculata, S. Platyceras, S. tigrina, and S. Wardi. Stanhopeas succeed in shallow teak or wire baskets, suspended not far from the roof. Ordinary drainage is not required, because the flowers, being produced on scapes that are quite pendulous, generally push their way down into the compost, and either come out through the bottom or sides of the basket. The compost should consist chiefly of Sphagnum Moss and fibrous peat, the last in the smaller proportion. The proper time for supplying fresh rooting materials is when the plants are starting into growth. Stanhopeas require abundance of water during the growing season, but in winter very little will suffice to keep the bulbs plump and fresh. The Chimaroid Masdeallias—most conspicuous being M. bella, M. Chimæra, M. Carderi, M. erythrochæte, M. gongora, M. Nycterina, M. radiosa, M. Winniana, M. Backhouseana, and M. Wallisi—also pass their flowers in a downward direction like the Stanhopeas, therefore basket culture is most suitable. The plants must be kept moist the whole year round, dryness at the root or in the air proving fatal. During winter the intermediate house is the proper place, but in summer the atmosphere of the cool house will suit them better. This change of temperature is also suitable for such plants as Odontoglossum grande, O. Insleayi, O. hastilabium, O. Krameri, and O. nævium.

COOL HOUSE.—Those who do not grow Orchids extensively confine their selection to the species and varieties requiring a cool temperature, and amongst cool Orchids are many beautiful flowers, most treasured of all the Odontoglossums. There is a warmer and cooler end in all houses, and it is at the warmer end that the following plants should be grown: The large yellow-flowered Anguloa Clowesi; the ivory white A. eburnea; A. Ruckeri, the inside of the flower being of a deep sanguineous red; and the pretty tinted and spotted varieties of A. uniflora. Lycaste Skinneri is an old and useful species, with bold handsome flowers of many colours, from the deep rosy L. Skinneri atrorubens to the pure white L. Skinneri alba. Anguloas and Lycastes thrive well in pots, and should be potted in a mixture of peat, loam, and Sphagnum Moss well drained. When repotting it is important to raise the base of the plants well above the rim of the pot, for although moisture-loving plants, the young breaks easily rot off if the plants are potted too low. The large ivory white Cymbidium eburneum is certainly a handsome Orchid, so also are the well-known C. Lowianum and C. Traceyanum. There are also two beautiful hybrid Cymbidiums, C. eburneo-Lowianum and C. Lowio-eburneum, both deserving a place in the front rank of Orchids. Other kinds well worthy of culture are: C. affine, C. Devonianum, C. elegans, C. giganteum, C. grandiflorum, C. Hookerianum, C. Mastersi, C. Parishi (warm house), C. pulcherrimum, and the rare C. Winnianum. Cymbidiums, having large fleshy roots, require plenty of pot room and good drainage, using as a compost one-half good turfy loam, the other half peat and Moss, to which may be added a little leaf soil and broken crocks. Instead of raising the plants above the rim of the pots, keep the soil at least ½in. below it, so as to facilitate watering. C. Lowianum does not require so much pot room as the others, and when properly potted and well cared for may remain undisturbed for many years, and will produce its long arching flower spikes more freely when kept in a pot-bound condition. An occasional dose of weak liquid cow manure water will greatly benefit the plants when sending up their flower spikes. C. Devonianum produces its pendulous racemes from the base of the young growths, and therefore basket culture should be given.

No Orchids are more worthy of cultivation than the new Grenadan Odontoglossums, especially the O. crispum and O. Pescatorei types. Most of them are easily managed, and yet sometimes they give more trouble than any other class, the principal causes of failure in most cases being too much water at the root and keeping the atmosphere of the house always in a saturated condition. It is advisable to allow the atmosphere to become comparatively dry for a few hours each day, so as to enable the plants to throw off excessive moisture. Nothing is more conducive to strong sturdy growth than this. When watering go carefully over the plants, and thoroughly water only those needing it, as if watered like some aquatic plants their roots will certainly decay. It is also of great importance that plenty of fresh

C. L. ALBA CÆRULEA.

air be admitted. Odontoglossums naturally inhabit high mountainous regions, so that it is obvious they cannot thrive for long without plenty of ventilation. Without air the plants will certainly deteriorate, even in the best houses. Odontoglossums require to be shaded from the sun at all times, and during very hot weather additional shading may be used, to keep the inside temperature cool. Use as little fire heat as possible in the house during cold weather, so as to keep the temperature as low as possible, as excessive artificial warmth is often the principal cause of deterioration among the plants. To assist in maintaining the proper temperature in winter, and to keep down the fire heat, cover the house each night with thick garden mats, and take them off at daybreak. The proper time to repot Odontoglossums is during the month of September, as at that time they commence to grow and become well rooted before winter sets in. When repotting select pots that are small in proportion to the size of the plants; they should be about half filled with drainage, and the potting material may consist of three parts Sphagnum Moss to one part fibrous peat. To these add a small quantity of broken crocks and coarse silver sand, mixing the whole well together. When repotting raise the plants a trifle above the rim. Owing to the great number of species and varieties of Odontoglossum, it is impossible to enumerate them all here; but it may be of some assistance to inexperienced cultivators to know that the following kinds are suitable for the cooler division: O. Alexandræ (crispum), O. aspersum, O. bictonense, O. blandum, O. Cervantesi, O. cirrhosum, O. cordatum, O. coronarium (this particular species, owing to its rambling habit, should be placed in a long narrow basket and suspended close to the glass), O. Edwardi, O. excellens, O. gloriosum, O. Halli, O. hystrix, O. Harryanum, O. luteo-purpureum, O. maculatum, O. mulus, O. nebulosum, O. nevadense, O. œrstedi, O. Pescatorei, O. polyaxthum, O. prænitens, O. ramosissimum, O. Rossi, O. Ruckerianum, O. Sceptrum, O. tripudians, O. triumphans, O. Uro-Skinneri, O. Vuylstekianum, and O. Wilckeanum.

Few Orchids are more brilliantly coloured than the Masdevallias. The following kinds are well worthy of culture: M. amabilis, M. caudata, M. Chelsoni, M. Courtauldiana, M. cuculata, M. Davisi, M. Gairiana, M. Gargantua, M. Harryana, M. ignea, M. macrura, M. racemosa, M. rosea, M. splendens, M. tovarensis, and M. Veitchiana. These may all be grown in pots as recommended for the Odontoglossums, but they prefer a slightly warmer temperature. The following are of dwarf growth and pretty when well flowered: M. Estradæ, M. floribunda, M. Gemmata, M. heiroglyphica, M. infracta, M. ionocharis, M. melanopus, M. muscosa, M. polysticta, and M. Wageneriana. All these grow best in shallow pans that may be raised on a shelf or suspended to the roof. The following species also thrive well under the same conditions as the Masdevallias, viz., Colax jugosus, Pleurothalis, Restrepias, Cochliodas, Ada aurantiaca, Neottia picta, Zygopetalum maxillare, Trichosma suavis, Pontheiva maculata, Promenæa, Epiphronites Veitchi, Sophronitis grandiflora, etc.

Temperatures of Various Houses.—The temperatures of each division as maintained by fire heat through the winter months should be as follows: East Indian house, 65deg. to 60deg.; Cattleya, or intermediate, house, 60deg. to 55deg. If a house be devoted entirely to Mexican Orchids it should average about 55deg. Cool house, 53deg. to 50deg. The higher figures are for the last thing at night, and the lower for early morning. When severe frosts or cold winds occur a few degrees lower will do no harm, provided the inside atmosphere is comparatively dry. In the summer the East Indian house should vary from 70deg. to 75deg.; Cattleya, or intermediate house, 65deg. to 70deg.; Mexican, 60deg. to 65deg.; cool, or Odontoglossum, house, as cool as it is possible to keep it. By day, with sun heat, each division should be allowed to rise from 10deg. to 15deg., and at the same time careful shading and ventilation are necessary. In all collections of Orchids it is important to destroy insects at once, which injure the plants, if healthy growth be desired. One of the safest insecticides is Richards's XL vaporising fumigator. For such insects as scale, mealy bug, and red spider the sponge and brush must be used.

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THE TERRACE, CRANMORE HALL, SOMERSETSHIRE

"COUNTRY LIFE."

ORCHIDS EASILY GROWN, WITH THEIR TREATMENT AFTER BEING IMPORTED.

It is not possible for those who have only a small house to grow many Orchids. The family is too large and varied to cram into one, two, three, or even more structures; and, as has been already mentioned, some species and hybrids require skilful management, so much so that only the experienced Orchid grower is likely to succeed. The following kinds may be recommended to the beginner to form the nucleus of a collection:

AERIDES.

ORCHIDS REQUIRING A WARM HOUSE.—The deciduous Calanthes are most useful for general decorations, and for the supply of an uninterrupted succession of flowers suitable for cutting during the winter months. The best kinds to grow are C. Veitchi, C. Sedeni, C. Victoria Regina, C. bella, C. Burfordiense, and the pure white C. Harrisi, all of which are hybrids raised in this country. Among the species the finest are C. vestita lutea, C. v. lutea, C. v. rubro-oculata, C. rosea, C. Regnieri, C. Sanderiana, and C. Stevensi. Owing to their easy propagation these plants are rarely brought from their native habitat, but if anyone has imported plants to deal with he should fix the pseudo-bulbs in an upright position, in the smallest pots possible to hold them, using dry Sphagnum Moss to keep them firm. Immediately they commence to break, repot them, using the following compost: One-half good fibrous loam, one-fourth leaf soil, and the remainder finely-chopped Sphagnum Moss and coarse silver sand, the whole being well mixed together. After being repotted, place the plants on the lightest side of the house, and give little water until the roots are in full activity and the growths appear vigorous, then the supply should be gradually increased. After the flowering season Calanthes require a long dry rest, and should be kept in the warm house on a shelf near the roof glass. The proper time to repot established plants is about March, when they commence to grow. Dendrobiums have always been regarded as easy to cultivate, and for usefulness where cut flowers are required in quantity the well-known varieties of D. nobile, D. Wardianum, D. crassinode, D. aureum, D. Dearei, and D. Phalænopsis Schroderianum are unsurpassed. Dendrobiums newly imported should be placed in pots just large enough to hold them for one season, the pots being nearly filled with drainage materials, making the plants quite firm by tying the bulbs to neat sticks. The crocks in which the plants are placed should be

sparingly watered at first, and as soon as the young growths and roots have fairly started, peat and Sphagnum Moss may be packed firmly around the base. Keep the new plants in an intermediate temperature until they have made a good start, when they should be placed in a hot moist position in the "growing" house. Newly-imported Cypripediums, such as C. barbatum, C. superbiens, C. Argus, C. Hookeræ, C. callosum, C. ciliolare, etc., may with safety be potted in well-drained peat and Sphagnum Moss soon after arrival, but such species as C. Stonei, C. Lowi, C. Rothschildianum, C. Parishi, C. Chamberlainianum, C. Sanderianum, etc., should be placed in small pots, keeping the base of the foliage on a level with the rim of the pot and filling up with crocks only. They should be well supplied with moisture through the crocks, but water must not be allowed to get into the growths or in the axils of the leaves, as they are extremely liable to decay from this cause.

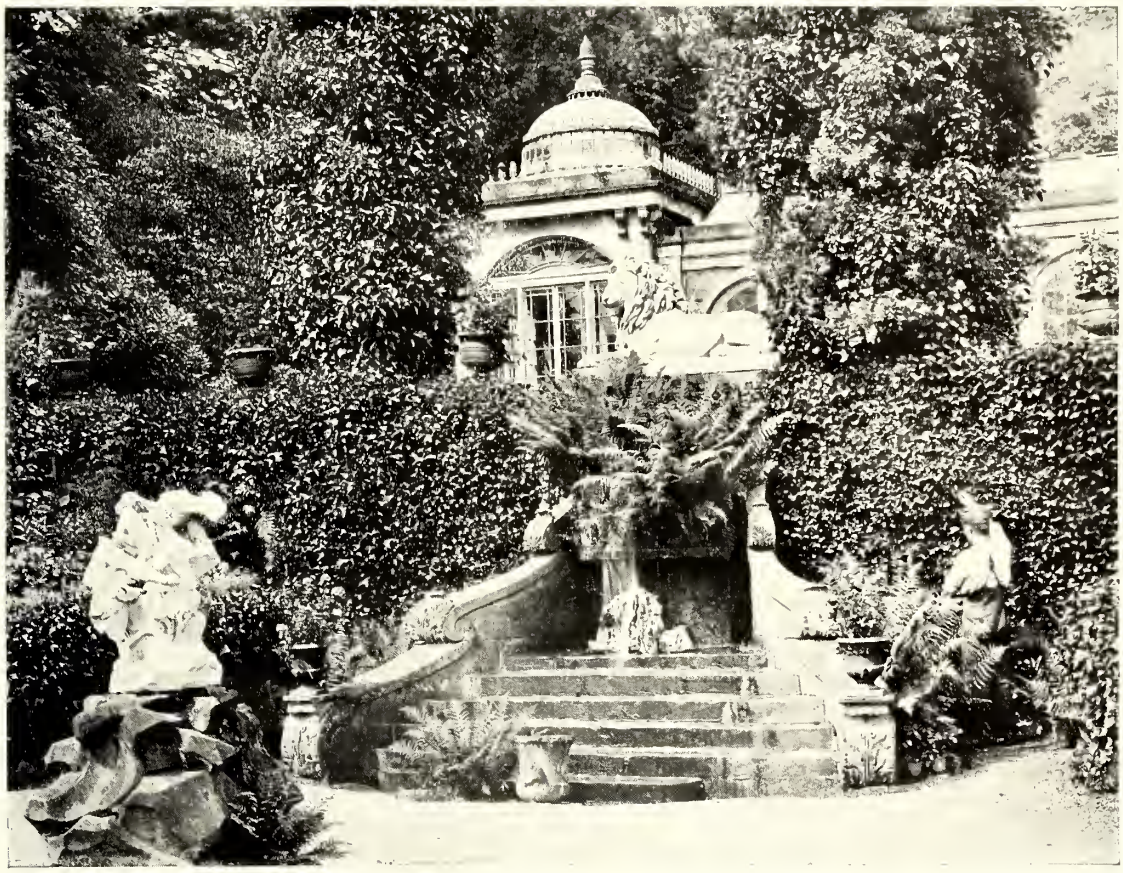
PLANTS FOR INTERMEDIATE HOUSE.—Few, if any, Orchids are handsomer than the beautiful Cattleyas and Lælias. Plants of these species may be had in bloom nearly the whole year round, beginning in January, February, and March with the numerous varieties of C. Trianæ, following which in April are C. Schroderæ, C. Lawrenceana, then in May and June C. Mendeli, C. Mossiæ, C. Skinneri, and Lælia purpurata; July, L. tenebrosa, L. elegans; August, C. gigas, C. Dowiana and its variety aurea; September and October, the well-known C. labiata autumnalis, C. Gaskelliana, C. Bowringiana, and L. pumila; November and December, C. Percivalliana, Lælia autumnalis, L. anceps and its many distinct varieties. Newly-imported Cattleyas and Lælias should on their arrival be treated similarly to the Dendrobiums. In order to induce root activity the atmosphere surrounding the plants should be kept moist, and pour water through the crocks two or three times a week, but no water should be allowed to touch the pseudo-bulbs or rhizomes, especially those of the L. anceps type, for fear of rotting them. Immediately these plants begin to grow, or young roots commence to push out, pot them in equal parts of peat and Moss, and it is advisable to intermix large crocks with the compost so as to prevent rapid decay and improve the drainage. When in full growth Cattleyas and Lælias should be watered only when the soil is properly dry, and then a thorough watering should be given. Miltonia Vexillaria is a general favourite among Orchidists, it being useful as a decorative plant, also for exhibition, for it is rarely absent from any large early summer show. At

ONCIDIUM ORNITHORHYNCHUM.

the present time it is frequently imported, and may be purchased at a very cheap rate. This plant requires similar management to Lælias of the anceps type on being freshly imported, but when root action commences it should be potted in Sphagnum Moss, mixing a moderate quantity of small crocks and silver sand with it. Place the plants in the coolest part of the house, and shade them from all sunshine until properly established. Cœlogyne cristata is a beautiful winter-flowering plant, but it is seldom imported, because it is so readily increased by division that established plants are easily obtained. Imported plants should on their arrival be placed upon a thin layer of Sphagnum Moss, and sprinkled overhead occasionally with tepid soft water, using a fine syringe for the purpose. When the pseudo-bulbs have regained their plump condition the plants may be placed in well-drained pans, using rough turfy loam and peat for them to root in. Such Cypripediums as C. insigne, C. Spicerianum, C. Charlesworthi, C. purpuratum, C. villosum, C. caudatum, and C. Boxalli which require the temperature of this house should be treated as recommended for C. barbatum, etc.

A. LÆLIO-CATTLEYA.

PLANTS FOR COOL HOUSE. — Such Odontoglossums as O. crispum, O. Pescatorei, O. Halli, O. luteo-purpureum, O. cirrhosum, O. triumphans, O. Harryanum, O. Rossi majus, O. Andersonianum, etc., should when newly imported be placed in the smallest possible space, using nothing but clean pieces of crocks to fix them with, and these crocks should be watered sparingly at first with the spout of the watering pot, only sufficient being afforded to replace that which may be lost by evaporation. Place the plants upon the stage and keep them well shaded from all sunshine. Under such treatment they will rapidly plump up, and roots form quickly in large numbers. At this stage they should be potted in a compost consisting of equal parts of peat and chopped Sphagnum Moss, mixing it well together, and adding a moderate quantity of small crocks to keep the soil porous. Until well rooted, great care must be taken not to overwater them. Then, as the roots and growth gain strength, water may be more frequently and liberally given. Lycaste Skinneri requires identical treatment; also such Oncidiums as O. concolor, O. Marshallianum, O. macranthum, O. crispum, O. varicosum, O. Forbesi, O. curtum, O. olivaceum, Lawrenceanum, etc. The brilliant Sophronitis grandiflora and Epidendrum vitellinum majus should be placed in small pans suspended well up to the roof glass. Those who are interested in Orchid cultivation know well how prone newly-imported plants are to flower, but it is very detrimental to allow them to do so before they are properly established. Vigorous growth is the thing to obtain, and over-flowering the plants at any time is undoubtedly an evil.



FERNS ON THE LION FOUNTAIN AT ALTON TOWERS.

FERNS—HARDY AND EXOTIC.

By Charles T. Druery, F.L.S., V.M.H.

To the studious and appreciative eye the delicate cutting and graceful form of a Fern are fully as attractive as a flower, and its lovely shades of green constitute indeed a welcome change from the brilliant hues of the parterre where Flora flaunts in dazzling costumes as gay as varied. Popularly, however, Ferns, especially the native hardy Ferns, are regarded as little better than weeds, and although in innumerable gardens we find specimens of one or two species, sometimes well grown and handsome, but more often starved and wretched looking, the full capacity of the plants as decorative foliage plants is utterly unknown to most people even among those who grow them. Our temperate island climate being decidedly congenial to Ferns, as is evidenced by their profusion in our Western Counties, certain forms of our particular native Ferns ranking, as we shall presently see, with the most beautiful ones the world produces, we propose in this article to do what we can to enlighten our readers as to their real and proper merits. Before, however, we enter upon this particular phase, we may point out that Ferns, incredible as it appears, are the accepted progenitors of all our flowers. There was a time in the history of the world when no flowers existed; the earth's surface was mainly covered with warm ocean waters and steamy marsh lands, roofed in with cloudy vaporous skies. Vegetation evolved from the humble seaweeds gradually found a footing on the land, and in adapting itself to aerial conditions was developed into gigantic Mosses, Ferns, and their allies, which age after age and æon after æon grew and flourished and died to form our present coal-beds and make us heirs to the wealth and power thence resulting. In time presumably cooler and drier conditions and brighter skies and sunshine bred the

flower in some subtle fashion, and eventually produced so utter a separation between Fern and flower proper that in these days only a few dim traces of surviving links appear in the Cycads and the Maidenhair tree (Salisburia adiantifolia), and these only to the keen-eyed scientific botanist. Into this realm of abstruse research it is not our province to stray, but we may point out that it was only in 1840 that the mystery of Fern reproduction was solved by the discovery that practically they do produce flowers, though no man had ever seen them until then, so microscopically small were they and situated in such an unexpected place. Ferns as we know them are on the average fairly large plants, since though some are very tiny and insignificant, others soar upwards to attain the majesty of trees and rival stately Palms in size and appearance. Hence on the one hand we have the beautiful little Tunbridge filmy Fern, forming a carpet of delicate Moss, and on the other the gigantic Dicksonias, Cyatheas, etc., which form the Fern forests of the antipodes. Small or large, however, the hunter for their flowers on these plants will be disappointed, no matter how keen his eyesight or powerful his lens. The so-called flowering Ferns—the Royal Fern, and exotic Osmundas, Anemias, and others—bear mere imitations of inflorescence, and on examination the apparent flower scapes resolve themselves into masses of little capsules containing an infinity of microscopic grains like seeds. If we pursue our search, we shall find every species of Fern to bear similar capsules and similar grains, though arranged in different fashions, usually on the under-sides of the fronds. In some they are arranged in lines, in others in dots, whilst in some forms they are spread out all over the surface, or in little cups on the edges, and so on in many various ways; and as the particular way in which these capsules are arranged has been found to be one of the most constant features, that is, one least affected by variation of form, botanists have divided up the Fern tribe into genera and species according to their arrangement. Our common Hart's-tongue, to wit, has long sausage-shaped heaps of brown capsules, which, carefully inspected, are seen to consist in each case of two lines of capsules which when ripe coalesce for want of space. These lines give a fanciful resemblance to the legs of a centipede (Scolopendra), and hence the Hart's-tongue has been dubbed Scolopendrium, and any Fern which has the same sort of fructification or capsule arrangement is a Scolopendrium. The common Polypody of the hedges has round golden heaps, without

A. F. F. SUPERBUM.

BLECHNUM SPICANT VAR LOMARIO.DES

any such thin cover as is usually present in other species. All Ferns with similar naked round heaps are Polypodies, and so on. We seem, however, to be forgetting the flowers, but in point of fact we are coming to them. The little grains contained in all the capsules are called spores, to distinguish them from seeds produced by flowers. The spore when it falls upon a moist spot does not, as would a seed, throw out a root and one or two leaves, and start at once as a plant like its parent, but it pushes out a little row of green cells which multiply and spread into a small heart-shaped scale about the size of a herring scale. This forms root hairs to attach it to the soil and nourish it, and this being done, if we detach it, turn it over, and look underneath, using a good magnifying glass, we shall find the flowers at last, and shall no longer wonder at the blindness of our forefathers, for, apart from the fact that this little scale had not been recognised as connected with Ferns at all, the flowers when found turn out to be simple, apparent pimples of two kinds, one round, numerous, and scattered all about among the root hairs, the other teat-like, and crowded together near the indentation of the heart. These two, however, between them fulfil all the functions of flowers, and eventually a fertilised seed finds itself at the base of the longer pimples, and from this up springs a Fern proper as proof that the flowers have done their work. In the ordinary course the youngster in due time becomes a little "chip of the old block," and cannot be discriminated in any way from the thousands of its kindred around it, but this is not always the case. Dame Nature every now and again—how we know not—infuses the power into the Fern to build itself up in a distinct and original way, and as a rule the spores subsequently produced yield the new form generation after generation. These later offspring, however, are frequently also endowed with original minds, as it were; some improve on the first sport, some go back to the normal, and others may be inconstant "rogues" who shift from plan to plan and make a muddle of all. Among these varied offspring lie the selective cultivator's best chances, and it is due mainly to these first inspirations of Nature, and secondly to the cultivator's care, that we owe that wealth of varietal types of which we are now treating, while it is a moot point how much we are indebted to the first for all the specific and generic variety existent in the world.

Improved form raised by Mr. Parsons. *Normal form of species.* *Plumose sports.*

A. f. f. plumosum raised from superbum. *A. f. f. superbum raised by Mr. Drivery.*

PEDIGREE OF ATHYRIUM FILIX-FŒMINA PLUMOSUM.

With regard to these natural sports Great Britain seems especially favoured. Whether it is some occult property in the air, soil, or general environment, or whether it is due to the greater research in a country which is easily traversed and involves no such risks

as occur in wilder and tropical regions, is uncertain, but the fact remains that while natural sports of exotic Ferns are extremely few, those of our native Ferns run into thousands, some of the species, such as the Lady Fern (Athyrium Filix-fœmina), Shield Ferns (Polystichum aculeatum and P. angulare), and the Hart's-tongue (Scolopendrium vulgare), have yielded their hundreds apiece, while the number has been immensely augmented by selection from their seedlings. Nearly all the native species (about forty) have afforded examples, many of which are curious, but many far and away more beautiful than the common types from which they sprang. It is, of course, this feature of improvement in decorative value which is our main justification in advocating their culture, since for mere oddities we have no fancy, while ardent admirers of exotics have stood entranced before some of our thorough-bred British Ferns, and declared no exotic could vie with them.

POLYSTICHUM ANGULARE VAR PLUMOSUM DENSUM.
1. The normal form of species. 2. Wild find in South Devon. 3. Frond of "densum" raised from 2. 4. Pinna of "imbricatum" raised from bulbil of "densum."

The chief types of variation are two, viz.:

1. Cresting or tasselling, in which the normal tapering points of the fronds and side divisions are formed symmetrically into tassels, ranging from simple forks in some varieties to repeatedly divided and many stranded bunches in others. The fronds themselves may also be divided from merely twin fronds to such excessive and repeated branching that a ball of Moss is the apparent result; and

2. The plumose, by many considered the more beautiful, in which the normal side divisions of the frond and its parts are developed into extremely delicate dissection, so that a frond normally bipinnate, that is, with side divisions (pinnæ) divided once again (pinnules), has these latter sub-divisions recut twice or even thrice, the result being intensely beautiful, and equivalent to the transformation of a goose feather into an ostrich plume.

A. F. F. PLUMOSUM IN POSSESSION OF H.M. THE QUEEN.

These two main types are associated, in the natural sports as well as in their improved progeny, with many sub-features affecting habit and appearance, and in some of the finest forms both are associated, together the combination being the acme of loveliness in Fern construction. One of our own Lady Ferns, for instance, A. f. f. superbum

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A FRILLED HART'S-TONGUE.

percristatum Druery, besides its delicate plumose cutting, has immense comminuted tassels at the top of the frond, large ones on the side divisions, smaller ones on the sub-divisions of these, and finally the ultimate tiny sections are distinctly fanned at the tips, and all as even as a die. The pedigree of this Fern is (1) the common Lady Fern, (2) a plumose form found in a field at Axminster, (3) a finer cut form raised from a spore of that, all so far uncrested, then (4) a sudden break on a batch of youngsters into cresting, and the selection of Aff. plumosum superbum Druery, the mother of the one described. To illustrate this pedigree as far as superbum, we give a photograph showing the various stages, and another showing incomparably the finest Lady Fern existing (Aff. plumosum Druery), a sister plant of percristatum, though absolutely uncrested.

Ferns, however, vary in other ways; some have their fronds rolled up and curled, others have them and their side divisions abruptly terminated with a pocket or a thorn, while in the Hart's-tongue the plumose character takes the shape of beautiful frills, and sometimes these have lacy edges. Both these again may be associated with beautifully fimbriate tassels. The variety, indeed, is not only charming but endless, and of late years there has been established a splendid outdoor collection at Kew embracing some thousands of plants and hundreds of forms, including most of the best.

Having now dilated somewhat upon the merits of these varietal forms, we may next consider their culture and adaptability for ornamental purposes to country and even town gardens. In the first place, then, with very rare exceptions, the constitutions of these highly-improved types are as robust and hardy as that of the common ones, which, being native, are necessarily fitted to withstand our severest winters. Herein they obviously possess a great advantage over tenderer exotics; but, inasmuch as their loveliness entitles them to every care, it is clearly a mistake to place the delicately cut forms in positions where they are likely to suffer from drought or stress of weather. Here we must study Nature. It is in some secluded glen, the air cool and moist, the soil the same and made up of leaf mould and rocky débris, the blustering winds excluded by the leafy screen of surrounding, but not overtopping, trees, which also shade them largely from the sun,

ATHYRIUM F. F. REVOLVENS.

where we find the stateliest Lady and Male Ferns and all the smaller tribe developed to the utmost. Fifty yards away, by the wind-swept roadside, we find them all, it is true, but in what a different form—short, stunted, and wind-worn. They are the ragged school, the tramps and vagabonds of Fern life; but over the crest and down in the glen we have the pampered aristocracy in court array, and in growing them under artificial conditions the nearer we approach this ideal the more the plants will repay us. We gather from the glen illustration, indeed, all the main needs for proper culture, viz., a loose, leafy, moist soil, cool moist air, and protection from winds and excess of sunshine. It is all in a nutshell. Hence for outdoor culture a shady position under a north wall, a good deep bank of leafy loam and some sort of wind-break in case of need, and we have an ideal place for some of the tougher class, Hart's-tongues, Male Ferns, and other Lastreas, and some of the dense-growing and crested Lady Ferns. Osmunda regalis, the Royal Fern, wants a specially damp position, and if the Marsh Buckler Fern (L. Thelypteris) be grown, a good plan is to sink a glazed earthen

FERNS IN THE WILD GARDEN AT CAUNTON MANOR, NEWARK.

pan or tub with the edge just below the surface, half fill with bricks, and complete with a peaty compost, planting the Ferns in the soil over this hidden arrangement, which, by retaining water, forms a bit of bog in which the roots will revel to the consequent benefit of the fronds. That difficult little Fern, the Parsley Fern (Allosorus crispus), takes absolute care of itself and thrives year after year if properly treated, Nature being again our teacher. We find this Fern on slaty, rubbly hillsides, rooting into shifting débris washed or rolled down from above, ever and again burying it. Profiting by the lesson, we dig out a hole and half fill it with leafy mould, mixed with a little gravel. On the top we place a clump of the Fern, mulch it up a little with the same compost, and then dump a spadeful or two of gravel stones over and round it. This done, take a big lump of rock or clump of brick-burrs and bed this so that the Fern crown can just push through underneath it on the north side. Water all well, and leave it alone. Presently the Fern, recovering from a presumed avalanche, begins its old trick of pushing fresh fronds through the débris and

rooting into the stuff below, and in a surprisingly short time a fine established clump will line the juncture of the rock with the soil. It may be taken as a rule that interspersed rocks are congenial to Ferns. They keep the soil from baking and encourage root-formation, and many a Fern will thrive if treated à la Parsley, minus perhaps so liberal a covering, since as a rule the crowns are better above the surface but in the shade.

Hart's-tongues are wall Ferns as well as ground Ferns, and require a little lime in the soil, hence if planted at a north wall foot they thrive capitally. The Male or Buckler Ferns do well in any soil, but the Mountain Buckler Fern (L. montana) does not like lime or hard water, and does well in a yellow loam. Blechnum Spicant, the Hard Fern, has the same dislike, but prefers a little more peat or leaf mould, assuming its largest size in the latter. The common Polypody, a denizen of old trees and wall tops where leaf mould has collected, indicates its predilections thereby; good sandy leaf mould and a well-drained and sloping position suit it best. Its pretty cousins, the Oak Fern (P. Dryopteris), the Beech Fern (P. Phegopteris), and the Limestone Polypody (P. calcareum) want a looser leafy compost and a shaded nook; the last-named needs some lime. The Spleenworts, one and all, are rock-lovers and need a chink, and, as a rule, some lime as well.

FERNS BY STREAMSIDE. VEN HOUSE, SOMERSET.

Finally, those who can and do grow Ferns in their little domains should ignore the common forms to a large extent, especially as fronting plants, and give a good selection of the best varieties at any rate an equal chance. Their relative merits would then speedily become clear, and the varietal forms undoubtedly would oust the common or normal types entirely, to the cultivator's great advantage.

CULTURAL HINTS AND A FEW OF THE BEST HARDY FERNS.

THE easiest species to grow are undoubtedly the Lady Fern (Athyrium Filix-fœmina), the Male Fern (Lastrea Pseudo-mas Filix-mas), the Broad Buckler Fern (Lastrea dilatata), the Shield Ferns (Polystichum aculeatum and P. angulare), and the Hart's-tongue (Scolopendrium vulgare); and as these embrace the bulk of the most beautiful varietal forms, there is no lack of material ready for those who wish to grow a collection either in the open ground or in pots under the cool roof of a conservatory. In the open all these species will thrive in ordinary garden soil, but it is quite worth while to encourage them by a liberal admixture of leaf mould or peat mould, especially if the soil has a tendency to stiffness; or a good dressing of old and well-decayed manure would serve the purpose equally well. As regards

position, the wind and the blazing sun should be avoided as far as possible; hence a bed under the foot of a wall facing north, or under the lee of a hedge or shrubbery, is preferable to an exposed one; but under overhanging trees even Ferns get out of condition through lack of sufficient light, and also through root-starvation owing to the monopoly of the soil by the roots of the trees themselves. In planting, care should be taken to leave ample room for development, and as far as possible the plants should be kept down to single crowns by persistent removal of offsets as they are formed. A crowded bunch of fronds is not only an eyesore, but under such conditions the full character of a variety is rarely seen to advantage. The larger forms should also be kept in the background, reserving the front for the smaller ones; and it is a good plan, even on a flat bed, to insert rough pieces of porous stone or brick burrs between the plants, as these not only check overcrowding to some extent, but retain moisture in the soil during dry spells, to the great benefit of the plants. Under glass the great thing to avoid is an excess of heat in the summer; in our ideal hardy Fernery we should never see the thermometer over 70deg. at the utmost. Hence hot sunshine must be excluded by shading—either thin scim outside the glass, or a wash of white upon it; a removable blind is of course the best, as the more daylight plants get the healthier they are. With very precious plants it is well to have them in two pots, the outer one keeping the inner one cool; and when this is done the two may be placed in a saucer containing sufficient water for the outer pot to stand in, while the inner one is free of the water, and hence, while benefiting by the percolation, the soil cannot get waterlogged.

TASSELLED HART'S-TONGUE (S. V. Blechnoides Cousins)

Space, however, precludes more than these few hints, and we will now proceed to describe a few of the best forms. Athyrium Filix-fœmina (the Lady Fern). Beyond question the most charming are the plumosums, A. f. f. Axminster and its progeny A. f. f. pl. elegans, A. f. f. pl. superbum, dissectum, plumosum Drueryi, crispatum, and kalon, all gems of first water, large in growth and finely cut. A. f. f. pl. Horsfall, Wills, and Barnes are also lovely, while A. f. f. Kalothrix, which needs glass protection, is like spun glass or floss silk, and stands alone in its peculiar line. Among the crested or tasselled varieties, A. f. f. percristatum Cousens, A. f. f. Elworthyi, A. f. f. corymbiferum James, A. f. f. Vernoniæ cristatum, A. f. f. regale, A. f. f. setigerum percristatum, and A. f. f. pl. superbum percristatum are all grand robust growers, even the pinnules being tasselled in the last-named. Then we have the curious allied to the beautiful in this line in A. f. f. Victoriæ, each side division in duplicate, and set at such an angle that the frond is a string of tasselled crosses, a unique Fern in all the world, and yet a native; A. f. f. Vernoniæ and conioides have a frilly look in their divisions;

A. f. f. revolvens has its pinnæ in ringlets and the end of each frond to match; A. f. f. stipatum Grantæ, congestum, Edwardsi, Findlayanum, and Whitwelli have densely compacted fronds, and consequently form good dwarf plants for front rows; A. f. f. orbiculare, gemmatum, and acrocladon represent a class of Ferns so heavily tasselled that they resemble masses of Moss arranged more or less frond fashion.

Among the Male Ferns, L. p. m. cristata, the King of the tribe, is a splendid fellow, finely crested and robust, forming a grand Tree Fern if kept to one crown. L. p. m. polydactyla Wills and L. f. mas polydactyla Dadds are good companions, while L. p. m. cristata plumosissima is a delicate silken édition de luxe of the species. L. p. m. ramosissima tries to imitate the Mossy section of Lady Ferns in a very masculine way, and L. p. m. ramulosissima does the same thing on a dwarf scale, and is in good company with the little gems

A BRITISH FERNERY.—MR. C. T. DRUERY'S COLLECTION.

L. p. m. crispata, crispata cristata, and crispa gracile, all a few inches in height only. A narrow-bodied son of the King aforesaid, L. p. m. cristata angustata, is a good foil, but not so robust. In some way it has allied itself with one of the dwarfs and given us L. p. m. angustata congesta, a curious little beauty. L. p. m. revolvens tries to cultivate ringlets like the Lady Fern, but only succeeds, very prettily, in rolling its fronds into tubes. There are three sub-divisions of the Male Fern tribe, and in each there are varieties on similar lines; the above are the choicest types. The Broad Buckler Fern (L. dilatata) likes a peaty moist station; it has given us fine tasselled forms, L. d. cristata Oscroft and grandiceps Barnes, and there are in cultivation two splendid varieties of the same species from the Azores, L. d. folioso cristata and polydactyla, which are quite evergreen and hardy under glass. L. d. Howardæ is a curiosity, all pinnules short and duplicated evenly. The Shield Ferns (Polystichum aculeatum and angulare) swamp us with types worthy of recommendation, and

we can but indicate a few. All the plumose divisilobes, as they are called, are magnificent. P. ang. div. pl. densum Jones and Fox rivals Todea superba in delicate division. P. ac. pulcherrimum is a grand Fern and without parallel for fineness of make and artistic finish; it is perfectly barren except in offsets, and is consequently rare. There are many tasselled forms of both species, and many alliances have been brought about between varieties by crossing, so that their name is legion. P. ang. cristatum Woll No. 10, grandiceps Talbot, Abbott, and Jacob Jones are splendid. In this tribe, as in the others, there are giants and dwarfs, and among the latter, often the prettiest, are Lyellii, crispata-congestum, parvissimum, and congestum; there are also P. ang. revolvens with rolled up fronds, very graceful, and others with infinite variety of cutting and make, proliferous and otherwise. In this tribe, indeed, one can hardly go wrong; a point, however, is that they mostly do best in the open. Some of the finest plumose ones indeed rarely perfect the tips of their fronds under glass, their very density breeding a sort of mouldiness in the unrolling coils unless abundance of air is provided.

THE YEW ARBOUR, ROUS LENCH.

Hart's-tongue (Scolopendrium vulgare) would form a grand collection by itself. A favourite position for it is at the foot of a north wall, or under the lee of a row of burrs or rocks facing north. They do well in pots well drained and with some little lime in the soil.

The frilled Hart's-tongues (S. v. crispum) are certainly the handsomest, as all are fine, S. a. c. grande Wills being the most distinct. Of late there have been introduced some crispums (Stansfield's and Cropper's) with fimbriated edges and tassels, all lovely things, but needing glass to show full form. S. v. cristatum ramo-marginatum, ramo-cristatum, grandiceps Cousins and other grandiceps are finely tasselled forms of the species, which varies in all directions from huge frilled ones down to the Mossy sections Wardii, Coolingii, Kelwayii, culminating in S. v. densum Kelway, which resembles, when well grown, a spherical ball of some Selaginella.

Finally, for glass culture in the lightest and airiest parts we must recommend the best forms of the Common Polypody (P. vulgare); P. v. cambricum, Barrowi, Prestoni, Hadwini, and other finds are simply lovely plumose forms. P. v. elegantissimum is a lace-

like variation, and P. v. cristatum, grandiceps Fox, Forster, and Parker are gems of cristation. P. v. pulcherrimum is on Cambricum lines of folioseness, but fertile. There are numerous other forms, and all do well if bedded on the surface of good rough brown peat and leaf mould mixed with a very little loam and some sand. Plant in shallow pans and stand these in saucers, keeping the saucers filled with water. Under these circumstances they form grand evergreen specimens, and improve in beauty year by year.

EXOTIC FERNS.

THESE comprise a large and variable class of plants, many being popular because easily grown and of beautiful form. In a large number the fronds are delicately divided and cut, while the fresh green colour of many of them tends to increase their popularity. For arranging with flowering plants they are invaluable, as they furnish charming masses of greenery to serve as a foil to the more gaudy tints of the flowers. Many Ferns are of delicate constitution, and need special care and attention; while on the other hand large numbers even of those that require a stove or greenhouse are robust, and if not coddled during their earlier stages of growth will stand considerable exposure, and may be used for indoor decoration for long periods with impunity. Again, where flowers are grown for cutting, Fern fronds are often used in their arrangement, the Maidenhair being frequently cultivated in large quantities for the supply of fronds alone. Ferns occur naturally in all quarters of the globe, and vary in height from 2in. or 3in. to 50ft. or 60ft., as Dicksonia antarctica in its Australian home, and the even taller Alsophila excelsa.

Though most Ferns have fronds of some shade of green, there are many exceptions, and some of those that are of that tint when mature are brightly tinged in their young state, while a few are clearly and distinctly variegated, a feature which occurs more frequently among the forms of Pteris, or ribbon Ferns, as some of them are popularly called.

In many kinds the fronds are crested, that is, they are tufted or tasselled at the ends, and this frequently leads to a more or less pendulous style of growth. Several of the

AN OUTDOOR FERNERY.

FERNS ON WALL.

Gymnogrammas are thickly covered with white or yellow powder, which is easily rubbed off. Curious forms are plentiful, but none are more striking than the Stag's-horn Fern (Platycerium), which has boldly-divided fronds, as its popular name suggests. Climbing Ferns are not numerous, but at the same time there are a few, while there are many with creeping stems which will travel some distance. The filmy or transparent Ferns are charming, but they need far more attention than any of the others, as they occur principally in moist forests, and on this account a particularly humid atmosphere is necessary.

CULTURE.—At one time peat soil and heavy shading were considered essential to the successful cultivation of stove and greenhouse Ferns, but this practice has been considerably modified of late years, and now the majority of decorative Ferns are potted in a mixture of loam, peat or leaf mould, and sand, while only moderate shading is given. Potting should be done about March, though plants that are growing freely may be shifted into larger pots if necessary at any time, except late autumn and winter. While the majority will succeed perfectly in the compost just mentioned, others need special treatment, and this will be alluded to in dealing with the separate families. Many Ferns are very beautiful when grown in suspended baskets or pots, their elegant growth being in this way seen to advantage. The dead trunk of a Tree Fern may be turned into a very beautiful object by planting other Ferns thereon; thus a specimen with ample leafage should be placed on the top, and various creeping kinds around the stem, which will in time be completely clothed with them. The top should be hollowed out for the reception of the plant there, and the creeping kinds may be bound round with a little live Sphagnum Moss, which will assist them to become quickly established. If damped overhead frequently this will soon take place. Ferns are by many regarded as water-loving plants, and this applies to most kinds, providing (and this is very important) that ample drainage is ensured, for stagnant moisture is hurtful.

PROPAGATION.—This is, as a rule, accomplished in three different ways—firstly, by division; secondly, by spores; and the third is only applicable to proliferous Ferns, that is, Ferns which produce little plants on the fronds. These tufts simply need to be brought in contact with

the soil to produce roots of their own. Division is best carried out in March when repotting, and if it is carefully managed no special treatment will be afterwards required. The spores, which in Ferns are equivalent to the seeds of flowering plants, afford a ready means of increasing them in large quantities, as in some kinds at least a single frond will contain thousands of spores. They are found principally on the under-sides, large masses of them being arranged in dots or bands. A careful examination will show that they are enclosed in what is known as spore cases, which in many kinds form a scale-like substance on the under-side of the frond or leaf. Directly these cases burst the spores are discharged in the shape of very fine powder, which often drifts some little distance before it finally settles. This explains how it is that young plants occur in various positions. To secure the spores, a frond or fronds should be cut off just as the earliest cases commence to discharge their contents, and folded up in a sheet of clean white paper. In a few days, if kept dry, they will be shed, and the operation of sowing may then be carried out. Pots 5in. in

A FERN DELL.

diameter are a suitable size for the purpose, and they should be prepared by putting 2in. of broken crocks in the bottom, on which the soil must be put. A mixture of loam, peat, and sand, passed through a sieve with a ¼in. mesh, forms a good compost. This must be pressed down moderately firm and made smooth, leaving about 1in. below the rim of the pots. Having been watered through a fine rose, the spores should, while the soil is still wet, be sown as thinly as possible. No soil must be sprinkled over them, a pane of glass laid on the pot being sufficient covering. If the pot be then placed in a small saucer of water a uniform state of moisture will be ensured, which is essential to the growth of the spores. All being well, after a lapse of a month or so the surface of the soil will become covered with a Moss-like substance, which as soon as it appears unduly crowded should be pricked off. This is carried out by preparing some pots in the same way as for sowing the spores, except that the soil is very lightly pressed down. The spores are then lifted up in tiny tufts with a pointed piece of wood, laid on the surface of the new soil, and lightly pressed

in position. Then if watered and kept in a humid atmosphere they will continue to grow, and after a time push up fronds, when they may be potted into tiny pots. Small Ferns are grown in this way by thousands in many nurseries. The months of February and March are suitable for sowing the spores, as they have then the entire season's growth before them. Young plants on the fronds need only be taken off and pegged securely on a pot or pan of light soil, when they will soon root.

The number of exotic Ferns in cultivation is enormous, hence a selection of the best in each family is given in the following list:

Acrostichum.—An extensive family, the members of which differ widely from each other in many particulars; indeed, the various plants now included under this head were formerly split up amongst half-a-dozen families. Most of them are more or less of a creeping nature, and some in a native state attach themselves to neighbouring trees, and mount upward after the manner of Ivy. They prefer a mixture of peat and sand. The best are: A. acuminatum, with much divided deep green fronds. It reaches a height of about 2ft. A. aureum, with pinnate fronds, sometimes 5ft. or 6ft. long, very bright green and leathery in texture. It is a native of the swamps of Florida, and must be treated as a semi-aquatic. A. Cænopteris, with creeping stems which will encircle the stem of a dead Tree Fern, the pinnate leaves depending gracefully therefrom. A. crinitum, known also as Hymenodium crinitum. This, the Elephant's Ear Fern, has large undivided fronds which are borne on short stout stalks. These fronds are very hairy, and suggest the popular name of this kind. A. drynarioides, with large, once divided fronds, which are pushed up direct from the ground without any visible stem. A. Herminieri, sword-shaped fronds, from 2ft. to 3ft. long. A. osmundaceum, the creeping stems of which mount up into large trees in a native state. The fronds, which are 2ft. long, are thrice divided, and of a deep green tint. A. quercifolium, a little creeping kind, with Oak-like leaves 2in. long. A. scandens, known also as Stenochlæna scandens, with long trailing stems furnished with leathery pinnate leaves. Most of the Acrostichums require the temperature of a warm greenhouse or stove.

Actiniopteris radiata.—The only species of the family. The plant from a central stem pushes up numerous fronds rayed like a Palm, to which the entire plant, though only 6in. to 8in. high, bears a considerable resemblance. It needs a mixture of peat, loam, sand, and broken bricks, while the pots must be thoroughly drained. The cool part of the stove suits it best.

Adiantum (*Maidenhair*).—This is an extensive class, many members of which are among the most popular of Ferns, the common Maidenhair (A. cuneatum) in particular being a universal favourite. The greater part of them are of comparatively simple requirements, and many will succeed in a greenhouse temperature. A mixture of loam, peat or leaf mould, and silver sand, is suitable. The best would include A. assimile, a loose-growing Maidenhair, well suited for suspended baskets. A. assimile cristatum, with crested tufts on the end of the fronds. A. aneitense, bold arching fronds about 2ft. long, well adapted for growing into a large specimen. A. Bausei, like a bold Maidenhair, with peculiar drooping leaflets. A. Birkenheadi, large thrice divided fronds, nearly 1yd. long when fully developed. A. Capillus-Veneris occurs in a wild state throughout the greater part of the globe, and is the only Maidenhair native of this country. There are many distinct varieties, one of which, imbricatum, is much like a miniature form of A. Farleyense. A. caudatum, with long once divided fronds that produce young plants at the tips. It is best grown in a suspended basket. A. Collisi, a garden plant with massive triangular-shaped fronds. It makes a grand specimen, and is useful in a cut state. A. concinnum has wide-spreading fronds, a Fern seen to great advantage in a basket. A. concinnum latum is larger and more upright than the last. A. cuneatum is the universally grown Maidenhair, and its fronds are in great demand in a cut state, while the plants are used for various decorations. The varieties are numerous, chief among them being: A. cuneatum deflexum, with drooping segments; A. c. elegans, very slender; A. c. gracillimum, a spreading plant with remarkably minute pinnules; A. c. grandiceps, with tassel-like tufts on the ends of the fronds; A. c. Pacotti, a dense-growing plant, with peculiarly clustered pinnules; A. decorum, a larger and bolder plant than A. cuneatum, with the young fronds of a reddish hue; A. Farleyense (Queen of Maidenhairs)—the fronds are very massive, and droop considerably from the weight of the large crisped pinnules; A. Fergusoni, an upright plant with deeply-lobed pinnules; A. formosum, a large spreading kind 1yd. high; A. fulvum, a neat little Fern, with young leaves of a bronzy tint; A. Henslowianum, beautifully arching fronds 18in. long, thickly clothed with overlapping pinnules; A. hispidulum, fronds distinctly forked, and the pinnules hairy—the young fronds are of a metallic hue; A. lunulatum, with long slender fronds that produce young plants from the tips—it should be suspended, and is quite deciduous during the winter; A. macrophyllum, a distinct species, with large leaflets which when young are tinged with red—it reaches a height of 15in. to 18in.; there is a variety (striatum) with variegated leaves; A. Moorei, known also as A. amabile, is a loose-growing plant of the cuneatum section, but the pinnules are larger and set farther apart—a charming basket plant; A. palmatum, remarkable for its zigzag stalk and large lobed pinnules; A. pedatum, the Bird's-foot Fern of North America, is hardy in some places, but does well in the greenhouse; A. peruvianum, large arching fronds and halbert-shaped pinnules, one of the largest growing of the Maidenhairs; A. reniforme, a curious little kind, which forms a tuft of simple kidney-shaped leaves; A. scutum, a large, handsome Maidenhair, with wide-spreading fronds of a pleasing shade of green; A. tenerum, somewhat like the last, but with deeper tinted fronds; A. tinctum forms a little tuft less than 1ft. high, the young fronds of a bright rosy red; A. trapeziforme, the large branching fronds of which are as much as 1yd. long, while the pinnules are 2in. in length; A. Williamsi is distinguished from all other Maidenhairs by the young fronds being dusted with a bright yellow powder.

Alsophila.—A strong-growing group, many of which are included with the Tree Ferns, and one species, A. excelsa, is perhaps the tallest of all Ferns. They do well in a mixture of equal parts of loam and peat, with a good sprinkling of sand. Most of them need a stove temperature. A. atrovirens, A. australis, A. crinita, A. excelsa, A. Van Geerti, A. pruinata, and A. Rebeccæ are the best and most distinct.

Anemia.—These are for the most part of dwarf growth, and remarkable from the fact that the barren and fertile fronds are perfectly distinct from each other, the latter, which are pushed up from the centre of the plant, resembling more the feathery inflorescence of a herbaceous plant than the frond of a Fern. Owing to this feature the members of the section to which the Anemias belong are known as flowering Ferns. Our native Royal Fern (Osmunda regalis) is a well-known member of this group. The Anemias principally occur in tropical America, a selection of the best being: A. adiantifolia, about 18in. high, with twice divided leaves of a deep green hue,

A. Dregeana, the size of the last, with deeply toothed leaflets of quite a firm leathery texture. The fertile or flowering part is borne on the upper portion of the fronds. A. Phyllitidis, of vigorous constitution, often reaching a height of 2ft. The pinnate fronds are of a dark leathery green, and form a bold tuft, which, when overtopped by the slender fertile ones, resemble a plant in flower. A. rotundifolia, fronds 1ft. long, with rounded pinnæ, which when first developed are of a reddish bronze tint. The fronds are disposed almost horizontally, and will root at the ends and push up young plants therefrom. The fertile fronds are like the preceding. A. tomentosa, distinguished from all others by the rusty-coloured hairs with which the stalks are thickly covered, though in other particulars it is something in the way of A. Dregeana.

Angiopteris evecta.—The huge spreading fronds of this are pushed up from a swollen base, so that it never forms a tree-like habit. A head of fronds will attain a diameter of 20ft., but of course it is very effective when much smaller than this.

Aspidium.—By some authors the Ferns grown in gardens under the names of Cyrtomium and Polystichum are grouped under the head of Aspidium, but they are here referred to under their better-known titles.

Asplenium.—An extensive group of fairly easy culture, the members of which in most cases push out their gracefully arching fronds from one central crown, thus forming a specimen of very regular shape. There are numerous kinds in cultivation, a few of the best being the following: A. alatum, with prettily toothed oblong-shaped pinnæ arranged on either side of a curiously winged stem. A. Bellangeri, in which the fronds are produced so regularly as to form quite a vase-shaped specimen. They are about 18in. long, from 2in. to 3in. broad, twice divided, and of a bright cheerful green. A. bulbiferum, very handsome, the much-divided fronds bearing a great number of small plants on their tips. A. cicutarium, fronds very thin in texture, and of a particularly bright green. A. Colensoi, a compact, dense-growing plant in the way of A. bulbiferum, but smaller. A. dimorphum, with two different sorts of fronds. A. ebeneum, a compact plant about 1ft. high, something like an enlarged form of the British A. Trichomanes. A. formosum, after the manner of the last, but with more divided leaflets. A. incisum, an upright plant 1ft. high, with the leaflets deeply cut. A. laserpitifolium, with extremely elegant much-divided fronds, which are 1yd. long and 18in. broad. A. longissimum, the fronds of this are 2ft. to 3ft. long and about 4in. wide. The pinnæ are arranged alternately on a conspicuous blackish stem. A. Nidus, which has large leathery undivided fronds, borne in a regular manner, thus leaving a hollow centre; it is from this circumstance known as the Bird's-nest Fern. A. obtusilobum, a dwarf Fern that pushes out long runners on which little plants are borne at intervals. A. rutæfolium, with very deeply-cut fronds. A. viviparum, the fronds of which are divided to the finest possible proportions, the plant being therefore of an exceedingly light feathery appearance, while the tiny plants are in some instances at least thickly scattered over the frond.

Athyrium Goringianum pictum.—A deciduous Fern, with spear-shaped fronds, and numerous leaflets divided into pointed segments. The stalks are reddish, while the fronds are of a greyish green hue. It reaches a height of 1ft. or more.

Bird's-nest Fern.—*See* Asplenium Nidus.

Blechnum.—Most of the Blechnums are vigorous Ferns, with either simple or once divided fronds. They succeed in a mixture of peat, loam, and sand, and grow rapidly, from which circumstance some of them are very popular. B. brasiliense is quite a miniature Tree Fern, with a stem 1yd. high, and when crowned with its massive once divided fronds it forms an imposing feature. The variety corcovadense differs from the type in the young fronds being bright red when young. B. glandulosum is a creeping kind with spear-shaped fronds 18in. in length, and furnished with long narrow sickle-shaped pinnæ. B. occidentale is of vigorous growth, but of comparatively dwarf habit, the fronds being about 1ft. long. It may be grown with very little trouble, and on this account is very popular.

Brainea insignis.—A small Tree Fern, with a stem never more than 4ft. high. The pinnate fronds are in the strongest examples about 1yd. long. They are of a bronzy tint when young. It needs stove temperature and careful cultivation.

Cheilanthes.—A pretty little class of Ferns, remarkable principally from the fact that the fronds are very hairy, hence they should be grown in a moderately dry atmosphere, as if very moist they soon decay. A selection would include: C. aurea, that reaches a height of about 6in., with triangular-shaped fronds, the under-sides of which are covered with a yellow powder. C. elegans, sometimes called the Lace Fern, from the fact that a frond presents the appearance of an intricate pattern of lace. They are very brittle, and clothed with a woolly down. C. farinosa, an upright grower 1ft. high, with fronds covered with a whitish powder, in the way of the Gymnogrammas, but not so pronounced. C. hirta Ellisiana, with long spreading intricately divided fronds, clothed with reddish brown hairs. C. tomentosa, a delicate greenhouse species, with quite woolly fronds.

Cibotium.—A limited group, one member of which, C. Barometz, forms a large wide-spreading specimen, while the other three, C. princeps, C. Schiedei, and C. spectabile, are Tree Ferns. C. Barometz is sometimes called the Vegetable Lamb, from its massive prostrate hairy stem.

Cyathea.—The members of this family consist for the most part of Tree Ferns, many of which are very rare. Two noble species for the conservatory are C. dealbata and C. medullaris. The first-named, C. dealbata, is said to occasionally reach a height of 40ft., but here it is seldom taller than 10ft. to 12ft. The fronds are of a bluish green colour above and silvery white underneath. C. medullaris is one of the most rapid in growth of Tree Ferns, and attains in its native habitats a height of 40ft., with spreading fronds 12ft. to 15ft. long. As C. dealbata is a native of New Zealand, and C. medullaris of the same district, and also of Norfolk Island, it follows that they will both succeed in a greenhouse. The last-named is valuable for decorations when small.

Cyrtomium.—Two species of Cyrtomium, both of which are natives of Japan, are valuable Ferns for the cool greenhouse, as they succeed better under such conditions than in heat. They are C. falcatum and C. Fortunei. Both have pinnate fronds about 18in. long, and of a stout leathery texture, the last-named being of a much deeper green than C. falcatum.

Davallia (*Hare's-foot Ferns*).—The Davallias form an ornamental class of Ferns, many having curious creeping rhizomes or stems which are particularly hairy, resembling the foot of an animal, hence the appellation of Hare's-foot Fern, as applied especially to D. canariensis. These creeping kinds are better adapted for hanging baskets or for rockwork than for growing in pots. They are not deep-rooting subjects, therefore, if confined at all, wide-mouthed pans are more suitable for them than pots. Care must be taken not to bury the creeping stems, as this is very injurious to the plants. In most kinds the fronds are freely produced, and many of them from their firm, solid nature will remain fresh a long time when used in a cut state. The species are numerous, a few of the best being D. bullata, sometimes called the Squirrel's-foot Fern, from the curious appearance of its creeping stems, which are clothed with reddish brown scales. The bright green elegantly divided fronds are about 1ft. long, and freely produced. It succeeds perfectly in the greenhouse, but is quite deciduous during the winter. D. canariensis (Hare's-foot Fern) reminds one of the last-mentioned, but is evergreen, and the fronds are as much as 18in. long, while their colour is a very deep green. D. dissecta is a free-growing stove species about 1½ft. high, the fronds being very finely cut and light green. D. elegans has also elegantly divided fronds, which are of a bright

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THE STRAIGHT WALK, INGESTRE HALL STAFFORDSHIRE.

"COUNTRY LIFE."

shining green, 2ft. long. In the variety polydactylæ the points of the fronds are distinctly crested. D. fijiensis is a vigorous kind, with bold arching fronds nearly 1yd. long, and even more minutely divided than the preceding. There are several varieties, that known as plumosa exceeding in grace the original species. D. fœniculacea has the habit of an Asplenium, and does not produce any creeping stems. The fronds, which are about 2ft. long, are divided as in the Davallias, and of a deep green tint. D. hemiptera is a creeping kind, with fronds only once divided, and from 6in. to 1ft. long. It is a pretty little basket plant. D. Mariesi is in the way of D. bullata, but more slender. This is used by the Japanese to form wreaths, crosses, and other designs, which are sent to this country during the winter when dormant, and if placed in a warm house and kept moist they soon become a mass of delicate fronds. There is a crested variety of this. D. Mooreana is one of the most handsome decorative Ferns in cultivation. It has wide-spreading much-divided fronds of a pleasing shade of light green, while, owing to its rapid growth, it is in general demand for growing into large specimens. D. parvula is one of the smallest of cultivated Ferns, and a perfect gem. It has fronds about 1in. long, with almost thread-like divisions. It is of a delicate constitution, and needs a shallow pan with a compost of peat, Sphagnum Moss, and sand, or it may be allowed to creep along a piece of dead Tree Fern trunk; it should be covered with a bell-glass. In D. pentaphylla, the fronds are only once divided, about 1ft. long, and of a pleasing green. It is well adapted for a suspended basket or Fern case. D. tenuifolia Veitchiana is of free growth, with long elegantly cut fronds, distinctly pendulous, thus rendering it a charming basket Fern for the stove. D. Tyrmani has silvery white scales on the creeping stems, and is thus readily distinguished from any other kind. The fronds, which are sparingly produced, are about 6in. long. It is a good greenhouse Fern.

Dicksonia.—The Dicksonias include amongst their number one of the most noble, and certainly the hardiest, of all Tree Ferns. This is D. antarctica, a native of Tasmania, which has a particularly sturdy trunk, and a large number of wide-spreading fronds, usually disposed in an almost horizontal or partially drooping manner. In the more sheltered districts of the South and West of England and Ireland D. antarctica will succeed out of doors. In all stages, even when small, it is from its great profusion of fronds a valuable decorative Fern. D. squarrosa and D. Youngi are both Tree Ferns, but not equal to D. antarctica.

Didymochlæna truncatula forms a short thick trunk, from which are pushed up fronds from 4ft. to 5ft. long and correspondingly broad. They are divided differently from most Ferns of large growth, being more like a gigantic Adiantum. The young fronds are of a bronzy tint, changing to a deep glossy green. This Fern succeeds in the greenhouse.

Doodia.—With one exception small-growing Ferns of firm texture, needing little more than protection from frost. They are of easy culture, and especially valuable when small for various decorations. Peat and sand suits them well. The small growers are D. aspera, D. caudata, and D. lunulata or media. The large one is D. blechnoides, with fronds 2ft. long.

Doryopteris.—Small or medium-growing Ferns of easy culture, and valuable from the fact that their plain simple fronds are very distinct from many others. A selection would include D. nobilis, with heart-shaped fronds in a young state, but as the plant develops they are more or less lobed. D. palmata has at first lobed fronds, which afterwards become deeply cut and slashed. D. sagittifolia, with fronds the shape of an arrow-head, is pretty and distinct.

Drynaria.—Curious yet ornamental Ferns, that need a soil composed principally of sandy peat. D. diversifolia has fronds from 3ft. to 4ft. long and 1ft. to 18in. wide. They are deeply lobed. D. quercifolia pushes up from a stout root-stock fronds like huge Oak leaves; hence the name of quercifolia.

Filmy Ferns.—*See* Hymenophyllum.

Flowering Ferns.—*See* Anemia and Osmunda.

Gleichenia.—Quite distinct from any other class, and of a rambling nature, the creeping rhizomes being particularly thin and wiry. They will attain a length of several feet, and produce fronds at intervals throughout. Some of them have peculiarly forked fronds and delicately cut leaflets. A favourite way of growing them is to train the long flexible shoots around a trellis or some other means of support, and when well furnished with fronds they present a charming mass of greenery. Give the plants a cool greenhouse temperature, and a soil composed principally of rough sandy peat. Good species are: G. circinata, G. dicarpa, G. dichotoma, G. flabellata, G. Mendeli, G. rupestris, and G. Speluncæ.

Gold Fern.—*See* Gymnogramma chrysophylla.

Goniophlebium.—A small group, one species of which, G. subauriculatum, is unsurpassed as a basket plant for the stove. In such a position the gracefully-disposed fronds will hang down for a length of 6ft. or even more. They are once divided, and from 6in. to 1ft. in width.

Gymnogramma.—Amongst the number of Gymnogrammas that are in cultivation the greatest interest centres around those known as Gold and Silver Ferns, which have their fronds completely covered with a yellow and white powder respectively. Some of them vary considerably when raised from spores, and on this account the list of names is a long one. Most of them are easily grown, the principal consideration being to see that they do not get syringed, or that there is no excess of surface moisture, otherwise the powdered kinds lose much of their charm. A selection of the best would include: G. Calomelanos, a bold-growing kind, with blackish stems and deep green leaves, powdered only on the under-side with pale yellow; G. chrysophylla, completely covered with golden powder. There are several varieties of this, notably grandiceps, with large crested tufts, and Laucheana, a more compact plant than the ordinary form. G. decomposita is a bold-growing, finely-cut kind, with yellow powder. G. peruviana argyrophylla is completely covered with pure white powder. G. schizophylla gloriosa has long, delicately-cut fronds, which are seen to the greatest advantage in a suspended basket. G. Wettenhalliana is a densely crested form, covered with sulphur-tinted powder.

Hare's-foot Fern.—*See* Davallia canariensis.

Hymenophyllum.—The Hymenophyllums form a group of filmy or transparent Ferns, a very distinct class. They all need a shallow soil, which should consist of peat, chopped Sphagnum Moss, small pieces of sandstone, and some clean silver sand. A humid atmosphere is absolutely necessary, and to ensure this they are usually grown in a close case inside the ordinary Fernery. A greenhouse temperature is sufficient for them, but though so charming they can scarcely be recommended for general culture. A selection of the best and most robust would include H. caudiculatum, H. chiloense, H. crispatum, H. demissum, H. Forsterianum, H. nitens, H. tunbridgense, and H. Wilsoni.

Hypolepis.—A pretty class, most of which have creeping stems, from whence the fronds are produced. These are much divided and regular in shape. H. distans has fronds about 1ft. long, and in H. repens they are three or four times that length.

Lastrea.—An extensive group with, for the most part, symmetrically-shaped fronds pushed up from one central crown. They are of comparatively easy culture, and do not need special attention. A good selection is: L. atrata, with bold arching fronds 2ft. to 3ft. long; L. atrata variegata, the leafage of which is striped with yellow; L. aristata variegata, with trapeziform fronds of a dark glossy green, and a whitish band down the centre of each leaflet; L. decomposita, of easy culture, with much-divided fronds 1ft. or more in length; L. erythrosora, remarkable for the beautiful bronzy hue of the young leaves, which turn to a deep green when mature; L. lepida, in which the fronds are once divided into exceedingly narrow and deeply-toothed segments; L. patens, a

regular-shaped plant with fronds about 2ft. long—a useful decorative Fern; L. Richardsi multifidum, fronds 2ft. in length and 9in. in width, all the divisions being tasselled at the tips; it forms a charming specimen.

Leucostegia.—Nearly related to the Davallias; indeed, L. immersa bears much resemblance to Davallia Mooreana, but instead of being evergreen it is quite deciduous.

Lomaria.—A numerous class, found throughout the greater part of the globe, one species, L. spicant, being a native of this country. Most of them have fronds but once divided, and several form quite an erect firm stem. The best are: L. aspera, a dwarf spreading plant with fronds about 6in. long; L. Boryana, long arching pinnate and leathery fronds, borne on a stout stem 2ft. high; it is almost like a Cycas, indeed a variety is known as L. zamiæfolia; L. ciliata has a slender trunk 6in. high, crowned by a profusion of bright green fronds, all the divisions of which are fringed at the edges; L. discolor bipinnatifida is one of the most handsome of all the Lomarias, forming a mass of fronds 3ft. or 4ft. high. The leaflets overlap one another, and are beautifully toothed and crisped. The colour, too, is of a particularly bright green. L. gibba is one of the most popular Ferns, forming a handsome vase-shaped specimen.

Lygodium.—Very distinct Ferns, with long slender twining (not creeping) shoots, which are mostly furnished with ample bright green leafage. L. dichotomum, L. japonicum, L. palmatum, and L. scandens are all good. L. scandens is very popular.

Maidenhair Fern.—*See* Adiantum.

Marattia.—Large robust Ferns, having wide-spreading fronds pushed up from thick massive crowns. The fronds are of considerable substance, and very distinct. The plants are semi-aquatic, hence they need copious supplies of water. The best known are M. alata, M. Cooperi, and M. fraxinea.

Microlepia hirta cristata is a strong, soft-growing Fern of easy culture, with prettily divided fronds, which are densely crested at the tips. It is a favourite kind for growing into specimens, as plants 6ft. through can be quickly obtained.

Nephrodium.—Nearly related to Lastrea, and the members of this group form for the most part plants of even growth, whilst they are very easily grown. N. Leuzeanum has large fronds, sometimes 6ft. long, and forms a bold-looking subject. By far the best known member of the group is N. molle, which is found wild throughout the greater part of the globe. Crested forms are very numerous in the case of this Fern, and in some this duplication occurs excessively.

Nephrolepis.—A beautiful class of Ferns, many of which have long narrow fronds, in most instances only once divided. In some cases they are quite pectinate or comb-shaped. For planting on rockwork they are unsurpassed, while being naturally of an elegant drooping character they are well adapted for growing in suspended baskets. They also succeed perfectly in pots, in a mixture of peat, loam, and sand, and, while most of them need stove temperature, a few may be grown in the greenhouse. The best are: N. acuta, with comb-shaped fronds 3ft. to 4ft. in length; N. Bausei, an upright plant from 1ft. to 18in. high, and with deeply cut leaflets totally unlike any of the others; N. cordata compacta, very prolific in the production of its charming arched fronds; N. davallioides, with particularly massive fronds 1yd. long; N. davallioides furcans, prettily crested; N. Duffi, the slender fronds of which are divided and subdivided in a striking manner; N. exaltata, a comb-shaped kind, with very pointed leaflets, one of the most useful and popular of all; N. philippinensis, the smallest of all, forms a dense tuft of upright fronds about 1ft. high, and is popular for growing in small pots; N. rufescens tripinnatifida, with broad massive leaflets deeply cut and slashed, thus forming a handsome specimen 1yd. or so high. The above are evergreen, except N. Bausei, which is totally deciduous, and produces small brownish tubers that must be kept moderately moist during the winter, otherwise they will perish.

WOODLAND FERNS.

Nothochlæna.—Very pretty delicate Ferns, some of which bear a certain resemblance to the Adiantums, but are covered more or less with meal as in the Gymnogrammas. They are sometimes called Gold and Silver Maidenhairs. A mixture of peat and small pieces of sandstone suits them best, and they need an open position where they will not be watered overhead. A selection would include: N. chrysophylla, whose much divided fronds, less than 1ft. in length, are covered with a golden powder; N. Eckloniana, with particularly dense leathery fronds clothed on the undersides with silky scales; N. Marantæ, a cool house plant, the undersides of the fronds being covered with reddish-brown scales; N. Newberryi is a pretty little plant thickly covered with hairs varying in colour from white to pale brown; N. nivea, a good deal in the way of N. chrysophylla, but the undersides of the fronds are silvery white; N. sinuata, with simple pinnate fronds 2ft. long and of a semi-pendulous nature, best grown in a suspended basket; N. trichomanoides, somewhat in the way of the last, but with leaflets lobed and white underneath.

Onychium.—Only two species of Onychium are in cultivation, and both are much admired because of their elegantly cut fronds. The first, O. auratum, pushes up a regular series of fronds from a single crown, as in some of the Asplenums. These fronds are 1ft. or so long and about 9in. or 10in. wide. It needs a stove temperature, while O. japonicum, on the other hand, is a plant for a cool structure, and is also a good Fern for the dwelling-house. Unlike the other, this produces a number of creeping underground stems which push up fronds in various directions. It forms a bright mass of shining green from 1ft. to 18in. high.

Osmunda.—The Royal or Flowering Fern (O. regalis) is a well-known British species, but there are two exotic kinds well worthy of cultivation. One is O. japonica corymbifera, a beautiful little dwarf plant with horizontally spreading fronds crowded and clustered at the tips. It is deciduous, while the other kind, O. palustris, is evergreen. It is something like a miniature form of the Royal Fern, but the leaf stalks and young fronds are bright crimson.

Pellæa.—Useful decorative Ferns, some of which are largely grown. Many of them have very dark shining stems, and in all the marginal arrangement of the spore cases on the under-sides of the fronds is a conspicuous feature. Some of the Pellæas are often grown under the generic name of Platyloma. The most useful are: P. atropurpurea, a variable kind, with bluish-tinted leaflets, brown in the centre; P. cordata, with spear-shaped fronds and leaflets, the fronds 1ft or more in length; the variety flexuosa has peculiar zigzag stems; P. falcata, a low-growing Fern with long, narrow, once divided fronds; P. geraniæfolia reaches a height of about 1ft., the small, prettily divided fronds being borne on thin wire-like stems a good greenhouse Fern; P. hastata, whose terminal leaflets are distinctly halbert-shaped, hence its name grows about 18in. high, and is excellent for a cool house; P. rotundifolia, the drooping fronds about 1ft. long, and furnished on either side with small roundish leaflets; P. ternifolia forms a tuft of slender semi-pendulous fronds 1ft. long. The leaflets, which are of a beautiful glaucous green tint, are each divided into 3-pointed lobes.

Platycerium.—The members of this family are unlike any other class of Ferns, the popular name of Stag's-horn as applied to them giving a good idea of the general appearance of the massive, drooping, fertile fronds. The barren ones are more or less erect, and in contour totally unlike the others. In a native state they grow on the branches of trees and similar positions; hence under cultivation their manner of growth should be considered. They do well planted in the fork of a large dead branch or in a pocket made of virgin cork. If in a pot, remove a portion of one side in order to allow the fertile fronds to develop. The compost most suitable for them is a mixture of peat and Sphagnum Moss, which must be kept moderately moist throughout the year. Some kinds are very difficult to obtain. The best of those in general cultivation are: P. alcicorne, P. alcicorne majus, P. grande, P. Hilli, P. stemmaria, and P. Willincki.

Polypodium.—A large and varied family, containing many species with quite simple fronds, while the bulk of the others are only once divided. A great number of them have fronds of a particularly hard, leathery nature; hence they are very valuable for decoration where exposed to draughts. They are very difficult to classify, and opinions vary greatly as to their nomenclature. The plants that by one author are included in the genus Polypodium are perhaps by another split up under a dozen heads. Most of them are of simple cultural requirements. Of those usually regarded as Polypodiums, a selection of the best would include: P. aureum, with bold massive fronds, usually consisting of one elongated terminal leaflet and a varied number of others; the whole plant is of a beautiful glaucous tint, while the golden scales which clothe the creeping stems form another distinguishing feature; it is largely grown as a decorative plant, often under the name of Phlebodium aureum; the variety glaucum has the bluish tint even more pronounced than in the ordinary form; P. crassifolium has thick sword-shaped fronds 1yd. long; P. diversifolium, with once divided fronds 2ft. long, forms an ornamental specimen; P. drepanum is noticeable among the Polypodiums from its pointed and serrated leaflets; P. Griffithianum, with leathery lance-shaped fronds 6in. to 8in. long, is very pretty and easily grown; P. lingua has simple fronds, pointed oblong in shape, and about 8in. or 9in. long; the variety corymbiferum is curiously crested and tasselled; P. membranaceum forms a tuft of strap-shaped leaves 1yd. long, and of a peculiar thin texture; P. Meyenianum, also met with as Aglaomorpha Meyeniana, is known as the Bear's-paw Fern, from the curious stout, hairy, creeping stem; the once divided leaves are about 1yd. long, while the leaflets are 2in. wide, except on the upper part of the matured fronds when they are fertile, and in this state reduced to very narrow proportions; it needs the same treatment as the Platyceriums; P. nigrescens is somewhat after the manner of P. aureum, but the leaflets are narrower, and of a deep blackish green; P. pectinatum, comb-shaped fronds 2ft. long, that bear a certain amount of resemblance to some of the Nephrolepis; P. pilosellioides, a little dense-growing, freely-creeping kind, with simple egg-shaped fronds at most not more than 3in. long; P. pustulatum, with simple fronds 1ft. long, on which the veins are beautifully traced; it is one of the most accommodating of Ferns; P. Schneideri, a beautiful hybrid kind, with fronds more divided and less glaucous than P. aureum.

Polystichum.—By some authors included in the genus Aspidium, but far more generally met with in gardens under the name of Polystichum. They are nearly all of easy culture, and distinguished by regular-shaped, much-divided fronds, arranged in a fairly symmetrical manner. The best are: P. capense, which forms a tuft, 2ft. high, of much-divided, dark green leathery fronds; P. falcinellum, whose fronds, from 1ft. to 18in. long, are of bright green; P. laserpitifolium, known also as Lastrea Standishi, has large spreading fronds so much divided as to be quite plumose in character; P. mucronatum forms a tuft of once divided fronds, remarkable for their curious sharp-pointed, almost triangular-shaped leaflets; P. setosum, a popular decorative kind, somewhat after the manner of the British P. angulare, but more hairy and of looser growth; P. triangulare laxum, with dark green, triangular-shaped leaflets and drooping fronds; P. tripteron has fronds divided into three, consisting of one large central division and two smaller ones at the base; the pointed leaflets are much cut and overlapping; altogether a full-sized frond is about 18in. long, and of a light green colour; P. tsus-sinense is a pretty little dwarf Fern, with elegantly-cut leaves, valuable for small pots; P. vestitum forms a regular specimen 18in. high, and its divided fronds have an upward tendency.

Pteris.—A widely distributed and extensive class of Ferns, which are, as a rule, of easy culture, and contain amongst

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their number decorative plants of much value. Many of them are extremely graceful, and, as they resist draughts better than most, are popular for the dwelling-house. Under such conditions many of them will keep in good health for years. Some species when raised from spores vary to an almost unlimited extent, hence distinct varieties are common. In a good selection of Pteris the following are all worthy of a place: P. arguta, a free, bold-growing plant which has fronds 1yd. long, and borne on bright reddish brown stalks. P. argyræa, somewhat after the manner of the preceding, but more spreading, and each leaflet has a broad stripe of white down the centre; it is one of the best of the variegated Ferns. P. biaurita, a robust Fern, stiffer and more upright in growth than either of the above. There is a variety marked with white as in P. argyræa. P. cretica forms a handsome tuft of dark green fronds. It reaches a height of about 18in., and is much grown for decorations. There are numerous varieties all ornamental, particularly albo-lineata, variegated with white in the centre of each leaflet; major, larger and bolder than the ordinary form; Mayi, like albo-lineata, but crested; nobilis, a dense but more slender plant than the preceding. P. incisa, also known as Litobrochia incisa, is a plant of bold growth, with fronds 3ft. or 4ft. long, of a distinct bluish green colour. P. longifolia, whose fronds are from 1ft. to 2ft. long, of a spreading habit and but once divided. The dark green leaflets are from 3in. to 4in. long and not more than ½in. wide. The variety Mariesi is more graceful than the type. P. scaberula has fronds as finely divided as those of the most delicate Davallias. They are over 1ft. long and 6in. to 9in. broad. This Pteris produces a number of creeping stems on which the fronds are borne. P. serrulata is the commonest of all greenhouse Ferns, and at the same time very beautiful. It is sometimes called the Ribbon Fern, from the general appearance of the leaflets. The varieties are innumerable, among them being cristata, with beautifully crested fronds; compacta, a little dense plant; major forms a handsome specimen; gracilis, with exceedingly narrow divisions of the fronds; Regina, variegated leaved; and Regina cristata, crested. P. tremula, a very popular Fern, pushes up its bold fronds in a regular way from a central crown. The fronds when fully developed are 3ft. to 4ft. long and 2ft. broad. There are several varieties, the most distinct being Smithiana, in which the fronds are very densely crested. P. tricolor is one of the most beautiful of variegated Ferns, but difficult to keep in good condition. It is rather dwarf, with leaves usually about 1ft. long. When young the fronds are of a rosy red tint, but as they mature become marked with white, green, and purplish red, an uncommon combination. P. umbrosa is somewhat in the way of P. cretica, but larger and more massive in all respects. P. Victoriæ has narrow, prettily variegated leaflets. P. Winsetti is very free in growth, with fronds from 1ft. to 18in. long. It forms a compact and graceful Fern.

SUNSHINE AND SHADE, KELLY HOUSE, TAVISTOCK.

Silver Fern.—*See* Gymnogramma peruviana argyrophylla.

Stag's-horn Fern.—*See* Platycerium.

Todea.—A class of Ferns remarkable for their (with one exception) finely cut and very delicate fronds. In the texture of the frond and other particulars they resemble the Filmy Ferns, and, like them, must be kept in a close case in order to maintain a constantly humid atmosphere. The exception just alluded to is T. barbara, also known as T. africana. This forms a short but massive trunk, from whence are produced large quantities of fronds 3ft. to 4ft. long and 1ft. broad. The leaflets are quite leathery in texture, and of a bright shining green,

T. superba, which may be taken as the type of the other section, forms a stem about 1ft. high, from which fronds are produced in great profusion. These fronds attain the length of 1yd. or so, and are from 6in. to 9in. wide. They are thrice divided and their leaflets are closely set. It is a charming Fern. Other species are T. Fraseri, T. pellucida, and T. plumosa.

Trichomanes.—These belong to the Filmy Ferns, and differ from the Hymenophyllums previously alluded to only in botanical particulars, the same method of culture being available for both. One species, T. radicans, is the Killarney Fern. The principal kinds are T. alabamense, T. alatum, T. angustatum, T. auriculatum, T. Colensoi, T. crispum, T. exsectum, T. maximum, T. parvulum, T. radicans, T. reniforme, T. tenerum, T. trichoideum, and T. venosum.

Woodwardia.—A small group of ornamental greenhouse Ferns, of which especial mention must be made of W. orientalis, a free-growing subject, with fronds 4ft. to 6ft. long and 1ft. to 2ft. broad, with bright shining green spear-shaped leaflets. It is well suited for standing on a pedestal or some similar position. W. radicans has long arching fronds, which bear small bulbils on their tips. They continue to grow and form quite effective plants while still attached to the parent. Directly they come in contact with the soil they produce roots of their own.

Selections of Ferns.

In order to make Fern selection as easy as possible we have given lists of the most popular and beautiful species and varieties. Of course it would be impossible to grow all in a small greenhouse, but any of the following may be chosen without fear of obtaining kinds of little beauty or difficult to cultivate.

Ferns for a Small Greenhouse.

Adiantum assimile
A. Capillus-Veneris
A. cuneatum
A. c. gracillimum
A. c. Pacotti
A. decorum
A. formosum
A. hispidulum
A. scutum
Asplenium bulbiferum
A. Colensoi
Cyrptomium falcatum
Davallia bullata
D. canariensis
D. Tyrmani
Doodia aspera
D. blechnoides
D. caudata
D. lunulata
Doryopteris palmata
Lastrea atrata
L. a. variegata
L. aristata variegata
L. decomposita
L. lepida
L. patens
Lomaria aspera
L. ciliata
L. discolor bipinnatifida
Microlepia hirta cristata
Nephrodium molle
N. m. corymbiferum
Onychium japonicum
Osmunda palustris
Osmunda japonica corymbifera
Pellæa atropurpurea
P. falcata
P. hastata
P. rotundifolia
P. ternifolia
Polypodium aureum
P. a. glaucum
P. lingua
P. l. corymbiferum
P. pustulatum
P. Schneideri
Polystichum capense
P. setosum
P. tsus-sinense
P. vestitum
Pteris arguta
P. argyræa
P. biaurita
P. b. variegata
P. cretica
P. c. albo-lineata
P. c. Mayi
P. longifolia
P. l. Mariesi
P. serrulata
P. s. cristata
P. s. compacta
P. s. major
P. s. Reginæ
P. s. R. cristata
P. tremula
P. t. Smithiana

When a few plants only can be grown, perhaps not more than a dozen, the selection should be confined to—

Adiantum cuneatum
Asplenium bulbiferum
Cyrtomium falcatum
Davallia canariensis
Lastrea patens
Microlepia hirta cristata
Nephrodium molle
Onychium japonicum
Polypodium aureum
Pteris argyræa
P. cretica albo-lineata
P. serrulata cristata or major
P. tremula

Select Greenhouse Ferns.

Adiantum assimile
A. a. cristatum
A. Capillus-Veneris
A. cuneatum
A. c. gracillimum
A. c. grandiceps
A. c. Pacotti
Adiantum decorum
A. formosum
A. fulvum
A. hispidulum
A. pedatum
A. reniforme
A. scutum
Alsophila australis
A. excelsa
A. pruinata
Asplenium alatum
A. bulbiferum
A. Colensoi
A. dimorphum
A. incisum
A. Nidus
A. rutæfolium
Athyrium Goringianum pictum
Blechnum glandulosum
Cheilanthes aurea
C. elegans
C. farinosa
Cibotium spectabile
Cyathea dealbata
C. medullaris
Cyrtomium falcatum
C. Fortunei
Davallia bullata
D. canariensis
D. Mariesi
D. Tyrmani
Dicksonia antarctica
D. Berteroana
D. squarrosa
D. Youngi
Didymochlæna trunculata
Doodia aspera
D. blechnoides
D. caudata
D. lunulata
Doryopteris palmata
Gleichenia circinata
G. dicarpa
G. dichotoma
G. flabellata
G. Mendeli
G. rupestris
G. Speluncæ
Hymenophyllum caudiculatum
H. chiloense
H. crispatum
H. demissum
H. Forsterianum
H. nitens
H. tunbridgense
H. Wilsoni
Hypolepis distans
H. repens
Lastrea atrata
L. a. variegata
Lastrea aristata variegata
L. decomposita
L. erythrosora
L. lepida
L. patens
Leucostegia immersa
Lomaria aspera
L. ciliata
L. discolor bipinnatifida
Lygodium japonicum
L. palmatum
L. scandens
Microlepia hirta cristata
Nephrodium molle
N. m. corymbiferum
Nothochlæna Eckloniana
N. Marantæ
N. Newberryi
Onychium japonicum
Osmunda japonica corymbifera
Pellæa atropurpurea
P. cordata
P. c. flexuosa
P. falcata
P. geraniæfolia
P. hastata
P. rotundifolia
P. ternifolia
Polypodium aureum
P. a. glaucum
P. drepanum
P. Griffithianum
P. lingua
P. l. corymbiferum
P. pustulatum
P. Schneideri
Polystichum capense
P. falcinellum
P. laserpitifolium
P. mucronatum
P. setosum
P. tsus-sinense
P. vestitum
Pteris arguta
P. argyræa
P. biaurita
P. b. variegata
P. cretica
P. c. albo-lineata
P. c. Mayi
P. incisa
P. longifolia
P. l. Mariesi
P. scabrula

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"COUNTRY LIFE."

Pteris serrulata
P. s. cristata
P. s. compacta
P. s. major
P. s. Reginæ
P. s. R. cristata
P. tremula
P. t. Smithiana
P. umbrosa
Todea barbara
T. Fraseri
T. pellucida
T. plumosa
T. superba
Trichomanes alabamense
Trichomanes alatum
T. angustifolium
T. auriculatum
T. Colensoi
T. crispum
T. exsectum
T. maximum
T. parvulum
T. radicans
T. reniforme
T. tenerum
T. trichoideum
T. venosum
Woodwardia orientalis
W. radicans

Tree Ferns.

Alsophila atrovirens
A. australis
A. crinita
A. excelsa
A. Van Geerti
A. pruinata
A. Rebeccæ
Cibotium princeps
Cibotium Schiedei
C. spectabile
Cyathea dealbata
C. medullaris
Dicksonia antarctica
D. Berteroana
D. squarrosa
D. Youngi

Select Stove Ferns.

Acrostichum acuminatum
A. aureum
A. Cænopteris
A. crinitum
A. drynarioides
A. Herminieri
A. osmundaceum
A. quercifolium
A. scandens
Actiniopteris radiata
Adiantum aneitense
A. Bausei
A. Birkenheadi
A. caudatum
A. Collisi
A. concinnum latum
A. Farleyense
A. Fergusoni
A. Henslowianum
A. lunulatum
A. macrophyllum
A. m. striatum
A. Moorei
Adiantum palmatum
A. peruvianum
A. tenerum
A. tinctum
A. trapeziforme
A. Williamsi
Alsophila crinita
A. Van Geerti
A. Rebeccæ
Anemia adiantifolia
A. Dregeana
A. Phyllitidis
A. rotundifolia
A. tomentosa
Angiopteris evecta
Asplenium Bellangeri
A. cicutarium
A. formosum
A. laserpitifolium
A. longissimum
A. obtusilobum
A. viviparum
Blechnum brasiliense
Blechnum brasiliense corcovadense
B. occidentale
Brainea insignis
Cheilanthes hirta Ellisiana
Cibotium Barometz
C. princeps
C. Schiedei
Davallia dissecta
D. elegans
D. e. polydactylæ
D. fijiensis
D. f. plumosa
D. fœniculacea
D. hemiptera
D. Moorcana
D. parvula
D. pentaphylla
D. tenuifolia Veitchiana
Doryopteris nobilis
D. sagittifolia
Drynaria diversifolia
D. quercifolia
Goniophlebium subauriculatum
Gymnogramma Calomelanos
G. chrysophylla
G. c. grandiceps
G. c. Laucheana
G. decomposita
G. peruviana argyrophylla
G. schizophylla gloriosa
G. Wettenhalliana
Lastrea Richardsi multifida
Lomaria Boryana
L. gibba
Lygodium dichotomum
Marattia alata
M. Cooperi
M. fraxinea
Nephrodium Leuzeanum
Nephrolepis acuta
N. Bausei
N. cordata compacta
N. davallioides
N. d. furcans
N. Duffi
N. exaltata
N. philippinensis
N. rufescens tripinnatifida
Nothochlæna chrysophylla
N. nivea
N. sinuata
N. trichomanoides
Onychium auratum
Platycerium alcicorne
P. a. majus
P. grande
P. Hilli
P. stemmaria
P. Willinckii
Polypodium crassifolium
P. diversifolium
P. membranaceum
P. Meyenianum
P. nigrescens
P. pectinatum
P. pilosellioides
Polystichum triangulare laxum.
P. tripteron
Pteris tricolor
P. Victoriæ

Ferns for Hanging Baskets.

Adiantum assimile
A. a. cristatum
A. caudatum
A. concinnum
A. cuneatum grandiceps
A. lunulatum
A. Moorei
Anemia rotundifolia
Asplenium longissimum
Davallia bullata
D. dissecta
D. fijiensis
D. f. plumosa
Davallia hemiptera
D. pentaphylla
D. tenuifolia Veitchiana
Goniophlebium subauriculatum
Gymnogramma schizophylla gloriosa
Nephrolepis, all the different kinds
Nothochlæna sinuata
Platycerium, all the species
Woodwardia radicans

SELAGINELLAS.

THE Selaginellas are closely allied to the Ferns, and, as they succeed perfectly under similar conditions, are extremely valuable for associating with them. Some kinds are very popular, notably S. Kraussiana, or denticulata as it is often called, which forms a spreading, Moss-like plant of quick growth, and is much used for carpeting bare surfaces, for edgings, and similar purposes. The Selaginellas vary greatly in size, from the little S. apoda, which forms a dense mass not more than 2in. high, to the 20ft. or more of S. Wildenovi. Varying as they do, no general mode of culture can be given for the whole of them. The majority need stove treatment and a moist atmosphere, but still some of them will succeed in a greenhouse. Most of them may be grown in shallow pans, and where a collection is brought together in this way it forms a charming and most interesting feature. Again, some of the trailing kinds which do not root deeply may be allowed to grow on the surface of large pots or in similar positions, while in the case of Ferns grown in hanging baskets a few pieces of Selaginella will grow and form quite an additional feature. All the Selaginellas, but more particularly the stove kinds, need a light, well-drained soil, with plenty of water, and a fairly humid atmosphere. A selection of the best is herewith given.

S. africana has its foliage arranged in a dense frond-like manner, on stems 1ft. high. S. albo-nitens, a slender trailing bright green plant. S. apoda forms a dense Moss-like mass, 1in. or 2in. high. S. atroviridis, dark metallic green, 1ft. high. S. caulescens, the branches pushed out in a regular manner from one central crown, being thus distinct from most of the others. A small form is known as S. caulescens minor. S. cuspidata, a tufted kind, produces its branches after the manner of S. caulescens. S. Emiliana, a regular Fern-like plant, with branches or fronds, 6in. to 9in. long, and of a bright green. It is one of the best of all, and is largely grown for the same purposes as some of the Ferns.

S. erythropus grows about 6in. high, and is remarkable for its red stems. S. flabellata, a plant of large growth, 2ft. high, with fan-shaped branches or fronds. S. grandis is remarkable for its broad frond-like branches, and is the most massive of all the Selaginellas. S. inæqualifolia

THE LOWER LAKE, HECKFIELD PLACE, HAMPSHIRE.

forms a freely branched specimen, 2ft. or 3ft. high. S. involvens, a regular-growing kind only a few inches high; it pushes out all its branches from one central crown. S. Kraussiana, a universal favourite, grown by thousands in many nurseries. Its trailing stems are of a delightful shade of rich green. The variety aurea is of a golden hue, and in variegata the tips of the young shoots are white. S. lepidophylla is the Resurrection Plant of North America. It forms a tufted mass 6in. or so across. S. Lobbi reaches a height of 3ft., and its broad flattened branches are of an intensely rich shade of green. S. Martensi, a freely branched kind that forms a compact specimen, 9in. to 1ft. high, very easily grown, and popular as a decorative plant. The variety variegata has white foliage interspersed with green. S. Poulteri is a small dense-growing kind, and a very pretty one. S. rubella, which grows about 1ft. high, has reddish stems, and the leaves also change to that hue when old. S. serpens, also known as

S. variabilis, is so called from the changes that take place in the colour of the leaves at different times of the day, being sometimes rich green, and at others almost white. It is of a flattened creeping habit and grows freely. S. umbrosa is often grown under the name of S. cæsia, in reference to the beautiful metallic blue tint of its foliage. Its slender stems trail to a length of from 1ft. to 2ft., and are furnished at intervals on either side with regularly shaped frond-like branches. It is also very beautiful in a hanging basket. S. Wallichi grows to a height of from 2ft. to 3ft., its wide spreading branches being thickly clothed with large leaves of a dark shining green, quite distinct from the others. It forms a handsome specimen. S. Wildenovi, frequently met with under the name of S. cæsia arborea, is a robust-growing climbing kind, its large flattened branches, which are in some cases 2ft. long, having leaves coloured as in S. uncinata.

The few that may be successfully grown in a greenhouse are herewith given; at the

THE GATEWAY, TISSINGTON HALL, DERBYSHIRE.

same time, they will grow equally as well in the stove: S. apoda, S. inæqualifolia, S. involvens, S. Kraussiana and its varieties, S. Martensi, and S. Poulteri.

Selaginellas are not, except in a few instances, difficult to manage, as they creep about in a free way, making quite a mossy covering to everything they cover with their fresh green growths. The dwarf kinds represented by Selaginella Kraussiana are here referred to. It must be remembered that some species are almost, if not quite, hardy, and these are very useful for covering the soil in a hardy Fernery or rock garden where the position is moist and not too exposed to the sun, otherwise the plants would be quickly burnt up. S. Kraussiana is the most hardy of all, and will survive out of doors even near London. A narrow border of this in a suburban garden, in which the plants used were Selaginellas and the common fragrant Musk, formed in every way a happy companionship. If only one kind

can be grown, the selection should be S. Kraussiana, as this is the hardiest and most safe. In plant houses where large Palms and Tree Ferns are grown, the Selaginellas may be planted, or rather dibbled in the soil in the pots, as then they form a charming covering, fresh and bright, for when once established they grow rapidly. Selaginellas may be grown also into quite large pyramidal specimens, but this is not of course a task everyone would care to undertake.

PALMS.

FEW classes of plants have advanced so much in popularity within the last few years as the different Palms, particularly those that form light and graceful specimens while still young. A suitable soil for most Palms consists of two-thirds good yellow loam to one-third leaf mould and sand. They need plenty of water at all times of the year, both at the roots and overhead. Large plants may be grown in comparatively small pots, but in many Palms the roots, though few, are of a deep descending nature, and much given to curl around the bottom of the pot. This sometimes goes on to such an extent that the ball of earth is lifted up, thus allowing the water to escape at the sides, and the plant consequently suffers. A great many of the Palms enumerated below will succeed in a greenhouse, but for a few stove heat is necessary. Many Palms have been necessarily omitted from the following list, but sufficient kinds are here named for the beginner, indeed more than he will require at first.

BISMARCKIA NOBILIS.

Areca.—The members of this genus all have prettily divided leaves even when young, and are very popular. The best known are A. Baueri, A. lutescens, A. monostachya, A. rubra, A. sapida, and A. Verschaffelti.

Caryota urens.—A very distinct Palm requiring stove temperature.

Chamærops excelsa, Fortunei, and humilis are all Fan Palms that are nearly hardy.

Cocos.—All light feathery Palms, a universal favourite being Cocos Weddelliana, which needs a stove.

Corypha australis.—This, which will succeed in quite a cool greenhouse, has fan-shaped leaves, the stems of which are furnished with hooked spines.

Dæmonorops.—Exceedingly pretty Palms when young, the much divided leaves being of a rich green. Require a stove.

Geonoma.—Warm house Palms that differ greatly from each other, the best being G. gracilis.

Kentia.—The most popular class of Palms in cultivation, two species, K. Belmoreana and K. Forsteriana, being grown in immense numbers for decorations.

Latania borbonica has immense fan-shaped leaves, and is effective either when small or large.

Phœnix.—P. dactylifera is very interesting as furnishing the Dates of commerce, but in beauty it is greatly surpassed by P. reclinata, P. rupicola, and P. tenuis.

Rhapis flabelliformis is a native of Japan, and does well in a greenhouse.

Seaforthia elegans, once popular, now superseded by the Kentias.

Other good Palms are the Calamus, Euterpe edulis, Licuala grandis, Pritchardia grandis, Sabal umbraculifera, and the Thrinax.

SILVER OR WHITE BIRCHES.

TREES AND SHRUBS IN GARDEN AND WOODLAND.

By W. J. Bean, Royal Gardens, Kew.

It will be generally admitted that shrubberies do not form one of the most beautiful features of many English gardens. Who is not familiar with the depressing "mixed shrubbery," an endless repetition of Laurel, Pontic Rhododendron, Privet, Aucuba, and such-like? All should be swept away in the interests of true gardening, and their place occupied by shrubs of infinitely greater charm and interest. One has at command a host of beautiful shrubs adapted to different places and positions, some unfortunately rarely seen. Trees are not as a rule so neglected and badly grown as shrubs. Their size in a measure protects them from the indiscriminate huddling together that their dwarfer relatives undergo. But the wealth of tree beauty that is now open to the planter is far from being fully taken advantage of. The Conifer "craze," that lasted through several decades in the middle of this century, resulted in these shrubs being planted too liberally in our parks and gardens, with the result that the deciduous trees that have been sent to us from the North temperate regions have never been adequately represented. I may mention specially the magnificent Oaks, Ashes, Maples, Hickories, Birches, Amelanchiers, and Magnolias from North America; the Cherries, Witch Hazels, White Beam Trees, Alders, and Walnuts of North Asia; the Limes of Eastern Europe; the Zelkowas and Pterocaryas of the Caucasus and Japan. It is hoped that the detailed lists which follow this chapter will do much to bring their value and that of many others into greater prominence.

However choice and beautiful our plants may be, little is gained if their arrangement and treatment are unsuitable. A common fault in planting shrubs is that of simply filling up the space, regardless of artistic effect or association. Every tree or shrub should be planted with a view to effect, perhaps for the sake of its own leaf beauty, or its bark, or its flowers, or to intensify

OAKS AT ASPALL HALL, SUFFOLK

the attractions of others with which it is associated. May be it is merely to serve as a shelter or background. The monotonous effect of most shrubberies is due to an indiscriminate mixing and dotting about of a small number of things repeated ad nauseam. Pleasing results are produced by bold informal groups consisting either of one variety or species, or of suitable combinations of two or more. The same principle should be followed in planting isolated beds on the turf. The beauty of all plants, more especially of the smaller ones, is naturally greater when they are represented in a mass. Their cultivation also is more satisfactory when this arrangement is adopted, as each group can be given its proper conditions (aspect, soil, etc.), and the plants are less likely to get encroached upon by greedy neighbours. A Scotch Rose, for example, need not have to wage an unequal fight with a Privet, nor a Darwin's Barberry with a Cherry Laurel. The dimensions of a group will depend upon the size and character of the species of which it is composed, and where two or more species are associated in a single group they must agree in habit and colour. The following arrangements may be mentioned as examples: Prunus Pissardi, with an undergrowth of the yellow-leaved Cornus Spathi; Hamamelis arborea (Witch Hazel), grown as low standards rising out of a mass of the white Mezereon (Daphne). These flower together in the early part of the year. Such plants as Forsythias, Almonds, Peaches, etc., which flower early, should, if possible, have a background of Holly, Holm Oak, or other evergreen. The evergreen Barberry (Berberis Aquifolium) and Jasminum nudiflorum make a charming combination, the sprawling yellow-flowered branches of the Jasmine making a bright contrast to the purple-tinted foliage of the Barberry. Shrubs of spreading habit like Philadelphus (Mock Orange), Weigelas, and Rhododendrons should never be mixed up with other things.

THE ABUSE OF VARIEGATED KINDS.—Trees and shrubs with variegated or golden or purple foliage brighten our gardens considerably, especially when flowers are scarce, but a certain restraint must be observed in their use. The variegated Negundo, charming as it is, has been far too freely planted. A similar result appears likely with Prunus Pissardi, as the prevailing tone of the garden should be a restful green, plants with coloured foliage only being planted in sufficient quantity to brighten and relieve the arrangement.

In planting new places, expense, time, and disappointment are avoided by obtaining trees and shrubs that have been well managed in the nursery. Most trees, to bear transportation safely to a distance, entirely denuded of soil for some days, must have very fibrous roots. This means that frequent transplanting in the nursery must be carried out, and it necessarily increases the cost of the plant. But, as many have learnt by experience, the expenditure incurred in furnishing a new garden is less when such plants are obtained at first. Planters should, if possible, see the plants before they are purchased; they should have short-jointed leads and sturdy stems. A careful planter will avoid all trees with long sappy leads, such as are often to be noticed in Conifers that have remained too long in one place for safe removal.

IMPORTANCE OF TREES AND SHRUBS ON THEIR OWN ROOTS.—In selecting hardy trees and shrubs, give preference to those on their own roots. Grafting and budding are undoubtedly valuable and necessary means of increase, but they have been abused. Grafted Conifers are invariably shorter lived and less vigorous than those raised from seed, and grafted shrubs generally require constant watching to keep down suckers from the stock. The following should especially be avoided. Deodars worked on Larch, Evergreen Oaks on deciduous ones, Cotoneasters and Rubuses on Thorn, Lilacs and Philyreas on Common Lilac or Privet, and, indeed, all grafted plants of which the stock and scion are widely separated in habit or relationship.

EVERGREENS.—No class of foreign plants has altered the general aspect and character of our gardens so much as the hardy evergreens. The only native evergreen trees of Great Britain are the Scotch Pine, Yew, Box, and Holly. The number of native evergreen shrubs, especially of the Heath family, is, of course, considerable, but they are usually dwarf. The magnificent Conifers of North America and Japan; the Bamboos of Northern

WELLINGTONIA AVENUE AT LINTON PARK, MAIDSTONE.

Asia; the glorious race of Rhododendrons that horticulturists (mostly British) have obtained by intercrossing the wild species of the Caucasus, Himalayas, and North America—these are but three out of numerous groups that the gardeners of only 150 years ago knew not. Yet in spite of all the wealth of evergreens available, some introduced, others raised in this country, it is surprising how much they are neglected. There is one evergreen, however, the Common Laurel, that should be rigorously excluded from a shrubbery, unless one has an entire group of it. Few other things can fight against its greedy, searching roots, and its upper growth smothers everything near itunless it be cut back continually, which destroys its beauty. Grown as an isolated shrub, with abundant space for its long graceful shoots

TREES BY THE LAKESIDE, WROXTON ABBEY, BANBURY.

and brilliant green leaves, the Common Laurel is, however, very beautiful, not, remember, when it is either cropped mercilessly once or twice a year, or jammed up with other things. The alphabetical lists which follow may be searched for the best evergreens, many of them handsome in both flower and leaf. Berberis stenophylla is one of the most graceful and free-flowering of hardy evergreens; B. Darwini, too, in sheltered spots is charming. The value of the Common Camellia as a perfectly hardy shrub in the South of England has never been realised. There are also Azalea amœna, Olearia Haasti, several Elæagnuses, green and variegated, the Skimmias and Pernettyas, for their fruits. In soils free from lime the great Heath family would furnish a garden complete.

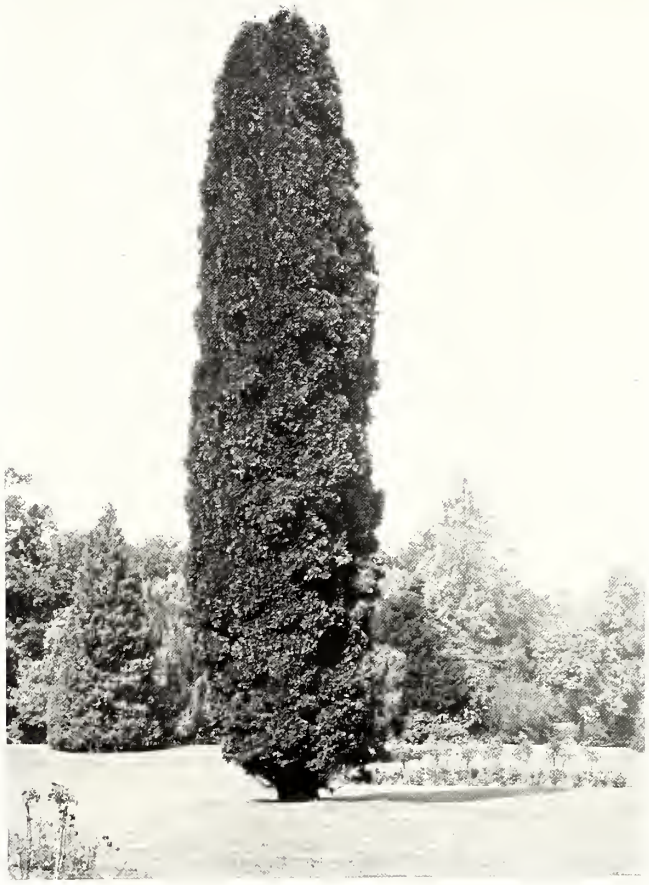
The fact that the HARDY BAMBOOS have only sprung into prominence during the present decade (although they have already made their mark in gardens) justifies special mention of them. Upwards of fifty sorts are now in cultivation, but owing to the similarity that exists between several of them, and the inferiority of others, about half of these only are needed to adequately represent this group of evergreens in ordinary gardens. They belong to a type of vegetation essentially tropical in character and distinct from that of our native flora. No hardy evergreens exceed—very few, indeed, equal—these shrubby grasses in beauty of form, luxuriance of leafage, or bright colour in winter-time. Their fresh tints give them great charm in midwinter; but to show all these qualities Bamboos

must be in vigorous health. A position sheltered from north and east winds is important, also a deep rich soil; but given these two conditions, their cultivation is very simple. It is chiefly a matter of abundant water and manure. The mistake is frequently made of removing these plants in autumn and winter; the proper time is May or later. Another error is that of planting the different sorts promiscuously. Each plant or each species should stand well apart. This not only allows of free and graceful development, but prevents the hopeless confusion that is the result of the underground stems running into each other. To those who are unacquainted with these plants, the following selection of a dozen species may be of use, as representing the best and hardiest in the neighbourhood of London: Arundinaria nitida, A. Simoni, A. japonica (Métaké), A. Fortunei and A. auricoma (both dwarf and variegated), Phyllostachys Henonis, P. Boryana, P. viridi-glaucesens, P. nigra, P. mitis, P. Kumasaca, and Bambusa palmata.

Although a few Conifers are deciduous, such as the Maidenhair Tree (Ginkgo), Taxodium distichum, the Golden Larch (Pseudolarix), and the true Larches, the great bulk of this family is evergreen. It comprises, indeed, the only hardy evergreens which, in

A BEECH WALK IN BLENHEIM PARK, OXFORDSHIRE.

stature and bulk, rival the large deciduous trees of cool temperate latitudes. Except for the Common Juniper, the Scotch Pine, and the Yew, the whole of the Conifers are exotic. The extreme popularity of Conifers, which was at its height about fifty years ago, undoubtedly led to the enriching of the gardens and parks of this country with what are now in many instances magnificent specimens. To realise how much, one has only to mention such places as Dropmore, Murthly Castle, and Ochtertyre. But Conifer planting was overdone, and in many gardens the light, graceful, flower-bearing deciduous vegetation natural to our climate was replaced by heavy masses of Pines, Firs, and Spruces from



LIBOCEDRUS DECURRENS AT FROGMORE (65 feet high).

America and Japan, many of which have proved but ill-adapted to general cultivation, and can only be grown to advantage in certain soils or localities.

When judiciously used, properly selected and planted, the Conifers constitute a most important group. Nothing, for instance, in the whole range of native or foreign trees is more stately and picturesque than the Cedar of Lebanon. How much we of the present day owe to those who, a century and more ago, planted this tree so abundantly in this country, the illustrations in this work will show. In some localities, especially in North Britain, certain Conifers, like the Douglas Fir, promise to be of value as timber trees.

IN SELECTING CONIFERS for purely garden use a study should be made of the species planted in other gardens with similar conditions as to soil, moisture, and altitude. The Spruces (Picea) are nearly all failures in light dry soil, but the Lawson Cypress and Larches succeed well. Nearly all the Pines are happy in poor gravelly ground. In localities exposed to sea-winds, the Monterey Cypress, Pinus insignis, P. muricata, as well as the Scotch, Corsican, and Austrian Pines, have proved valuable. For chalk, the Cedars, Larches, Abies nobilis and A. Pinsapo, the Maidenhair Tree, Lawson Cypress, Thuja gigantea (Lobbi), and T. occidentalis, as well as the Yews and Junipers, are among the best. The Conifer family is especially noteworthy for the polymorphous character of many of its species. The well-known Retinosporas are generally nothing more than forms, "states" the botanists term them, assumed by various species of Thuja and Cupressus. Strictly speaking, "Retinospora" has no separate existence as a genus. This, however, is a botanical phase of the matter. What concerns the majority more is the same tendency to variation that has shown itself in the numerous coloured varieties now in gardens, as well as in those that differ in growth. The Common Spruce (Picea excelsa) is a tall stately tree, which has "sported" into numerous dwarf forms only a few feet high and admirably adapted for the rock garden. The Lawson Cypress again has assumed almost every shade of colour and every form of growth except a prostrate one. A blue-white or glaucous hue, although more or less present in most Conifers, shows itself most conspicuously in the Blue Spruce (Picea pungens glauca) and Cedrus atlantica glauca. For supplying various shades of yellow, the golden variety of the Common Yew and several varieties of the Lawson Cypress are very useful; and Cupressus macrocarpa lutea is a singularly charming yellow form of the Monterey Cypress.

TREES AND SHRUBS IN WINTER.—Although evergreens have added so greatly to the warmth and attractiveness of gardens in winter, deciduous vegetation, too, is full of beauty

then. Indeed, it is the big deciduous trees that should predominate in the garden landscape, and not, as occasionally happens, the sombre hues of Spruce and Fir. One admires the tender, delicate grace of the Birch and Willow, the gaunt, rugged strength of the Oak, and the wonderfully fretted outline of the Elm, standing out in every detail against the sky. The one element of beauty we miss then is that of colour; but there are trees and shrubs even in November to brighten the garden with their bark and fruits. These are not used so extensively as they might be, though the beauty of the silvery trunks of the Birch has not been overlooked by planters. But there are several trees and shrubs equally telling in the colour effects they produce in the short winter days. The Canoe Birch (Betula papyrifera) exceeds even our native species in the clear whiteness of its bark. Other trees that have warmer colours are the red and yellow barked varieties of Salix vitellina. A striking Willow, too, is Salix daphnoides, its bark in winter becoming a blue-white colour. These Willows when grown for colour effects should be planted in masses and pruned hard every year, early in March. The white-stemmed Brambles are particularly striking from October onwards. There are several of them, but by far the best is Rubus biflorus, often to be had from dealers under the erroneous name of R. leucodermis. Then there are the Cornus with red and yellow stems, and the Kerrias with their bright green bark. It is scarcely necessary to repeat how essential it is that all these shrubs should be planted in bold informal groups. The Willows mentioned are especially charming near the water's edge.

TREES AND SHRUBS WITH FINE FRUITS.—Turning to the trees and shrubs with ornamental fruits, it is unfortunate that many of the finest (like most of the Thorns) lose their fruits before winter. Birds, too, play havoc with many of them, especially in hard weather. Still, the following are worthy of mention in this connection: Sea-Buckthorn (Hippophæ rhamnoides), with orange berries crowding the branches — to obtain fruits plants of both sexes have to be grown; Cotoneaster tomentosa, scarlet, the best of the genus remaining in fine condition till March; Hollies, especially the yellow-berried one; the Snowberry (Symphoricarpus racemosus), white; Cratægus Pyracantha and Lælandi, whose scarlet fruits must be protected from birds; Cratægus Crus-Galli and its several varieties retain their scarlet haws for a long time. Against a sunny wall, with restricted root space, Vitis heterophylla and the Hop-

SILVER FIR, ABIES NOBILIS.

leaved variety are often remarkably beautiful, by reason of the wealth of turquoise-blue berries they bear. The large pyramidal clusters of fruit borne by the Stag-horn Sumach are also attractive, being covered with crimson hairs Few native shrubs surpass in beauty the Spindle-tree (Euonymus) when its rosy scarlet fruits are bursting and disclosing the orange-coloured seeds within.

A WINTER GARDEN.—There seems to be room for a new feature in gardens—at least, in gardens of fair size. This I may term the outdoor winter garden—that is, a piece of ground specially prepared and set apart for trees, shrubs, bulbs, or, indeed, any plants that flower or are bright with fruit or bark, say from November to the end of February. For the purpose we should need a fertile, well-drained piece of ground open to the south, but sheltered by thick evergreens from north and east. Some of the trees and shrubs with ornamental fruit or bark that could be used I have alluded to already. The following is a list of those that flower during the winter. If the plan of bringing them together in one spot be not adopted, the list may still be of use to those who wish their gardens to be as bright as possible during that season. Some country houses are seldom visited at any other time. November: Arbutus hybrida, A. Unedo and varieties, Daphne Mezereon variety grandiflora, Elæagnus glabra, E. macrophylla, E. pungens (all three delightfully fragrant), Hamamelis virginica, Jasminum nudiflorum, Lonicera fragrantissima, L. Standishi. December and January: Chimonanthus fragrans and varieties, Clematis calycina, Cratægus monagyna variety præcox (Glastonbury Thorn), Erica mediterranea hybrida, E. carnea and E. carnea alba, Garrya elliptica, the Laurustinus. February and early March: Berberis nepalensis, Cornus Mas, Corylopsis spicata, Daphne Blagayana, D. Laureola, D. Mezereum and variety alba, and D. oleoides, Erica mediterranea, Forsythia suspensa, Hamamelis arborea, H. japonica, H. mollis (the best), and H. Zuccariniana, Prunus Davidiana, P. Amygdalus variety persicoides (the earliest Almond), Pyrus japonica, Rhododendron altaclarense, R. dauricum, R. Nobleanum, and R. præcox. A little later come Rhododendron fulgens and R. Thomsoni, Cassandra calyculata, Nuttallia cerasiformis, Forsythia intermedia and F. viridissima, Pieris (or Andromeda) floribunda and P. japonica, and Common Gorse.

The last group may be said to usher in the great flowering-time of our hardy trees and shrubs, which extends from the end of March till the end of June. The zenith is reached in the middle of May; from July onwards the number sadly diminishes. It is between July and March that we need more hardy shrubs in flower, and collectors should bear this fact in mind. The number is, however, increasing, and some valuable additions to the group have been made in recent years. Of those that flower in winter and early spring I have given a fairly complete list; here is a selection of the more noteworthy that bloom from August till October: Caryopteris Mastacanthus, Hydrangea paniculata and the variety grandiflora (both effective, especially if the number of shoots is reduced early in the season so as to increase the size of the trusses; by good cultivation they may be obtained 18in. long and 12in. in diameter), various Hypericums and Clematis, Magnolia grandiflora, Hibiscus syriacus (this and its numerous varieties are very charming in warm localities), Ulex nanus, Lespedeza bicolor and L. Sieboldi, Sophora japonica, Hamamelis virginica, Tecoma radicans, Dabœcia polifolia, various Ericas, Clethra alnifolia variety tomentosa, Ligustrum lucidum, L. Quihoui (a very pretty Privet), Buddlea variabilis, Clerodendron trichotomum. Fortunately the great bulk of Composite herbaceous plants flower during autumn, and it is to them more than to woody vegetation that we shall probably always have to look to brighten our gardens at that season.

AUTUMN COLOURS.—In Britain it is, apparently, impossible to obtain the colour effects that make the autumn vegetation of North America so glorious. Even trees that thrive perfectly here fail to colour. Still, we possess a large number of trees and shrubs that are delightful in their autumnal livery of crimson, purple, scarlet, and gold. The following may be mentioned as of more than ordinary interest in this connection: The

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American Red and Scarlet Oaks; the Tupelo, bronzy red; Carya tomentosa, yellow (one of the most remarkable of American trees); Ulmus pumila, an Asiatic Elm which has small leaves changing to golden yellow; Liquidambar, purplish red; Gleditschia triacanthos, often a lovely yellow; Celtis occidentalis (Nettle-tree) and Zelkowas, both yellow; the Golden Larch (Pseudolarix); Ginkgo biloba, orange yellow; deciduous Cypress, red; various Maples; Betula corylifolia, orange yellow.

Among shrubs a few of the best are: Berberis Thunbergi, which dies off a rich scarlet, and is so beautiful in autumn that on some estates it has been planted in great quantity so that sportsmen may enjoy its colour during the shooting season; Ghent Azaleas, purple and red; Enkianthus, scarlet and crimson; Fothergilla, rich red; the taller American Vacciniums; Rhus cotinoides, orange, scarlet, and crimson—perhaps the finest of all shrubs for autumn colour; R. typhina, R. glabra, R. Toxicodendron (the poison Ivy), and other species, mostly rich orange red; Euonymus alatus, crimson.

PINE BY WATERSIDE.

Among climbers: Vitis Coignetiæ, a noble Vine, crimson; V. Romaneti; the Teinturier grape, purple, and various other Vines; Veitch's Ampelopsis and the Virginian Creeper, especially the variety of the latter called muralis, which climbs and clings to walls without any artificial support; Lonicera japonica flexuosa, red-purple. A certain amount of mystery attends the autumn colouring of trees. Some years the most reliable will fail. On the other hand, every season one notices species, not usually conspicuous in the matter of autumn tints, beautifully coloured. A bright summer and not too rich soil appear to be most favourable.

TRANSPLANTING.—In the cultivation of trees and shrubs transplanting is one of the most important items. Upon its proper performance depends much of the future welfare of the subject. Two questions must be considered, viz., the best time and the proper method. Evergreens in general may be transplanted with greatest safety in autumn or late spring. Hollies and Bamboos should be moved in May, and not before they give evidence of renewed growth. Rhododendrons, Heaths, and all that class of evergreens with a compact mass of fibrous roots may, with due care, be removed at any time between September and May. The most suitable time for transplanting deciduous trees and shrubs is just after the leaves have fallen, but the work can, as a rule, be safely performed during open weather at any time throughout the winter and early spring. The Magnolias and the Tulip-tree are

exceptions; like the Bamboos, they should never be disturbed at the root until there is evidence of new growth—that is to say, not before May.

In shifting a plant from one place to another preserve the fine fibrous roots (which are the real workers) as much as possible. If a portion of the soil in which they are growing can be shifted as well, so much the better, but, except in the case of small material, this is often difficult to accomplish without a proper transplanting machine. The root fibres are, however, of more importance than the soil attached to them. In removing a large deciduous tree or shrub, a trench should be first dug all round it far enough from the trunk to reach its small roots. Then carefully and gradually work the soil away with a fork, and preserve the roots. Lay damp mats over them whilst they are exposed. Where the tree is again to be planted, a hole should be prepared large enough to allow of the roots being spread out evenly all round, and to their full extent. Care should be taken to break up the soil finely, especially that which comes immediately in contact with the roots. In heavy land, too, deep

A STANDARD WISTARIA.

planting is a great evil; in light sandy soil the ill-effects are not so great. A safe rule is not to bury that part of the stem whence the uppermost roots spring more than 2in. or 3in. A thorough watering should be given, and as summer approaches an additional help to transplanted trees is afforded by a 3in. mulching of short manure. The amount of care to be given in transplanting trees, and afterwards, varies of course with their adaptability to the process and the estimation in which particular ones are held. It may be said, however, that valued specimens, especially those becoming unwieldy in size and those that have long remained undisturbed, should not if possible be touched. However carefully performed, there is always a certain risk attached to the operation. When the fact of a tree having to be removed is known a sufficient time beforehand, it is a good plan during the previous winter to dig a trench round it near enough to cut off the younger roots and to fill this with new soil. The tree will root into this, and thus make its ultimate removal safer and easier. When planting previously unbroken ground, it is important that it

RHODODENDRONS AT SWANMORE HOUSE, HAMPSHIRE.

should be thoroughly trenched, say, to a depth of 2ft. Single trees, especially important ones, should never be put in holes (as is, however, so often done) barely large enough to hold their roots, unless, of course, the ground has previously been cultivated. Sufficient ground should be trenched for them to root in for several years. The more, in fact, the better.

PRUNING.—Whilst not in itself absolutely necessary, pruning is important. In pruning the cultivator's aim is twofold. He wants to control the shape and size of the plant, and also, it may be, to influence the size and character of the flowers.

To consider first the practice in respect to trees and shrubs when the flowering question does not arise. This, of course, applies mainly to the large trees of our gardens—the Elms, Oaks, Beeches, etc., some of them with coloured or variegated foliage. With all these the pruner's aim is to obtain a finely-proportioned, well-built tree, which shall represent the species in its true beauty. A perfect tree must have a clean straight trunk, the axis from which all its main branches must spring. We all admire height in trees, but height in itself is a source of danger to the tree. It will be noticed that very old trees—that is, those that have survived the storms of more than two or three centuries—are usually low and spreading. The exceptions, like the Sequoias of Western North America, which are of immense size and age, occur in sheltered valleys and in groves or forests. Their trunks, moreover, are almost invariably erect and unforked, consisting of one straight clean axis from which only minor ramifications extend. It is from these giants that we obtain a hint of what we have to aim at in the treatment of isolated specimen trees in parks and gardens. If we want noble trees and secure against storms, the forking of the main trunk must be prevented. If this should occur low down, the crown of the tree becomes divided into two halves, and during storms the swaying inevitably starts a crack at the fork by means of which water, and ultimately fungoid parasites, enter the heart of the tree. Thus the first stage towards its destruction is reached. I have repeatedly seen such trees, especially Beeches, rent in two by wind, and one half brought to the ground. The first thing, therefore, in pruning a young tree is to obtain a well-defined leading shoot; and as long as the tree is under control, or until the trunk has attained the natural height of the

species, this should have its predominance over any rival leaders maintained. Some trees which in their native countries are naturally tall and stately, are apt in this country, from causes due no doubt to an unsuitable climate or soil, to become stunted and spreading in growth. Much may be done to induce a taller, freer growth by thinning out the crowded branches and considerably shortening back those that are left. Whether cultivators will care to take this trouble depends, of course, on the esteem in which particular trees are held.

PRUNING FLOWERING SHRUBS.—Here the end desired is quite different. Some shrubs, indeed, never need be touched with the knife, as, for instance, evergreens and those shrubs

CEDAR ON LAWN AT SWANMORE PARK.

that form clear, well-defined stems, like Rhododendrons or Halesias. Whenever it is necessary to cut them in merely from considerations as to space, or because some particular outline is desired, the best time to prune is just after flowering. The shrubs for which pruning is really necessary to obtain fine and abundant flowers are those which renew themselves by young sucker growths from the base, such, for instance, as various species of Spiræa, Kerria,

Philadelphus, Diervilla, Deutzia, Shrubby Honeysuckles, etc. All these are apt to become choked up with old, half-dead or weakly growths, which should be removed. Immediately after flowering is again the best time. Take Philadelphus Lemoinei as an example. To see this lovely shrub at its best, the old-flowering shoots should be cut clean out every year as soon as the flowers are past, say in July. At that time the new growths springing from the base have already become 1ft. or more long, and they alone should be left. By this treatment long graceful wands wreathed with fragrant bloom are every year obtained, and the whole plant consists of flowering wood alone. The worst possible form of pruning (one, however, too commonly practised) is an indiscriminate cropping back of all branches without any regard to their age or to the flowering season of the species—in fact, treating a flowering shrub pretty much the same as if it were a Privet hedge. As a rule, mere shortening back of branches should be avoided. A judicious thinning is what is needed. At the same time, autumn-flowering shrubs, and, in fact, all those that flower on the current season's wood, may, if necessary, be cut back annually almost to the previous year's wood. Such plants, for example, as Spiræas of the Bumalda group, Hydrangea paniculata, late-flowering Brooms, and Ceanothus azureus and its varieties, may all be treated thus, especially if grown in beds or groups where it is desirable they should not get beyond a certain height. The best time to prune this class is just before growth begins—as a rule in February—so as to allow as long a season of growth as possible. Forsythias, which flower early and grow rapidly, may be spurred right back as soon as the flowers are past.

Care of Old Trees.—Bearing some connection to the matter of pruning is that of the care of old trees. Almost every garden contains one or more veterans which either for their botanical interest or for the associations that belong to them are precious to their owners. Some trees again, like our native Oak, are picturesque in decay. At any rate, one of the commonest applications made to tree experts is for advice as to the preservation of old trees. The two more immediate causes of premature decay are starvation at the root and injury by storms and disease. Such trees as the Beech and 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 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 out and shortening back 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 treament.

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 aid is 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 long, 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 till 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 all 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.

WE hope the useful article of Mr. Bean will assist those who have yet to learn that a great host of flowering trees and shrubs, and evergreens also, are rarely used in the English garden.

PRUNUS SERRULATA IN FLOWER.

It is time a thorough awakening occurred in respect to the pleasure grounds and woodland, for one sees there trees and shrubs utterly unsuitable for their position, possessing neither beauty of leaf, flower, nor form, and frequently jammed together in a way to destroy all characteristic growth.

Of recent years many important introductions have come from abroad, and these should be considered in planting in the future. It is well also to take up one family of shrubs or trees and plant the most beautiful varieties in it, avoiding always the desire to obtain mere collections, for these are never satisfactory, unless the garden is of sufficient size to group families together with good effect. Be careful that in the use of variegated foliage this is not overdone, for nothing is more distressing than a surfeit of spotty leaves. The advice of Mr. Bean to avoid Conifers, which are never happy in this climate, is excellent. One has only to walk through an English park where Conifers have been planted with little consideration as to their suitability for the position to see how much expense is frittered away.

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AN AVENUE OF FIRS.

BEAUTIFUL DECIDUOUS TREES AND SHRUBS.

AMONGST deciduous trees and shrubs, that is, the group which loses its foliage, are many of great beauty, and it is upon these that the landscape gardener in a large measure depends for rich effects at all seasons, even in winter, when Willows, Birches, and other trees make rich pictures with their coloured bark. The notes of each species and its varieties have been compressed into as small a space as possible, without, it is hoped, curtailing any necessary information.

Abelia chinensis.—This Chinese species is the only thoroughly hardy kind amongst the half-dozen species of Abelia that are in cultivation. It forms a neat, freely-branched little shrub, that reaches a height of 2ft. to 3ft. The small pointed leaves about 1in. long are bright green, and the pretty pink tubular-shaped blossoms are borne in clusters at the point of every shoot. They do not open all at once, but a succession is maintained from the end of July until September is well advanced. It is propagated from cuttings of the current season's shoots, taken in August, and dibbled firmly into sandy soil. They must be placed in an ordinary garden frame, and kept close and shaded till rooted. Another name for A. chinensis is rupestris. Other species of much charm are A. floribunda and A. triflora, but these are tender.

Acer.—The Maples form a large group, consisting principally of trees remarkable for their handsome foliage rather than flowers, and including the different forms of Sycamore too. The flowers are for the most part insignificant, but the peculiarly-shaped seed-pods which succeed them, and popularly known as keys, are decidedly attractive. To one section at least of Acer the term tree does not apply, for this group is quite shrubby. This section comprises the different forms of A. polymorphum or palmatum, which are called collectively Japanese Maples. The commoner Maples are readily raised from seeds sown as soon as ripe in prepared beds in the open ground, and covered with about 1in. of soil. Where a few of one kind only are needed the seed may, if preferred, be sown in pans or boxes. The choicer forms are grafted or budded on to seedling plants of the commoner kinds, the typical Acer palmatum being used as a stock on which to graft the innumerable forms of Japanese Maples. Grafting of the larger kinds is performed, as in the case of fruit trees, in the spring, while budding is carried out in August. The Japanese Maples must after grafting be kept close under glass, the stocks being generally grown in small pots for the purpose. Side grafting in early spring is the method usually employed. Grafting is, however, a great evil. The trees should be upon their own roots.

A selection of the best Acers would include:

A. dasycarpum.—A tree 30ft. to 40ft. in height, with deeply-cut leaves, and in most forms silvery under-sides. It is a native of the United States, and very popular there as an ornamental tree. In the variety laciniatum the leaves are more deeply cut than those of the type. This species has many synonyms, such as A. palmatum, A. saccharinum, A. Douglasi, A. rubrum, and others.

A. Negundo (*Ash leaf Maple*).—This is a familiar tree in gardens, especially its variegated form, which is extremely ornamental, but must always be planted judiciously, as its variegation is very distinct and effective. All trees and shrubs with pronounced foliage must be planted with discretion, otherwise the effect is spotty. Variegata has light green and whitish leaves, which are pleasing when associated with trees or shrubs having dark-coloured foliage. It may be used even in shrub form, being cut down each year. Grow it upon its own roots. Aureo-variegatum is another form, in which the leaves are quite golden in colour.

A. palmatum or polymorphum.—This is the type of the numerous Japanese Maples, among which are included some of the most beautiful of our hardy shrubs for their foliage. These Maples are largely used for indoor decoration, from which circumstance they are by many considered tender, but such is not the case, as they are perfectly hardy. A good well-drained loam that is not parched up at any season, and a situation somewhat sheltered from high winds, but at the same time quite open to light and sunshine, suit them best. The best of these Japanese Maples are: Atropurpureum, leaves rich purple-crimson; dissectum, very finely cut; flavescens tinged yellow; involutum, the edges peculiarly turned inwards; linearilobum, leaves cut into strips; roseum marginatum, leaves small, green, edged with rose; sanguineum, bright red; septemlobum, so named from its seven lobes.

A. pennsylvanicum.—A tree 20ft. high or so, with a spreading head, well furnished with large lobed leaves. The prominent feature of this Acer is the bark, which is green, striped with white. From this circumstance it is also known as A. striatum. In the United States it is popularly called the Moose Wood. A. canadense and hybridum are the same.

A. platanoides.—This is the Norway Maple, a decidedly ornamental tree, that will reach a height of 50ft. or more. There are many varieties, some with variegated and others with cut leaves. The varieties of this are Columnare, cucullatum, globosum, heterophyllum variegatum, laciniatum, palmatum, purpureum, Reitenbachi, rubrum, and one of the most beautiful of all Schwedleri, the young leaves of which are quite red; its colouring is very rich in spring.

A. Pseudo-platanus.—The common Sycamore is known to everyone as a quick-growing ornamental tree, and among its many varieties are alba variegata, Leopoldi, which has leaves mottled with red and white, atropurpurea, a very handsome purple Sycamore, and purpurea, with purple foliage.

A. rubrum (*Scarlet Maple*).—The name of rubrum (red) applies to the flowers, which, though small, are bright red, and borne in such numbers early in the spring on the still leafless branches that on a bright day the tree seems to glow with colour. A. rubrum has eleven synonyms in the Kew hand list. Its recognised varieties are Drummondi and Sanguineum.

A. saccharinum (*Sugar Maple*).—The leaves of this are deeply cut, and more or less glaucous underneath. It forms a large wide-spreading tree of considerable interest, owing to the fact that it is the Sugar Maple of the United States and Canada, its sap being there collected for the manufacture of sugar.

A. tataricum var. Ginnala.—A small tree from the Amur river, with lobed leaves, smaller than those of other kinds, but in the autumn changing to bright red tints before falling.

Æsculus (*the Horse Chestnut*).—The Chestnuts form an important family, and the Pavias, which are natives of North America and popularly known as Buck Eyes, are now included in the same group. They bear great resemblance to the other forms of Æsculus. The common Horse Chestnut is easily raised from seed, sown in beds as soon as ripe, and covered with about 2in. of soil. All the varieties may be grafted or budded on to this, grafting

HORSE CHESTNUTS IN A PARK.

being carried out, as with fruit trees, in the spring, and budding in July.

Æ. flava is a small sparsely-branched tree with light green leaves and yellow flowers. It is not particularly showy, but interesting.

Æ. Hippocastanum.—The common Horse Chestnut is by far the best known of all, and one of the most ornamental of our large trees, both in foliage and flowers. There are many noble avenues of them in the country, one of the best known being in Bushey Park, and during the flowering-time of the trees it is visited by thousands. The double-flowered variety (flore-pleno), though seldom seen, is distinct from this type. Of other forms of the Horse Chestnut a very important acquisition is the scarlet-flowered Æ. Brioti, which continues long in beauty and is very bright and free, unlike many forms.

Æ. parviflora.—This is also known as Pavia macrostachya, and is, unlike the preceding, quite a bush; but it pushes up suckers so freely that when not more than 6ft. to 8ft. high it is often quite twice that distance across. The Horse Chestnut-like leaves are very dark green, while the long spikes of bottle brush-like flowers are borne towards the end of July, when few other shrubs are in bloom.

Æ. Pavia, known also as Pavia rubra. The remarks concerning Æ. flava will apply equally here, except that the flowers are red.

Æ. rubicunda.—This is really a form of Æ. Hippocastanum, and under the popular name of the scarlet Horse Chestnut is well known. It does not attain the size of the common kind, yet it forms a well-balanced specimen from 20ft. to 30ft. high, densely clothed with deep green leaves, and when studded with its pretty red flowered spikes it is very welcome upon the lawn or in the pleasure grounds. Rosea, which flowers during May or June, has flowers of a pronounced rosy tint.

Ailantus glandulosa (*Tree of Heaven*).—This is a very quick-growing tree, clothed with pinnate leaves, from 2ft. to 3ft. long, and occasionally furnished with pendulous clusters of reddish seed-vessels, something like the keys of the Ash. This does well in towns, and can be readily increased by cutting the roots up into lengths of 8in. to 1ft. and inserting them firmly in a bed of good sandy soil, the upper portion of the root being about 2in. below the surface.

Allspice (*American*).—*See* Calycanthus.

Alnus (*Alder*).—The Alders are closely allied to the Birch, but succeed best in damp spots, under much the same conditions as the Poplars. They are propagated readily by seeds, which ripen freely, and in the case of large quantities are sown outside in prepared beds, and very lightly covered with soil, a few Spruce branches being laid over afterwards to check evaporation. The choicer kinds are increased by cuttings, put in the open ground in winter, and by grafting, which is performed in the spring, the stocks being seedling plants of the common Alder. This, which is known as Alnus glutinosa, is a free-growing tree, that reaches a height of 50ft. to 60ft. A prominent feature is furnished by the pendulous male catkins, which are borne in great profusion in early spring. The leaves are roundish, an from 1in. to 2in. long. Besides the ordinary form there are some well-marked varieties, notably A. glutinosa aurea, with golden leaves; A. g. impericulis laciniata, leaves finely cut, a charming tree, forming quite a picture of grace and elegance; and A. g. quercifolia, with Oak-shaped leaves. There are several other species natives of North America and of Japan, but our native Alder is equal to any of them. A. barbata, or cordata as it is also called, is a good kind, but there is a great host of Alders, chiefly varieties and synonyms. The leading species are A. barbata, A. cordifolia, A. firma,

A. glutinosa, A. incana, A. japonica, A. maritima, A. nitida, A. oregona, A. orientalis, A. pubescens, A. serrulata, and A. subcordata.

Amelanchier (*Snowy Mespilus*).—The Amelanchiers are charming flowering trees, still called in some books by the old name of Mespilus. There are four distinct species given in the Kew list, and a host of synonyms. Thus A. Botryapium of catalogues is A. canadensis (the June Berry), which, though it will attain a height of 30ft. or so, flowers in great profusion when much smaller than this. The branches are slender, and in early spring smothered with pure white blossoms. The berries when ripe may be mixed with soil or sand and kept damp till the spring, when they must be sown. It can also be increased by layers, put down in the autumn. Although the Canadensis is the chief species, there are others, such as A. alnifolia, A. oligocarpa, and A. vulgaris with its form named cretica; of each species there are many varieties.

Amorpha fruticosa (*the Bastard Indigo of Carolina*).—This is a distinct shrub, which pushes up strong shoots from the base to a height of 6ft., and clothed with pinnate leaves. The flowers, which are borne in closely packed terminal spikes, are small, but of an intense shade of purple, against which the bright yellow protruding anthers stand out conspicuously. Like other leguminous shrubs, it will hold its own better than many subjects in sandy soils. The flowers are borne during the latter part of July. This Amorpha pushes up suckers freely, which may in the autumn be taken off with their roots; another species is A. canescens.

Amygdalus (*the Almond*).—The Almonds are now grouped with the Prunuses, but they are set out here, as the popular botanical names have been too much in vogue to eradicate at once. But the true names as at present recognised are given also. The Almond is too well known to describe. Its misty pink bloom is a herald of spring. We may search for Snowdrops and early spring flowers when the Almond flowers open shyly in the gusty March days, too often to suffer from cold winds and frosts.

A. communis is the name of the ordinary species, and there are several well-marked varieties. Amara, or the Bitter Almond of commerce, is of note for the sake of its large and beautiful flowers, which are deeper in colour than those of the ordinary species. Closely allied to this is the Sweet Almond (A. dulcis), which is even earlier in flower than the variety Amara. A very charming variety is called flore-pleno, which has almost double flowers, and these resist winds and frosts more strongly than the frail petals of the single Almonds. Their rich rose shade is welcome; indeed, it is a tree to make a group of for its beauty in the early year. Macrocarpa is a very important variety, altogether bolder and larger than the common Almond, while the flowers are nearly 3in. across, white, tinted with pink in the centre. Pendula is, as the name suggests, a pendulous variety.

A. Davidiana.—This Chinese species is one of the most recent acquisitions to the family, and the earliest of all to unfold its flowers. It is a more slender plant than the common Almond, and its rose-coloured flowers are much smaller, but borne in such profusion that the branches are completely wreathed with them. The earliest flowers are often borne before January has left us. There is a variety (Alba) with white blossoms.

A. nana is a dwarf bush about 1yd. high, with pink flowers freely borne while the branches are still leafless. It is a pretty little bush that when once established pushes up suckers freely. This can be propagated by suckers, and A. communis by seeds, while this latter serves as a stock for the others, which may be grafted in spring, or budded in August.

This is the present classification of the Amygdalus group:

Prunus Amygdalus	=	Amygdalus communis.
,, var. amara	=	,, ,, var. amar and A. amara.
,, ,, dulcis	=	,, ,, ,, dulcis.
,, ,, macrocarpa	=	,, ,, ,, macrocarpa.
,, ,, persicoides	=	,, ,, ,, persicoides and Persica amygdaloides.
P Davidiana	=	Amygdalus davidiana and Persica davidiana.
P. nana	=	,, nana.
P. Persica	=	Persica vulgaris and Amygdalus Persica.
,, var. flore roseo pleno	=	Amygdalus prunifolius flore pleno.
,, ,, flore albo pleno	=	,, prunifolius flore albo.
,, ,, foliis rubris	=	Persica foliis rubris, Persica atropurpurea, and Amygdalus atropurpurea.

The chief species or synonyms, compiled from the Kew list, only are given. One cannot make these changes in nomenclature too clear, otherwise information given is likely to prove misleading.

Aralia spinosa (*Angelica Tree*).—This pushes up stout, spiny stems to a height of a dozen feet or so, while the huge divided leaves are wide-spreading, and impart to the plant quite a sub-tropical aspect. It is also well worthy of consideration as a flowering shrub; the large terminal plume-like panicles of creamy white blossoms are borne late in the autumn when few other shrubs are in flower. Pieces of the root cut up into lengths of 6in. to 9in. and planted in light and sandy, but at the same time fairly moist, soil will soon form plants.

Ash.—*See* Fraxinus.

Azalea.—Although the hardy Azaleas are now placed amongst the Rhododendrons it seems that it would be unwise to remove them to that genus in this alphabetical list, as likely to confuse the general reader. But it must be remembered that the Azaleas, once kept distinct, are now merged, and rightly so, into the Rhododendron family. The hardy Azaleas are unrivalled for effect amongst the deciduous shrubs, and smothered with blossom before the leaves have developed. Of late years Mr. Anthony Waterer has raised beautiful forms at Knaphill, and the "Knaphill" race of Azaleas is rich in beautiful colours, from white, through yellow, orange, and buff, to crimson, scarlet, and flaming tones, which create glorious pictures in the garden in the late spring and early summer. The shrubs should be planted in groups, when the rich colouring of the flowers is most effective, and in autumn the foliage turns to warm tints, crimson, brown, purple, and other shades intermingling, making the bushes almost as beautiful in their autumn dress as when covered with blossom in spring and early summer. New hybrids are being raised, as, for instance, between A. mollis or the Ghent or hardy forms, and the late-flowering sweetly-scented A. occidentalis has been crossed with A. mollis, with the result that a distinct and fragrant group has arisen. Seed may be raised in beds of well-prepared soil and just covered with a little sand. Keep the beds moist and shaded till the young plants make their appearance. Layering should be done as soon as possible after the leaves drop, and layers will take two years to root sufficiently for removal. Grafting, which is principally employed for the increase of the choicer varieties, is a delicate operation, best carried out towards the latter part of the summer. The plants need to be kept close in the propagating house about a couple of months before a union is complete. The hardy Azaleas, or Ghent as they were formerly called, because so many hybrids were raised in the neighbourhood of the old Belgian town, have originated by crossing the native North American

species with Rhododendron flavum, formerly called A. pontica, and when planting them choose a sheltered position, not because the shrubs are in any way tender, but to shield the flowers as much as possible from cold winds and late frosts. The majority of them are in bloom before the time of frosts has hardly passed, and sometimes a few nipping frosts will destroy the flowers wholesale. It is to minimise the evil of this as far as possible that shelter is advisable. But few shrubs, it may be added, are more suitable for planting in woodland or on the fringe of walks than these, as here the colours are brought out in full richness, lighting up the landscape even more brightly than masses of the Rhododendrons, familiar in many gardens, and which are frequently overdone. It may seem strange to write of Rhododendrons being less brilliant than the Azaleas when all are grouped under the same heading, but in the course of time one will get accustomed to this alteration in nomenclature. A peat soil or a mixture of loam and peat will provide suitable material, and it may be useful to mention that Mr. Waterer writes as follows respecting this class: "In a general way all American plants may be said to delight in, and to require, what is called peat soil; it was at one time believed that they would not thrive in any other. Experience, however, proves the contrary, and it is now found that Rhododendrons and Azaleas, which are the most important of that class, as well as any other of the more vigorous-habited plants, succeed in almost any soil that does not contain lime or chalk. In many sandy loams they grow with as much luxuriance as they do in peat; in fact, almost any loamy soil, free from lime or chalk, may be rendered suitable for them by a liberal admixture of leaf mould or any fibrous material, such as parings of pasture land. When the soil is poor cow dung, in a thoroughly decayed state, forms one of the best manures for these plants." Seed-pods, it must be remembered, should be picked off immediately the flowers are over.

The principal species are:

A. calendulacea (*Rhododendron calendulaceum*). — A somewhat spreading bush, 6ft. or so in height, bearing a profusion of orange-coloured flowers. This is one of the most handsome of North American shrubs, but one does not often see it in English pleasure grounds. The reason, doubtless, why so many of the species are rare is because they have become overshadowed by the splendid beauty of the hybrids. The flowers of A. calendulacea are orange, and of course this beautiful colour is seen distinctly in the hybrid race; without it the Azaleas would lose much of their richness and charm. Bartram, who discovered this species in America, records his first impression thus: "I saw the blossoms covering plants on the hillsides in such incredible profusion that, suddenly opening to view from deep shade, I was alarmed by the apprehension of the hill being on fire."

A. arborescens (*R. arborescens*).—This is a little-known shrub, but worth planting for the sake of its very fragrant flowers, which are touched with soft rose. It is not so important as many species, but should be included for the sake of its pleasing foliage and sweetly-perfumed blossom.

A. indica.—This is the Azalea so frequently seen in English greenhouses. It is not strictly hardy, but will sometimes succeed in gardens of the South of England and Ireland. Amœnum is a variety of it. It is interesting to find a handsome bush of it in the open unprotected, but of course only in quite favoured climates may it be trusted out of doors.

A. mollis.—The name is retained because it is so familiar, but R. sinense is the proper designation of a useful little shrub, which seldom grows more than 1yd. in height. The flowers expand just before those of the other kinds, and are of a terra-cotta shade, and a sheltered position is necessary if one is to enjoy the blossoms unsullied by late frost. A. mollis is a charming species, its flowers so large and exquisite in colour, though without fragrance, but this is atoned for by their colouring, which varies from rose through pink, buff, and salmon, a delightful series, which makes the shrub of great value for growing in pots in the greenhouse.

A. nudiflora. — A variable species, native of a considerable tract of country in North America. It grows, as a rule, from 4ft. to 6ft in height, and, as in the case

GROUPS OF AZALEAS, ETC.

SHRUBS IN A DELL.

of the other North American kinds, the leaves assume in autumn brilliant colours. The flowers are of varied shades.

A. occidentale (*R. occidentale*).—This is the species that Mr. Waterer has used so freely for hybridising with the early kinds; and as A. occidentale flowers late, the season of the hybrids is happily prolonged. This is a shrub that one should see more frequently in English gardens. It has been in a measure overlooked, but its glossy foliage and sweetly-scented white or yellow flowers are too precious to lose, and, unlike the majority of the deciduous Azaleas, blossom and leaf are together. It is worth growing for its fragrance alone, and the delicately-coloured trusses, arranged upon the table or elsewhere, scent the apartment.

A. pontica.—This name is retained here, but it may be mentioned that it is now called Rhododendron flavum. It is a native of the Black Sea region, and forms a handsome bush about 6ft. in height, and in the middle of May is laden with bright yellow flowers. This has given rise, with other species, to a host of beautiful garden forms.

A. Vaseyi.—This species is little known at present, as it has not been introduced many years from North America. It comes from North Carolina, and makes a free, pleasing bush, covered with flowers early in May. The colouring is very charming, pink, changing to pure white with age, and it is certainly a shrub that should be in all gardens of any size. It has proved quite hardy, and begins to bloom early, sometimes even in its second year.

A. viscosa (*the Swamp Honeysuckle*).—In moist soils this grows with considerable vigour, and its pink-tinted flowers are very sweetly scented; they expand rather later in the season than the majority of hardy Azaleas; indeed, it is the last of all to bloom, expanding even as late as the month of August. This species also has been much used for hybridising with other kinds, and the result is a race of delicately-coloured flowers, rose, white, and other pleasing shades.

To make the nomenclature of the Azaleas quite clear are given the chief species, with their true names, according to recent classification:

		True Name.
Azalea ovata	=	Rhododendron ovatum.
,, arborescens	=	,, arborescens.
,, calendulacea	=	,, calendulaceum.
,, pontica	=	,, flavum.
,, indica	=	,, indicum.
,, ledifolia	=	,, ledifolium.
,, linearifolia	=	,, linearifolium.
,, nudiflora	=	,, nudiflorum.
,, occidentalis	=	,, occidentale.
,, rhombica	=	,, rhombicum.
,, serpyllifolia	=	,, serpyllifolium.
,, pontica	=	,, sinense.
,, Vaseyi	=	,, Vaseyi.
,, viscosa	=	,, viscosum.

Berberis.—There are deciduous and evergreen Barberries, both groups proving valuable shrubs for the pleasure ground, for the sake in a large measure of their showy fruit and finely-coloured leaves in autumn. Of the true deciduous kinds the chief are:

B. Thunbergi.—This is one of the most important of the entire family. It is a dense twiggy bush, with slender arching shoots, from the under-sides of which the bell-shaped reddish brown flowers hang in great profusion. These flowers make their appearance simultaneously with the little roundish leaves. The berries, which ripen in autumn, are small but bright sealing-wax red in colour. A brilliant autumn feature is furnished by the decaying leaves, which change to a glowing crimson before they drop. It is quite hardy, and worth growing only for its brilliant colouring in autumn.

B. vulgaris (*the Common Barberry*).—This is a native of Britain, and a well-known and highly-ornamental shrub. The drooping racemes of yellow flowers render it attractive in the spring, while the orange scarlet oblong-shaped berries are even more showy. There is a purple-leaved

variety called atro-purpurea, which in poor stony soil is better coloured than under any other conditions. All these Barberries are readily raised from seed sown in a fairly moist sheltered spot.

Beech.—*See* Fagus.

Betula (*Birch*).—The Birches, many of them unsurpassed in grace and beauty, occur throughout the temperate regions of the globe, and even extend into the Arctic Circle. They succeed best in a good open loam, but at the same time are not fastidious as to soil or situation. The common kinds are easily raised from seeds, which may be sown when ripe either in beds in the open ground or in pans in a frame. In any case they must only be very lightly covered, and shaded from the sun till the young plants make their appearance. The varieties are grafted or budded on to seedlings of the common kinds, grafting being done in the spring and budding in July. But grafting is a mistake; own root plants should be grown.

B. alba (*Native Birch*).—This is the native Birch, the Queen of the Woods, the most graceful of all hardy trees. The whitened trunks stand out like shafts of burnished silver, and with their elegant drooping spray form a charming woodland feature at all times, but especially in winter. It is extremely variable in many respects, hence there is a long list of well-marked varieties. There is a beautiful weeping form (pendula), in which the naturally drooping habit of the common Birch is far more pronounced; and another (Youngi) that if grafted standard high droops almost straight to the ground. Young's Weeping Birch, as it is called, is the most beautiful of the weeping Birches. In the variety dalecarica the leaves are very deeply cut, while those of purpurea are of a bronzy purple hue. Other distinct kinds are Fastigiata, which reminds one of the Lombardy Poplar; the golden-leaved aurea; and the nettle-leaved Birch (B. urticifolia), which has finely-cut downy leaves.

B. nana (*Marsh Birch*) is a little dwarf shrub found in Russia, Lapland, Siberia, etc. It is of a spreading habit, though in some instances at least it does not rise many inches above the ground.

B. nigra, the Red Birch of North America, differs widely from its European relative. As a rule the main trunk divides into several large branches at but a little height from the ground. The branchlets, too, are much less numerous and not so pendulous as in the common Birch. The most marked feature of the Red Birch is its bark, which is of a reddish cinnamon colour, and in winter partially peels off, and remains attached to the main trunk and principal branches in large flakes. This gives to the tree a wild and picturesque appearance. The new bark thus exposed is of a lighter tint.

B. papyrifera (*Canoe Birch*).—This is a species little seen in gardens, but it should be planted in the future for the sake of its beautiful bark, which is even more silvery than that of our native species. The Paper Birch, or Canoe Birch as it is also called, comes from North America, as the popular name of Canoe arises from the fact that the tree is largely used in making canoes. It is when young that the silvery colour is so pronounced, as then the bark is smooth, but becomes rugged with age.

There are, of course, other Birches, but those kinds of chief importance for the majority of gardens have been mentioned.

Birch.—*See* Betula.

Bladder Senna.—*See* Colutea.

Brooms.—*See* Cytisus.

Buddlea globosa (*Orange Ball Tree*).—A large shrub, which will reach a height of 12ft. or more, clothed with long greyish Willow-like leaves, and about the end of May bears a great profusion of globular heads of blossoms of a bright orange colour. The flowers have the fragrance of honey. It is a native of Chili, and is often injured by severe winters, but quickly recovers. A light loam suits it best, and cuttings put in sandy soil in a shady frame about August will soon root. B. paniculata is the other species in the family

A JAPANESE CHERRY.

Calycanthus floridus (*the American All-spice*) is a compact shrub, seldom more than 6ft. high, clothed with dark green ovate leaves. The flowers borne early in June are about 2in. across, of a peculiar lurid purple colour, and pleasantly scented. Propagated by layers put down in the autumn. Two years will elapse before they root sufficiently for removal. C. præcox is a synonym of the Winter Sweet (Chimonanthus fragrans).

Caragana.—There are several species

of this, but the best is the Siberian Pea Tree, which attains the dimensions of a small tree. The pretty pinnate foliage is of a deep green tint, while the yellow pea-shaped blossoms are borne in great profusion towards the end of April. It will grow well and retain the rich colour of its foliage even on dry sandy soils. Seeds ripen readily, and if sown at once in a sheltered bed out of doors quickly germinate.

Carpinus Betulus.—This is the common Hornbeam, a medium-sized tree, almost indifferent to soil or situation. It bears cutting well, and for this reason is often used as a hedge plant, for which it is well adapted. Seeds are easily obtained, and if sown in the open ground as soon as ripe and covered with ½in. of soil quickly germinate.

THE WILD CHERRY.

Carya.—A race of North American trees nearly related to the Walnut, and remarkable for their handsome compound leaves, which in some species at least are very large. They are the Hickory Nuts of the American backwoodsmen. The Caryas, which need a deep loamy soil, are raised from seeds sown directly they are ripe. The principal species are C. alba, C. amara, C. myristicæformis, C. porcina, and C. tomentosa, all of which are very rarely seen in England.

Castanea vesca or **satira** is the Spanish Chestnut so frequently met with in our parks and woods. It grows best as a rule in sandy loam, and the seeds should be sown as soon as possible after they are ripe. Being large, they are best sown in drills and covered with about 3in. of soil.

Catalpa bignonioides is a very handsome tree, quite distinct, and forms a rather wide spreading head, with large and heart-shaped leaves, while the flowers, which are produced in panicles at the ends of the branches, are white, speckled with purple and yellow. It may be raised from seeds, or cuttings of the roots about 6in. long, if planted in sandy soil with the top portion 1in. below the surface, will form young plants. Another name for C. bignonioides is C. syringæfolia, and there are two varieties, one named aurea being very rich in colour. This should be pruned hard back each year, and may then be associated with such shrubs as the Paulownia. C. Bungei, C. cordifolia (speciosa), and C. Kæmpferi are fine kinds, but less important than bignonioides. The Catalpas appreciate moist soils, and noble trees may be seen by river-side gardens, whilst it is even happy in towns. It is a tree that deserves to be thought of, as few kinds have nobler foliage, and its flowers appear when few other trees are in bloom, namely, in July and early August.

Cerasus (*the Cherries*).—This is one of the most charming of all tree groups, and no pleasure ground or woodland is complete without a collection, planting the more beautiful kinds in distinct colonies to get the full effect of their wonderful masses of flowers. The Cherries are now associated with the Plums, but kept distinct, as the name Cerasus is so familiar in gardens. They are all of high ornamental value, and, taken collectively, are unsurpassed among flowering trees. Though the majority of them have white flowers, there are some more or less tinged with pink. While one admires a Cherry tree in bloom, in Japan its blossoming-time is made the occasion of national rejoicing, and no wonder, for surely an avenue of trees enveloped in blossom must be a picture of no common beauty. We regard Cherry time in England as the most delightful of all seasons. No tree is more sumptuous, hidden, indeed, beneath its flowery burden.

The various Cherries may be readily raised from seeds, and the choicer varieties can be grafted in spring in the open ground, or budded in July, but these methods are not advised. A selection of the best from an ornamental point of view would include:

C. Mahaleb.—This European Cherry flowers early in May, when the pure white blossoms are borne in the greatest profusion. It forms a tree 20ft. to 30ft. in height, while the minor branchlets are disposed in a very graceful manner.

C. Padus (*Bird Cherry*).—The flowers of this are quite distinct from those of the other Cherries, being small, greenish white, and borne in long drooping racemes. It is a decidedly ornamental tree that flowers in May, and is known popularly as the Bird Cherry. It should be planted more in the woodland; its flowers are too powerfully scented for the garden.

C. pendula.—This is one of the favourite Cherries of Japan, and in this country among the first to unfold its blossoms. It is of a graceful, somewhat drooping growth, and is usually grafted as a standard, in which way the long slender shoots are seen to great advantage, particularly when laden with their rather small but beautiful pink blossoms.

C. pseudo-cerasus.—There are several forms of this, the Japanese Cherry, the flowering season of which has

been referred to. Though it attains the dimensions of a timber tree in Japan, large specimens are not met with in this country. The double-flowered forms have been largely imported within the last few years, and in some of them the beautiful pink blossoms are 2in. in diameter. This Cherry in all its forms succeeds best in a fairly cool, moist loam, for in dry sandy soils it soon suffers. The names of Cerasus Sieboldi, James H. Veitch, and C. Watereri have been applied to varieties of this species.

C. semperflorens, the All Saints' or ever-flowering Cherry, forms a tree from 15ft. to 20ft. high, of graceful growth, and remarkable from the fact that a continuous succession of its rather small white blossoms is kept up for a long time.

C. serrulata, another Japanese Cherry, is very distinct in growth from any of the others, the main stem usually dividing at but a little height from the ground, and then branching off almost horizontally in a peculiarly abrupt way. The pointed leaves are serrated in so marked a fashion as to give rise to its specific name. The flowers are white, sometimes tinged with pink, and semi-double. It blooms about three weeks later than C. pseudo-cerasus, and is very beautiful.

C. vulgaris.—This is the common wild Cherry, a native of Britain, and the species from whence many of the fruiting kinds have been obtained. There are several varieties, of which the double-flowered is the finest. Few trees are more beautiful than this.

As the Cherries are so important, the names of the chief kinds are given as they are still known, as also the recent classification in the Kew hand list of trees and shrubs:

Prunus	=	Cerasus.
Acida	=	Acida and caproniana.
,, var. semperflorens	=	Semperflorens.
Avium	=	Avium, domestica, dulcis, etc.
,, flore-pleno	=	Domestica flore-pleno.
Juliana	=	Juliana.
Cerasus	=	Vulgaris.
,, Rhexi flore-pleno	=	Caproniana multiplex, C. ranunculiflora, and serotina flore-pleno.
Chamæcerasus	=	Chamæcerasus.
Pennsylvanica	=	Pennsylvanica and borealis.
Pseudo-cerasus	=	Caproniana flore-roseo-pleno, Pseudo-cerasus, Sieboldi rubra, and C. Watereri.
Serrulata	=	Serrulata, Sieboldi.
Mahaleb	=	Mahaleb, Padus Mahaleb.
Padus	=	Padus.
Serotina	=	Serotina.
Virginiana	=	Padus oblonga, Cerasus virginiana.

Cercis Siliquastrum.—This, known as the Judas Tree, usually forms a specimen 12ft. to 20ft. high. The flowers, which make their appearance before the leaves, are of a bright rosy purple colour, and borne in crowded clusters along the branches. The peculiar leaves, almost kidney shaped, furnish another feature of interest. The Judas Tree prefers a cool, fairly moist soil, and is readily increased by seeds, which often ripen. They should be sown, when ripe, in pans of sandy soil, covering them with about one-third of an inch of the same compost and placing them in a frame. C. Canadensis and C. chinensis are less-known species.

Chestnut, Spanish.—*See* Castanea.

Clethra alnifolia is the Pepper Tree of the United States, and forms a rather upright shrub from 4ft. to 5ft. high, clothed with ovate leaves about 3in. long, and bearing towards the end of July and in August dense spikes of greenish white, sweet-scented blossoms. It prefers a damp soil, with a fair amount of vegetable matter in it. Seeds of this Clethra can be sometimes obtained, when they must be sown in peaty soil and placed in a frame, or rooted suckers may often be detached from established plants. There are other kinds, but all bear a great general resemblance to that just described.

Colutea (*Bladder Senna*).—The Coluteas are remarkable for their large, curiously-inflated seed-pods, from whence the popular name is derived. The shrubs grow readily from seeds, either sown in the open ground or placed in a frame. Their great value to the planter is that they will both grow well, even in poor, dry, sandy soils.

C. arborescens.—This is a loose-growing bush, 10ft. to 12ft. high, clothed with bright green pinnate leaves, and bearing yellow, pea-shaped flowers, succeeded by the curious pods already noted. These pods are tinged with red.

C. cruenta.—Scarcely so vigorous as the preceding, from which it differs in the leaves being more glaucous, the flowers of a reddish orange colour, and the pods of a deeper hue. The species are: C. arborescens, cruenta, istria, and melanocalyx. It is not unusual for C. arborescens to be planted upon railway banks even near London and yet succeed. Few things are less fastidious as regards soil or position.

Cornus.—This is an extensive genus; some species are by no means of high ornamental value, while others are very attractive. The Dogwoods, with their bright red bark during the winter, are the showiest of all. They can in most cases be increased by suckers, or layers quickly root. The principal species are:

C. alba, a shrub 6ft. to 8ft. high, which is remarkably bright and effective during the winter from the brilliant red of its bark. The variety sibirica is of dwarfer growth, and the bark of a lighter red. A group of this is a brilliant winter picture. C. alba Spathi is one of the best variegated leaved shrubs in existence, the green portion being limited to a little in the centre of each leaf, the rest being rich golden yellow, whilst the variegation does not get burnt by the sun in summer. This is a variegated shrub worth making a group of.

C. florida.—This is quite a tree, and flowers in April. The little flowers are borne in clusters, each cluster being surrounded with four large white bracts that are exactly like a white flower with four petals. It is a universal favourite in America, but in this country is rarely seen in a flourishing condition. It requires evidently hotter suns than ours.

C. macrophylla, known also as C. brachypoda, is quite of tree-like habit, the branches being arranged in a peculiarly horizontal way. The large oblong-shaped leaves acquire a rich colour before they fall. There is a variety of this in which the leaves are edged with white. There are other Dogwoods, such as the Japanese C. Kousa, but the most important have been described, although C. Amomum, Baileyi candidissima, capitata, Nuttali, and stolonifera are interesting. Never forget the rich winter beauty of C. alba and its variety sibirica. In the Royal Gardens, Kew, there is a small bed of the Siberian form, which during the winter is as bright as any flower of summer, and its rich crimson stems are even showier when the little Winter Aconite is flowering at the base.

C. Mas.—The Cornelian Cherry, as this is called, is very distinct from any of the other species. It forms a large shrub 12ft. high, and is very pretty in February, at which time the leafless shoots are studded with tufts of yellow blossoms. The berries are also ornamental, but not often produced. There is a variety elegantissima, in which the leaves are margined with cream, flushed with red.

Corylus avellana is the common Hazel Nut, known to everyone, and a plant that will hold its own in almost any soil or situation. Besides the ordinary form there is a variety with purple and another with golden leaves, a weeping one, and one in which the leaves are curiously cut and slashed.

C. Colurna (*the Constantinople Hazel*) is quite a tree, that will reach a height of 50ft. The catkins are long, and, being freely borne, impart quite an attractive feature when at their best. The husks that surround the nuts are of peculiar shape.

Cotoneaster.—This is a valuable group of shrubs and small trees. Like the evergreen species, the deciduous ones are of more value for their showy fruit than for the beauty of their blossoms; yet at the same time the clusters of white flowers are very charming in the spring. All the Cotoneasters are readily increased by seeds, to

obtain which the berries should be gathered when ripe, mixed with some sand, and kept moist till the spring or early summer, when they may be sown out of doors if in large quantities or small lots in a frame. Desirable kinds are:

C. baccillaris.—A tree 15ft. to 20ft. high, which is during the spring profusely laden with clusters of white flowers, and in the autumn the slender shoots are burdened with brownish berries. It is of graceful growth, and is a tree that delights in moisture, hence may be planted by pond and lake side. As its growth is very graceful, it is seen to advantage in these positions.

C. frigida.—This, which attains the dimensions of a bold shrub or low tree, has larger leaves than any of the others, and they are retained till late in the season. The berries are scarlet, and in the autumn, when ripe, make a bright show. It is very strong in growth, and is worth planting for the foliage and brilliantly-coloured fruit.

C. horizontalis.—One of the newer kinds; its sturdy branches will spread some distance, even though the plant is not more than 2ft. high. The minor shoots are arranged on the branches in a regular flattened frond-like manner, while the leaves are disposed just as regularly on the twigs. The berries are of a bright vermilion when ripe, and the leaves die off almost as richly tinted.

C. Simonsi.—This is one of the best of all, forming a rather upright shrub from 5ft. to 6ft. high, with roundish leaves and bright scarlet berries. In mild winters it is almost evergreen in character. It is worth planting for its effective fruits alone, and is a handsome garden shrub, often called C. Simmondsi, but this is incorrect.

Cratægus.—The Thorns are a large and variable class, consisting for the most part of small or medium growing trees, very attractive in the spring when covered with flowers, and in some kinds equally so in autumn, at which

THE WHITE THORN IN MAY.

time they are laden with bright-coloured fruits. The most valuable from an economic point of view is the common Hawthorn, which, under the name of Quick, is so much used as a hedge plant, for which its prickly, impenetrable nature, combined with the fact that it stands trimming well, eminently fits it. Some of the varieties, too, are the most striking Thorns we have when in bloom, particularly Paul's Double Scarlet, which supplies a tint unrepresented, except among varieties of the Hawthorn, throughout the entire family. Nearly all the Thorns are increased by seeds, which are gathered in the autumn, mixed with sand, and allowed to lie a year before sowing in beds in the open ground, and covered with about 1in. of soil. The varieties, however, are increased either by grafting in the spring or by budding in July. A select list of Thorns is as follows:

C. Aronia.—This, which is a native of the South of Europe, forms a somewhat upright-growing tree, clothed with deeply-cut leaves and clusters of white flowers, which usually expand about the end of May. The large yellow fruits form one of the most distinct features of this kind.

C. Carrierei.—A very beautiful Thorn of free bold growth, with ample glossy foliage, which becomes tinged with orange and red in the autumn. The individual flowers are large, white, slightly tinged with pink. Quite a winter feature is furnished by the great oblong scarlet berries, which hang on long after the leaves have fallen.

C. coccinea.—This is a clean upright-growing tree, with leaves more or less heart-shaped, that change to various shades of red and yellow in the autumn. The flowers, which are borne in flattened clusters, are white, with pinkish anthers, and the berries that succeed them are scarlet when ripe. It is a very common Thorn in North America, and there are numerous varieties in cultivation, but none very widely removed from the type.

C. Crus-galli.—The Cockspur Thorn, as this is called, is distinguished from the others by its huge conspicuous spines, which render the name of Cockspur a particularly appropriate one. The flowers are large and somewhat late, while the berries are of a deep red. Like many other North American trees, the leaves of this die off brightly coloured. There are several varieties, one of the most notable being salicifolia or pyracanthifolia, with narrow leaves of a peculiar spreading style of growth, and so pronounced that a specimen grafted about 6ft. high will push out horizontally for some distance, so as to form quite a living table.

C. Douglasi.—The blackish purple berries of this Thorn are conspicuous. It is a native of North-West America, and forms a sturdy and somewhat upright-growing tree.

C. Oxyacantha (*the common Hawthorn*) is too well known to need description, but the varieties or departures from the normal type are numerous, distinct, and many of them very beautiful. Of the ordinary kind with white flowers there is a double form, both single and double pink, and single and double scarlet, the best of all being that known as Paul's Double Scarlet. The Glastonbury Thorn (C. Oxyacantha præcox) is remarkable for flowering so early that in some winters the first blossoms are open soon after Christmas. C. O. variegata, with prettily variegated leaves; laciniata, whose foliage is deeply cut; pendula, weeping; stricta, upright; and leucocarpa, yellow berried, are all distinct kinds.

WHITE BROOM.

C. pinnatifida.—This Chinese Thorn forms a tree about the size of the common kind, with large, deeply divided leaves, borne on such long footstalks that they partially droop. The berries are large and red when ripe, while the leaves turn yellow before they drop.

C. tanacetifolia.—The Tansy-leaved Thorn is remarkable for its peculiar deep-cut hoary foliage, and is valuable for its late flowers, being as a rule the last of the Thorns to bloom. The flowers are white, against which the blackish anthers stand out conspicuously on close examination. The berries are greenish yellow when ripe. The Thorns are familiar in many old English parks and gardens, and few shrub groups are more picturesque. In spring and autumn they are of rich beauty.

Cytisus (*the Broom*).—The various members of this group are all remarkable free-flowering shrubs, and apart from their beauty they are valuable from the fact that they succeed better than most shrubs in dry sandy soils. This is to a certain extent owing to their roots going deeply into the ground, hence Brooms may be planted upon rough

dry banks, or in similar positions, in which few things will succeed. They may be raised in quantity from seed, which ripens freely, and need only be sown in a sheltered spot out of doors. Cuttings, too, put in a frame are not difficult to strike. The Brooms do not produce many fibrous roots, while the main ones if undisturbed go almost straight down for some distance. From this circumstance established specimens transplant badly, and when growing on in a nursery they should be shifted every year till permanently planted. A good selection of Brooms includes:

C. albus.—This is a shrub that reaches a height of 6ft. to 10ft., and in May every shoot is wreathed with small white pea-shaped blossoms. It is popularly known as the Spanish Broom.

C. nigricans.—A beautiful shrub from 3ft. to 4ft. high, clothed with trifoliate leaves, and bearing almost throughout the summer erect racemes of yellow flowers. It is sometimes grafted on the Laburnum, but is more ornamental on its own roots.

C. præcox.—This flowers even earlier than the Spanish Broom, from which it also differs in being of a shorter and denser habit of growth; the flowers are of a sulphur hue. It is probably a hybrid between C. purgans and C. albus.

C. purpureus.—The slender shoots of this are long and arching, but it seldom reaches more than 2ft. in height. The flowers are purple, but there is a variety (albus) in which they are white.

C. scoparius.—This, the yellow Broom, flowers for two months or more, from early May onward. It is a well-known British shrub, varying a good deal in height, according to the conditions under which it is growing, and remarkable for the rich golden colour of its blossoms. There is a very handsome variety (Andreanus), in which the side wings of the flower are of a deep velvety brown. The Broom family is of great interest, but unfortunately seldom well represented in English gardens. There are many other kinds of some importance besides those already described, such as the dwarf C. Ardoinei, suitable for the rock garden, C. austriacus, C. biflorus, C. capitatus, C. decumbens, C. hirsutus, C. monspessulanus, C. purpureus, and C. sessitifolius.

Daphne Mezereum.—Several of the Daphnes are included with the evergreen shrubs, but this beautiful species is quite deciduous. It forms a sturdy, rather upright, freely-branched bush 3ft. to 4ft. high, and its leafless branches are quite early in the year completely wreathed with charming pink, richly fragrant blossoms. To a particularly deep-coloured form the name of rubrum is applied, while in album the flowers are white. A distinct kind is that known as grandiflora (autumnalis), which blooms in November, and the flowers are larger than the others. The Mezereon likes a cool moist soil, and if shaded from the full rays of the sun so much the better. The red berries of this Daphne are also very ornamental. It is increased by seeds. The Mezereon and its double white variety are seldom made good use of in gardens. They are valuable shrubs, flowering in early spring, in winter almost when the weather is mild, and should be planted with some carpeting plant beneath. For the delicious fragrance of the flowers one should grow the Mezereon or one of its varieties.

Desmodium penduliflorum, known sometimes as Lespedeza bicolor. This pushes up slender wand-like shoots from the base to a height of 6ft. or so, clothed with trifoliate leaves, and about September they are terminated by large clustered masses of reddish purple blossoms. Very few other shrubs are in bloom when this is at its best. It can generally be increased by division.

Deutzia.—These are all pretty free-flowering shrubs that will do well in any ordinary garden soil that is not dried up during the summer. They can be struck from cuttings of the young shoots taken in July, put into pots of sandy soil, and kept close and shaded in a frame till they root, which will be in about six weeks. A length of 4in. to 5in. is very suitable for the cuttings. They may also be inserted in the open ground after the leaves have fallen.

D. crenata is a free-growing shrub, 6ft. to 7ft. high, that bears its white blossoms in great profusion in June. There are two double-flowered varieties which may be placed amongst the most beautiful and interesting of flowering shrubs; they are flore-pleno, in which the blossoms are tinged with pink outside, and Pride of Rochester, pure white.

D. gracilis.—A little bush seldom more than 2ft. high, with white flowers, borne as a rule towards the end of April. It is a universal favourite for forcing, but out of doors needs a sheltered spot.

D. parviflora.—This is a pretty early-flowering shrub. Its flowers, instead of being borne in elongated racemes as in the preceding, are formed into a flattened head. Between D. gracilis and D. parviflora a hybrid has been raised, which, under the name of D. Lemoinei, has proved to be a valuable addition to the genus. D. corymbosa and Scabra are interesting species.

Dogwood.—*See* Cornus.

Elæagnus angustifolia (*the Wild Olive*) is a loose graceful tree 20ft. high, clothed with long Willow-like leaves of a silvery hue, which when the slender branches are stirred by the breeze are particularly attractive. E. hortensis is synonymous.

Euonymus.—While the majority of the generally grown forms of Euonymus are evergreen, there are at least two deciduous kinds that must on no account be omitted. They are:

E. europæus (*the Spindle Tree*), a shrub that reaches a height of about 6ft., the flowers being of little account, but in autumn the pendulous fruits, which are of a light scarlet colour, are decidedly attractive, and still more so after a time, when the capsule splits and reveals the orange-coloured seeds within. There is a variety (fructu albo) with white fruits, also several forms, such as atropurpureus, aucubæfolius, folius argenteo-variegatis, folius aureo-variegatis, nanus, and pallidus.

E. latifolius.—This is larger in all its parts than the preceding; it forms quite a tree, and has even more showy fruits than those of E. europæus. Both are easily increased by seeds sown when ripe, a small quantity in a pan placed in a frame, and a large amount in a sheltered spot outdoors, covering with ½in. of soil.

Exochorda grandiflora (*Pearl Bush*).—This is sometimes classed with Spiræas, and is a very beautiful white-flowered shrub, forming a graceful specimen 6ft. to 8ft. high. It blooms as a rule about the end of April, and is often very attractive upon a wall. It can be increased by layers put down in autumn or winter, but they take two years to root sufficiently for removal. S. Alberti is an interesting species.

Fagus (*Beech*). — The only species worthy of especial mention is the common Beech (Fagus sylvatica), of which there are innumerable varieties, differing from one another in many ways. Two or three have variegated leaves, and a good form of the purple Beech is particularly attractive, while the weeping kind must be included in any selection of pendulous-growing trees. There is also a weeping form with purple leaves, and mention must be made of heterophylla, which has leaves cut and slashed in a peculiar way, asplenifolia or the Fern-leaved Beech, and cristata. The common Beech can readily be raised from seed, and is used as a stock on which to graft or bud the numerous varieties, grafting being usually done in the forking of the branches in spring, and budding in July.

Forsythia.—Two pretty early-flowering Japanese shrubs with yellow blossoms.

F. suspensa is the better of the two, and forms a loose-growing plant (almost a climber), which is very beautiful when trained to a wall. If so grown, after the allotted space is covered the shoots must be allowed to develop at will, when they will droop down for 6ft. or more, and when in flower form golden wreaths. This Forsythia flowers in March, and any pruning that is necessary should be carried out immediately after blooming, as the growth that is then made will flower well the following spring. Grown as a bush in the open ground it is also beautiful.

F. viridissima.—This is a far more compact shrub than the preceding, and is clothed with Willow-like leaves. The flowers are rather paler in hue than the other. Both are easily struck from cuttings put firmly in the open ground in the autumn, or in a frame at almost any season, while the long flexible shoots of F. suspensa often root at the points where they come in contact with the ground.

Fraxinus (*Ash*).—The best-known species of this family is the common Ash (F. excelsior), which is represented by many varieties. There are three distinct weeping forms, and two with peculiarly cut leaflets, while one (monophylla) has the whole of the leaflets merged into one large leaf. The golden-leaved Ash too is very pretty. The Ash grows readily from seeds sown either in the autumn when ripe or kept in soil till the spring. The varieties are easily grafted or budded on to seedling stocks.

F. americana is a more upright-growing tree, with larger leaves than our native Ash, while F. lentiscifolia, known also as F. parvifolia, forms a small dense-growing tree, with slender branches and narrow leaves. F. Ornus is the Flowering Ash, and bears in May large plume-like clusters of creamy white blossoms.

Genista.—This group is closely allied to the Brooms (Cytisus), and with regard to soil and propagation the same notes will apply. There are a great many species, the following being the best:

G. ætnensis.—This is one of the largest of the family, and will reach a height of 10ft. to 12ft., the half-pendulous, bright green thong-like shoots being about the end of July furnished with golden blossoms.

G. hispanica.—A particularly dense-growing spiny plant, from 1ft. to 2ft. high, and in June a mass of golden blossoms. It is known as the Spanish Furze. Spartium hispanicum and Ulex nanus are synonymous.

G. sagittalis.—This is a creeping plant only a few inches high, but remarkable for its peculiarly winged stems, so unlike any of the others. It does well on rockwork.

G. tinctoria.—A British species that will flower almost throughout the summer. It is variable in habit, one form (elatior) being much taller than the type. The double-flowered (flore-pleno) is very handsome.

G. virgata, which flowers during the latter half of the summer, is a good-sized bush 5ft. to 6ft. high. It is valuable because it blooms so late, and remains some time in beauty. Other good Genistas are G. anglica, monosperma, radiata, and especially sagittalis.

Gleditschia triacanthos is the Honey Locust of the United States. It is quite a tree, with deep green twice divided foliage. As a flowering tree it has no particular merit. The stem and branches are clothed with large and formidable spines, which give quite a singular appearance to the tree. There is, however, a spineless form, and a weeping one. The Gleditschia is propagated by seeds principally sent here from America, which should be sown on arrival, and whether in a frame or out of doors they must be covered about 1in. deep.

Halesia.—There are about half-a-dozen species of Halesia, the best two being:

H. hispida.—A free-growing shrub, native of Japan, clothed with ovate leaves about the size of those of the Laurel, and rough in texture. The flowers produced in May and June are individually somewhat Snowdrop-like, and borne in semi-pendulous, elongated clusters.

H. tetraptera (*Snowdrop Tree*).—This is from 15ft. to 20ft. high, the general appearance of the flowers being indicated by the popular name. Both these Halesias prefer a fairly cool, moist soil, and can be increased by layers. H. diptera and parviflora are also species of some importance.

Hamamelis.—The Witch Hazel is so called from the resemblance that the leaves bear to those of the Hazel.

H. arborea, the most ornamental of the genus, is a large shrub or small tree, and if the winter is mild it is quite early in January a beautiful picture, the leafless branches being clothed with peculiar starry flowers, with bright yellow petals. During a sunny day in January the tree at a little distance appears to be enveloped in a cloud of gold.

H. japonica is in the way of the last, but it is rather later in flowering, and a plant of smaller growth, while the petals are of paler yellow.

H. virginica.—An irregular-growing bush, with smaller flowers than those of H. arborea, and not so brightly coloured, while they are borne late in the autumn instead of in the new year. The Hamamelis can be propagated by layers that take two years to root, but as seed of H. virginiana can sometimes be obtained, the usual method is to graft H. arborea on to the young plants of H. virginica.

Hibiscus.—There are several beautiful kinds of Hibiscus that require the protection of a stove or greenhouse, and a few that are of herbaceous character, but there is only one that can be regarded as a hardy shrub, and that is H. syriacus (also known as Althæa frutex), of which, however,

HIBISCUS.

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there are many varieties in cultivation. They are particularly valuable from the fact that the flowering season is during August and into September, at which time few shrubs are in bloom. This Hibiscus prefers a sunny spot and a fairly deep moist loam, for if too dry the foliage becomes disfigured before the flowering season. Seeds ripen from which young plants can be easily raised, but the particular varieties cannot be increased in this way. They can be propagated from cuttings about 1ft. long, taken in the winter and put firmly into sandy soil in a sheltered spot in the open ground, two-thirds of the cutting being buried in the soil, or they may be taken in July, put in pots in a frame, and kept close and shaded till rooted, which will be in about six weeks. For this treatment the cuttings need not be more than half the length of those put in the open ground. A selection of varieties is herewith given. With single flowers—Cælestis, blue; Carneus, pink; Albus, white, crimson blotch at the base of the petals; Roseus striatus, pink striped; Totus albus, pure white. With double flowers—Albus plenus, white; Amaranthe, reddish violet; Bicolor hybridus, light pink; Carneus plenus, pink; Duc de Brabant, reddish purple; Coccineus plenus, red; Lady Stanley, salmon rose; Puniceus plenus, carmine red; Purpureus variegatus, purple, leaves margined white. Totus albus is one of the most beautiful of this series.

Hickory Nut.—*See* Carya.

Hippophæ rhamnoides (*Sea Buckthorn*).—A first-rate shrub for seaside planting, but at the same time it does equally well inland. It forms a fair-sized bush from 6ft. to 10ft. in height, clothed with Willow-like leaves of a silvery whiteness underneath. The berries, which are crowded round the shoots for nearly a foot, are about the size of peas, and of a bright orange tint. During the latter part of the autumn and in winter this Hippophæ is one of the brightest of our shrubs. The male and female flowers are borne on separate plants, hence to ensure the production of berries both sexes must be represented. One male plant to a dozen females will be sufficient. It is well suited for planting near the water, as it prefers a cool moist soil. This Hippophæ can be raised from seeds, which should be sown in the spring in pans or boxes and placed in a frame.

Honey Locust.—*See* Gleditschia.

Hornbeam.—*See* Carpinus.

Horse Chestnut, The.—*See* Æsculus.

Hydrangea.—This is a sumptuous group of shrubs, with noble flower heads, which make brilliant pictures in the garden. In the southern counties of England, Devonshire and Cornwall in particular, the plants luxuriate, and during the flowering season are very handsome. In some Cornish gardens the plants form quite leafy hedges, whilst in the South of Ireland also they are very beautiful; indeed, in many seacoast gardens Hydrangeas attain great luxuriance. Of course, a protected position should always be chosen, as in no other would it be safe to trust them in our climate. A great point is to prune moderately hard, as only in this way can strong wood be expected. The Hydrangea family is not well known, except of course in the case of the ordinary H. Hortensia, but besides this species there are other handsome kinds.

H. Hortensia, or, as it is sometimes erroneously called, Hortensis, is the principal species, and of this there are several varieties. A. acuminata is interesting, as the flowers vary considerably in colour, those of a blue shade being of considerable beauty. Otaksa has delicate pink flowers and very handsome rich green foliage, Thomas Hogg white, and Stellata blue or of a pinkish shade, whilst they are double in form. Lindleyi is an interesting variety also. The varieties of this species given in the Kew hand list consist of Acuminata, Lindleyi, nigra, stellata, and variegata.

H. paniculata grandiflora.—This is more shrub-like than the preceding, and reaches a height of 4ft. to 6ft. The massive pyramidal-shaped heads of creamy white blossoms are borne in July and August, at which time they are particularly valuable. After being open some little time the flowers become more or less suffused with pink. This is one of the most handsome of all garden shrubs, forming a leafy noble group on the outskirts of the lawn; indeed, it must not be crowded with other shrubs, but left to create a bold effect. In some soils the flower trusses are of huge size, but to produce anything like a good result the soil must be well manured, and during the winter receive a liberal mulch. A very important point is to cut the stems hard down each winter. Unless this be done, satisfactory flowers will never be produced.

H. quercifolia, or the Oak-leaved Hydrangea, is a shrub that must not be passed over, as the flowers are pleasing in colour and the leaves handsome. This will grow with great vigour in gardens by the sea.

Other species of interest are H. petiolaris, H. pubescens, H. radiata and its variety canescens, H. Thunbergi, and H. vestita.

In many gardens the flowers of H. Hortensia frequently assume a rich bluish shade, and when seen in the subdued light of the woodland this colour is wonderfully effective. Probably the blue shades arise from the shrubs being in a soil containing much iron. A correspondent to *Le Jardin* writes thus: "Everybody knows and admires the blue Hydrangea, but what is still not well known is how to produce the blue flowers. In the way of mixtures what has not been tried in order to impart this blue to the flowers of Hydrangeas—soils obtained from slate quarries, powdered slate, ferruginous soils, sulphate of iron, etc.—in a word, a heap of materials and ingredients not always at hand nor easy to procure. The compost which I recommend is, on the contrary, within the reach of everyone, and it simply consists in the use of coal cinders. The mixture which I have used for five years to impart the blue colour to the flowers of my Hydrangeas is one-third peat soil, one-third leaf compost, and one-third coal cinders." Cuttings of the Hydrangeas formed of the young growing shoots taken any time during the summer will root readily enough in a close frame.

Hypericum (*St. John's Worts*).—This is a large family, through all of which runs a strong likeness, the flowers of the entire set, both species and varieties, being yellow. They will grow well in any ordinary garden soil, and flower, as a rule, during the latter part of the summer. Cuttings of the growing shoots put in a frame soon root, while many of them produce seeds freely, which should be sown when ripe. A few of the best are:

H. Androsæmum (*the Tutsan*).—A shrub about 1yd. high, with flowers borne in flattened clusters throughout the summer months. Its beautiful foliage and fruits are of more account, however, than the flowers, which give rise to berries of an almost black colour, each about the size of a pea.

H. aureum.—This is a little-known species, growing to a height of about 4ft., with leathery leaves and orange yellow flowers, conspicuous for their clusters of stamens; they appear about the end of July.

H. calycinum (*Rose of Sharon*).—A plant of prostrate growth, reaching a height of about 1ft., with beautiful golden flowers over 3in. in diameter. It does well under the shade and drip of trees. This is unquestionably the most thoroughly useful of the whole family, forming excellent covert and growing where few other shrubs will thrive, such as in the shade of trees; it forms a dense groundwork, and has become naturalised in some places.

H. Hookeriana.—This is an Hypericum one seldom sees in gardens, notwithstanding its beauty. It is of rather tall growth, and the golden-coloured flowers are quite 2in. across, whilst they appear until the autumn. Even when other Hypericums have ceased to bloom this continues to expand its blossoms, which are sufficiently attractive to gather for indoor decoration. A small bed of it on the lawn is a pretty sight. H. oblongifolium is another name for it.

H. patulum.—This Japanese species is a graceful little bush about 18in. high, with a great profusion of flowers. The hybrid between H. patulum and H. calycinum, known

as H. Moserianum, is one of the best of all, and is, it is believed, the only garden hybrid amongst the Hypericums. This is a shrub that should be in all gardens, and one can easily trace its parentage, as it is exactly intermediate. The shrub takes the form of a graceful bush, with arching shoots supporting large deep golden flowers, and these appear until autumn is far advanced. Sometimes it gets much cut back by severe frosts.

The Hypericums mentioned are the most useful of the family, but there are several others, each meritorious in its particular way, such as H. ægyptiacum, H. Ascyron, H. elatum, H. empetrifolium, H. hircinum, H. inodorum, H. prolificum, and H. uralum, all of which are in the Kew collection.

Jew's Mallow.—*See* Kerria.

Judas Tree.—*See* Cercis Siliquastrum.

Juglans regia is the Walnut, of which there are several varieties, chiefly remarkable for their different fruits. There is, however, a distinct weeping form, and a Fern-like variety of much beauty called laciniata. These may be grafted in spring on seedlings of the ordinary kind. Two North American forms of Juglans attain the dimensions of timber trees, viz., J. cinerea (Butter Nut) and J. nigra. As regards the fruit, neither of them is equal to our own cultivated Walnut.

Kerria japonica.—This is quite an uncommon shrub, with bright green leaves and single yellow blossoms, but its double-flowered variety is a very common plant even in cottage gardens, where frequently, trained to the dwelling-house, it will continue to produce its bright golden blossoms like little Roses throughout the greater part of the spring and summer. There is a form with variegated leaves and small pale yellow flowers, but this is dwarfer than the double kind, and not an important shrub. Its foliage has a somewhat blotchy effect, and in a mass is very uninteresting and common-place. The species, though so rarely seen, is a very pretty shrub, and should be planted in a free group. It is quite as welcome as the familiar double variety.

Kolreuteria paniculata.—This is very useful for small gardens, as it is quite a tree in habit, and yet grows little more than 12ft. high. It forms a clear stem, and somewhat irregular-shaped head, clothed with pretty pinnate leaves, while the long spikes of yellow blossoms are produced in June and July. It grows well in any ordinary garden soil, and is increased by seeds, or by cuttings of the roots taken in the winter, cut up into lengths of about 6in., and put in sandy soil in a frame. Its pretty flowers are most freely produced during hot summers.

Laburnum.—The Laburnum is one of the most beautiful of all our spring-flowering trees, being in every way distinct from anything else at that time in bloom. The long pendulous racemes of yellow blossoms suggested the name of Golden Rain, by which it is known in some districts. Formerly it was included in the genus Cytisus, but being so distinct it is now separated. The Laburnum will grow in almost any soil, and is a delightful town tree. It seeds so freely that young plants will spring up in all directions. These seedlings may be employed as stocks for the several varieties, grafting being performed in the spring, and budding in July or August, but grafting should be avoided whenever possible. Of the varieties, Parksi, Watereri (the finest of all), and alpinum (the Scotch Laburnum) have particularly fine flowers, while other distinct forms are aureum, with golden leaves; pendulum, weeping; and quercifolium, with lobed leaves, somewhat like those of the Oak.

A Laburnum that has attracted a good deal of attention at times is Adami, on which may often be found three kinds of blossoms—first, the ordinary Laburnum; secondly,

THE LABURNUM WALK AT WEST DEAN PARK, CHICHESTER

purple flowers, as in Cytisus purpureus, with the foliage and slender shoots of that kind; and, thirdly, Adami, of a purplish yellow colour intermediate between the two. This remarkable tree appeared in 1825 in the nursery of M. Adam, near Paris. It is said to have originated by budding C. purpureus on to the Laburnum, which after a time produced intermediate flowers as well. It is in every way a remarkable instance of a graft hybrid.

Leycesteria formosa.—A native of the Himalayas, forming a shrub from 4ft. to 6ft. high, with hollow green stems and deeply tinted leaves. The flowers, borne in drooping clusters, are white, tinged with purple, and not particularly showy, but they are partially sheltered by large leaf-like bracts, which form the most conspicuous portion of the inflorescence. These bracts are in this country of a purplish colour, but in the brighter atmosphere of their Himalayan home they are said to be remarkably brilliant. The flowers are produced during the latter part of the summer and early autumn months. Cuttings put in during the autumn strike root readily either in the open ground or in a frame, this last being preferable. This shrub is sometimes planted as a covert, as pheasants appreciate the fruit.

Lilac. — *See* Syringa.

Liquidambar styraciflua is a North American tree with lobed leaves, and bears a great resemblance to some of the Maples. Its most prominent characteristic is the brilliant red or purplish red tints assumed by the leaves in autumn, and retained for some time before they drop. This Liquidambar strikes freely from layers, which root sufficiently in a year to be removed. Besides this, seed is often obtainable, and should be sown as soon as possible, but it will even then frequently remain a year or so before germinating. A second species, L. imberbe, is more of a bush, and not particularly ornamental. The Liquidambar is worth planting for its autumn colouring alone.

Liriodendron tulipifera.—This is a truly noble tree, and is said in North America to attain 100ft. in height. The three lobed leaves are remarkable for the abrupt termination of the central one, so distinct from those of any other tree. Their autumn tints are various shades of yellow. This Liriodendron is known as the Tulip Tree, which name is derived from the blossoms, which are borne in June on the tips of the shoots, and in general appearance greatly resemble those of a Tulip. They are of a yellowish tint. There are several varieties, in one of which, integrifolia, the leaves are without lobes, and in another, aurea, they are of a golden tint. Seed of the Liriodendron is usually sent from America, and should be sown as soon as ripe in a light fairly moist soil, and covered ½in. deep. The leaves of the Tulip Tree change in the autumn to rich yellowish shades.

Magnolia.—A magnificent group of flowering trees and shrubs, the majority blooming during the spring months. In the case of one or two of them they flower so early that the flowers are occasionally injured by late spring frosts. Magnolias as a class prefer a good deep open soil of a loamy nature that is not dried up at any time. They are not robust-rooting subjects, form but few fibres, and are very impatient of removal. To run as little risk as possible in this respect some of them are kept in pots in many nurseries. Propagation of the different kinds is a slow process. They should when possible be layered, but some will take two or even three years before they are sufficiently rooted for removal. M. purpurea or obovata is the easiest to propagate in this way, and plants so obtained are often used as stocks on which to graft some of the other kinds. The operation of grafting, however, requires to be very carefully performed, and several appliances are necessary, so that it should be left to professional hands. The best Magnolias are:

M. acuminata (*Cucumber Tree*).—Quite a tree, with a wide-spreading head of branches, clothed with bright green ovate leaves about 6in. long. The flowers, which are borne in June after the foliage has completely developed, are about 4in. in diameter, and of a greenish yellow colour, owing to which tint they do not stand out conspicuously. Cordata is a variety.

MAGNOLIA CONSPICUA.

M. Campbelli.—A beautiful species, which requires a rather sheltered place. It is not always satisfactory, but its fragrant rose-coloured flowers are very handsome.

M. conspicua.—A bushy tree, with large pure white sweet-scented blossoms borne in great profusion, generally in April, on the still leafless branches, and therefore all the more conspicuous. This, which is also known as the Yulan, is occasionally called the Water-lily Tree, from the great resemblance that the pure white flowers, with their massive petals, bear to those of the White Water-lily. There are several varieties, such as M. Lenni, Soulangeana, and Soulangeana nigra, in which the flowers are heavily stained with purple. It may be interesting to give the names of the various varieties and hybrids. The species itself is also known as M. Yulan, and garden forms, as given in the Kew list, comprise: M. Alexandrina,

cyathiformis, speciosa, spectabilis, superba, triumphans, and Yulan grandis. The variety most frequently seen is Soulangeana, which flowers rather later than the species, and is readily recognised by its purple suffused flowers. M. conspicua when in full beauty is a lovely picture, and noble examples of it exist in gardens, particularly at Syon House, Brentford, where there is a tree of the type and also of Soulangeana. When in full beauty the tree seems as if wreathed with snow, the bold flowers as pure as a snowdrift, and remaining some time in beauty. Unhappily, late frosts are apt to destroy their freshness, and for this reason it is wise to plant the early-flowering Magnolias in some fairly sheltered spot, where, for instance, the big flowers are thrown into high relief by a background perhaps of Yew or some dark-toned evergreen. Even in quite town gardens this Magnolia succeeds, and its early flowers are always a pleasure to look upon.

M. Fraseri.—This is a handsome species from the South United States. Its pale green leaves are sometimes 12in. or more in length and 8in. wide, whilst the flowers are creamy white.

M. glauca.—This is quite a shrub, from 6in. to 12in. high, with leaves much like those of the Laurel, but thinner in texture; the creamy white flowers are about 3in. in diameter, and borne on the points of the shoots during July and August; they are very sweetly scented, and turn to quite a buff tint with age. It likes a peaty soil.

M. Lennei.—The flowers of this are very large, borne before the expansion of the foliage, and of a rich rosy purple outside, but lighter within. Though plants 6ft. high will flower freely, it grows to nearly twice that height. This Magnolia forms quite a bush, with numerous wide-spreading branches. A form of M. conspicua.

M. macrophylla.—This Magnolia is only suitable for sheltered spots, as the huge leaves, sometimes nearly 1yd. long and 9in. or 10in. wide, are quickly injured if in an exposed place. The flowers, which are borne in June, are large, white, with a purplish centre, but they are sparingly produced.

M. parviflora.—This Japanese species of Magnolia is a desirable shrub for small gardens, as it will flower when not more than 1yd. high. The flowers are globular in the bud state, but when expanded are about 4in. in diameter. At that time the tuft of crimson anthers in the centre of the bloom forms a noticeable feature.

M. purpurea.—This is also known as M. obovata, and forms a spreading bush 6ft. or so in height, with flowers purple in the bud state, and light within; they follow soon after those of M. conspicua.

M. stellata.—This is a charming little species, the first of all to flower, at least in most seasons, though M. conspicua soon follows. It is a compact, freely branched bush, and when not more than 1yd. high every shoot is terminated with its pure white starry blossoms. They are about 3in. in diameter, and composed of numerous strap-shaped petals, which soon droop down, thus leaving the central portion higher than the rest of the flower. There is a blush-coloured kind. A bed of this Magnolia is very pretty in the early year.

M. Soulangeana.—Supposed to be a hybrid between M. conspicua and M. purpurea, and its appearance would support that theory, as it is in every way about midway between the two. It is a very desirable kind.

M. tripetala.—This is a large, bold tree, with leaves nearly 18in. long, and arranged around the points of the shoots regularly, for which reason it is sometimes called the Umbrella Tree. The creamy white flowers are borne in May and June, after the expansion of the leaves.

M. Watsoni is likely to prove an important Japanese species, as it is very hardy, and its flowers are of great beauty, being very sweetly scented, creamy white, set off by deep red filaments. M. hypoleuca and C. Kobus may be grown also.

Maple.—*See* Acer.

Mespilus, Snowy.—*See* Amelanchier.

Mezereon.—*See* Daphne Mezereum.

Mock Orange.—*See* Philadelphus.

Morus.—The Mulberry (Morus nigra) is a well-known tree, grown for the sake of its fruits, while the leaves are much used for feeding silkworms. For this latter purpose a second species, M. alba, is also employed, but its greenish white fruits are not much sought after. This is very prolific in varieties, one of the most distinct (pendula) being of a singular weeping habit of growth. The Mulberry will strike readily from cuttings; even large branches stuck in the soil will, under favourable conditions, soon root.

Mountain Ash.—*See* Pyrus Aucuparia.

Mulberry.—*See* Morus.

Negundo aceroides or fraxinifolium.—This is the old name for the Maple known as Acer Negundo. The best-known Negundo is that with variegated leaves, which is so frequently seen in suburban gardens. Seeds of the green-leaved type grow readily if sown as soon as ripe in the open ground, and when the young plants are strong enough the variegated kind may be budded thereon in July and August. A union is quickly effected.

Oak.—*See* Quercus.

Oxydendron arboreum.—A Vaccinium-like plant that needs a moist, peaty soil in a somewhat sheltered spot. The spikes of white Lily of the Valley-like flowers are borne in August, while later on the leaves change to an intense crimson scarlet, which hue is retained till they drop.

Paulownia imperialis.—A quick-growing Japanese tree, with large heart-shaped leaves and spikes of purple Foxglove-like flowers. A bright summer and autumn is, however, required to develop flower buds, and even if formed they are often injured by frosts in the following spring, as the Paulownia naturally flowers early. In some of the more favoured districts it flowers well, and its beauty in the neighbourhood of Paris is generally recognised. Can be propagated by root cuttings taken in winter and put in a frame. It should be cut hard back every year if immense leaves are desired for sub-tropical gardening.

FLOWER OF MAGNOLIA CONSPICUA (less than half size).

Pavia.—*See* Æsculus.

Pepper Bush.—*See* Clethra.

Persica vulgaris (*Prunus Persica*).—This, the common Peach, is represented in our gardens by several varieties, differing principally in the colour of their blossoms, white, pink, and crimson being represented amongst them. The Peach is by some authorities included in the genus Amygdalus (Almond), and by others it is classed with the Plums (Prunus), but here it is kept distinct from either. It is a popular favourite from the fact that its charming bright-coloured blossoms are borne quite early in the spring while the branches are still leafless. There is also a purple-leaved variety of the Peach. These various ornamental forms are propagated by budding on to seedlings of the common kind, or on to the Almond. The operation is carried out in July and August, the bud being generally inserted near the ground. In the Kew list the varieties mentioned are: Flore roseo-pleno, flore albo-pleno, and folius rubris.

Philadelphus (*Mock Orange*).—A vigorous free-flowering class of shrub, quite happy under anything like favourable conditions. Most of them can be increased by division, or rooted suckers may be taken off, while cuttings of the growing shoots strike if put in a frame in July, or stouter ones in the open ground later on. There are several species and numerous hybrid forms in cultivation. Distinct species are:

P. coronarius.—This is the Mock Orange or Syringa, a much branched bush, from 8ft. to 10ft. high, with white flowers borne in great profusion during the month of May. Distinct varieties are aurea, with golden leaves, and Keteleeri, which has double flowers. There are some other half-a-dozen distinct varieties, their names being flore-pleno, foliis argenteo variegatis, foliis aureis, nanus, Satsumi, and tomentosus.

P. grandiflorus.—A bold shrub 10ft. or 12ft. high, with larger flowers than the preceding, and two or three weeks later in expanding. Inodorous is a synonym and laxus a variety.

P. microphyllus.—This is remarkable among its larger brethren from its size, as it forms a dense twiggy shrub not more than 2ft. high, with flowers the size of a shilling. Several hybrids have been raised between this and the other kinds, one of the best being Lemoinei, a charming June-flowering shrub. Others are Boule d'Argent (double) and Candelabre (single).

The Mock Oranges form a very beautiful class, and give great charm to the shrubbery during the early summer, when the flowers are fully open. Some species are rather too powerfully scented, but their perfume is fresh and sweet, whilst the leaves are almost hidden with bloom, as few shrubs are more profuse. They will grow in quite ordinary soil, and the smaller species, such as P. microphyllus, deserve to be grouped upon the lawn in conspicuous positions, as these are very pleasing, being without the rather ragged unduly vigorous character of the more shrubby species. An exquisite indoor decoration is one composed of the flowering shoots of P. grandiflorus or coronarius, arranged in a bowl, singly, and without anything else for association; keep all worn-out shoots cut away.

Plane.—*See* Platanus.

Platanus orientalis is the Oriental or common Plane, a highly ornamental tree under any conditions, but particularly valuable from the fact that it is one of the best trees for London. The ordinary form has five-lobed leaves, while in the variety acerifolia the lobes are generally three in number, or, if five, less deeply cut than in the common kind. This variety, acerifolia, is frequently called the London Plane, and is often confounded with the American Platanus occidentalis, which in this country, at least, is inferior to the Oriental kind. Planes are increased by layers or by seeds, which should be sown as soon as ripe in the open ground. Recent classification places P. acerifolia as a distinct species, but it is usually grouped with orientalis.

Populus.—As quick-growing trees for damp places the Poplars are generally planted, and some of them are very handsome. They are all easily propagated by cuttings, even of the stout branches, put in the open ground in the autumn. The best include:

PHILADELPHUS (Mock Orange).

P. alba.—The Abele or White Poplar, of which large specimens are frequently met with. This forms a round-headed tree that derives the name of the White Poplar from the under-sides of the leaves, which when quivering in the breeze give a tree a peculiarly white appearance. Bolleana is of more upright growth, and now called pyramidalis.

P. balsamifera (*Balsam Poplar*).—The leaves of this tree are less heart-shaped than those of most Poplars, while the quantity of balsamic gum with which the buds are covered is another distinctive feature.

P. nigra.—This, like P. alba, is a large tree, but the leaves are not white underneath, as in that kind. The well-known Lombardy Poplar, an erect tree, is a variety of this.

P. tremula (*the Aspen*).—The name of this species is derived from the peculiar trembling of the foliage, which in the case of a large tree gives out a sound as of running water. There is a weeping variety of this which is very ornamental.

Prunus (*the Plum*).—The Cherries, Peaches, and Apricots are all included now under the head of Prunus, but they are here kept distinct.

P. cerasifera (*the Myrobalan or Cherry Plum*) is a very ornamental tree, which has small white blossoms in great profusion quite early in April. The fruits are also showy and pleasant to eat, but they are seldom produced in quantity. The Myrobalan Plum is sometimes used as a hedge. A purple-leaved variety has, under the name of Prunus Pissardi, become very popular within recent years. This is also known as Atropurpurea, and is a handsome tree with its deeply coloured foliage and rich red fruit. It is a suitable tree to associate with the white Lily.

P. sinensis, also known P. japonica, is a small, much-branched bush about 1yd. high, with slender shoots wreathed throughout the greater part of their length with comparatively large double blossoms, in one form white and in the other tinged with pink.

P. spinosa (*the Sloe*) and **P. insititia** (*the Bullace*) are both well known, but the only one to specially mention is the double-flowered variety of the Sloe, which has rosette-like blossoms of the purest white. It is an important shrub.

P. triloba.—A charming bush from 4ft. to 5ft. high, that flowers early in April. The flowers, which are double, are about 1½in. in diameter and of a beautiful rose tint when first opened, but with age they become almost white. It is thoroughly hardy, but for all that is a charming wall shrub.

The commoner kinds of Prunus can be readily raised from seeds, and the choicer varieties grafted in the spring, or budded in July.

Pyrus.—This is a very extensive class, comprising the Apple, Pear, Medlar, and Mountain Ash. Various methods of propagation may be employed for the numerous members of the family, as in the first place many of them can be raised from seeds; next, convenient branches may be layered; while in the case of such kinds as P. japonica and P. Maulei rooted suckers may often be detached; and with the forms that cannot be depended upon to come true from seed, they may be grafted in the spring or budded in July on to their nearest ally. A good selection is herewith given:

P. Aria (*White Beam Tree*).—A large native shrub or dwarf tree, with leaves more or less lobed and white underneath, and their silvery colour is very noticeable when the foliage is stirred by the wind. The berries are red. Angustifolia, flabelliformis, græca, lutescens, salicifolia, and sulphurea are varieties.

P. Aucuparia (*Mountain Ash or Rowan*).—A common tree, but at the same time remarkably handsome, the pretty divided bright green leaves being attractive throughout the season. In spring the clusters of white flowers impart quite an additional feature, and a far more brilliant one is furnished in autumn by the bright scarlet berries. There is a variety with yellow fruits, and another in which the branches are pendulous.

P. baccata, usually called P. Malus baccata, is the Siberian Crab, a tree of graceful growth, and very beautiful either in flower or when loaded with its ruddy fruit. This is a tree to plant upon the outskirts of the lawn, as it is too shapely to crush into the ordinary arboretum. There are several varieties, those named in the Kew list being aurantiaca, conocarpa, edulis, genuina, lutea, microcarpa, obconoidea, præcox, striata, and xanthocarpa. The Siberian Crab is often regarded as one of the most charming of all deciduous trees.

EVERGREEN OAK.

P. coronaria.—This North American Pyrus is much in the way of the common Crab Apple, with rosy-coloured blossoms, which are very sweet scented. The fruit is small and greenish when ripe.

P. floribunda.—This is usually called in catalogues and books P. Malus floribunda, but, whatever its name, no dwarf-flowering shrub is more precious. This and its other varieties are amongst the most attractive shrubs or dwarf trees in gardens, the drooping shoots being wreathed with blossom in May. Its growth is slender, and the flowers are crimson in the bud, but expand almost white, and one has the contrast of the two, which makes a rich effect. This is a shrub that deserves to be grouped for the sake of its colour and grace. Atrosanguinea is a very deeply-coloured variety, also Halleana, whilst the decidedly pendulous character of a kind called Elise Rathke is very pleasing.

P. germanica (*the Medlar*).—This is principally considered for its fruit, but at the same time the large white blossoms in conjunction with the handsome foliage are effective. An old Medlar tree is picturesque, with its spreading leafy head and rather short, stout trunk; it may certainly be classed amongst the most handsome of all flowering trees. There are several varieties of interest for their fruit, but the Nottingham kind is as famous as any.

P. japonica.—A universal favourite, often spoken of as Cydonia. It is a charming wall plant, in which position its crimson blossoms brighten many a winter day, for it commences to bloom about Christmas and continues till spring is well advanced. As a shrub in the open ground, where it will grow from 4ft. to 5ft. high, it is equally beautiful, but of course blooms later. There are numerous varieties, the flowers varying in colour from white to crimson, such as alba, the brilliant red cardinalis, nivalis, white, and the fiery Knaphill scarlet, which is perhaps as rich as any. Our gardens owe much to the beauty of this free and handsome shrub.

P. Malus is the common Crab or Wild Apple, the forms of which are almost endless, but under the new classification many kinds once grouped with the Malus section are now either given specific rank or transferred elsewhere. Coccinea, flexilis, mitis, monstrosa, nervosa, pendula, and rosea are varieties of the common Crab.

P. Maulei.—This is much like a small form of P. japonica, as C. Maulei is less

than 1yd. in height. The orange red blossoms are freely produced in the spring, and in autumn the golden yellow fruits add quite another feature. These fruits, which are as large as small Apples, make excellent jam.

P. Smithi, known also as Mespilus Smithi and M. grandiflora, as well as Cratægus grandiflora, is a medium-growing tree, with deep green leaves, and showy white blossoms. The fact that it blooms towards the end of May or June, when the bulk of spring-flowering trees is past, is a point in its favour. It is of dense growth and pleasing in the pleasure grounds. It is now called P. lobata.

P. spectabilis (*Chinese Crab*).—This Chinese species forms a free, somewhat upright-growing tree, with large semi-double flowers, bright red in the bud, but paler when expanded. It is one of the showiest of all the Crabs. Rosea plena is a double variety of great beauty. Its flowers crowd thick upon the shoots in spring, wreathing them in tenderest pink.

RHUS COTINUS.

P. Toringo is a slender-growing Japanese Crab, with a profusion of small pink flowers. Its elegant growth and numerous flowers render it an extremely attractive shrub or dwarf tree.

P. vestita.—This is altogether larger and more vigorous than the White Beam Tree, which it resembles to a certain extent.

The Crabs form one of the most precious families of all. Besides the species and varieties named above, there are such forms as John Downie, remarkable for the profusion and brilliancy of its fruit, the Dartmouth Crab, and a recent weeping variety of much merit named Elise Rathke. It is a family that should be well taken in hand, and the best forms selected and grouped.

Quercus (*the Oaks*).—The Quercus is a very numerous family, embracing the Oaks, representatives of which are to be found in all the temperate regions of the globe. Most of them produce acorns freely, from which young plants can be raised in quantity. They should be sown as soon as possible after ripening, as they do not keep long in a satisfactory manner. The varieties can be grafted in the spring, but they do not unite readily, and, as in the case of flowering trees and shrubs in general, grafting is a pernicious practice. Always raise from seeds and by layering if possible.

As there are so many Oaks, a selection is a difficult matter, but those enumerated are all good:

Q. alba.—One of the American Oaks that derives its name from the whitish character of the young bark. This forms a noble tree, and the oblong lobed leaves die off tinged with reddish purple.

Q. Cerris (*Turkey Oak*).—This is a vigorous-growing tree, with branches and twigs altogether straighter than those of our English Oaks, from which it is also distinguished by the cup of the acorn being bristly.

Q. coccinea.—The brightest of the American Oaks, as the large, glossy, deeply-lobed leaves change to a scarlet colour some time before they drop. It is a large tree, and very handsome; splendens is even a richer form. It is impossible to convey in words how wonderfully effective these American Oaks are in the landscape by reason of the brilliant colouring of the foliage.

Q. macrocarpa.—Notable for its very large, deeply-lobed leaves and the size of its fruits, the acorn being nearly buried in the cup. The foliage dies off a reddish colour.

Q. nigra.—A tree about 20ft. high, with tortuous branches, dark-coloured bark, and large curious Pear-shaped leaves. They change to a blackish red in autumn, but soon drop.

Q. Phellos.—This North American Oak is readily distinguished from all other natives of that continent by reason of its long, narrow, Willow-like leaves, and its straight shoots.

Q. Robur.—Under this head are included our two British Oaks, which by some are considered distinct species, that with the acorns borne on long stalks being Q. pedunculata, and the short-stemmed one Q. sessiliflora. The bold rugged appearance of our native Oak gives character and interest to many an English park. Varieties of the British Oaks are numerous, there being upright,

weeping, cut-leaved, golden-leaved, and purple forms. Concordia is a very handsome golden-leaved variety.

Q. rubra.—A handsome tree in the way of Q. coccinea, but the large sharply-cut leaves die off more of a purplish red than the scarlet hue of the other.

Rhodotypos kerrioides.—A Japanese shrub much like a Kerria, except that the flowers are pure white; indeed, it is even in some catalogues spoken of as a white-flowered Kerria. It is increased by cuttings put in a frame in July or by division in the autumn.

Rhus (*the Sumachs*).—These may readily be divided into two classes—firstly, those with compound leaves, and, secondly, those with undivided foliage, the best-known example of which is the Venetian Sumach (Rhus Cotinus). In some of them the long compound leaves are very handsome, and nearly all are remarkable for the rich colours that the leaves assume in the autumn before they drop. They are not at all particular as to soil or situation, and can in most cases be increased by root cuttings, taken in the winter, cut into lengths of about 6in., and inserted perpendicularly in light sandy soil, the upper portion of the root being about 1in. below the surface of the soil. A few of them can be increased by layers, notably the Venetian Sumach. The best kinds are:

R. cotinoides.—This is generally seen as a shrub, though in America it attains the dimensions of a small tree. It is chiefly remarkable for the bright orange scarlet tints that the leaves assume in the autumn before they fall. During a dull autumn this is often the brightest tree or shrub that we have.

R. Cotinus.—A beautiful shrub, chiefly noteworthy for its curious inflorescence. The flowers are borne in a much-branched panicle, which also produces a number of thread-like filaments clothed with fine hairs. These are sufficiently numerous to envelop the greater part of the plant in masses of pinky wool-like substance during the latter part of July and in August. It is on this account sometimes called the Wig or Smoke Plant. In the variety atropurpurea the panicles are of a purplish hue. The leaves turn yellow in the autumn.

R. glabra.—The long pinnate leaves of this are very handsome, and of a deep green, while they are quite smooth. There is a variety, laciniata, in which the leaflets are cut and slashed, the entire leaf being almost as finely divided as a Fern. The decaying leaves are rich red.

R. Toxicodendron (*Poison Ivy*).—A climbing species with trifoliate leaves, which are very attractive in the autumn; it must be here alluded to in order to call attention to the excessively poisonous nature of the sap, from which circumstance it is known in North America as the Poison Ivy. It should not be placed where children can have easy access to it.

R. typhina.—This, which is known as the Stag's-horn Sumach, is one of the finest of all. When not more than 10ft. or 12ft. high it is of quite tree-like habit, the sturdy wide-spreading branches being clothed with long pinnate leaves, which in the autumn change to a brilliant crimson. The male and female flowers are borne on separate plants, the latter being by far the more showy. They are borne in terminal spikes, and so thickly covered with short hairs as to appear like reddish velvet.

Ribes.—Included in the genus Ribes are the Gooseberry and Currant, and of the latter two species take high rank as flowering shrubs. They are the Flowering Currant (Ribes sanguineum) and the Golden Currant (R. aureum). Both can be readily propagated by cuttings put in sandy soil in the open ground during the autumn.

R. aureum.—This is a slender-growing bush with lobed leaves of a cheerful green, and a profusion of yellow blossoms, borne in April and May, as a rule slightly later than those of the flowering Currant.

R. missouriensis.—This is now called R. americanum, and is chiefly or note for its bright claret-coloured leaves in autumn.

R. sanguineum.—An old and well-known shrub that will succeed in almost any soil or situation, and of which there are several distinct varieties in cultivation. Prominent among them are albidum, with whitish blossoms; atrorubens, deep red; glutinosum, pinkish lilac; Gordonianum, yellowish red; and flore-pleno with pretty double flowers.

R. speciosum, the Fuchsia-flowered Currant, has bright crimson flowers, and is a very interesting species.

Robinia.—Ornamental flowering trees, the best-known being the False Acacia (R. Pseudacacia), of which there are many varieties. They will succeed even in dry stony soils, and retain their freshness through a long spell of drought. The common kind is easily raised from seeds, and the others may be grafted thereon in the spring before they start into growth, but get all upon their own roots. The two best species are:

R. hispida (*Rose Acacia*).—A low tree with spreading branches, and young shoots clothed with hairs, whilst the clusters of pea-shaped blossoms are of a beautiful rosy pink colour, and borne in June and July.

R. Pseudacacia.—Quite a timber tree of rugged growth, while the prettily divided leaves are bright green. The flowers, which are borne in May, are white, but in one variety, Decaisneana, they are pink, while semperflorens will maintain a scattered succession of blooms throughout the summer. Other varieties are: Angustifolia elegans, with narrow leaflets; aurea, golden foliage; and umbraculifera, a compact form which, grafted standard high on the common kind, is known as Mop-headed Acacia; Bessoniana is a very fine variety, which is sometimes advertised as on its own roots. It is vigorous, leafy, and is a good town tree.

Rubus (*Bramble*).—Some of these are well known, but there are not many that rank high as ornamental subjects, though a few exceptions occur. The best are:

R. biflorus.—A sturdy, upright-growing Bramble that will reach a height of 6ft. to 10ft., and is remarkable for the peculiar white stems, which in winter are very conspicuous. This is the best of the white-stemmed Brambles, and should be grouped for the sake of its stems alone.

R. deliciosus.—A Currant-like shrub, which in April is laden with blossoms 2in. in diameter, like single white Roses. A delightful shrub, worth planting upon the lawn.

R. fruticosus flore-pleno (*R. exsecatus*).—This variety of one of our native Brambles produces in great profusion, during July and August, clusters of very double pink blossoms.

R. nutkanus.—An upright-growing shrub about 1yd. high, with bold lobed leaves and white flowers.

R. odoratus, much like the last, but with purple blossoms.

There are so many kinds that space does not permit of every one being described. The white-stemmed R. biflorus should be more planted. It is as yet very rare, but too charming in winter to be forgotten. Its stems have a peculiar effect by moonlight.

St. John's Wort.—*See* Hypericum.

Salisburia adiantifolia, also known as Ginkgo biloba, is a native of China, and a very distinct tree. The trunk is generally straight and erect, while the branches have also an upward tendency. The minor shoots droop somewhat. The leaves are in shape like the pinnules of the Maidenhair Fern, hence it is often called the Maidenhair Tree. The foliage dies off yellow in the autumn, and is then very conspicuous.

Salix.—The Willows are a beautiful group, and rapidly form good-sized bushes in any damp spot, while a few attain to the dimensions of trees. They are all readily increased by cuttings stuck in the ground at any time when dormant. Particular mention may be made of:

S. alba.—A large, graceful tree, of which the Orange and Cardinal Willows, both remarkable for their brilliant-coloured bark, are regarded as varieties. These richly-coloured kinds should be planted by water. Their effect in winter is decidedly good.

S. babylonica.—The ordinary Weeping Willow, which forms quite a tree, and its slender shoots hang gracefully. There is a variety, annularis, in which the leaves are often in the shape of a ring encircling the shoots.

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S. daphnoides, a strong, bold-growing species, remarkable for the bluish glaucescence of its young bark.

Other Weeping Willows besides S. babylonica are S. alba vitellina pendula, a form of the yellow-barked Willow, in which all the minor branches are pendulous; S. purpurea pendula, American Weeping Willow; S. Caprea pendula, the Kilmarnock Willow, and S. sericea pendula, the Silver Weeping Willow, three strictly pendulous kinds that need to be grafted standard high in order to show their long drooping shoots to the best advantage.

The following notes about the important group of Weeping Willows, translated from the *Deutsche Gartner Zeitung*, and written by M. Rehden, are important, and the translation appeared in the *Garden:*

"Among the trees distinguished by their drooping habit some Willows may be cited as truly deserving the name of weeping trees, and in which this peculiarity of growth constitutes a trait characteristic of the species and not an artificially maintained deviation from the natural mode of vegetation. Their branches droop to the ground naturally, whereas in many others of the so-called weeping trees, such as drooping forms of Ash, Elm, Birch, etc., there is nearly always a clumsiness, and their branches have the appearance of being forcibly curved downwards. We should guard against an excessive use of Weeping Willows in landscape effects owing to this same weeping habit. One large isolated Weeping Willow, or a group of such trees on the margin of water, gives a much better effect than a number scattered about promiscuously. We could hardly choose a better place for displaying the picturesqueness of the Weeping Willow than the margin of water, in which the branches drooping to the surface are reflected and seemingly continued. Further, the Weeping Willow when isolated has an advantage over many other weeping trees in its beauty of habit, and especially the elegance of its lines. Here there is no hardness, no stiffness, all is grace and softness; like a fountain of water, the branches rise lightly into the air in no compact mass, to fall again gracefully on themselves. On the other hand, in most other weeping trees artificially made by grafting on standards there is none of this lightness of aspect and of form. Willows are admirably suited for giving us an abundance of foliage and shade where these are desired.

"The Weeping Willow which is best known and certainly the most beautiful is Salix babylonica. Certain other Weeping Willows are often met with in cultivation under this name, the more so as the true S. babylonica is a delicate tree in countries where the climate is at all severe. Its native country is said to be the East and China, although as a fact it has never, so far, been found wild in those countries. It is certain, however, that it already existed in Europe in the middle of the eighteenth century. It is called Babylonian because it was thought to be the tree under which the Jews sat down to weep on the banks of the Euphrates River, but it is now well known that the tree which grows on the banks of the Euphrates and resembles a Willow is the Populus euphratica, a Poplar with a peculiar foliage, having narrow leaves resembling those of the Willow and others with broad round-oval leaves. This Poplar is now in Europe, but has never shown any inclination to thrive with us. Salix babylonica rises to a height of from 30ft. to 60ft.; the branches stretch out in curves to a great width and then fall in lengths, generally a yellow-green when young, afterwards changing to a brown-yellow. In habit it much resembles S. alba vitellina pendula. The long or lance-shaped, finely indented leaves are borne upon short leaf stalks covered with fine hairs. The leaves, each 2in. to 5in. long, and less than 1in. broad, are covered at first with scattered silken hairs; later they become smooth, a bright green on the upper side, a bluish grey-green on the lower. The female catkins are small, and supported by leafy peduncles. The male tree is rarely seen in cultivation. There is one form which is peculiar in having the leaves rolled in spirals or rings, viz., annularis is more delicate than the type, weaker in growth, and more rare than beautiful. Other kinds are mentioned, but we make allusion particularly to the beautiful babylonica.

Sambucus (*Elder*).—There are only two species of Elder that need be specially mentioned, viz., S. nigra, the common Elder, and S. racemosa, the red-berried kind. They will grow in almost any soil or situation, and cuttings about 1ft. long, put firmly in the open ground during the winter, will soon root.

S. nigra, the common Elder, is known to everyone, but besides the ordinary form there are three varieties—one in which the leaves are variegated with white; a cut-leaved form; and, lastly, the Golden Elder, whose leaves are of a yellowish green when first expanded, but when exposed to the summer's sun they become of a beautiful deep golden tint. A sunny spot and a rather poor soil is favourable to the colouring of this Elder.

S. racemosa (*Scarlet-berried Elder*).—A good deal like the last, but the berries, instead of being black, are scarlet. There are also varieties of this—plumosa, with cut leaflets, and a very graceful shrub for the lawn; plumosa aurea, a golden form of the preceding; and tenuifolia, in which the leaflets are reduced to long narrow strips, thus forming a singular but graceful plant. The scarlet-berried Elder is wonderfully bright when smothered with its scarlet fruit.

Sea Buckthorn.—*See* Hippophæ rhamnoides.

Siberian Crab.—*See* Pyrus baccata.

Snowberry.—*See* Symphoricarpus.

Sophora japonica.—A large and handsome tree, with very deep green pinnate foliage, which retains its colour throughout the summer, however hot, and well on into the autumn. The clusters of white pea-shaped blossoms are borne in November, it being the last of all our hardy trees to flower. There is a good weeping variety (pendula), and a variegated kind named variegata.

Spanish Chestnut.—*See* Castanea.

Spartium junceum (*Spanish Broom*).—This is an upright-growing bush, with long Rush-like shoots, and produces in great profusion its large, rich golden yellow pea-shaped blossoms. It is at its best during June and July, but continues to flower longer than that. For planting in sandy and stony soils it is particularly valuable. Propagated readily from seed sown when ripe.

Spindle Tree.—*See* Euonymus europæus.

Spiræa.—A charming group of flowering shrubs, all of which are hardy, bear a great profusion of blossoms, and by a judicious selection a succession can be maintained throughout the greater part of the spring and summer. They all prefer good soil, and resent being parched up during the summer, a cool moist spot suiting them best. Most of them push up a succession of suckers and thus form a dense mass. When this happens and any pruning is necessary it should be devoted to thinning out the old and exhausted shoots rather than curtailing the vigorous ones, which produce the finest blossoms. From their habit most of the Spiræas can be propagated by division, or by detaching rooted suckers, while cuttings of the growing shoots, taken about August and put in sandy soil in a close frame, will soon root. With the great number of different kinds a selection is a difficult matter, but the following are the best:

S. arguta.—A neat-growing bush, 3ft. to 4ft. high, that bears its flattened clusters of pure white flowers on the upper part of the thin, wiry, gracefully arching shoots of the previous year's growth. From the middle of April well on into May it is at its best.

S. ariæfolia.—A large shrub, 8ft. to 10ft. high, that bears in June large plume-like panicles of creamy white blossoms.

S. Bumalda.—Not more than 2ft. high, and bearing in June and July clusters of pretty pink blossoms. There is a form of this—Anthony Waterer—with bright crimson flowers, and this is one of the most valuable dwarf shrubs in cultivation; its flower colouring is very rich.

S. canescens.—A vigorous kind that will grow from 6ft. to 10ft. high, and produces long, arching shoots, clothed with small regularly disposed leaves. The flowers,

which are borne in clusters for some distance along the shoots, are white, and are at their best from the end of June onwards. It is also known as S. flagelliformis—a handsome kind with many synonyms.

S. Douglasi.—This forms a mass of closely packed shoots, each of which is terminated by a dense spike of deep rose-coloured blossoms. It flowers in July and August.

S. japonica.—A bush from 4ft. to 6ft. high, clothed with lanceolate leaves, the young ones of which are tinged with red. The flattened clusters of rosy red blossoms commence to expand about the middle of June, and maintain more or less of a succession until autumn. Callosa and Fortunei are the same, and varieties of japonica, to which separate paragraphs are devoted, include S. Bumalda. Other kinds are alba, superba, glabrata, and ruberrima.

S. Lindleyana.—This differs from any of the Spiræas previously mentioned in having pinnate leaves, and it is also one of the largest in growth, for it will reach a height of 10ft. to 12ft. The large terminal panicles of white flowers are borne at the end of July, in August, and sometimes as late as September.

S. media. — A bush about 1yd. high, crowded with pure white blossoms in May and June. It is also known as S. confusa.

S. prunifolia flore-pleno.—At the end of March and in April the long arching shoots of this Spirea are crowded with clusters of little pure white double blossoms, in which stage it is very beautiful. It grows from 4ft. to 6ft. high.

S. salicifolia. — A variable species that pushes up numerous shoots from the base after the manner of S. Douglasi. In S. salicifolia the flowers are for the most part light coloured, though some are pink.

GATHERING LILAC

S. Thunbergi.—The first of all the shrubby Spiræas to unfold its blossoms, being even earlier than S. prunifolia flore-pleno. S. Thunbergi has slender arching shoots, tender green leaves, and clusters of white blossoms. It grows 3ft. to 4ft. high.

Very few of the Spiræas are worthless, and it may be helpful to readers, although the most important kinds have been described, to give a list of the chief species. They are: S. bella, betulifolia and its variety corymbosa, Blumei, bracteata, brumalis, bullata, cana, canescens (of which no less than twenty-four synonyms are given in the Kew list), cantoniensis, chamædrifolia and its variety flexuosa, conferta, crenata, decumbens, discolor and its variety dumosa, Douglasi, expansa, hypericifolia, japonica, lævigata, Lindleyana, media, Nobleana, prunifolia, pubescens, salicifolia and varieties, sorbifolia, Thunbergi, tomentosa, trilobata, and Van Houttei.

Staphylea colchica.—A shrub from 4ft. to 6ft. high, with pinnate leaves and nodding racemes of whitish sweet-scented blossoms. It is largely used for forcing, and in the open ground flowers towards the end of May. Propagated by layers put down in the autumn.

Sycamore.—*See* Acer Pseudo-platanus.

Symphoricarpus racemosus (*the Snowberry*) is a bush from 4ft. to 6ft. high that will grow in sandy soils and in shady spots. Favourably situated, however, it bears a quantity of fruits from whence the popular name is derived. These berries, about the size of small marbles, are pure white, and remain on through the autumn and greater part of the winter.

S. vulgaris.—A smaller shrub than the last, with pink flowers and white berries, which are, however, much smaller and not so showy as those of S. racemosus. There is a variety of S. vulgaris in which the leaves are edged with yellow, and very pretty it is.

Syringa (*Lilac*). — There are several species of Syringa, but the showiest are S. persica (Persian) and S. vulgaris (the Common Lilac). This last is represented by numerous varieties, all of which are good garden shrubs, that will grow in any soil of fair quality. They are all readily increased by budding or grafting. Grafting results in suckers, which must be grubbed out, so own root plants are preferable. There is no need to graft. They may be obtained by layering or by cuttings. The growing shoots, especially if those of medium vigour rather than the very strong ones be chosen, will root if taken about midsummer or a little later, put into pots of sandy soil, placed in a frame, and kept close and shaded till struck, which will be in about six weeks or two months. Stouter cuttings may also be put in the open ground in the autumn, but these do not strike so well. When a plant is on its own roots, suckers with their attendant fibres may be taken off in the autumn or winter.

S. persica.—This is a much branched and compact bush, with small leaves and clusters of lilac flowers. There

is a variety (alba) with white blossoms, and another (laciniata) with divided leaves.

S. vulgaris.—The common Lilac is a well-known shrub and a universal favourite. Its varieties are numerous, but as the range in colour is not great, some of them greatly resemble each other. A good selection would include: Alba grandiflora, white; Charles X., deep purplish lilac; cœrulea, bluish; Dr. Lindley, reddish lilac; Marie Legrange, pure white, dwarf habit; and Souvenir de L. Spath, massive clusters of deep lilac-purple blossoms. Double-flowered varieties: Alphonse Lavallée, reddish lilac; Emile Lemoine, pinkish mauve; Leon Simon, pink, one of the very best doubles; Madame Lemoine, white; President Grevy, bluish lilac.

S. amurensis, S. chinensis, S. Emodi and its varieties, S. japonica, S. Josikæa, and S. oblata are welcome also.

Tamarix gallica.—A loose-growing shrub, with bright green feathery branches, and spikes of pretty pink blossoms, which are borne during the latter part of the summer. Its great value consists in the fact that it will flourish even close to the sea, and especially along the South Coast it is much employed for hedges, screens, and similar purposes. At the same time the Tamarisk will in a fairly moist soil do well inland. There are several kinds, but all are much alike. Put cuttings in a frame in the summer or in the open ground in autumn.

Thorns.—*See* Cratægus.

Tilia (*Lime*).—The common Lime (Tilia europæa) is a well-known tree, whose foliage turns yellow quite early in dry soils. It is useful in many ways, but its ornamental qualities are not of a very high order. There are several forms, one of which (pendula) is very noticeable. The other half-dozen species that are in cultivation all bear a good deal of resemblance to the common Lime.

Tree of Heaven.—*See* Ailanthus glandulosa.

Tulip tree.—*See* Liriodendron tulipifera.

Ulmus (*the Elm*).—There are two species of Elms natives of Great Britain, viz., U. campestris, the common or field Elm, and U. montana, the Wych Elm. Both are valuable timber trees, and of both there are varieties innumerable. These varieties differ in form from each other, and from the type in habit, foliage, and other particulars. Some of the variegated and weeping kinds are decidedly ornamental. The different forms are propagated by suckers, layers, seeds, grafting, and budding. The seed should be sown when ripe, usually soon after midsummer, and covered with about ½in. of soil.

Viburnum.—A large genus of free-growing shrubs, the best known of which is our native V. Opulus sterilis, the Snowball Tree, which forms a highly ornamental specimen. The Viburnums are for the most part increased by seeds or layers. A selection of the best is as follows:

V. Lantana (*Wayfaring Tree*).—A large bush, with rough leaves and clusters of white flowers in May and June.

V. macrocephalum.—Does better on a wall than in the open. It bears huge heads of white blossoms.

V. Opulus.—A handsome shrub of somewhat upright growth, reaching a height of from 12ft. to 15ft. The lobed leaves are decidedly ornamental, and the clusters of white blossoms very pretty, while in early autumn the red berries are very rich in colour. The decaying leaves, too, are very brilliant; indeed, this shrub is worth planting for its autumn effect alone. Sterilis has globular heads of white blossoms, and is very beautiful.

V. plicatum, a native of Japan, has distinct wrinkled leaves and large rounded heads of flowers, after the manner of the Guelder Rose. It blooms towards the end of May, and is a shrub to make a group of upon the grass.

Walnut.—*See* Juglans.

Wayfaring tree.—*See* Viburnum Lantana.

Weigela.—A beautiful group of flowering shrubs, the earliest kinds of which were originally introduced from Japan. Since then numerous hybrids have been raised in this country and on the continent, a selection of the best being: Abel Carriere, rich rose; Candida, white; Dr. Baillon, claret; Eva Rathke, crimson; Hortensis nivea, white; Lavallé, purplish crimson; rosea, pink; and Looymansi aurea, with golden foliage. The Weigelas (also known as Diervilla) will thrive in any ordinary garden soil, and can be increased by cuttings put in a frame in July, or in the open ground in the autumn. They are excellent shrubs for town gardens, and may be seen flowering gaily even near to railway stations.

Wych, or Witch, Hazel.—*See* Hamamelis.

WAYFARING TREE (Viburnum Lantana).

ACROSS THE GARDEN AT LEVENS HALL WESTMORLAND.

SUGGESTIONS FOR PLANTING TREES AND SHRUBS.

By the Hon. Vicary Gibbs, M.P.

HAVING been engaged for many years in forming a collection of specimen trees for an English park and garden, and having attended to their selection, planting, and disposition, I think I may be able in this chapter to make some suggestions which will prove useful to anyone else engaged in the same interesting task. The place with which I have been concerned is situated to the north of London, on a heavy clay soil, and the temperature has fallen in the case of the winter of 1895-96 as low as 2deg. below zero, so that it may be taken that any trees to which I may refer can be successfully cultivated in any part of England where the conditions are not materially worse. As the variety of trees which can now be obtained from any leading nurseryman is so large, and since their differences of form and foliage give such distinction and interest to a garden, it seems a pity that more care and attention should not be paid to them by those who live in the country. At present it only too often happens that while great pains are given to the flowers, the trees and shrubs are looked upon as mere necessary furniture or background. Little thought is given to their selection in the first instance, and still less after they are once planted, with a view to correcting any faults in their growth, or to seeing, by judicious pruning or removal, that the choicer and more delicate sorts are protected from injury or destruction.

Placing the Trees.—In planting a garden it is desirable to so place your trees that they may produce a pleasing contrast, not merely in their colouring, but also in their foliage and form. It is also advisable in planting a shrubbery border not to put all the big trees

at the back and graduate downwards towards the front, like a stage in a greenhouse, but rather to bring some of the taller trees near to the eye so that the line is made irregular. Two advantages will arise from this course: one will be enabled to plant a larger number of trees in a given space, which is a gain where space is an object, and, further, your shrubbery will appear larger and produce a better effect. It must be remembered that where trees are planted for ornament and not for profit, it is essential that they should have sufficient room to make their natural growth and to show their uninjured forms clear against the sky. Of course in their early stages, when they are young, they are the better for the shelter of near neighbours to protect them from the mischievous effects of frost and wind, but as they become stronger and grow high enough for their heads to be above the frost level, then it is necessary, if they are to become permanent ornaments to a garden, that their neighbours which overshadow or impinge upon them should be ruthlessly cut away. From the above remarks it will be seen that it is desirable to decide as early as possible what trees you desire to be permanent, and to see that the plants in their vicinity, whether they be Larches if trees, or Privets and Laurels if they are shrubs, are cheap and unimportant, so that when the time comes for their removal or destruction no great sacrifice will be involved.

A GROUP OF ELMS IN ALDENHAM PARK.

Many people seem to imagine that as far as the trees of a garden are concerned, they only require to be planted, and can then be left to look after themselves, whereas the contrary is the case, and during the first five-and-twenty years of their existence, at any rate, they require close attention if they are to be brought to perfection. They should, if possible, never be allowed to touch one another, and this is particularly the case with coniferous trees, for though a deciduous tree which has been damaged will often remake itself when relieved from its oppressive neighbour, a conifer that has once lost its lateral boughs can no more reproduce them than a maimed man could develop a new arm or leg.

PRUNING OF TREES.—In the case of standard trees, special attention must be paid to the leader, for an erect central lead is not only necessary to the ultimate production of a shapely plant, but it is also certain that with this in existence the tree will grow better and more rapidly; it is not too much to say of a young deciduous tree that if the leader and roots are all right the lateral boughs are bound to follow suit. Accordingly it will be found necessary to remove cleanly all false or second leads close to the stem, and where both of two leads are equally strong and healthy the more central must of course be retained; if, however, the less central be much more vigorous and promising, keep that, especially if the tree be young, for in the course of a year or two by natural growth the kink or curve in the stem will disappear. If the leader be much out of the

straight, it must be tied up to a cane or stake, but do not let this be done with string or wire, unless the bark be fully protected by cloth or felt, otherwise the attachment, if only of string, will cut clean through the bark as the tree swells, and literally strangle it. The proper attachment for the support is bass, for by the time the leader has grown vertical the bass rots and the stick falls down of itself, thus avoiding the necessity of going up with a ladder to remove it. Where a tree shows a disinclination to make a central lead, the lateral boughs into which the strength of the tree is going should be pruned hard back, cutting inwards in pyramidal fashion from the base up to the central lead which you want to assist. Do not be disturbed if the tree thus treated presents a painfully formal appearance suggestive of Noah's Ark, and do not pay any attention to the criticisms or ridicule of those who have made no study of the subject. One year's growth will much lessen the formality, and in two or three years you will probably hear no remarks except "what a well-grown little tree!" Where the central lead is hopelessly bad, or where the natural habit of the tree is to form a bushy growth, it is often better not to attempt to preserve a weak leader which is out of the centre, but to cut it off and make a mop head; nor is this to be regretted, as the tree so treated will give a pleasant change of form if standing among tall and fastigiated neighbours. If you desire to remove the lower branches of a young tree, either to show the beauty of the stem, as in the case of a Birch, or to prevent its injuring adjoining shrubs, which is often necessary, do not take off too many boughs at a time, otherwise you will weaken the tree's constitution and make its leader so long, thin, and whippy that it will be liable to be readily broken by wind. Content yourself, therefore, with clearing from 6in. to 1ft. of the stem each year until the requisite height be obtained.

A WEEPING BEECH IN ALDENHAM GARDENS.

Now let me say something about PRUNING generally, apart from the formation of a central lead; the best time for this operation is the late spring, just before the sap rises, but small boughs not thicker than the little finger can be taken off at any time of year. Trees vary very much in the degree to which they submit to the knife. Some seem actually stimulated and rendered more vigorous by it, and among these are to be numbered all kinds of Cratægus, Yew, and Holly, while the gum-producing trees, such as Cherry, Plum, Peach, and Almond, are very intolerant of the process, and it is better in their case not to cut the hard wood at all, but merely to shorten the growth of the current year where requisite. In the case of a Birch, never remove large boughs after the sap is up, otherwise it will bleed to death, though no bad effects will follow if the tree be in a dormant state. If a plant be delicate and liable to be injured by cold, do not prune it except in the spring. I remember killing some

plants of Rhus Cotinus stone dead by pruning them shortly before they were exposed to a hard winter. Broadly speaking, nearly all deciduous trees can be pruned with advantage in their young state, and hardly any conifers; in the case of the latter they are best left quite alone, except for the removal of any superfluous leaders. There is, however, one marked exception in this class, and that is the various Retinosporas, which in this climate, at any rate, are apt to get very ragged and mangy if allowed to grow naturally, but when pruned they make handsome solid and vigorous pyramids.

It is, of course, very difficult to give general directions as to pruning on paper, though it might be quite easy to say what should be done to this or that tree if it were before one. A general rule may, however, be laid down that all boughs which turn back and grow inwards or across the others, and still more all those which turn upwards and take a vertical direction, should be removed. Most trees, except the Beech, have a tendency to throw out a mass of small shoots from their stems, especially where the original boughs have been removed. These should always be taken away, as in a young tree they use up the sap which is wanted for the formation of a fine head, and in an old one they lessen the impressiveness of the trunk and weaken the contrast between grey bole and green branches.

With regard to the PLANTING of trees, the soil in which they are to grow should whenever possible be thoroughly trenched and broken up; it is really astonishing to note the different rate of progress of two trees in all other respects similar, one of which has the advantage of trenched ground and the other not. Of course where trees are planted as specimens on turf it is impossible to break up the ground, but in that case the wider the hole in which they are placed the better chance they will have, and it will help them if ever so small a circle of unturfed ground is left round them, as it will give air to the roots and protect the tender bark from being bruised by accidental blows from the mowing machine. If the soil be heavy and the situation moist, the tree will do better if planted on a gently swelling knoll rather than on a dead level, and provided the rise in the ground is sufficiently graduated to produce a natural appearance the tree will also look better. Nothing is so fatal to the prospects of a young tree as standing water at the roots, and this in a clay soil is a

A GARDEN WALK AT HELMINGHAM HALL, SUFFOLK.

very common cause of failure. If you notice a specimen tree looking sickly, with leaves of a washy yellowish green colour, you will often save its life by lifting it, putting some fine soil round the roots, and replanting it 1ft. or 18in. higher in the ground. Where the tree is of sufficient importance to warrant the expense, a small drain-pipe from its roots in connection with the nearest drain in the paths or elsewhere will greatly help it in the early struggle for existence, and by the time the tree gets old enough to make free root action its roots will drain the soil naturally.

Where a tree has to stand alone without shelter, whether as a specimen or in an avenue, do not plant it in its permanent situation until it has assumed a fair size, say, about 6ft. high; you will gain time rather than lose it by keeping it in some nursery or shrubbery of your own where it is thoroughly protected though not touched or overshadowed by older trees. Do not attempt to plant choice trees or shrubs in the immediate vicinity of old forest trees, at any rate not under their drip, as the result is certain to be disappointing; the old inhabitants will suck all the good out of the soil, and the better the mould you put round the new comer to help it the quicker will you find that it has to draw its sustenance from among a mass of extraneous roots; moreover, the young tree in the natural search for light and air will bend away from the old ones and become warped and stunted, till, after dragging out a miserable

AN OLD SCOTCH FIR.

existence for ten or a dozen years, it either dies or has to be cut down. It follows, therefore, that anyone who wishes to make a collection of fancy trees and shrubs should remove (not all at once, but year by year) every old tree that can be spared—I mean all that are ill-grown or injuring others, or that are not required as a shelter from wind.

Never be content in a garden with the half measure of cutting down a condemned tree, but have it stocked out by the root, otherwise in the case of nearly all deciduous trees you will have an unsightly and cumbersome coppice growth springing up from the stool, and in any case you will leave a quantity of surrounding soil for many years unfertile. People are too

THE SQUARE GARDEN, KING'S WESTON.

prone to forget that an old tree occupies almost as much space under ground as it does above. One of the great difficulties of tree-planting is that to enable them to thrive as well as possible they must be planted closer together in their young state than they can remain when their size has increased. This means the gradual removal for some years, and later on the destruction of those which are not required.

In the case of REMOVING TREES it is well to note that there is as much difference among the various kinds of trees in their power to stand the shock of removal as in their toleration of the pruning knife. A broad general line can be laid down that evergreen trees stand removal far worse than do their deciduous congeners. To give particular instances, among the former, the Pinus Laricio, the Holly, and the evergreen Oak are particularly bad movers, while the Cypresses and Thujas occupy a middle place, and Yews and Spruce Fir move fairly well. Of deciduous trees the Oak, Beech, and Spanish Chestnut are bad to move, while softer-wooded kinds, such as Lime, Birch, Horse Chestnut, and Sycamore, as well as all kinds of Thorn, transplant well. Of all trees the Horse Chestnut is by far the best to move, and however big and at whatever time of year you move it, you will find it hard to kill if reasonable pains be taken with its replanting. I have moved one, about 10ft. high and in full leaf, in the middle of the summer, without its resenting the ill-timed operation at all.

As to the best time for MOVING TREES, *i.e.*, in spring or autumn, there will always be disagreement, but my view is that, on a heavy soil at any rate, it is mainly a question of season. If I could know beforehand that I should have an open winter, followed by a droughty spring, hot sun and east wind, I should, undoubtedly, plant directly the first autumn rains had soaked the soil; if I could foresee a hard winter and mild moist spring I should go in for March-April removal. These remarks apply only to deciduous trees; in the case of conifers, and indeed all evergreen trees, I am convinced that April (and in a late season even late in April) is the best time for removal.

Personally, if I had to choose between moving a big Cypress or Pine in August or December, I should unhesitatingly choose the former. The cause of the death of half the

RETINOSPORA SQUARROSA, WITH PINUS AUSTRIACA IN BACKGROUND.

newly moved trees is that their roots are left too long above ground, and that is why the percentage of loss is so much smaller among trees moved from one part of an estate to another than among those which come from a distant nursery. The secret of successful removal is to get as big a ball of earth with the roots as possible, and where the soil is inclined to fall off to tie up the ball in a bag of matting while it is being shifted. Before replanting see that all bruised and damaged roots are cleanly cut off and those that remain spread out evenly and not crumpled up, then shake fine soil well into them and over them, and have it well trodden in, seeing that the same process is repeated several times during the process of filling up the hole. In the case of a dry spring following where you have lately planted trees, their chances of life will be greatly increased if you are able to water them, although no amount of watering will produce for them what they really require—a moist atmosphere; accordingly, it is far more useful to syringe their heads and stems well, and so encourage the rise of the sap, than to saturate the ground round them, as after recent removal their root action is so feeble that they cannot absorb much water in that way, and unless they are very well drained water merely lies there and does more harm than good. A very good plan is to bind the whole of the stem with hay-bands, as these hold the water and keep the bark protected from the drying influence of sun and wind.

It may now be well to consider what SORT OF TREES you should plant in your garden with the best prospect of success. I have heard before now a friend say, "I really don't know what trees would do with me, and I don't want to have the trouble and expense of planting a lot of trees which, owing to soil or situation, may never do any good." To such an one I would reply, "Walk out into your country lanes or fields, and see what are the finest trees growing naturally; if you are living on heavy clay soil they will be found to be Oak and Elm; if on a light gravel, Walnut, Spruce, Scotch Fir, etc.; if on chalk, Beech, to give a few examples. You do not want in your garden to reproduce exactly the trees which you see flourishing along your roadsides, but what you can do is to learn from these what species are likely to succeed with you, and then you can get garden varieties of them which to the casual observer will be perfectly distinct, though botanically they are the same." It must be borne in mind that the commonest tree in a vigorous and healthy state is a finer object than one which (however beautiful and conspicuous in its own habitat) is, owing to unsuitable conditions of soil and climate, struggling painfully for bare life.

If the reader of these lines should be quite ignorant of arboriculture and yet desire to start a collection of trees, he will find little help in an ordinary nurseryman's catalogue, and the strings of foreign and often ill-spelt names will hardly help him to distinguish between a rock-plant, a grass, and a monarch of the forest. I would suggest in such circumstances that a personal visit should be paid to Kew Gardens and to one or two of the leading nurseries, where a large collection of good trees can be seen growing, and a selection made according to the individual taste of the purchaser.

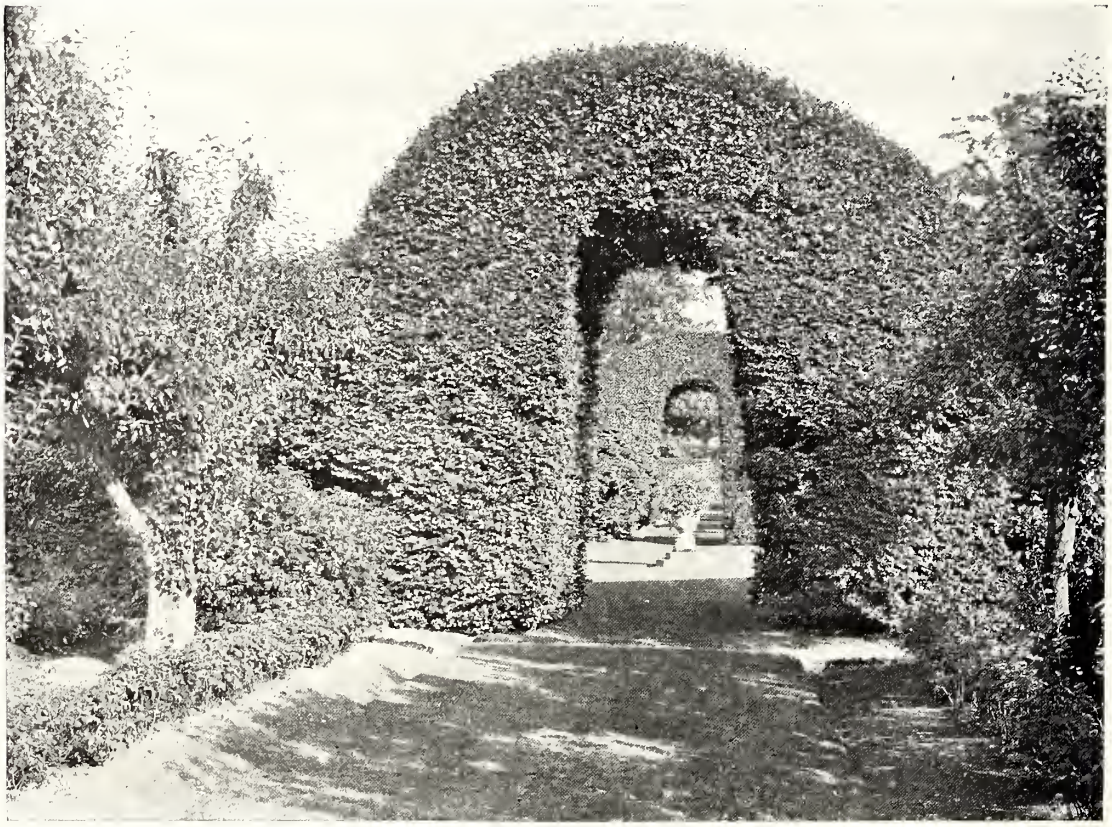
If anyone is in doubt whether to go in specially for conifers or deciduous trees, I would rather recommend the latter. (1) Because they require less care and attention, though they require a great deal. (2) Because they are cheaper. (3) Because it is far more common in a well-kept garden to see a good pinetum than to find a well-assorted collection of choice deciduous plants. I have mentioned earlier in this article that it is well so to plant trees as to get the greatest contrast of form, foliage, and colour; and to assist others in attaining this object I will now give some lists of those plants which differ most conspicuously in these respects. Among trees which grow in an erect pyramidal fashion, and make marked points in the landscape, are the Lombardy Poplar, and its more uncommon variety Populus Bolleana, fastigiated forms of the Oak, Elm, Birch, Acacia, and Thorn, which can be obtained from any good nursery, and which are far too little planted, not so much on account of their own beauty as from the way in which they set off their more spreading neighbours. Among evergreen trees it is comparatively easy to get examples of pyramidal growth, and it is only necessary to mention the Irish Yew, the various kinds of Cypress, such as C. Lawsoniana, C. Fraseri, C. erecta viridis, the Thujiopsis Borealis, and Thuja Lobbi. Trees of this character require careful and tasteful planting; if you overdo them you will destroy the natural look of your place and give a suggestion of a suburban cemetery, and it should be noted that two or three points pretty close together of varying heights do not produce a good effect; on the other hand, one tall Cypress or Poplar standing up like a sentinel and breaking the sky-line among Thorns, Quinces, or other low-growing round-headed trees, gives the same improvement to a view as is produced by a church steeple.

TAXUS GRANDIS.

Trees which are markedly in contrast with the foregoing from their squat and rounded habit are all kinds of Cratægus, the scarlet Horse Chestnut, the Quince, snowy Mespilus, Medlar, Catalpa, Walnut, Pyrus Malus

floribunda, Ailanthus, and all pollarded and weeping trees. Among trees which have a very large leaf are the Ailanthus, Horse Chestnut, Catalpa, Sycamore, Plane, Paulownia, Dimorphanthus; and in contrast to these may be set the Birch, Hornbeam, Acacia, Gleditschia, Willow, and one or two varieties of Elm and Maple, which are conspicuous for small and elegant foliage. Trees of which the leaves are naturally cut into and indented, or of which a cut leaf (laciniata) form can be obtained, are: Kolreuteria paniculata, Birch, Beech, Lime, Alder, and Maple, which are all very effective, and just as hardy and vigorous as the type.

Trees which can be grown with a more or less yellow or golden foliage are: Spanish Chestnut, Poplar, Horse Chestnut, Tulip, Hop Tree (Ptelea trifoliata), Elm (two or three varieties), Oak (Q. concordia), Alder, Sycamore, Ash, Yew, Cypress, and Juniper. Silver or white-leaved forms of the following trees are obtainable: Spanish Chestnut, Elm, Oak,



BEECH ARCHES AT LEVENS HALL.

Sycamore, Maple, Negund, Yew, Cypress, and Juniper (alba spicata). Trees with a glaucous colouring are the Willow, Pyrus Aria, or Whitebeam; Hippophæ rhamnoides, or Sea Buckthorn; Cratægus orientalis, and C. tanacetifolia, Populus Bolleana (Aspen); and glaucous varieties of several Conifers can also be secured, among which I may mention: Cedar, Cypress (C. Fraseri), Juniper, and Abies pungens. Among trees that show a reddish or purple foliage, besides the well-known copper Beech, are the purple Plum Prunus Pissardi, the purple Beech, Oak, and Elm. The variety of Maple known as Acer colchicum rubrum has its young shoots of a bright red, whilst A. Schwedleri shows a delicate pink all over in the spring. The numerous Japanese dwarf Maples present many different shades, from deep red to pale amber, and they form a great ornament to a garden, being, as far as my experience goes, perfectly hardy; in fact, they have only two faults—(1) they are costly, and (2) they are of very slow growth. The same remark applies to all these out-of-the-way non-natural coloured trees as to those of very stiff and spiky growth, namely, that they must be planted judiciously

A CORNER OF THE GARDEN, LEVENS HALL, WESTMORLAND.

and not overdone; one copper Beech here and there in a park may look very well, but if they constantly recur they make heavy blots in the landscape.

With GOLDEN-LEAVED PLANTS the danger is that they should be too garish and conspicuous, and it is very important not to plant golden forms of two different trees in close proximity, as they quarrel with one another, and the more brilliant of the two kills the other. It is impossible to name any two green-leaved trees which do not harmonise, but place, say, a golden Yew and a golden Oak in juxtaposition and you will find that the result is most unsatisfactory. I have seen frequently small gardens spoilt and vulgarised by the too free

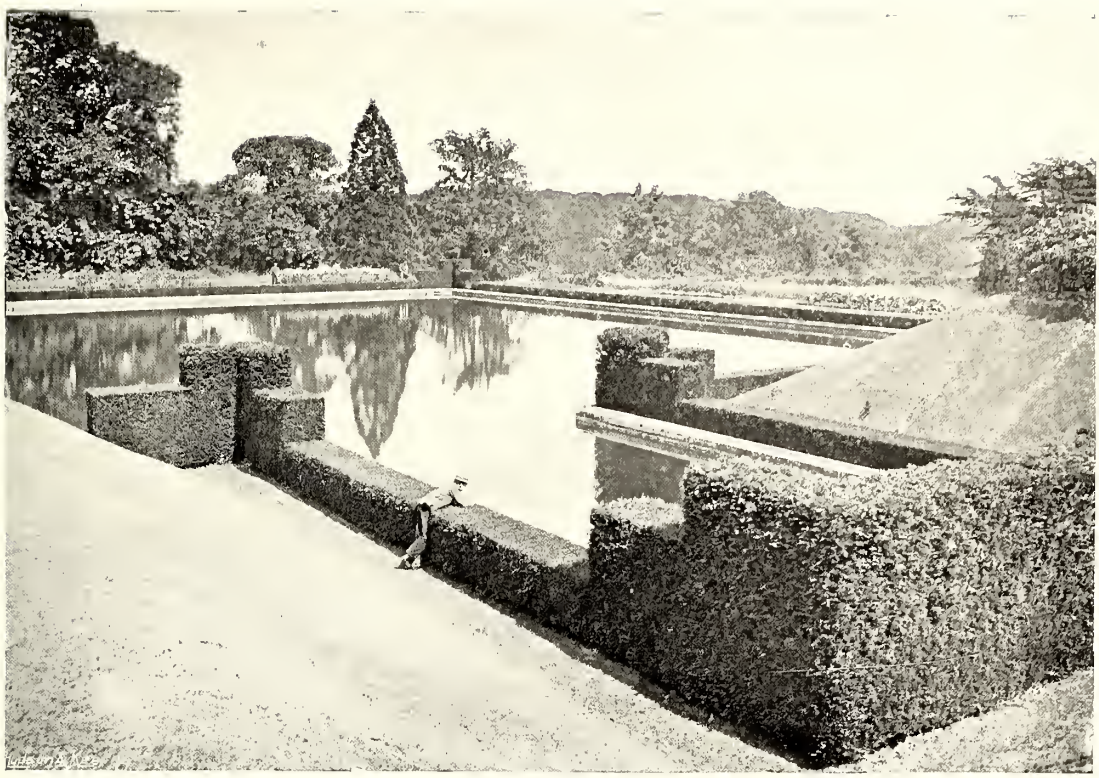
employment of golden Elder and the spotted Aucuba; the proper use for the former is not to dot it about among other shrubs, but to mass it boldly in a sunny place where it can be seen from a distance. It must not be forgotten that all trees and shrubs with golden foliage (the Aucuba alone excepted) require unimpeded light and air to bring their colouring to perfection.

Before I bring this chapter to an end I should like to add a few lines about the use of WEEPING TREES in a garden. I know they are not universal favourites, but in my judgment they are a very pleasing addition if their places be well chosen. They are not suited to belts or shrubberies, as they take up a great deal of room, and suffer more in appearance from contact with others than do trees of erect habit; in fact, unless I could give a weeping tree the space on which to stand absolutely clear, I would rather be without it. Their proper place is on turf as specimens, and preferably on a slope or bank and near the edge of water. Some of the more beautiful are Sophora japonica, Gleditschia Bujoti pendula, Lime, Birch, Beech, Elm, especially Ulmus Petersii pendula, a far preferable form to the ordinary weeping Elm, which

DOVASTON YEW ON BANK.

partakes too much of the formal shape of an open umbrella, and perhaps prettiest of all the weeping Acacia. It is well in buying weeping trees to choose them with as high a standard as possible, as the boughs damage both the turf and themselves as soon as they touch the ground

Having now fulfilled the task which I set myself of saying something about the planting removal, pruning, and arrangement of trees, together with some notice of the kinds most suitable for an English garden, I feel that the time has come for me to conclude. I am very conscious that all that I have written is sadly deficient in literary grace. There are no quotations from Theocritus, or Milton, or Spenser, or Bacon; no fine writing about "the immemorial Elms," or how "the rude and moss-grown Beech o'ercanopies the glade"; instead, there is a succession of bald facts, of the truth of most of which I have satisfied myself by actual experience, extending over about a quarter of a century, as an amateur arboriculturist; hence arises the obvious result that what I write cannot interest anyone except those who have the same tastes and pursuits. However, should any of my suggestions prove useful, I shall be more than content.



THE SKATING POND, ASHRIDGE PARK, GREAT BERKHAMSTED.

EVERGREEN TREES AND SHRUBS.

AMONGST the many evergreen trees and shrubs are noble groups, the Hollies and so forth; but the following list will reveal the wealth of kinds at command of the planter:

Andromeda.—At one time this constituted a large group of evergreen shrubs, but the majority are now classed under the heading of Pieris, such as floribunda, formosa, japonica, and nitida. Therefore only one species is here considered—A. polifolia—a little shrub about 1 ft. high, clothed with narrow greyish leaves, and producing its little pinkish bell-shaped flowers during the summer months. It is a very interesting species, not troublesome to grow in a peaty soil, and is one of those shrubs that may be planted amongst boggy plants, such as the Trilliums and things that appreciate moisture. A. polifolia is not too often seen in gardens, but it is too leafy and pleasing to ignore. Angustifolia and major are varieties.

Aralia.—Many members of this genus are tender, and two or three of the hardy kinds are deciduous, there being indeed but one evergreen to be mentioned here.

A. chinensis.—A sturdy plant, with lobed leaves of a stout leathery nature, very popular for decorations indoors, but at the same time it forms a handsome shrub for the open ground in the South of England. Seeds are frequently sent to this country in quantity from the South of France, from which plants can be readily raised. This plant is also known as Aralia Sieboldi.

A. Sieboldi.—*See* A. chinensis.

Arbutus.—An ornamental group of evergreen shrubs or small trees, of which the best known is A. Unedo, the Strawberry Tree, which forms one of the notable features of the celebrated Lakes of Killarney. This is raised from seed, and the other kinds are usually grafted on to it.

A. Andrachne.—This is a native of the Levant, and forms a stout-growing tree, clothed with shining narrow Laurel-like leaves, and spikes of greenish white waxy flowers borne in the spring. The old bark peels off, leaving the smooth, reddish trunk, which is conspicuous.

A. Menziesi, known also as A. procera, is more upright growing than the last, while its white sweet-scented flowers are borne in the autumn. The large shining leaves are handsome, being of a peculiar metallic green.

A. Unedo.—The spikes of whitish waxlike blossoms of this Arbutus are produced in the autumn, when few shrubs and fewer trees are in bloom. Besides the typical kind there is a variety, Croomi, with reddish flowers. The name of Strawberry Tree is derived from the fruits, which ripen in about a year from the time of the flowers. It is not thoroughly hardy, being injured during winter.

The Arbutus belong to the Heath family, and of the four species there are several varieties. A. Unedo has for its forms integrifolia, microphylla, quercifolia, and rubra, the garden name of which is Croomi.

Aucuba.—A useful class of neat-growing shrubs, valuable from the fact that they will succeed better in shady spots and in smoky districts than the majority of evergreens. The common form, A. japonica, has green leaves blotched irregularly with cream, but there are several varieties, differing in the marking of the foliage, while in others the leaves are quite green. The Aucuba bears the male and female flowers on different plants, hence in order to obtain the bright scarlet berries that make such a goodly show the two sexes must be planted in close proximity. All of them strike root from cuttings put in a shady spot.

Berberis.—There are two distinct sections of these, firstly, what is known as the Ash Barberries, which were formerly called Mahonia; and, secondly, the evergreen forms of the ordinary Barberry.

B. Aquifolium, a native of North America, is the best-known of the first-named section; indeed, several to which distinct names have been given are simply seedling forms of this. It is a beautiful shrub, with pinnate leaves of a rich shining green, furnished at the edges with spines, while the terminal masses of golden yellow flowers form a charming feature in the woodland in early spring. The purple berries towards the end of the summer are also very conspicuous. This Barberry will grow in almost any soil or situation, and is a valuable covert plant. It is readily increased by seeds or division. Many of the leaves become richly tinged with crimson in the autumn, when they are much used for associating with cut flowers of Chrysanthemums.

B. Darwini, a native of Chili, with deep green Box-like leaves and rich orange-coloured blossoms, produced in great profusion in the spring, while occasionally a second crop appears in the autumn. This is one of the most charming of all flowering shrubs, and a group of it in flower is delightful, producing a glorious effect from its remarkably handsome flowers, so freely produced that the whole shrub is full of colour.

B. duleis, or **buxifolia,** a rather upright-growing shrub, with solitary golden blossoms suspended by unusually long stalks.

B. empetrifolia.—This is a low-growing bush, seldom more than 2ft. high. The slender branches are clothed with narrow leaves, and in the season studded with yellow blossoms.

B. nepalensis (*the Asiatic*) is a noble plant, with very long pinnate leaves, but is rather tender, the hardiest from that portion of the world being M. japonica, which has lemon-coloured blossoms, borne in mild winters soon after Christmas.

B. stenophylla.—A hybrid between B. Darwini and B. empetrifolia, and one of the most beautiful of outdoor shrubs that we have. It reaches a height of 6ft. to 8ft., and the long arching shoots clothed with small deep green leaves are arranged so gracefully that when in full flower the entire plant forms a fountain of gold. Like the others, it flowers in spring, and can be raised from seeds.

Box, The.—*See* Buxus.

Buxus.—The Box (Buxus sempervirens) is a well-known native shrub, of which there are many varieties in cultivation, but a good ordinary form is quite equal in beauty to any of its varieties. A particularly dwarf variety is often used as an edging to flower beds.

B. balearica (*Balearic Box*) is much larger in all its parts than the common kind. The Box is a useful plant for hedges, as has been mentioned elsewhere, and its fragrance as one brushes past it is agreeable, whilst its fine colour at all times should bring it into greater favour even than it seems to be at present. It forms an interesting hedge, and when grouped possesses much beauty, whilst its numerous varieties are important, although the species itself should receive first consideration. The Handsworth Box originated at the nurseries of Messrs. Fisher, Son, and Sibray, near Sheffield, and is one of the finest forms of all, having very broad deep green foliage. The Myrtle-leaved and the variegated are two good kinds, and a golden variegated Box of much beauty is aurea variegata. In the Kew list the following varieties are named, which shows how greatly the common Box varies: Arborescens, argentea, aurea maculata, aurea pendula, aureo-marginata, elegantissima Handsworthi, latifolia, latifolia maculata, longifolia, myosotifolia, myrtifolia, navicularis, Ponteyi, prostrata, rosmarinifolia, and suffruticosa. B. Harlandi, B. japonica, B. microphylla, and B. Wallichiana are species.

Cassiope tetragona, a neat little Heath-like plant, with deep green foliage and tiny waxlike, bell-shaped blossoms; it needs a peaty soil and a moist spot. The upright-growing C. fastigiata is even more particular in its requirements. C. hypnoides is interesting. Synonyms are Andromeda fastigiata, A. hypnoides, and A. tetragona.

Cerasus.—Most of the species of Cerasus are deciduous, but there are two well-known evergreen kinds, viz., the common Laurel (C. Laurocerasus) and the Portugal Laurel (C. lusitanica).

The common Laurel is well known, and generally planted as a screen to clothe sloping banks or similar positions. The ordinary form, which is frequently injured during severe winters, is surpassed in hardiness by its varieties, colchica and rotundifolia. As Mr. Bean has pointed out, the Laurel must not overrun everything else in the garden.

The Portugal Laurel is more frequently seen as a regular-shaped bush, or even as a standard. Both may be struck from cuttings put firmly in the ground in a shady spot, but the common kind roots more readily than the other.

Choisya ternata (*the Mexican Orange-flower*) has trifoliate leaves, and clusters of white sweet-scented flowers during the summer and autumn. Cuttings need the protection of a frame, and may be taken in spring or in summer. This shrub is very beautiful in many gardens, and appreciates a warm rather light than heavy soil, and sheltered sunny position. It grows with great rapidity, and in some places, where the position suits, it becomes almost a weed, forming, in truth, quite a hedge. It should be one of the shrubs planted in the borders near the house, as its glossy green foliage is pleasant at all times, but when in flower the white clusters diffuse an agreeably nutty perfume into the house. Few evergreen shrubs are more charming than this. In the Northern Counties it must be grown in a greenhouse, and even under glass is welcome.

Cistus.—A beautiful class of shrubs, most of which are, however, too tender for general cultivation. On the sea-coast in the South and West of England they do well. Cuttings taken in August, dibbled into pots of sandy soil and placed in a frame, will root before the spring. The hardiest are: C. ladaniferus (Gum Cistus), large white flowers spotted purple; C. crispus, reddish purple; C. laurifolius, white. The two kinds that are especially worthy of mention are C. ladaniferus and C. laurifolius. These are, perhaps, the most hardy, and are sufficiently handsome to be grouped upon the lawn or in the pleasure grounds, where they form leafy masses, relieved by large single flowers. A warm dry soil is necessary, and when established a group of them is an interesting feature in the garden. These two species should be grown before others, as they are in the truest sense of the word "shrubby."

Cotoneaster microphylla.—This is a charming species, dwarf and hardy; it is, indeed, a dense-growing procumbent shrub, with tiny polished green leaves, and a profusion of crimson berries in winter. It was probably first raised in England in the famous Horticultural Society's gardens at Chiswick. This Cotoneaster may be used in many ways in gardens. Some of the best winter effects possible are the result of making large breadths of the shrub, perhaps, against some flights of steps leading from one part of the garden to another, or upon the rock garden, over which it will spread its wiry shoots, so pleasant to look upon at all times. When bright with its crimson berries, this Cotoneaster is, indeed, a shrub of no common beauty. It is a native of the Himalayas, and is found at an elevation of between 5,000ft. and 6,000ft.

C. buxifolia.—A small-leaved species, forming a bush 4ft. to 5ft. high, clothed with dark green Box-like leaves and bright red berries. Both this and C. microphylla may be raised from seed, the berries being gathered when ripe, and kept in moist soil till the spring. This causes the pulpy matter to decay, and the seeds being cleaned therefrom should be at once sown in a pan or box, and in a sheltered position some of the young plants will soon appear, though many of the seeds will probably remain till the following spring. Mr. Bean of Kew, in writing to the *Garden* in reference to this Cotoneaster, says: "I have seen it nowhere finer than at Kew, where there is a mass 10ft. high and 40ft. through, which admirably shows the value of this shrub as an impenetrable screen, either for blocking out some objectionable view or for shelter. It is perfectly hardy here. Its branches are long, slender, and but little branched. If the plants are trained up so that they can hang downwards, the effect is very

graceful. The happiest use I have seen made of this Cotoneaster is where it has been planted so as to grow over an iron fence. This it now completely hides, and its long snake-like branches, standing prominently out from the main body of the plant on both sides, give as light and elegant an effect as it is possible for an evergreen to produce."

Cratægus Pyracantha.—This, which is known as the Fire Thorn, is generally treated as a wall plant, in which position its bright orange scarlet berries form a cheerful winter feature. It also does well as a bush in the open ground, and may be grown from seed treated in the same way as recommended for the Cotoneasters, or from cuttings about 1ft. long and inserted firmly for two-thirds of their length in a sheltered spot in the open ground. Lælandi is a handsome variety.

Dabœcia polifolia.—A lovely upright-growing shrub that reaches a height of 1ft. to 2ft. The flower spikes are erect, and the drooping bell-shaped blossoms, which are larger than those of any other hardy Heath, are in the common kind purple, but there is a form (alba) with white, and one (bicolor) with both purple and white flowers mingled on the same plant. This little shrub will flower continuously from May to October. It is readily increased by seeds, which should be sown in spring in peaty soil, and placed in an ordinary garden frame. In every good garden the Dabœcia should be shown in bold groups or breadths.

OLEARIA MACRODONTA.

Daphne.—A pretty class of low-growing free-flowering shrubs, the flowers of which are deliciously scented. The Daphnes are increased by layering the lowermost branches, which may be carried out in the spring, but it will be two years before they are sufficiently rooted to be taken off. A selection of the best is as follows:

D. Blagayana.—A spreading bush, with ivory white blossoms in spring, very suitable for the rock garden, and succeeding in well-drained soil. It is hardy and straggling in growth.

D. Cneorum (*Garland Flower*).—This is not more than 1ft. high, but of trailing habit, with small deep green leaves and dense clusters of pink highly-fragrant blossoms. It is a little shrub that needs a peaty soil, and a cool moist situation.

D. collina.—An upright shrub not more than 2ft. high, and bearing its clusters of pink blossoms throughout the winter months.

D. Laureola (*Spurge Laurel*).—An evergreen bush, with very deep green leaves and sweet-scented greenish yellow flowers that open in February. Though the blossoms are less showy than those of other kinds, it is valuable as a subject that will grow well under the shade of trees.

D. pontica.—This is similar to the preceding, but not so vigorous, while the flowers, which are of a richer yellow, are later in expanding.

Elæagnus.—The Elæagnuses are a highly ornamental, quick-growing group, the evergreen species of which are natives of Japan. Cuttings about 6in. long taken in August, put into pots of sandy soil and kept close in an ordinary garden frame, will root without difficulty. The young leaves of all of them are remarkable from the fact that they are clothed with small scurf-like scales, which lessen in number as the shrub develops.

E. macrophylla is furnished with ovate leaves about 4in. long, deep green above and intense silvery beneath. When stirred by the wind the contrast between the two sides of the leaf is very marked. This will form a large specimen 6ft. to 8ft. high. This shrub should be more frequently planted in gardens, as it is of distinct appearance and in every way desirable.

E. pungens.—The leaves of this are not so large as those of E. macrophylla, nor so silvery underneath, but it forms an equally handsome shrub. There is a variety, aurea, in which the centre of the leaf is of a golden yellow; and another, variegata, which has a margin of white. This species and its varieties are very beautiful, and shrubs that should certainly be more grown in English gardens.

Erica.—*See* Heath.

Escallonia.—All handsome shrubs, most of which are, however, rather tender, except in the South and West of England. Cuttings of the growing shoots taken about

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ARCHES OF VERDURE, BROME HALL, NORFOLK.

"COUNTRY LIFE."

July, and inserted into pots of sandy soil, will, if put in a close frame and shaded from the sun, soon root. The best are:

E. macrantha.—A stout bush, 6ft. or so in height, clothed with deep green glossy leaves. The bright crimson Fuchsia-like flowers are borne throughout the summer months, and often well on into the autumn. This forms quite a hedge in the South of England and Ireland, and frequently may be seen clothing the fronts of houses. It is a very charming shrub when the climate is suitable.

E. montevidensis is an interesting kind, with white flower clusters.

E. Philippiana.—A slender and spreading, yet freely-branched shrub, clothed with small deep green leaves, and in July absolutely laden with myriads of tiny white flowers. It is the hardiest of all the Escallonias.

E. rubra.—This is altogether smaller than E. macrantha, but a charming free-flowering shrub.

Euonymus japonicus.—This species of Euonymus and its numerous varieties are among the most popular of evergreen shrubs, one reason being the fact that they succeed under so many and varied conditions. As evergreens for the seacoast, even within the range of the salt-laden spray, they are unsurpassed; and in shady spots they hold their own remarkably well, while in smoky districts, even in the heart of London, good specimens may be met with. In pots and tubs for corridors, balconies, and window sills these Euonymuses are very useful, and they are also well adapted for clothing walls, etc. They are very easily increased, as cuttings about 6in. long put in a frame will soon root at any season, except the depth of winter. Besides the ordinary green-leaved form there are varieties in which the leaves are marked with white and yellow respectively. These are less robust than the green-leaved kind.

E. radicans is a rambling or creeping shrub, with small deep green leaves. It is not generally met with, but its variegated variety is universally cultivated. It is decidedly ornamental as a shrub, is a first-rate wall plant, and may be used as an edging after the manner of Box.

Fire Thorn.—*See* Cratægus Pyracantha.

Garrya elliptica.—The leaves of this Californian shrub remind one of some form of the Evergreen Oak. It is a somewhat upright bush, 6ft. high, and produces a profusion of long yellowish green pendulous catkins during the winter months. It is fairly hardy, but in some districts is greatly benefited by the protection of a wall. The catkins are the male flowers, and appear on separate plants from the female, this latter being less ornamental than the other. Cuttings should be treated as recommended for Escallonia, but they take longer to root. The long catkins or tassels are a delightful winter indoor decoration.

Gaultheria.—Peat-loving plants, of a tufted or spreading habit of growth, and may be increased by division carried out in the winter.

G. procumbens (*Creeping Winter Green*).—A spreading plant, a few inches only high, that will carpet a surface with its deep green leaves, which acquire a bronzy hue in winter, at which season the bright red berries nestling among the foliage are very attractive. An excellent little shrub to form a groundwork for taller things, such as the Hamamelis or Wych Hazel.

G. Shallon.—This forms a dense mass, usually about 1yd. high, clothed with heart-shaped leaves, while the spikes of white bell-shaped flowers appear in the summer. It is in some districts used as a covert plant.

Heaths.—Besides the true Heaths, which belong to the genus Erica, there are included under this comprehensive title the Ling, or Heather (Calluna vulgaris, which see), with its innumerable forms, and Saint Dabœc's Heath (Dabœcia polifolia). Hardy Heaths are a beautiful class of low-growing shrubs, and if a good selection is made a succession of bloom may be maintained almost throughout the year. They all prefer a soil containing a fair amount of peat, or, failing this, a mixture of leaf mould is almost as good. The uses to which Hardy Heaths may be put are numerous, as in the first place permanent beds planted with them are always attractive; next, owing to the low stature of most of them, they are useful as an edging to some of their larger-growing allies, such as Rhododendrons, Kalmias, etc., that require the same kind of soil. Besides this, sloping banks and similar spots may often be rendered attractive by planting the least fastidious of our hardy kinds. Most of them, being of a low tufted habit of growth, can be readily increased by division, that is, the plant or tuft may be dug up in the winter and pulled into several pieces with roots attached to each, as is often done in the case of many herbaceous subjects. The few that are of a more tree-like growth and cannot be split up in this fashion may be propagated by cuttings of the young shoots taken in the autumn and inserted very firmly into pots of sandy peat. A length of 2in. is suitable for the cuttings, and the leaves should be taken off the lower half to allow of their being buried in the soil. These must be kept in a close frame till rooted. The principal hardy Ericas are:

E. arborea (*Tree Heath*).—The largest of all the Heaths, reaching a height of 8ft to 10ft. It forms a somewhat upright bush, clothed with tiny leaves, and early in the spring is studded with small white bell-shaped blossoms. It is rather tender. This Heath is a native of the Mediterranean region, and its wood is largely sent to this country to make the so-called Briar-root pipes, the name of Briar being simply a corruption of the French word Bruyère (Heath).

E. carnea, or **herbacea.**—The earliest of all the Heaths to flower, as its bright rosy red blossoms begin to open soon after Christmas. This is a low-growing plant, being seldom more than 6in. high. There is a variety (alba) with white blossoms. Few of the Heaths are more beautiful than this, or so bright in mild winters.

E. ciliaris.—Distinguished by its hairy leaves, this little Heath may be met with on some of our commons, where, during August and September, its rosy red blossoms are very attractive. Few things are more precious in the garden.

E. cinerea.—The typical form with purplish flowers is one of our commonest native Heaths, but there are several varieties, differing widely from each other in colour, for among them we have white, crimson, deep purple, bright red, and pink flowers. They are all very beautiful and valuable from the fact that they are at their best about midsummer, and serve to maintain the Heath season until the Heather flowers.

E. codonodes is now called E. lusitanica. It is somewhat in the way of E. arborea, but not so large a grower, and produces its tiny bell-shaped pinkish blossoms as early as February in mild winters. A species for all good gardens, and fairly hardy. It is a native of Spain and Portugal.

E. mediterranea.—A graceful bush, 4ft. to 6ft. high, and its rosy red blossoms are produced from March to May. There are numerous varieties, such as alba, atropurpurea, atro-sanguinea, and rosea.

E. multiflora.—This grows about 1yd. high, and its small red blossoms appear more or less freely during the autumn and winter months.

E. Tetralix.—The cross-leaved Heath is a British species which grows about 1ft. high. The flowers are pale red from July to September. It is a very charming species, and appreciates moisture, hence it is often found luxuriating in boggy spots. Alba and rubra are distinct varieties.

E. vagans (*the Cornish Moor Heath*).—This bears, in August and September, dense spikes of pale purplish red blossoms. It grows about 1ft. high, and flowers in great profusion.

Here also is included Calluna vulgaris, the Ling or Heather. In its ordinary form it is known to everyone, but a fact not so generally recognised is that there are many beautiful varieties, differing widely from each other and from the type. They are alba minor, alba pumila, alba rigida, alba Searlei, alba Hammondi, all white; Alporti, crimson; rosea, pink; tenuis, scarlet. In aurea the

foliage is of beautiful golden hue. The species is quite as pleasing as any of the varieties, and the little shrubs are happy in dry, poor soils and quite sunny places. Such information need hardly be given.

Hedera (*Ivy*).—Most of these come under the head of climbing plants, but there are a few known as Tree Ivies, which are quite bushes, and show no tendency to climb. They are very ornamental evergreens, and consist of arborescens, a variety of the common Ivy, with a gold and silver variegated form. Hedera canariensis arborea and H. Rægneriana are two kinds with large heart-shaped leaves. Cuttings, which should be put in a frame in early autumn, do not root so readily as climbing Ivies. The tree Ivies are well adapted to form groups upon the lawn or its outskirts. There is a leafiness about these shrubs that compels attention, and their rich green tints are beautiful at all times, especially in the winter months.

Ilex (*Holly*).—The common Holly (Ilex Aquifolium) is undoubtedly our most beautiful native evergreen, and is unsurpassed as a hedge plant, while immense quantities are used for decorations at Christmas. The common kind is known to everyone, but there is a host of varieties not so often met with. The ordinary Holly is readily raised from seeds, which are obtained by gathering the berries when ripe and burying them in soil or sand till the spring or summer. They must then be sown in beds in the open ground, and many of the young plants will make their appearance in the following spring, while others will not appear till the second year. They grow slowly, hence they may stand two years before transplanting. The varieties are increased by grafting or budding on to seedling plants of the common kind. Grafting is done in March, while budding, which is generally adopted, is carried out in July and August, the operation being similar to that employed for Roses.

KALMIA.

A few strongly marked varieties are—with green leaves: Bessoni, without spines; crassifolia, very thick leaves; ferox, Hedgehog Holly; Hendersoni, broad spineless leaves; Hodginsi, broad deep green leaves, strong spines; myrtifolia, small leaves; recurva, spines arranged backwards; tortuosa, twisted leaves. With variegated leaves: Argentea marginata, silver margined; argenteo picta, white blotched; aurea, golden leaved; ferox argentea, variegated Hedgehog; Golden Queen, Milkmaid, and Waterer's Golden. There is also a counterpart of the common Holly, except that the berries are bright yellow when ripe. Three distinct weeping kinds are pendula, argentea pendula, and aurea pendula, with green, white, variegated, and yellow variegated leaves respectively. Other species are:

I. cornuta.—A very distinct bush, native of Northern China; it has the terminal spines arranged like horns, hence its name.

I. crenata.—This is a dense twiggy bush, its spineless oval-shaped leaves being not more than 1in. long. The variety aurea, which has the foliage tinged with gold, is a charming little shrub. Native of Japan.

I. latifolia.—The leaves of this are as large as those of the Laurel, and the plant itself is of tree-like habit. It is rather tender.

Kalmia.—The few species of this genus are all pretty flowering shrubs, natives of North America, and succeeding under the same conditions as the Rhododendrons, that is, in a fairly moist situation, and a soil composed principally of peat, or good open loam mixed with leaf mould. They are increased by seeds, which ripen freely, and should be sown as soon as ripe in pans of peaty soil. The seeds are very minute, and must be sown thinly on the surface of the soil, and just covered with a sprinkling of sand. If a pane of glass be laid over the pan, and the whole placed in a frame shaded from the sun, the young plants will soon make their appearance, and the following spring may be pricked off into other pans of sandy peat, pressed down very firmly. They do not grow fast, and will take four or five years to reach flowering size. The principal species are:

K. angustifolia.—A neat-growing upright bush from 2ft. to 3ft. high, with oblong-shaped leaves, little more than 1in. long, and clusters of bright rosy red, salver-shaped blossoms, at their best about the end of May. There are several varieties, such as lucida, nana, ovata, rosea, and rubra.

K. glauca.—This is seldom more than 1ft. high, and readily distinguished from the others by the whitish under-sides to the leaves. The flowers, which are borne in great profusion, are of a pretty purplish pink tint. It is one of the most charming of flowering shrubs in the early days of May.

K. latifolia.—The giant of the family, forming a shrub 6ft. to 8ft. high, and as much through, clothed with shining deep green leaves, and clusters of pink blossoms in June and July. Irrespective of flowers it is a very handsome shrub, and is frequently grown as a standard. Myrtifolia and polypetala are forms.

Laurus nobilis (*the Sweet Bay*).—This is an evergreen shrub or tree, with foliage much like a small-leaved Laurel, and of a deep green colour. The leaves are very aromatic, and much used for flavouring. Cuttings about 6in. long put in sandy soil in a frame during September will root the following spring.

Ledum latifolium and L. palustre.—These two Ledums are much in the same way, both being small shrubs from 2ft. to 3ft. high, clothed with oval-shaped leaves from 1in. to 1½in. long, deep green above, and brownish underneath. In the latter part of April they are studded with clusters of blossoms, which in L. latifolium are white and in L. palustre lightly tinged with pink. Both need a moist peaty soil, and are increased by seeds treated the same as those of the Kalmia.

A RHODODENDRON DRIVE.

Ligustrum (*the Privet*).—There are several kinds of Privet, and included amongst them are a few very ornamental flowering shrubs. Some of them, too, have finely variegated foliage. The common Privet (L. vulgare) was at one time largely used as a hedge plant, but for this purpose it is now to a great extent superseded by the oval-leaved Privet, which has more persistent leaves. Both of these will succeed in almost any soil or situation. Privets are easily struck from cuttings about 1ft. long, two-thirds of which is inserted firmly in the soil in a somewhat sheltered position. The end of September is a good time for this operation to be performed. The best Ligustrums are:

L. japonicum.—A bush from 6ft. to 8ft. high, clothed with deep green shiny leaves quite 6in. long. The clusters of creamy white flowers are borne in June and July. There is a pretty variegated leaved variety of this.

L. lucidum.—Somewhat like the preceding, but a larger grower; its spreading panicles of flowers are produced in July and August.

L. ovalifolium (*the Oval-leaved Privet*).—A well-known kind that is met with almost everywhere, even in smoky towns. There are several variegated forms, of which the golden-leaved (aureum) is one of the finest of yellow-leaved shrubs, and a universal favourite

L. Quihoui.—The foliage of this is somewhat like that of the common Privet, but it forms a more straggling bush; its value consists in the fact that its spreading spikes of white blossoms are not borne till the autumn, long after all the others are past.

L. sinense.—This is a large tree-like bush, with branches disposed in an almost horizontal manner, while the leaves on the minor twigs are regularly arranged. The creamy white flowers, which are usually at their best about the latter half of July, are borne so freely as to almost hide the foliage. It is one of the most ornamental of all shrubs flowering at that period.

L. vulgare.—The common Privet is represented in our gardens by many varieties, all of which are as indifferent to soil and situation as the typical kind. There are several varieties, such as aureum, luxifolium, italicum, and variegatum.

Oak, Evergreen.—*See* Quercus.

Olearia.—There are several kinds of Olearia, known as the Daisy Trees of New Zealand; but only one is hardy enough for general planting. This is:

O. Haasti.—A dense-growing bush, with very dark green leaves a good deal like those of the Box, and seldom exceeding 4ft. in height. In the early part of August it is completely covered with small pure white Daisy-like flowers.

The species named is the most useful of the family, and may be grown even in suburban gardens with success, as it is indifferent to smoke. Other kinds of note, though a family likeness runs through the whole group, are O. macrodonta, which is the same as O. dentata, O. stellulata (synonyms O. Gunniana and Eurybia Gunniana), and O. Traversi (synonym Eurybia Traversi).

Osmanthus.—These are all compact-growing shrubs, with spiny leaves exactly like those of the Holly, but in reality they are more nearly related to the Privet. The small white flowers, which are freely borne in little tufts from the axils of the leaves in early autumn, are not showy, but agreeably scented. Though the different kinds of Osmanthus mimic the Holly, they differ greatly therefrom in their propagation, as cuttings put in a frame in early autumn strike root readily, whereas it is very difficult to increase Hollies in this way. All the different forms of Osmanthus are natives of Japan. Varieties of O. Aquifolium are: O. ilicifolius, O. ilicifolius purpureus, the leaves tinged with purple; O. ilicifolius variegatus, O. ilicifolius myrtifolius, with small Myrtle-like leaves.

Pernettya mucronata is a dense evergreen bush, native of the district bordering on the Straits of Magellan. The small pointed leaves are less than 1in. long, and of a deep shining green. The pure white Lily of the Valley-like flowers appear in great profusion in May, and are in direct contrast to the deep-tinted foliage. By far the most prominent feature of this Pernettya is the crimson berries, which remain on throughout the winter, thus rendering it one of our most ornamental shrubs at that season. There are several varieties, differing widely in the colour of their berries, which range from pure white

to deep blackish purple. The Pernettyas are readily increased by seeds, to obtain which the berries should be gathered when quite ripe, and rubbed up with a little dry sand to remove the pulp. Sown in a pan of sandy peat, covered with ¼in. of the same soil, and placed in a frame, the young plants will make their appearance in three or four months, and should be potted into small pots when large enough, planting them out afterwards. Pernettyas enjoy a peaty or loamy soil, and should be grouped, as their berries are very rich and varied in colour. Free masses of them make interesting features in the garden. Although rarely seen, that is no reason why they should not become more common.

Phillyrea.—These are all compact bushes, clothed (with one exception) with small Privet-like leaves. Their ornamental qualities are not of a very high order, except in P. Vilmoriniana, the leaves of which are quite 6in. long and of a deep green tint. It is a very good shrub for towns.

Pieris.—These, formerly grouped with the Andromedas, form a neat-growing, free-flowering class of hardy shrubs, that succeed best in a peaty soil and a fairly moist situation. They may be raised from seed when obtainable, or cuttings will strike if kept close in a frame, but they take a long time to root. P. floribunda is a compact shrub from 3ft. to 4ft. high, having small ovate leaves of a very dark green, while the pure white Lily of the Valley-like flowers are borne in dense partially erect spikes. P. japonica is pleasing.

Privet.—*See* Ligustrum.

Quercus (*the Oak*).—Though the Oaks form a large family, most of them lose their leaves during the winter. The best-known and by far the finest of the evergreen kinds is the Holm Oak (Quercus Ilex), which forms a magnificent tree, usually of a much-branched shrub-like style of growth. There are many varieties, differing in shape and size of the leaf and in habit from the type. In the Kew list the forms enumerated are: Crispa, diversifolia, Fordi, Genabi, Gramuntia, latifolia, macrophylla, rotundifolia, and Smilax. The Cork Oak (Q. Suber) is, save for its rugged bark, much like this kind.

Q. cuspidata and Q. glabra are ornamental Japanese Oaks, usually seen here as shrubs rather than trees. The Holm Oak is increased by sowing the acorns as soon as ripe, and the varieties by grafting on to seedlings of the type, under glass in the summer, but it is a difficult operation unless in professional hands.

Rhamnus Alaternus is a Myrtle-like shrub of somewhat spreading habit that reaches a height of 10ft. to 12ft. There are several varieties, the most ornamental being one in which the leaves are variegated with white.

Rhododendron. — Undoubtedly the finest evergreen flowering shrubs that we have are the numerous hybrid Rhododendrons, that form such a gorgeous display during the spring and early summer months. By far the commonest species is R. ponticum, a native of Asia Minor, with purplish flowers. This is the Rhododendron so universally planted for covert. R. ponticum has been crossed and recrossed with R. arboreum, R. catawbiense, and R. caucasicum, and by this means the present magnificent race of hybrids has been obtained. Rhododendrons are all peat-loving plants, yet at the same time peat is not absolutely necessary for their culture, as they will succeed in loam even of a heavy nature, particularly if some leaf mould be incorporated with it. One important consideration is that they all need a fairly moist soil, as if parched up during the summer they quickly suffer. In planting Rhododendrons where there is any danger of drought, the soil should be formed like a saucer around the plant, as in this way artificial watering, if necessary, can be more readily given than if the ground is made entirely level. Though Rhododendrons will grow in peat or loam, they resent the presence of lime in the soil; hence in chalky districts they will not thrive. The different kinds are increased by seeds, layers, and grafting. Seeds are employed for the raising of R. ponticum in variety, and are sometimes sown in a sheltered spot out of doors, and covered with Spruce boughs to afford a

RHODODENDRONS IN AN IRISH GARDEN (DONEGAL).

certain amount of shade and protection until the young plants appear. In a general way, however, unless enormous quantities are required, it is best to sow in pans or boxes, and place in a frame. The seed is very minute, and for its reception the pans should be drained with broken crocks, and filled to within ½in. of the rim with sandy peat, the whole being pressed down firm and level. On this the seed must be thinly sprinkled, and lightly covered with a little sand. A watering through a fine rose having been given, the pans may be stood in a frame and shaded from the sun. When large enough to handle, the young plants may be pricked off, that is, dibbled into other pans or boxes of the same soil, and finally, when large enough, planted out. The seed should be sown as soon as possible after ripening.

Layering can only be carried out in the case of those plants with branches sweeping the ground, and the operation is best performed during the autumn months. The portion of the branch that is to be buried should be tongued, after the manner of a Carnation, that is, it must be cut halfway through, and then split up for 3in. or 4in., a small stone being inserted to prevent the wound closing up, and the whole pegged securely in position and covered with 6in of soil. The adoption of this method is strongly advised.

Grafting is adopted for the wholesale increase of the various hybrid kinds, the stocks employed being small seedling plants of R. ponticum. They should be about the thickness of a cedar pencil, being taken up from the open ground and put into small pots for the purpose. Side grafting, which is best performed in July and August, is generally employed, but the plants need to be kept in a close propagating case for about a month to six weeks after the operation. It is one of those things better left to professional propagators.

A selection of the best hybrid varieties would include: Altaclarense, scarlet; Atrosanguineum, blood red; Baron Osy, cream, blotched maroon; Blandyanum, reddish crimson; Brilliant, scarlet; Broughtonianum, rose red; Caractacus, purplish crimson; Cruentum, rich lake; Dhuleep Sing, blackish crimson; Dachess of Connaught, white, marked yellow; Everestianum, rosy lilac; Francis B. Hayes, white, maroon blotch; Florence, pink; Frederick Waterer, fiery crimson; Helen Waterer, white, edged red; Helene Schiffner, pure white; James Marshall Brooks, scarlet; John Waterer, glowing crimson; Joseph Whitworth, purple lake; Kate Waterer, deep rose; Lady Eleanor Cathcart, rose spotted chocolate; Lord Eversley, scarlet crimson; Michael Waterer, rosy scarlet; Minnie, blush white; Mrs. John Clutton, white; Nobleanum, scarlet, early; Old Port, rich plum; Rosalie Siedel, white, spotted pink; Sir Humphrey de Trafford, rose, yellow centre; William Ewart Gladstone, rosy crimson.

Other distinct Rhododendrons, apart from the hybrids above enumerated, are: R. davuricum atrovirens, 4ft. or 5ft. high, and towards the end of March covered with purple flowers 1½in. across; R. Fortunei, a bold-growing bush, with large flowers partially drooping and arranged in loose clusters: they are agreeably scented, and the hybrids raised from it also retain the same character; R. præcox, rosy lilac flowers borne in March; and two pretty little kinds, natives of Switzerland—R. ferrugineum and R. hirsutum—to both of which the term Alpine Rose has been applied. These form dense bushes, not more than 2ft. high, with bright red flowers borne about midsummer. In the Southern Counties of England and also Ireland many of the Indian kinds may be grown out of doors, but unless in these exceptionally favourable places they must receive greenhouse protection.

Considerable space has been devoted to the Rhododendron, because it is one of the most noble of all flowering shrubs, but in many gardens it is unfortunately allowed to run wild, usurping positions that could be well filled by shrubs as interesting and in their way as beautiful. This does not mean condemnation of a splendid group of summer-flowering shrubs, but planters must be urged not to use the shrubs too freely, planting them here, there, and everywhere, as if the whole beauty of the shrub world were crammed into this family alone. Some soils, warm peaty loam, or good loam, without other mixture, greatly favour robust growth, and then the seedlings spread profusely until the pleasure grounds are filled with Rhododendrons and nothing more. This is the abuse of a handsome shrub.

Ruscus aculeatus is the Butcher's Broom, a dense-growing plant, with small deep green leaves and bright red berries. It is useful for growing under the shade of trees, and is increased by division in winter the same as an herbaceous plant. There are other kinds: R. Hypoglossum, in which two leaves are joined together, and R. racemosus, known as the Alexandrian Laurel. This is now classed as R. Hypophyllum.

Skimmia.—The different Skimmias are neat little evergreen shrubs, that are during the winter profusely laden with bright red berries. The best are S. Fortunei, S. Foremanni, and S. japonica. They are readily increased by seeds sown when ripe, in pots or pans of ordinary soil, and placed in a frame.

Sweet Bay.—*See* Laurus nobilis.

Ulex europæus is our own native Furze or Gorse, whose rich golden blossoms form such a charming feature on many of our heaths and commons. The double-flowered variety is even more showy. Both will grow well on dry, sandy soils, and cuttings will strike without difficulty if put in early in the autumn, choosing a sheltered spot out of doors. U. nanus is a dwarf form, and flowers in the summer.

Veronica.—In the South and West of England, particularly in sheltered spots near the sea, the various shrubby Veronicas, hybrids of New Zealand species, thrive well, and form a charming class of flowering shrubs, but in most parts of the country they need greenhouse protection. They are all easily propagated by cuttings put in sandy soil and kept close and shaded in a frame anywhere during the spring and summer months. V. Traversi is a free bush, smothered in late summer with almost white flowers, but it is rather tender. V. speciosa and its varieties are very useful also, but they are not shrubs to plant wholesale in gardens.

Viburnum.—While most of the Viburnums are deciduous, there is one valuable evergreen kind—viz., V. Tinus (the Laurestinus)—whose flattened clusters of pinkish white flowers are borne throughout the winter months. It is sometimes injured by very severe frosts, but soon recovers. There are several varieties, the most marked being lucidum, in which the flowers are larger and whiter than the type. Cuttings put in sandy soil in a frame in September will root in the spring.

Vinca major and V. minor are the large and small Periwinkle respectively. Both are slender creeping plants, and have blue flowers; there are variegated varieties of each, and V. minor has a form with white flowers. They are of great use for growing near or even under trees, and will thrive almost anywhere.

Yucca gloriosa (*Adam's Needle*) is the largest and boldest of the hardy kinds, as when old it forms a stout branching stem 6ft. or more in height, every branch being terminated by a thickly clustered rosette of stiff sword-shaped leaves from 2ft. to 3ft. long. The white flowers borne in tall spikes from the ends of the branches form a very showy feature in July and August.

Y. recurva has the leaves less stiff and gracefully recurving, while Y. filamentosa is remarkable for the thread-like filaments at the edges of the leaves. All are increased by digging up a clump and cutting off the stout roots, which, if potted or planted with the growing point uppermost, will push up leaves from that portion and thus form a young plant. Groups of Yuccas upon the lawn are very handsome, the green foliage being at all times imposing.

Zenobia speciosa.—This belongs to the Andromeda family, and was at one time classed with them. Its chief synonym is Andromeda cassinefolia. It is a beautiful shrub, with whity waxy flowers, reminding one of those of the Lily of the Valley. A charming variety is pulverulenta, with whitish leaves, and both this and the type will succeed in peaty soil.

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TREES AND SHRUBS FOR THE SEASIDE.

THE number of trees and shrubs that will succeed in proximity to the sea is limited, owing, firstly, to their inability to withstand the salt-laden spray, and, secondly, to the fact that in many places at least they are exposed to such rough winds that unless of a very hardy constitution they suffer severely. It is therefore evident that, given a fair amount of shelter, a much greater variety of trees and shrubs may be successfully grown than in a bleak and exposed spot. Such being the case, a good deal may be done by first forming a shelter belt or screen of the most robust subjects only. This may consist of the Norway Maple, Sycamore, Pinus Pinaster, P. Laricio, P. sylvestris, P. montana, Whitethorn, Ash, Beech, Blackthorn, Elder, and Elm. Such trees and shrubs will hold their own even in exposed positions, and serve to protect their more delicate brethren. In sheltered spots, even very near the sea, there is much greater choice, and along our Southern and Western Coasts many plants, such as Myrtles, Fuchsias, and Hydrangeas, that require protection elsewhere, are quite at home. For ornamental hedges, screens, and such purposes three plants are particularly valuable, viz., the evergreen Euonymus, Tamarisk, and Sea Buckthorn. The first of these, a neat evergreen bush, is largely planted along our Southern Coasts, either as isolated shrubs or as hedges and screens. The Tamarisk is also very valuable for the same purposes, as if trimmed closely it forms a dense hedge, while if allowed to develop at will its plume-like branches are exceedingly graceful. The Sea Buckthorn is a Willow-like shrub with greyish foliage and orange-coloured berries. It is hardier and altogether a more robust subject than the other two.

A selection of the best trees and shrubs for the seaside is herewith given: Acer pseudoplatanus (Sycamore), A. platanoides (Norway Maple), Aucuba japonica, Alnus (Alder) in variety, Atriplex halimus, Berberis in variety, Betula (Birch), Cupressus macrocarpa, Colutea, Cerasus in variety, Cratægus (Thorn), Cytisus (Broom), Euonymus japonicus and its variegated varieties, E. europæus (Spindle Tree), Fraxinus (Ash), Fagus (Beech), Hypericum, Hippophæ rhamnoides (Sea Buckthorn), Halimodendron argenteum, Ilex (Holly), Laurus nobilis (Sweet Bay), Laburnum, Ligustrum (Privet), Populus (Poplar), several varieties, Pyrus aucuparia (Mountain Ash), Prunus spinosa (Blackthorn), Pinus Pinaster, P. montana, P. Laricio, P. sylvestris, P. austriaca, P. insignis, this last-mentioned for mild districts; Quercus (the Oak) in different forms, particularly Q. cerris (Turkey Oak) and Q. Ilex (Evergreen Oak); Ruscus aculeatus (Butcher's Broom), Ribes aureum, R. sanguineum (Flowering Currants), Symphoricarpus racemosus (Snowberry), Syringa (Lilac), Salix (Willow), many kinds, Sambucus (Elder), Tamarisk, Ulex (Furze), Ulmus (Elm), particularly U. montana, Viburnum Opulus (Guelder Rose), V. Tinus (Laurestinus).

For particularly favoured spots: Aralia Sieboldi, Arbutus Unedo (Strawberry Tree), Escallonia, several kinds, Fabiana imbricata, Fuchsia, in great variety, Hydrangea, Myrtus (Myrtle), Pittosporum, many sorts, Veronica in variety.

TREES AND SHRUBS FOR TOWNS.

IN the smoke-laden atmosphere of towns many trees and shrubs fail to thrive, and this applies more particularly in the case of evergreens, as the foliage becomes choked with soot, whereas deciduous kinds that renew their leaves every year are better enabled to combat the noxious fumes, which are at their worst during the winter, when the other group is of course leafless. Still, there are a few evergreens that will succeed fairly well in towns, the best being: Aralia Sieboldi, Aucuba japonica, Buxus sempervirens (Box), Cerasus lauro-cerasus (Laurel), C. lusitanica (Portugal Laurel), Euonymus japonicus, Hedera (Ivy) of sorts, Ligustrum ovalifolium (oval-leaved Privet), Osmanthus illicifolius, Phillyrea Vilmoriniana, Yucca filamentosa, Y. gloriosa (Adam's Needle). Deciduous kinds are: Acer platanoides (Norway

Maple), A. pseudo-platanus (Sycamore), Ailantus glandulosa (Tree of Heaven), Amygdalus (Almond), Cerasus (Cherry) of sorts, Colutea arborescens (Bladder Senna), Cotoneaster in variety, Cratægus (Thorn), many kinds, including the double-flowered varieties of the common Hawthorn, Dimorphanthus mandchuricus, Euonymus europæus (Spindle Tree), Forsythia suspensa, F. viridissima, Fraxinus (Ash), different forms, Genista hispanica (Spanish Furze), Hibiscus syriacus, Laburnum vulgare, L. alpinus, Morus nigra (Mulberry), Persica (Peach) in variety, Platanus acerifolia (London Plane), Philadelphus coronarius (Mock Orange), Populus (Poplar), many kinds, Prunus (Plum) of sorts, Pyrus aucuparia (Mountain Ash), P. japonica, Rhus (Sumach), several varieties, Ribes aureum, R. sanguineum (Flowering Currant), Robinia Pseud-Acacia (Locust Tree), Salisburia adiantifolia, Sambucus nigra (Elder), Sophora japonica, Syringa (Lilac), many varieties, Ulex europæus plenus (double Furze), Ulmus (Elm), several kinds, Viburnum Opulus (Snowball Tree), Weigela, different varieties.

WEEPING TREES.

AMONG ornamental trees those of a weeping character are the most striking, for they are extremely elegant in growth and graceful in outline. From this circumstance they are especially valuable for the embellishment of the garden or lawn. Like all trees of pronounced character they must not be planted too freely, otherwise the good effect they produce is apt to be destroyed. By combining them with other subjects charming results may be obtained, and associated with columnar-growing trees the distinctive characters of each are brought more prominently forward. Some, such as the Weeping Ash and Beech, form a splendid arbour if grafted standard high and their wide-spreading branches are supported at some little distance from the trunk, when if allowed to droop they hedge in the enclosed space with quite a wall of drooping shoots. Some of these weeping trees have the pendulous character much more pronounced than others. For instance, in the Kilmarnock Willow when grafted standard high the long shoots hang down almost parallel with the main stem, whereas in the Babylonian

A WEEPING ELM.

HEATHY BANK AT KEW.

Willow the branches have an upward tendency, while the minor shoots and twigs are strictly pendulous.

Weeping Trees must be rightly placed. The illustration of the Weeping Elm shows how beautiful a tree of this growth is when not muddled up with other things. Willows by waterside, and weeping trees planted to reveal their true beauty, add to the charm and interest of a garden. But weeping trees must not be used recklessly or in too great a variety. A few well placed are beautiful, but too many are monotonous.

The best weeping trees are: Abies canadensis pendula, a variety of the Hemlock Spruce, all the young shoots of which are drooping; Abies excelsa inverta, a Norway Spruce, whose branches hang close to the stem; Alnus incana pendula, a pretty Alder with drooping shoots; Betula alba laciniata pendula, B. alba pendula, B. alba Youngi, three distinct weeping varieties of the common Birch; Thuja (Biota) orientalis pendula, a graceful form of the Chinese Arborvitæ; Caragana arborescens pendula, a Laburnum-like shrub with yellow blossoms; Cerasus Avium pendula, C. Mahaleb pendula, C. pendula rosea, C. serotina pendula, four beautiful Weeping Cherries; Corylus Avellana pendula, a distinct variety of the Hazel; Cratægus Oxyacantha pendula, the Weeping Hawthorn; Cupressus Lawsoniana pendula, one of the many varieties of Lawson's Cypress in which the young shoots are drooping; Fagus sylvatica pendula, F. sylvatica purpurea pendula, the drooping forms of the common and purple Beech; Fraxinus excelsior pendula, F. excelsior aurea pendula, and F. parvifolia pendula, weeping varieties of the common, the golden-barked, and the small-leaved Ash; Ilex Aquifolium pendulum, I. Aquifolium argenteo-pendula, I. Aquifolium aureo-pendula, three distinct Hollies; the Weeping Walnut; Juniperus oblonga pendula, J. virginiana pendula, two graceful forms of Juniper; Laburnum vulgare pendulum, a drooping variety of the Laburnum; Larix europæa pendula, the Weeping Larch; Morus alba pendula, a striking form of the White Mulberry; Populus tremuloides pendula, the St. Julian Poplar; Pyrus Aucuparia pendula, P. communis pendula, P. prunifolia pendula, P. salicifolia pendula, four distinct kinds of Pyrus; Quercus pedunculata pendula, a Weeping Oak; Robinia Pseud-Acacia pendula, a variety of the False Acacia or Locust Tree; Salix americana pendula, S. babylonica, S. Caprea pendula, S. sericea pendula, four pretty Weeping Willows; Sophora japonica pendula,

BABYLONIAN WILLOW.

a very graceful tree; Taxus baccata Dovastoni, a variety of the Yew with wide-spreading branches and pendulous shoots; Thuja occidentalis pendula, which variety of the American Arborvitæ has all the minor branches pendulous; Ulmus campestris pendula, U. campestris macrophylla pendula, U. montana pendula, four distinct Weeping Elms; Wellingtonia gigantea pendula, a form of the Wellingtonia, with branches that droop close to the main stem, but this is very ugly.

COVERT PLANTS SUCCEEDING IN SHADE.

SHRUBS that will succeed under the shade and drip of trees are in considerable demand in game-preserving districts for covert planting, and when in masses they afford a safe shelter for the game, especially during the breeding season. From an ornamental point of view, too, shrubs available for planting in shade are particularly valuable, but the list is at most a limited one. The best are: Aucuba japonica, Berberis (Mahonia) Aquifolium, B. vulgaris, and B. repens, Buxus sempervirens (Box), Cerasus lauro-cerasus (Laurel), Cornus alba (Dogwood), Coton-easter, several kinds, Cratægus Oxyacantha (Whitethorn), Daphne Laureola (Spurge Laurel), D. pontica, Gaultheria Shallon, Hypericum Androsæmum (Tutsan), H. calycinum (Rose of Sharon), Hedera (Ivy), numerous forms, Leycesteria formosa, Ligustrum (Privet), different kinds, Prunus spinosa (Sloe), Rhododendron ponticum, Rosa rubiginosa (Sweet Briar), Ruscus aculeatus (Butcher's Broom), Rubus (Bramble), various forms, Symphoricarpus racemosus (Snowberry), Vinca major and V. minor, the greater and lesser Periwinkle.

BAMBOOS (HARDY).

THE various Bamboos have become very popular of late years, and though at first it was feared that they would suffer greatly during severe winters, their hardiness is now generally proved, their only injury being a browning of the foliage, from which with the return of spring they quickly recover. Many of the Bamboos are full of grace, and seen

to the best advantage when standing free from all their associates, as in this way the beautiful plume-like branches are disposed in their natural light and elegant manner. The species and varieties are numerous, and vary in height from the 20ft. or more of Arundinaria Simoni to the 12in. of Bambusa pygmæa. At one time all the hardy kinds were included in the genus Bambusa, but they are now divided into several genera, although for popular purposes the collective title of Bamboo is still applied to the whole of them. They all need a good loamy soil, with a fair admixture of leaf mould, a liberal amount of moisture, but not a water-logged soil, and a position if possible where they will be sheltered from harsh dry winds, which affect them more than actual frost. The larger kinds, whose stately shafts are so noticeable, are particularly effective on the margins of lakes or banks of streams, while some of them are seen to great advantage when standing singly on a lawn. Where space exists, and the situation is suitable, a Bamboo garden may be formed, such as that at Kew, which is now one of the most attractive features of the gardens. An old gravel pit was utilised for the purpose, and being provided with suitable soil the sunken position was all in favour of the Bamboos, which have flourished wonderfully. They are grouped in such a manner that, while each individual kind can display its natural beauty without let or hindrance, the entire collection forms one harmonious whole. Many of the hardy Bamboos can be readily propagated by division, and this is the method usually adopted for their increase. The different kinds are: Arundinaria Fortunei variegata, A. Fortunei aurea, A. Hindsi, A. Hindsi graminea, A. japonica (often known as Bambusa Metake), A. nitida, A. Simoni, A. Simoni striata, Bambusa disticha (nana), B. palmata, B. pygmæa, B. tessellata, often known as B. Ragamowski, B. Veitchi, Phyllostachys Henonis, P. Kumasasa, P. mitis, P. nigra, P. Quilioi, P. violescens, P. viridi glaucescens, Thamnocalamus falcata, and T. Falconeri.

In the opening chapter, by Mr. Bean, important reference is made to the Bamboos.

HEDGES.

HEDGES are a necessary adjunct to the garden, as in some instances they serve the purpose of a wall or fence, and in others they are useful to shut out unsightly objects

THE TERRACE STEPS, ROUS LENCH COURT, WORCESTERSHIRE.

A HEDGE OF YEW, BOX, HOLLY, ETC., AT HALL BARN, BUCKS.

or for many kindred reasons. A number of different subjects, both evergreen and deciduous, are available for the formation of hedges, and the Holly and Yew are two of the best; but to succeed they need a good loamy soil, hence the Privet and Whitethorn, both of which will grow almost anywhere, are far more generally planted, while by some mixed hedges are preferred, though as a rule one class of plant alone is the more satisfactory. In planting a hedge one important item is to thoroughly prepare the ground beforehand by trenching, and if necessary incorporating a dressing of manure. A selection of hedge plants is as follows:

THE HOLLY.—The best plants of this for the formation of hedges are good well-rooted examples about 2ft. high that have been frequently transplanted, and are therefore ready for

shifting. The most favourable time of the year to transplant the Holly is the first week in April, as with care it will then scarcely feel the check of removal. The distance at which the plants are put apart will depend upon their width, but from 1ft. to 18in. is very suitable. After planting, they should not be cut for a couple of years at least, in order to allow them to become thoroughly established. Trimming may be done in autumn or in the month of April, this last being the best. The hedge must be cut wedge-shape, in order to allow as much light and air as possible at the base of the plants, as upon this depends a good deal of their density at that point.

YEW.—This will succeed in heavier and colder soil than the Holly, and may be planted throughout the latter part of the autumn, in winter, and early spring. The general directions given in the case of the Holly are equally applicable to the Yew. This last may be clipped in the autumn or spring, the latter being the best provided it is done before growth commences.

PRIVET.—The oval-leaved Privet makes the best hedge, and one that will succeed almost anywhere. Good sturdy plants from 1ft. to 2ft. high are the best for the purpose, and they should be planted from 6in. to 9in. apart. In order to form a dense base the hedge should be clipped back to a height of 1ft. the first July after planting. This just-named month is the best for trimming a Privet hedge, as being then in full growth, the young shoots quickly hide mutilation. But Privet must not be overdone. A hedge of Quick or Holly is a thousand times preferable.

WHITETHORN. — This is the term usually applied to the common Hawthorn (Cratægus Oxyacantha), which is very generally used for hedges. The young plants are raised from seeds, and when about 1ft. high are planted permanently. A space of 6in. should be allowed between each plant, and the hedge is greatly improved if a year after planting it is cut back to within 6in. or 9in. of the soil, as this causes it to push out numerous shoots at the base. It may be clipped as the Privet, or in the winter. Planted alternately, the Whitethorn and Privet form a good hedge, the sturdy nature of the Thorn tending to support the weaker shoots of the other.

Other evergreen subjects suitable for hedges are Box, which forms a neat compact fence ; Laurel, that must not be trimmed with shears, but cut with a knife in July and August ; and several Conifers. The best of these are Abies excelsa (Norway Spruce), Cupressus Lawsoniana, Retinospora obtusa, Thuja gigantea, and Thuja occidentalis. Conifers lose too much sap if trimmed during the growing season, hence the operation should be performed in autumn or early spring.

Deciduous hedge plants are numerous, some of the best being the Beech, Hornbeam, Blackthorn or Sloe, and the Cherry Plum (Prunus Myrobalana). In proximity to the sea Euonymus japonicus, Tamarisk, Escallonia macrantha, and the Sea Buckthorn make good hedges. These are more fully dealt with under the head of seaside shrubs.

There is room for considerable improvement as regards hedges in English gardens. Privet is condemned because of its monotonous aspect and the evil odour of its flowers ; but why place one's whole faith in an individual shrub, when the Yew, Holly, Box, and other shrubs are available. True, in the larger gardens of England, the Yew and other beautiful hedge plants are made excellent use of, as our illustrations testify ; but this is not the case in the smaller places, which should be as carefully planted in every way as larger domains. Of course, the selection will depend in no small measure upon the locality, many very beautiful shrubs succeeding only by the warm seacoast, the Escallonia and Veronica Traversi for example, but even where opportunities are provided they are not taken advantage of. A hedge of Tamarisk or of Escallonia is a hundred times more charming than one of Privet, or any common shrub one tires of through constant repetition. It is unfortunate that such shrubs as the Sweet Briar are not more planted, hedges fragrant in leaf and beautiful in colour, a strong defence also against stock. In the garden one looks for variety, not irritating repetition of set things.

CLIPPED YEWS AT ELVASTON CASTLE, DERBYSHIRE.

CONIFERS.

CONIFERS, or cone-bearing plants, include not only the Pines, Spruces, Silver Firs, Cedars, etc., but also the Cypresses, Arborvitæ, Retinosporas, and others of this class, while two or three that cannot be regarded as cone bearers, such as the Junipers and Yews, are also included in the order. As timber trees many of the Conifers occupy a prominent position, for the timber sent to this country in immense quantities from various parts of the globe, under the collective terms of Fir, Pine, or Deals, is all the product of Coniferous trees. A prominent characteristic is the presence of resinous matter in the wood.

Many of the Conifers are also of great beauty, the massive and sombre-hued Pines, the symmetrically-shaped Silver Firs and some of the Spruces, the graceful Lawson's Cypress, and forms of the Hemlock Spruce; while they vary in height from the 300ft. of Wellingtonia gigantea (in its native habitats) to the 1ft. or 2ft. of some of the Junipers, Retinosporas, and varieties of the Norway Spruce. As isolated trees for the park or lawn, many of the Conifers occupy a high position, and much the same may be said of their suitability for the formation of avenues. Again, as belts or screens to protect more tender plants by sheltering them from the keen northerly or easterly winds, several Conifers are usually employed, particularly the Spruce Fir and the Austrian or Corsican Pine. Several of them bear cutting and trimming well, hence they are available to make evergreen hedges. The most generally employed, and next to the Holly the finest, hedge plant we have is the Yew, while less impenetrable hedges may be formed of Thuja Lobbi, the American Arborvitæ, Cupressus Lawsoniana, and the Norway Spruce.

Coniferous plants, as a rule, succeed best in a good open loam, which though well drained is not parched up at any time. They are propagated by seeds, cuttings, or grafting. The first-named method is the best for most Conifers, particularly the Pines, Silver Firs, and Spruces, which are seldom satisfactory if struck from cuttings, or grafted. Where large quantities are raised from seed, beds should be prepared in the open ground by thoroughly

digging and then raking the surface level. On this the seeds must be sown, just patted down with the back of the spade, and lightly covered with, in most cases, about ½in. of soil, the large seeds requiring more, and the minute ones less. A slight shelter of Spruce boughs is of service until the seed germinates.

Smaller quantities of seed, particularly of the choice kinds, are much better sown in pans and placed in a frame than in the open ground. Early spring is a good time for sowing the seed, in preparation for which the pots or pans must be well drained, and filled to within 1in. of the rim with open sandy loam. When placed in a frame the seeds need not be covered as deeply as if in the open ground, a good guide being to cover each seed with its own depth of soil, which must be kept moderately moist, but above all avoid an excess of moisture. A critical time in the raising of seedlings is just as they appear above ground, when the soil may often with advantage be kept slightly drier. Plenty of air must be given to prevent decay, the principal use of the light of the frame at this period being to ward off very heavy rains. As the young plants grow they may be dibbled into pans of soil or in outside beds. If grown in pots during their early stages Coniferous plants must not be kept too long in this condition, otherwise the roots acquire a corkscrew style of growth, and the plant is liable to be blown over at any time by strong winds. When seeds are sown either out of doors or in a frame, a sharp look-out must be kept for mice, which quickly effect considerable damage.

CUTTINGS.—Some classes of Conifers can be readily increased by cuttings, and they will form as good plants as seedlings. Under this head come the Retinosporas, Thujas, Cupressus, and Junipers. The cuttings do best in pots, those 5in. in diameter being a very suitable size. They must be prepared by putting some broken crocks in the bottom to about one-third of the height, and then filling the pot very firmly with light sandy soil, sifted through a ¼in. sieve. A length of 4in. to 6in. is very suitable for the cuttings, which must have the bottom leaves removed, and then be dibbled securely into the pots got ready for them. If the pots are filled with cuttings they must be thoroughly watered through a fine rose, and then placed in a frame, which must be kept close and shaded from sunshine. August and September are good months for putting in the cuttings, and

CEDARS AT CHISWICK HOUSE, CHISWICK.

during the winter protect the frame from the frost. As the spring advances those that are struck may be potted off. Should any signs of decay appear before the cuttings are rooted, a little air may be given to dry up the superfluous moisture and thereby arrest decay.

Grafting is a pernicious practice, and is generally done in August, the stocks employed being young seedling plants established in pots, with stems about the thickness of a pencil. Side grafting is the method usually adopted, and those operated on must be kept quite close and shaded under glass till a union is complete. It is strongly advised, however, that this method be entirely abolished. Grafting is responsible for so many failures amongst Conifers, the stock proving victorious over the scion. One can well understand that unless the two fit in exactly and develop satisfactorily the results must be unpleasant. The different Conifers as a rule cannot be depended upon in smoky districts, where deciduous subjects succeed better than evergreens.

A few of the best for chalky soils are: Abies excelsa, Cedrus atlantica, Deodar Cedar (Cedrus Deodara), Pinus Laricio, Pinus sylvestris, Larix europæa, Sequoia sempervirens,

FIRS AT BRAMSHILL PARK, HAMPSHIRE.

Cupressus Lawsoniana, Cupressus macrocarpa, Thuja gigantea (Lobbi), Juniperus Sabina, Juniperus virginiana, Taxus baccata.

The nomenclature of the Conifers has undergone considerable alteration, and whilst desirous of preserving the old names at present, for the sake of those readers not yet accustomed to the new classification, the true names are also given, according to the Kew hand list.

A selection of the most ornamental Conifers is herewith given:

Abies brachyphylla.—A Silver Fir from Japan, which has only been known in this country a little over twenty-five years, hence no very large specimens are to be met with. It forms a pyramidal-shaped tree, with regularly whorled branches, disposed in a horizontal manner, and clothed with rich green leaves, the longest of which are about 1½in. in length. Its rich colour, and the fact that it is perfectly hardy and not particular as to soil, renders this a very desirable subject for planting as a single specimen in the park or on the lawn. Synonyms are Picea brachyphylla and Pinus brachyphylla.

A. canadensis.—This, the Hemlock Spruce, is an exceedingly graceful tree, at all events up to 20ft or 30ft. in height. It is usually of broadly pyramidal shape, the branchlets being slender and more or less drooping. The leaves are only about ½in. long, while the cones are also very small. There is also a variety parvifolia. The true name of this now is Picea alba.

A. cephalonica.—A beautiful Silver Fir, which is at most a medium-sized tree. It forms a dense pyramid, broader in proportion to its height than most of its near relatives. The leaves are stiff, and terminate with a sharp point. The young shoots are liable to be cut by late spring frosts, therefore it should be planted in a somewhat exposed position in order to retard the growth as long as possible.

A. concolor.—A Silver Fir that in the valleys of California will reach a height of 100ft. to 150ft. It is of dense growth, less regular in outline than most of its class, but still the tendency is towards a pyramidal shape. The leaves are of rather a light green above, and glaucous beneath.

A. Douglasi (*the Douglas Fir*) is one of the giants of the forests which occur so plentifully in Western North America. It there reaches nearly 300ft. in height, the trunk being as straight as an arrow, with the greater part quite without branches. The flagstaff (150ft. high) in Kew Gardens is formed of one single shaft of the Douglas Fir. Its ornamental qualities are also of a high order. When standing alone its main stem is particularly straight, while the regularly disposed branches taper gradually from base to summit. The foliage is of a rich green tint, and the drooping cones are in some specimens borne so plentifully on the points of the shoots as to add quite a distinctive character to the tree. The variety taxifolia has longer leaves, which are of a deeper hue than those of the type. There are other forms, such as the Colorado variety and glauca. This is now known as Pseudotsuga Douglasi.

A. excelsa.—The common or Norway Spruce. This is a well-known tree, largely used as a screen or nurse plant to more delicate subjects. It is also valuable for timber, supplying as it does the white deal of commerce. When planted singly as an ornamental tree, it forms a dense pyramid, the lowermost branches of which have a drooping tendency. This supplies the Christmas trees so much in demand at that season. There are several varieties, including a group of dwarf forms with a maximum height of 3ft. to 4ft., and in direct contrast to the 80ft. to 100ft. of the typical A. excelsa. The dwarf forms are Clanbrasiliana, pumila, glauca, and pygmæa. In the variety inverta the branches droop almost close to the main trunk, and in Finedonensis the young shoots are pale yellow.

A. grandis.—A huge Silver Fir in its native home, the North-West of America, and a very handsome tree in this country. The leaves are bright green above and glaucous beneath, while the branches are more slender and the branchlets less numerous than in some of the others, so that it forms as a rule a lighter specimen than most of them. Late spring frosts are sometimes liable to injure the young shoots.

A. Menziesi.—The leaves of this Spruce distinguish it from any other kind, being slender, stiff, and sharp pointed, and of a decidedly glaucous hue. It is quite spiny to handle. This Spruce is of a rather wide-spreading growth, and forms a handsome tree. The loose light brown cones are borne in clusters at the points of the branches, and are then very noticeable. It needs a deep, loamy, moist soil.

A. nobilis.—In its North American home this is said to reach 200ft. to 300ft. in height, and being in some instances furnished with branches from bottom to top, it well merits the name of nobilis. In this country it forms a particularly sturdy specimen, with regularly whorled branches. The leaves when young are bright green, but with age they change to a deep glaucous colour, the contrast in the two tints being during the growing season very noticeable. The cones, which are borne upright on the branches, are large and handsome, being quite 6in. long and 2in. in diameter.

A. Nordmanniana.—This is nearly related to the common Silver Fir, but at the same time there are many well-marked points of difference. It forms a handsome specimen, with stiff horizontal wide-spreading branches, clothed with deep glossy green leaves. It is never injured by late spring frosts, and is less particular as to soil and situation than most of the Silver Firs.

A. orientalis.—This is somewhat in the way of the common Spruce, but it is altogether a smaller tree, and is much less formal in outline, owing to the drooping character of the minor shoots, which impart considerable grace to a specimen. The leaves being somewhat closely pressed to the stems render the shoots more slender in the Norway Spruce.

A. pectinata.—The common Silver Fir. This occurs in vast numbers in the great forests of Central Europe, but as a timber tree it is inferior to the Spruce. It forms a tapering tree with rich green foliage, but is less ornamental than several other species. As a set off, however, it will succeed perfectly where many other kinds fail.

A. Pinsapo.—In the Spanish mountains this will reach a height of 60ft. to 80ft., and in this country it may be planted as a lawn tree. The branches are not flat as in most of the Silver Firs, while the leaves, which stand out almost direct from the branches, are stiff and sharp pointed, so that a tree of this is a spiny subject to touch.

A. (Picea) pungens.—A beautiful North American Spruce, that forms a rather spiral-shaped tree, clothed with deep green foliage. There is a variety (glauca) in which the glaucous colouring is so pronounced that the entire shrub is of a bluish grey tint. This variety forms a charming medium-sized specimen for the lawn, the colour being so distinct and pleasing. It is known as the Colorado Blue Spruce. Argentea is a very beautiful kind also. Blue Spruce is one of the most striking in colour of all Conifers, and when grouped, or even set out singly, its colour is wonderfully effective, as every shoot is silvered over, a pretty and unusual tone, welcome in the landscape at all times; but in winter, when the deciduous trees and shrubs are leafless, then the Silver or Blue Spruce shows up in its true dress. A. pungens is a very hardy Conifer, and to ensure well-coloured forms the shrubs should be raised from seed, as only in this way is it possible to obtain good results. Too frequently the shrubs are grafted upon the common Spruce Fir, but this is a great mistake. One can never get satisfactory results when this practice is followed.

A. Smithiana.—This Himalayan Spruce is quite distinct from any other kind, forming a pyramidal specimen, with the points of the branches and the shoots as pendulous as a Weeping Willow. The cones, which are about 6in. long, are freely borne in drooping clusters. This Fir is somewhat liable to be injured by late spring frosts.

A. Webbiana.—A beautiful Silver Fir from the Himalayas. It is of robust, sturdy growth, clothed with leaves 2in. long, which are deep green above and silvery underneath. This latter character is in this species very pronounced. It fruits freely when little more than 12ft. high, the cones being 6in. or 7in. long, of an intense purple colour, and borne erect on the branches. This Fir is perfectly hardy as far as the winter's frost is concerned, but it starts into growth so early that it often suffers very much in the spring.

Abies, True (*Silver Firs*).—A. amabilis, A. balsamea, A. brachyphylla, A. bracteata, A. cephalonica, A. cilicica, A. concolor and variety violacea, A. firma, A. Fraseri, A. grandis, A. homolepis, A. lasiocarpa, A. Lowiana, A. magnifica, A. Mariesi, A. nobilis, A. Nordmanniana, A. numidica, A. pectinata, A. Pinsapo, A. sachalinensis, A. sibirica, A. Veitchi, A. Webbiana, its variety Pindrow.

Araucaria imbricata.—This is quite distinct from any other tree, and is popularly known as the Monkey Puzzle, which name, from the formidable spiny character of its foliage, is a particularly appropriate one, or the Chili Pine. In its native country (Chili) it reaches a height of 100ft. to 150ft., in which case the top only is furnished with branches, but here when flourishing it is sometimes met with as a perfect cone, the lower branches sweeping the ground. This Araucaria needs a fairly moist and deep soil; the female cones form large globular masses at the ends of the branches. This is one of the poorest of trees to plant in gardens near London or any other large town. It is not in the least degree suitable for such positions, as

it usually wears a sorry look, the lower branches dead or dying. Only in quite favourable places, such as at Dropmore, Maidenhead, will the tree attain a great height and touch the ground with its prickly branches. Once it gets out of health it is almost impossible to restore its vigour. How often is this tree recommended for small forecourt gardens, but it is better to have no tree at all than this Araucaria

Arborvitæ, Chinese.—*See* Thuja orientalis.

Biota orientalis.—*See* Thuja orientalis.

Cedars.—*See* Cedrus.

Cedrus atlantica.—This is a near relative of the Cedar of Lebanon, from which it differs principally in being of looser growth, while, as a rule, the foliage is more glaucous, and in some this silvery blue tint is very pronounced. The variety Glauca (the Silver Atlas Cedar) is of great beauty, being in its best forms of quite a silvery colour, and the tree grows vigorously and rapidly. It is one of the best of all the glaucous foliaged Conifers.

C. Deodara (*the Deodar*).—This is Himalayan, and remarkable for its extreme grace and elegance, though some forms have this character more pronounced than others. The Deodar is now frequently met with, and it succeeds in the neighbourhood of London better than many other Conifers. In its Indian home it is a valuable timber tree, but here is principally grown for its high ornamental qualities. It must be remembered that it is not as hardy as one would like, and in the last severe winter was considerably cut up. There are several varieties.

A WALK OF CORSICAN PINE.

C. Libani.—The Cedar of Lebanon is well known, at least by name, to almost everyone, and noble trees are freely scattered throughout the country. As a rule its massive trunk divides into several branches a short way from the ground, the whole forming usually a flattened tree, built up, as it were, of numerous tiers of branches. The cones, which are borne in profusion, standing erect as they do scattered over the flattened branches, have a singular effect. More need hardly be written of this tree. It is alluded to in the introduction, and noble groups are the glory of many an English park and garden.

Cryptomeria japonica.—The usual shape of this is a narrow spire, though in this respect individuals differ somewhat. The branches are produced in an irregular manner, so that it is less symmetrical in shape than many other Conifers. It prefers a good deep moist soil. There are several varieties, one, Lobbi, being more compact and of a deeper green, while nana is but a low rounded bush.

C. elegans, frequently regarded as a distinct species, is a form of C. japonica. It is a Japanese tree, which, when standing singly, usually assumes the shape of a rounded cone, very effective when from 6ft to 20ft. high. During the growing season the foliage is bright green, but towards the end of autumn it changes to a bronzy crimson, which is retained throughout the winter, thus rendering it very noticeable at that season.

Cupressus (Retinospora) filifera.—A dense shrub, usually assuming the shape of a blunted pyramid, with long thread-like shoots and soft green leaves. It forms a beautiful specimen on a lawn, standing out by itself on the grass.

C. Lawsoniana.—This is one of the most beautiful of all the Cypress tribe; the rich green Fern-like branchlets, which droop at the tips in an exceedingly graceful manner, with the contour of the entire specimen, combine to render a plant of this Cypress an exceedingly graceful object, whose beautiful green tint is retained throughout the year. There is quite a host of varieties, the best being: Alba spica, young shoots creamy white; alba variegata, white branchlets interspersed with the green ones; aureo-variegata, with golden variegation arranged same as last; erecta viridis, an upright bright green form, one of the best of all; filiformis, with long, slender, cord-like branchlets; gracilis, a very graceful form; lutea, young growth bright yellow; nana, a globular plant, 2ft. or 3ft. high; nana glauca, like the last, but with bluish foliage. These two will stand for years with little increase in size. In the Kew hand list the varieties of C. Lawsoniana are grouped according to the colour of foliage and form and habit. As regards the colour of the foliage, the following varieties are enumerated: Albo-maculata, albo-picta, albo-spica, albo-variegata, argentea, argenteo-variegata, aurea, aureo-variegata, glauca, glauca pendula, lutea, ochroleuca, and Silver Queen. Of the columnar or fastigiate forms the following are named: Alumi, erecta viridis, erecta viridis argentea, Fraseri; of spreading form, amabilis, Bowleri, californica, darleyensis, fragrans, fragrans

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argentea, intertexta, juniperina, patula, Smithi, and Youngi. As regards the pendulous kinds, glauca pendula, gracilis pendula, gracilis gracillima, and pendula vera are named, whilst of globose or dwarf kinds choose compacta, nana, and Shawi. One of the most distinct of all forms is erecta viridis, which is used largely in gardens, and is unquestionably one of the most interesting and vigorous of all Conifers. It is not so apt to become unhealthy as many forms, and the variety lutea is another very useful shrub, with quite golden foliage—a variegated variety of great value because its colouring is decided, unlike that of so many variegated shrubs, which are the reverse of pleasing or effective. Silver Queen is a pretty silvery-tipped variety, and argentea is also of merit, the leaves quite silvery in tone; a very distinct Conifer.

C. leptoclada.—This is of a strictly upright style of growth, clothed with bluish grey foliage. It is seldom more than 4ft. or 5ft. high, and the clear hard outline fits it for planting in the formal garden. A fairly moist spot suits it best.

C. macrocarpa.—Quite a tree, with a dense head of spreading branches and bright green foliage. In the South and West of England it is very beautiful, but it is not thoroughly hardy all over the country. It stands cutting well, hence it may be used for hedges, screens, etc., in favoured localities. There is a variety, fastigiata, the branches of which are upright and closely pressed to the trunk. Crippsi is a distinct form.

C. nutkatensis.—This is somewhat after the manner of C. Lawsoniana, from which it differs in the frond-like branchlets, being of a coarser texture and of a paler green. It is perfectly hardy, but resents being planted in a dry soil. There are several well-marked varieties.

C. (Retinospora) obtusa.—A timber tree of Japan, and highly ornamental in this country. Its habit is variable, but it usually forms more or less of a pyramid, in which the beautiful flattened frond-like branches are arranged one above the other. For planting in a group or as a single specimen it is one of the most ornamental Conifers in gardens. There are several varieties, all beautiful; the most distinct being aurea, golden yellow foliage; compacta, a sturdy dense form; erecta, of erect growth; gracilis aurea, exceedingly graceful, the young growths clear yellow; nana, a rounded bush; pygmæa, a little spreading shrub not more than 1ft. high.

C. (Retinospora) pisifera.—More slender and plume-like than C. obtusa, and much less dense in growth than that kind. In good, fairly moist soil R. pisifera forms a handsome specimen, but when dry it becomes thin and bare. It, however, stands cutting well, and is therefore sometimes used for screens and hedges. There is a golden-leaved variety of considerable beauty, but it must never be forgotten that the coloured varieties are less hardy than the type. Albo-picta, darleyensis, plumosa, plumosa argentea, plumosa aurea, squarrosa (which see), and squarrosa sulphurea are forms, but plumosa is usually considered a species in gardens where special prominence is given to it.

C. (Retinospora) plumosa.—This assumes the character of a dense cone crowded with short feathery branches of a deep green colour, thus forming a handsome specimen, equally effective whether 5ft. or 15ft. high. There is a variety, argentea, in which the young growth is creamy white; another, aurea, golden yellow; and variegata, in which the entire plant is flecked with white, as with flakes of snow.

C. sempervirens.—The distinctive character of this Cypress throughout the Mediterranean region is well known, its somewhat funereal aspect being familiar to us in illustrations of Greece, Turkey, Asia Minor, etc. It usually forms a dense columnar tree, but there is a form with spreading branches.

C. (Retinospora) squarrosa.—This is a variety of C. pisifera, but is given prominence because it is a familiar garden shrub. It has a profusion of branches heavily clothed with foliage. The pointed leaves stand out quite clear of the shoots, and are not closely pressed thereto, as in most of its allies. The colour of the foliage is a beautiful silvery green, and as a specimen from 6ft. to 12ft. high it is charming.

C. thyoides.—This, the White Cedar of the United States, is often met with under the name of Chamæcyparis sphæroidea. It is of a dense pyramidal habit of growth, whose slender branchlets are clothed with tiny glaucous green leaves. This needs a moist soil, indeed, it will thrive in a more swampy spot than most Conifers. There are several varieties, those recorded in the Kew hand list being atrovirens, glauca, Hovei, Kewensis, variegata, and viridis.

Fir, Silver.—*See* Abies.

Fir, Silver common.—*See* Abies pectinata.

Juniperus (*Juniper*).—This is an important and beautiful family of coniferous shrubs, which one would much like to see more planted in gardens to form bold spreading groups. The Savin is rarely well placed, but it is a shrub one can hardly see too much of, spreading over banks and forming low leafy groups in the woodland.

J. chinensis.—A broad bush-like specimen, with long pointed leaves over the greater part of the shrub, but towards the tips they are small and scale-like. It is thoroughly hardy, and from 5ft. to 8ft. high forms a very attractive specimen. Aurea is a golden foliaged variety, and there are other distinct forms.

J. communis.—This is the native Juniper, extending in a wild state from Great Britain to Norway, Siberia, and Kamtschatka. In this country it usually forms a small tree from 6ft. to 12ft. high, clothed with spiny leaves, while in the Arctic regions it is a low creeping bush. The most notable variety is hibernica, whose branches are short, erect, and close set, so that it is of quite a columnar habit. It appreciates a moist soil, and its greyish colour is very charming.

J. excelsa.—This usually forms a symmetrical pyramid, with peculiar glaucous leaves, which give to the entire plant a greyish green hue. It is decidedly ornamental when from 12ft. to 15ft. high, but as a large specimen it is much less attractive.

J. rigida.—A very distinct and ornamental species of Juniper from Japan. It forms a low tree with somewhat upright branches; but the minor shoots are pendulous, and clothed with long sharp-pointed leaves. When first developed they are of a yellowish green, but deepen with age.

J. Sabina.—The common Savin of gardens, and in some forms at least one of the most beautiful of the Junipers. It is a low spreading bush, clothed with particularly rich green foliage, and for the fronts of shruberries or for rock-work it is a most desirable low-growing shrub. A variety named tamariscifolia is very distinct and pleasing. The Savin and its varieties (but the species is as welcome as any of its forms) make quite dense carpets of undergrowth, and will clothe in beauty places suitable only for the Furze or a similar shrub which revels in a hungry soil. Those who have not used the Savin should do so, and they will not regret adding a shrub so beautiful in colour and picturesque in growth to the garden. Of J. Sabina, besides the very distinct tamariscifolia, there are the Knap Hill and other forms.

J. thurifera.—This attains to quite tree-like dimensions, as it will grow 40ft. or even more in height—this in its native countries of Spain and Portugal. Here, however, it will develop to a considerable height. It is hardy, distinct in appearance, being of conical form, and when planted upon the lawn gives decided variety to the usual shrubs and trees of English gardens.

J. virginiana (*the Red Cedar*).—One of the largest in growth of the Junipers, reaching in its native habitats a height of 50ft. to 60ft. It is well known in this country, usually forming a medium-sized tree of pyramidal outline, with foliage acquiring a bronzy red colour. There are numerous varieties, the most marked being aureo-variegata, in which many of the minor shoots are yellow.

Larix europæa (*Larch*).—Though different species of Larch occur throughout the various temperate regions of the globe, our common European species is, with one exception, equal to any of them. It is too well known to

need any description, being remarkable among Coniferæ from its deciduous character. In spring, when the young leaves are just pushed forth, few trees are more charming and fragrant. Pendula, which has quite graceful branches, weeping and of great length, is the most interesting variety.

L. Kæmpferi.—This is now called Pseudolarix Kæmpferi, and is a moderate-growing tree of pyramidal habit, and as far as branches are concerned it greatly resembles the common Larch, the leaves also being tufted in the same way. They are, however, much longer and broader, and when first expanded are of a light yellowish green, which deepens as the season advances, and in autumn they change to a golden yellow. Other species of Larch are: Griffithi, leptolepis, occidentalis, and pendula.

Libocedrus chilensis.—An extremely beautiful low-growing tree of pyramidal outline, but sometimes rather narrow at the base. It is remarkable for the beautiful glaucous hue of the foliage, but it is only hardy in the more favoured districts of England.

L. decurrens.—A North American tree that reaches a height of over 100ft., and is there valuable for its timber. In this country, however, it is grown only for ornament, and is worthy of it, being very distinct from anything else. It is in good soil of a dense columnar habit of growth, and remarkable for the rich deep green hue of its foliage. Glauca and compacta are varieties.

Picea, True (*Spruce Firs*).—P. alba, P. Alcockiana, P. Engelmanni and variety glauca, P. ericoides, P. excelsa and numerous varieties, P. Glehni, P. Maximowiczi, P. Morinda, P. nigra, P. obovata, P. orientalis, P. polita, P. pungens, and P. rubra.

Pine.—*See* Pinus.

Pinus.—The true Pines form an extensive group, and include some of the most valuable timber trees, and also many that occupy a prominent position for their striking aspect. The following are well worthy of especial mention:

P. austriaca. — The Black or Austrian Pine is a quick-growing tree, with dense dark green leaves, so that it is of an unusually sombre appearance. It is valuable for planting as a nurse tree, for forming screens or similar purposes, while it is very ornamental, and is useful to plant in exposed places near the coast to shelter gardens. It is not only rapid in growth, but unrivalled as a shelter by sea, and even in large towns, whilst its deep colouring is always enjoyable.

P. cembra (*Swiss Stone Pine*).—This forms a tall, dense, narrow pyramid, with leaves of a dark green hue, and marked with silvery lines, thus imparting a greyish hue to the specimen. It is thoroughly hardy, well furnished with foliage, and owing to the shortness of its branches does not require so much space if planted as a single specimen as in the case of many other Firs. The wood of Pinus cembra is much valued in the Alpine regions, but in this country it is planted solely as an ornamental tree. There is a curious dwarf variety (pumila), which bears cones freely when not more than 1yd. high.

P. contorta.—A native of California and Oregon, and perfectly hardy in this country. As a tree from 12ft. to 20ft. high it is ornamental, being of dense, compact growth, usually of pyramidal shape, and clothed with rich green foliage. It is suitable for planting singly on small lawns.

P. excelsa (*Bhotan Pine*).—This belongs to the same group as Pinus cembra, and this Himalayan species is in many respects widely removed therefrom. It forms a free-growing tree, with regular, wide-spreading branches, upturned at the points. The leaves are long, slender, drooping, and of an ashen green tint. This drooping character is particularly noticeable at the tips of the branches. The bark on the young shoots is of a pale greyish tint, and the cones, which are 8in. or 9in. long, are freely borne, and quite pendulous. It succeeds best in light well-drained soils.

P. insignis.—This beautiful and distinct Fir is hardy only in the more favoured districts of the country. It forms a wide-spreading tree, distinguished by the rich grass green hue of its ample foliage. It must in any case be planted in a sheltered spot.

P. Laricio (*the Corsican Pine*).—One of the least fastidious of all the Pines, succeeding in good soil or on bleak exposed hillsides. It is a valuable timber tree, and is largely planted for shelter, or as a nurse plant to more delicate subjects. Standing singly it forms a tall straight tree, with rather short branches, so that it does not cover so much space in proportion to its height as many others. It is pleasing to know that this fine Pine is being more largely planted in gardens.

CONIFERA FORSYTHIA—AN EXAMPLE OF WRONG PLANTING.

P. macrocarpa.—A large tree, frequently dividing into several stout branches near the ground. The leaves are from 9in. to 12in., of a distinct glaucous green hue, and clustered in a striking manner at the points of the shoots. The cones are very large, hard, and furnished with hooked spines.

P. montana.—A variable species, which is a native of the Alps, Carpathian, and Pyrenees mountains. Besides the name of P. montana, it is also known as P. pumilio, and P. uncinata. It usually forms a densely-branched bushy specimen, clothed with short, stiff, deep green leaves. Some of the varieties of this are quite dwarf, but mostly wide spreading.

P. muricata.—This Pine is a native of the coast range of California, and forms a very distinct low-growing tree, clothed with deep green leaves. It seldom produces any di ect leader, and the large branches are irregular in growth. A conspicuous feature is furnished by the hard spiny cones, which are clustered round the stem in whorls of seven or eight and remain on for years, so that one branch will have numerous clusters attached to it.

P. Pallasiana.—Somewhat in the way of P. Laricio, but forms quite a distinct tree. The main trunk after some distance usually produces several large ascending branches, and deep green leaves, about 6in. long. Seen in a mass it has a decidedly blackish appearance. P. Pallasiana is very plentiful in the Crimea.

P. Pinaster (*the Cluster Pine*).—This derives its popular name from the manner in which the hard woody cones are clustered around the shoots, where they remain for years. It usually forms a wide spreading pyramid, clothed with long leaves of a bright green tint. The deeply furrowed bark is a distinct feature of this species. Apart from its ornamental qualities it is valuable from the fact that it succeeds near the sea even in sandy soils. This feature has been greatly taken advantage of in some parts of France.

P. Pinea (*the Stone Pine*).—A highly picturesque tree throughout Southern Europe, particularly in Italy, where in some districts it is frequently seen in the landscape. It forms a clear stem for some little distance, and then divides into several large branches, thus forming a rounded head. The leaves, which are about 6in. long, are deep green in tint, while the large globular cones are so hard as to have given rise to the name of the Stone Pine.

P. ponderosa.—This is a huge and valuable timber tree in the North-West of America, and in this country forms a very distinct tree for the park and pleasure ground. From a sturdy erect stem are pushed out stout branches with ascending points. The long dark green leaves are limited to the ends of the shoots, thus imparting a distinct appearance to the tree.

P. Strobus (*Weymouth Pine*).—A tall tree of pyramidal shape, with slender silvery green leaves. It is somewhat in the way of P. excelsa, but the branches are not so wide spreading, while the foliage is less robust, and the cones a good deal smaller. It is the White Pine of the North American lumbermen.

P. sylvestris (*the Scotch Fir*).—A well-known species, the forests of which form a prominent feature in many parts of Scotland. It will thrive even in poor soils and in exposed situations, and is therefore often planted for shelter. There are many varieties, the golden-leaved form being particularly noticeable. Pumila and pygmæa are dwarf varieties.

P. tuberculata.—A low irregular-growing tree with deep green leaves and clusters of cones as in P. muricata. The cones of P. tuberculata are, however, longer and thinner than those of the other. It is a distinct Pine, suitable for small gardens, as it is of slow growth.

Prumnopitys elegans.—A Yew-like shrub or small tree, usually of a dense broadly columnar outline. The leaves, which are about $\frac{3}{4}$in. long, are bright green above and glaucous beneath. It succeeds in a good soil, and fairly sheltered spot. This Prumnopitys is noteworthy as one of the few South American Coniferæ that succeed in this country.

Pseudolarix Kæmpferi.—*See* Larix Kæmpferi.

Retinospora.—*See* Cupressus, as all the forms have now been placed in this group.

Sequoia sempervirens.—This, the Californian Redwood, rivals the Wellingtonia gigantea, as the most gigantic tree on the surface of the globe, for it attains a height of nearly 300ft., and is extremely valuable for its timber. In this country it forms a conical specimen with dark green Yew-like leaves It is frequently injured by late spring frosts. The thick spongy bark is a very noticeable feature of this tree. The Redwood

A DECIDUOUS CYPRESS.

A CORNER OF THE GARDEN, BLICKLING, NORFOLK.

requires a fairly moist soil, otherwise the foliage becomes browned.

Spruce.—*See* Abies.

Taxodium distichum (*Deciduous Cypress*).—Remarkable as one of the deciduous members of the Coniferæ; it forms a highly ornamental tree. When young it is more or less of a pyramid, but as it grows up the top branches lengthen and it usually forms a spreading head. The pinnate leaves are of a beautiful light green, changing to a reddish hue in the autumn before they drop. The deciduous Cypress needs a very moist soil; indeed, it will succeed in quite a swamp.

Taxus baccata (*the Common Yew*).—The Yew is a native of this country, and apart from its value as an ornamental tree it may be cut and trimmed into almost any shape, so that it is largely planted to form hedges and for the formation of different figures. The varieties are almost innumerable, some of them being grown in many gardens. The most distinct are aurea, young growth golden yellow; Dovastoni, the main branches spread horizontally, and the minor ones are pendulous; elegantissima, leaves striped with yellow; ericoides, a little bush with tiny leaves; fastigiata (the Irish Yew), a well-known upright-growing kind; fastigiata aurea, a golden-leaved form of the last; fructo-luteo, with yellow berries; nigra, with peculiar blackish blue leaves. Doubtless few, if any, shrubs are more frequently seen in gardens than the Yew in one or other of its forms. Its wonderfully vigorous growth is responsible for the indifference it displays to cutting in either to form a hedge or to create figures, this constituting what is known as topiary work. This is, of course, a misuse of a beautiful Conifer, so deep and sombre in colour and picturesque in growth. Noble trees are the chief features of interest in many an English garden, trees that have braved the storms of a thousand years, and sometimes, as at Cherkley Court, near Leatherhead, planted in immense groves, an imposing picture, and the growth is so dense that neither snow nor yet rain can scarce pierce the thick deep green branches. And, too, in many a hallowed acre the Yew is precious, touching with beautiful colour the surrounding scene, and picturesque in its old age. One has yet to see the Yew well placed in gardens. It is not a tree merely to cut into fantastic shapes or to grow as a hedge, but beautiful in itself, sufficiently so surely to group simply in the pleasure ground, or to form a shelter. One might write many pages concerning this noble evergreen Conifer, of its value to form an arbour, and so forth, but this is impossible in the space at command. The Yew should be raised from seed, and purchasers should ask for seedling plants, particularly of the fine golden variety, which, when true to name, is very handsome, a pure golden colour, which is retained. It is wrong, however, to use this golden-leaved shrub too freely, and never dot it about, as this simply results in a spotty effect, decidedly unpleasant, but its appearance is welcome when masses are formed. In the Kew hand list no fewer than thirty varieties of Taxus baccata are mentioned.

Thuja gigantea.—The most beautiful of all the Thujas or American Arborvitæs, and one that is frequently met with under the name of Thuja Lobbii. Its habit is generally that of a narrow cone, with densely arranged frond-like branches of a rich bright green, which is retained throughout the winter.

T. dolabrata.—From its early stages to a height of 12ft. to 18ft. this Japanese tree is very beautiful, but after that it frequently gets bare at the base, and much of its beauty is lost. In its young state it often forms a perfect pyramid, whose lowermost branches trail on the ground. The branchlets are almost Fern-like, deep green above and glaucous beneath, while they are coarser in texture than their near allies the Thujas. There is a variety, lætevirens, a little dense bush of a bright green hue; and variegata, some of whose leaves are variegated with white.

T. Lobbi.—This is an important garden shrub, and one of the best known of all Conifers; its variety aurea is distinct. T. gigantea is the same.

T. occidentalis.—This, the common American Arborvitæ, is a loose-growing tree of a broadly pyramidal shape; its foliage is of a bronzy green during the growing season, and becomes browner in winter. In a moist soil it forms a decidedly ornamental specimen, but will not thrive where dry. It is a good screen or hedge plant. The

A STUDY OF YEWS AT HOLME LACY, HEREFORDSHIRE.

variety lutea has deep yellow foliage, while in Verveæneana it is of a bronzy orange hue. A weeping form (pendula) is also very noticeable. A. Thuja, called Warreana, is considered the hardiest of the Arborvitæ group.

T. orientalis (*the Chinese Arborvitæ*).—This is a common plant in gardens, usually of columnar habit, and dense in growth. It is seldom seen much over 15ft. in height. There are many varieties, the best being aurea (the Golden Arborvitæ), a dense globular bush, whose young growth is of a rich yellow; elegantissima, an upright bush about 6ft. high, deep golden yellow in the summer and bronzy orange in the winter; pendula, with long whipcord-like shoots. Synonym, Biota orientalis.

Wellingtonia gigantea (*the Mammoth Tree*).—This was discovered in 1852 in California, and no tree has since that time attracted so much attention, its huge size, which is its principal feature, forming the subject of many pictures and stories. An estimated height of 350ft. has been attained by the Wellingtonia, with a circumference of 60ft. measured at 10ft. from the ground. In this country the Wellingtonia pushes up a straight trunk very much thickened at the base, and regularly furnished with branches, which shorten so gradually as to form a cone. There is a weeping variety (pendula).

A BIG TOMATO HOUSE.

THE CULTURE OF VEGETABLES.

By Edwin Beckett.

THIS most practical branch of gardening appears at length to be receiving proper attention, and few other departments of horticulture can show a greater advance than the culture of vegetables. No doubt immense improvements have been made in the system of cultivation all through Her Majesty's long reign, especially during recent years, on account of the more scientific methods adopted to bring many of our best vegetables to a high state of perfection. This satisfactory state of affairs has taken some time to perfect, and may be attributed to the painstaking efforts of many of England's best gardeners.

Vegetables Past and Present.

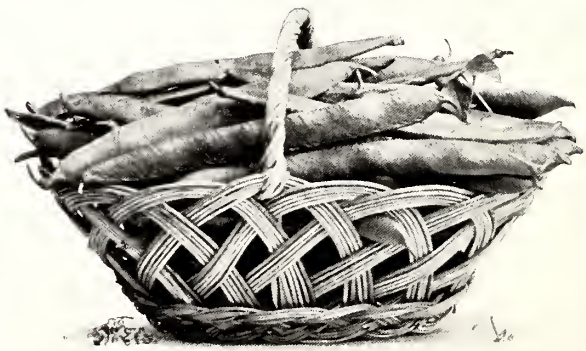
I propose to say a few words about the principal vegetables in detail, for the purpose of comparison between past and present, and as an instance of recent development let us select, first, the Pea.

In any well-ordered kitchen garden the supply of this welcome esculent may now be spread over several months, from the late spring until the early autumn, and during this period the produce is of high quality. Such fine sorts as Early Morn, Duke of Albany, Daisy, The Prior, and others equally good, each of them producing Peas of large size, in pods of great length, prove conclusively the value of cultivating the choicest varieties. While referring to this matter, it is always well to bear in mind that as much labour, space, time, and expense are needed to cultivate an indifferent crop as to produce a fine one. Many of the high-class varieties are of a desirable habit of growth, combined with their free-bearing qualities. Flavour too—really an essential quality—characterises the majority of the newer introductions. As a further encouragement to grow good varieties,

PEA, WINDSOR CASTLE MARROWFAT.

raisers of new Peas and other vegetables are invited to send seeds to the gardens of the Royal Horticultural Society, where facilities are given each year for testing the quality of their produce, and where those of undoubted merit receive awards of varying value. No matter what the subject may be, advance can, in almost every instance, be chronicled. Beans of all kinds now give results far exceeding those attained by the older forms. Broccoli and Cauliflowers are now finer than ever, and the same may be said of most members of the Brassica tribe, which include the invaluable Brussels Sprouts, Borecole or Kale, Savoys, and Cabbage. Onions, by the modern method of culture, rival the Spanish introductions, and they now embrace many excellent sorts. With wise discrimination those of good keeping qualities may be grown to a large size, and thus the ground on which they are raised made to give better results. Of Leeks, our Scottish friends have no longer a monopoly, our leading Southern gardens now producing this valuable vegetable of equal merit to those of any part of the United Kingdom. Such varieties as Prizetaker and Champion are typical of what this vegetable should be. Carrots, such as Shorthorn, Intermediate, and Long Red Surrey, are represented by roots of good colour, large size without coarseness, and, best of all, the new Red Intermediate may be said to embody all that a good Carrot should be. There are several good new Parsnips, though these, probably owing to their not being a universal favourite on the table, are fewer in number than other standard vegetables. Cucumbers must, of course, be considered in such a chapter as this, and few vegetables can show such improvement. Many of the best varieties are quite prolific, and their individual fruits, owing to successful development, are long, well-shaped, and of excellent quality. Beet, Turnips, and other less important groups have each advanced, and that most juicy fruit, if fruit it can be called, the Tomato, may safely claim to have increased in demand and variety.

Celery is one of the most important and popular vegetables cultivated, and the aim of every gardener should be to have a succession of well-blanched sticks from the first week in September until the end of March. This may easily be accomplished by selecting suitable kinds and regulating the time of sowing the seed. No crop that I am acquainted with is more profitable, and nothing improves the land more, as by following out the proper mode of culture every particle of ground has to be broken and moved to a good depth, thus ensuring a thoroughly sweetened soil ready to receive almost any successional crop the following season. Potatoes have vastly improved of late years, not only in flavour and texture, but even more in the weight and size of crop which they will produce and in their capacity for resisting disease. In one respect they form an exception to all other important vegetables, which with care can be produced in any good kitchen garden. From long experience I am convinced that Potatoes cannot be grown successfully on stiff clayey ground, and as they can now be purchased of the best quality from sources



RUNNER BEAN, MAMMOTH WHITE.

where the ground is more congenial it is useless to waste one's own or employer's money making the attempt; the tubers do not deteriorate by travelling, and a sack can be bought as easily as coals. If one lives on a chalky soil or sandy loam grow Potatoes by all means, but on heavy clay do not attempt it, for they will never succeed.

As regards varieties of Asparagus, little improvement, if any, has been effected during the last few years, but fortunately its cultivation is now far better understood, and it is grown by the acre, where a few small beds formerly sufficed. Asparagus does not require half the labour sometimes given, and when once the beds are made they will last a lifetime; with little labour to keep them in good condition, it is surprising that more amateurs do not cultivate it, as the difference of flavour between fresh cut Asparagus and that which has been exposed in the shop window for days is perhaps more marked than in the case of any other vegetable.

With the solitary exception of Parsley, very little improvement has taken place as regards herbs, and probably as many or even more pot-herbs were in general use and cultivation 100 years ago than at the present day. Certainly in every well-ordered garden a small plot should be allotted to them, for they are always in request owing to the variety of flavouring afforded.

ASPARAGUS.

No better proof could be given of the great progress in vegetable culture of late years than the displays at the leading exhibitions throughout the country, and the vegetables staged on these occasions are not merely a few specially selected roots or plants which have received particular attention, as by far the larger proportion of the vegetables left at home correspond with those exhibited. This, therefore, brings one to the consideration of the means adopted whereby vegetables of high quality may be produced, and that this matter may be impressed on the mind of the reader let it be distinctly understood that it is almost impossible to exaggerate the advantage of deep cultivation.

DEEP CULTIVATION.—To grow vegetables satisfactorily more depends upon a thorough system of tilling the soil than perhaps many are prepared to admit, and the great success which our leading gardeners have attained has been due to this practice. The mere digging of the soil one spit deep, as practised in the majority of gardens throughout the country, has proved a sad drawback to the culture of vegetables, whilst, when the proper method has been followed, magnificent results have been achieved, even where the soil is of a most undesirable character. Soils differ materially, and in many cases considerable pains have to be taken to improve them. Crops, too, vary in their requirements, some preferring light and warm soil, while others thrive exceedingly well in clayey ground, such as gardeners describe as of a heavy texture. How then are we to manage so that the most may be got out of the soil, and that each year may see a repetition of the success which should follow the first season's efforts?

There are two methods of dealing with the soil, one known to practical gardeners as true trenching, and the other an inferior plan, that of bastard trenching. We will consider the latter method first.

BASTARD TRENCHING consists of digging out and wheeling away the top spit of the soil from one section of the garden, upon which you may wish to work, to the other, leaving a trench some 18in. to 2ft. in width and carried right across the section which is being dug. The bottom soil is then proceeded with, and this is dug over in the ordinary way, and manure incorporated at the same time. Next the top spit of the ground immediately adjoining the trench is turned over on to the loosened subsoil, and in placing this in position care must be taken to keep a trench open of a space equal to that covered in. The subsoil is treated as in the first instance, and the aforementioned operations are repeated, until at length the whole section of the ground has been dealt with. The soil at first taken out and wheeled away has to be filled into the last trench, and the task is thus completed. This sort of trenching is specially suited to shallow soils.

TOMATO, DEDHAM FAVORITE.

TRUE TRENCHING is of great value on all kinds of land, and during periods of great heat and drought the beneficial effects of the deep cultivation which it involves are especially marked. To trench the garden in true form, take out a trench of the same width as that suggested in the case of bastard trenching, but in this instance to the depth of two spits. The soil should be removed to the end of the piece of ground being operated upon. Proceed then to dig the adjoining ground, throwing the top spit into the bottom of the open trench, and the second spit on to the top of this, by this method quite reversing the original order of things. Observe this rule throughout the piece of ground dealt with, filling in the trench at the end when this is reached with the soil first removed. Old and impoverished soils must be liberally treated, applying manure of a heavy kind to light, warm, sandy soils, and in the case of clayey and retentive material light manure should be applied.

TRENCHES. — Everyone uses these for growing Celery, many use them for Leeks, and a few for Peas and runner Beans; but wherever heavy manuring, constant saturation with sewage water, or other such means for producing exceptionally fine specimens, or for anticipating or prolonging the usual growing season of the plant, are resorted to, then this method of cultivation will be found most advantageous. The trenches, as a rule, should be about 18in. deep, and have a good foot of manure in the bottom, with a coating of about 3in. of garden soil, when they will be fit to receive any of the above vegetables, which, as I have already mentioned, can digest considerable nourishment.

HOEING.—The use of the hoe is not sufficiently appreciated in gardens, but more good can be secured by the judicious use of this simple implement than many are aware. At all times, in the growing season, the frequent use of the hoe has the effect of keeping the weeds under, breaking up the soil, and letting the air well into it. The roots also by these means are aërated, and the conditions prevailing in the soil are such that the assimilation of food supplies is enhanced. When the British gardener learns to attach proper value to the right use of the hoe, he will be enabled to record progress both in the saving of labour and

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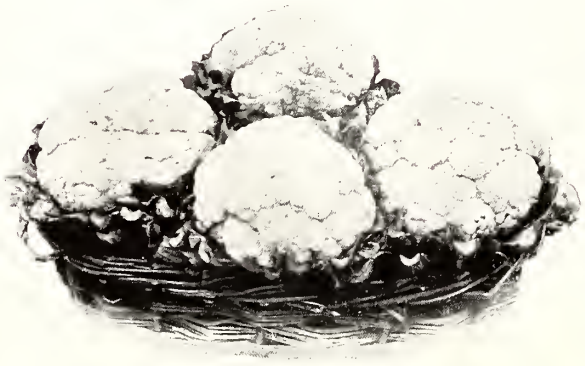
in the quantity and quality of the crops. Unless the surface soil is constantly stirred, the beneficial results which should follow every fall of rain are not so lasting. It is only natural to suppose that, after the rain has passed, and the sun and winds dry the surface of the soil, little air can pass through the crust-like covering. Then hoeing contributes so much to the well-being of the plants. By this operation the crust may be broken up, and the soil opened to the air, with the result that roots of the different crops readily absorb the plant food thus provided, and development proceeds at a much greater rate than would otherwise be the case. The question of preparation of the garden soil having now been fully dealt with, attention should be turned to the arrangement of the proposed crops.

CABBAGE, DWARF GREEN CURLED.

A PROPER ROTATION of crops must always be observed if successful culture be desired. There are a few exceptions to the rule, but in most cases it is important to adopt a regular system of cropping the garden. Soils contain such varied ingredients—some useful to one plant and some to another—that it is only possible to get the most out of each part of the garden by planting a succession which will feed on and consume the different chemical constituents, until the time comes for their replenishment, by applications of manure, either artificial or animal. Soils certainly in some gardens are more suitable for some crops than for others, but even in such cases it is possible in the course of time to add the ingredients which are lacking, so that ultimately, by a proper rotation, one may get all the produce to an equal standard of excellence. There is a rule to observe calculated to give eminently satisfactory results, and it is this: The rotation of crops should be of such a character that plants of the most diverse kind, which draw their sustenance from different levels, should follow one another. Thus if shallow-rooting plants of the character of Potatoes, Turnips, and Lettuce, and the like, which absorb and assimilate the fertilising constituents on the surface of the garden, are raised during the first year, then first they should be succeeded by those subjects which go down very deep, as, for example, the tap-rooted Parsnips, Carrots, and Beet. Then, again, in the third year the most suitable crop would be a medium-rooted one, and would naturally include Cabbage, Broccoli, Cauliflower, and similar vegetables. In this way the deep-rooting vegetables, passing through the upper stratum, would consume whatever was of value in the way of plant food in the little worked soil at the lower level, and the maximum advantage would be obtained from a given piece of ground before the time was reached for breaking it thoroughly up, laying it fallow, and exposing it to the sweetening influences of frost and air, and giving it something more than its usual dose of manure. Mention was made earlier of a few exceptions to the general rule of the necessity for rotation, and in this category we may safely include the vigorous-rooting Leeks and Onions. These hardy esculents succeed well in the same quarters year after year, and as they revel in soil constantly enriched with generous dressings of manure, each season's further supply of food makes the



CAULIFLOWER, MAGNUM BONUM.

prospect of a rich harvest all the more promising. This now brings one to an important consideration in the successful culture of vegetables, namely:

RED TURNIP RADISH.

SEED SOWING.—How often have promising crops been spoiled by the too free use of seed. It is no exaggeration to state that the quantity of seed usually sown is greatly in excess of what is needed, and often a sufficient quantity is sown in one row to fill at least three or four times as much space. It must be apparent to all thoughtful cultivators that this is waste of time, labour, and money, and in their early days the plants become unduly crowded and incapable of rendering a good account of themselves. Although crowded seedlings may be thinned in good time, the result cannot be so good as when from the first a moderate sowing has allowed natural development of the plants. On no account should the seeds be sown broadcast, but in rows. Thinning, weeding, and hoeing are more effectively carried out and the work more easily advanced when the seeds are sown in rows; moreover, by following this rule, greater space for the development of the crop is ensured. According to the growth of the respective vegetables, the space between the rows has to be determined, and only by allowing plenty of room for each kind to develop can good crops be obtained. The seeds must be sown deep enough, and the following rules should be observed: Peas and French Beans, 3in. to 4in.; Broad Beans, 4in. to 6in.; Onions, Leeks, Broccoli, Cauliflowers, Cabbages, Brussels Sprouts, Turnips, and Kales from 1in. to 1½in.; while in the case of Parsley, Parsnips, and Carrots, ½in. to 1½in. Radishes, Lettuces, and Endive succeed well when sown to a depth of ½in. In determining the kind of vegetable to be sown in shallow and in deeper drills, it should be borne in mind that the more vigorous-rooting varieties require a drill of a depth undesirable for the weaker-growing sorts.

TURNIP, WHITE MILAN.

THE TIME OF SOWING must necessarily depend upon the situation and aspect of the garden. Seeds that could be sown with safety early in the year, in gardens situated in a warm protected position, would fail absolutely where the situation is cold and bleak and probably damp. One must, therefore, be guided by circumstances before commencing operations in the early part of the year. In sowing seed outdoors in January, February, and early March great care must be taken. From this time forth, however, the work should proceed rapidly, the majority of the main crops being sown during the latter part of March and April, and the late supplies proceeded with by sowing in May and June. Succession crops should always

be provided for, thus good and wholesome vegetables may always be gathered, and the vegetable garden put to its fullest use. Gardeners frequently make the mistake of not commencing sufficiently early with many of the best vegetables, and in consequence the results are poor. Failures are often recorded through this cause with Celery, Parsnips, Autumn Cauliflower, Brussels Sprouts, Leeks, and Onions. If representatives of the foregoing are to be obtained, agreeable both to the palate and the eye, it is important that they be taken in hand much earlier than is the general rule. A long season of growth does not necessarily result in a vegetable becoming coarse and inedible; but, on the contrary, it should be properly matured and in prime condition for the kitchen. Visitors to our leading horticultural exhibitions must have seen the marvellous displays made by some of the best vegetable gardeners of the United Kingdom, and it will almost always be found that deep cultivation, together with an early sowing (in many cases under glass), has largely contributed to the successful result. Onions and Leeks, for instance, are often raised under glass in the early days of January, and after they have attained sufficient size pricked off into boxes or small pots, and grown on successively until they are ultimately planted out in quarters specially prepared for them. By following this mode of culture, these vegetables attain enormous proportions, and, in the case of Onions, bear favourable comparison to those grown in the South-West of Europe

POTATOE, UP-TO-DATE.

A longer season of growth with Leeks ensures better bleaching, and the same remark also applies to Celery. Tap-rooted subjects, such as Carrots and Parsnips, may be grown to perfection with little more than ordinary pains. Holes should be made with a crowbar in the soil to the depth of 3ft. or 4ft., and these are afterwards filled in with finely-sifted soil, such as that from the potting shed. When this has been worked down into the holes and rendered sufficiently firm, seeds are sown on the surface, only a few in each hole, and in the end, when the seedlings appear, the best individual plant is retained and the others removed. When the crop has matured, almost every individual root will produce the vegetable in its best form, free from blemish, and in excellent condition for culinary purposes. Some may urge, and with much truth, that this method of culture involves considerable work and time, but surely when vegetable growers find that failures under this system are unknown they will adopt the plan. Very little seed is necessary when proper regard is paid to its sowing. The costly novelties may be acquired, and a good crop result from the first season's sowing, when seeds are sown thinly, and thus novelties may be more readily tried than if they were subjected to the system of culture so general in this country. Too often, unfortunately, Celery, Brussels Sprouts, Autumn Cauliflowers, and other equally valuable vegetables are not planted far enough apart to ensure proper development. It is important to allow plenty of space between each plant and the rows.

MANURE.—The manure to be used must be determined by the nature of the land. Heavy soil with a clay subsoil should always, if possible, be well dressed with stable manure, which should be used in as green a state as possible, and the straw ought not to be taken from

ONION, SILVER-SKIN.

it, as this will assist in lightening and draining the ground. Soil, however, of a lighter character, especially that which is gravelly or chalky, should receive far more liberal supplies, and nothing is better than that from the farmyard used in a half-rotten state. In my opinion far too many gardeners rely upon artificial manures. When used carefully I am quite aware good results often follow, especially in wet, showery weather; but during a dry season the effects in many cases are actually harmful, and patent manures, of which there are now so many in the market, should be used with great caution. Bone dust is one of the most valuable, as it is safe, beneficial, and lasting.

There is sometimes a tendency to use manure too liberally, and this is fatal when the ground has not been thoroughly trenched. The soil is apt to become too rich, and even actually poisoned, so that the results are as disappointing as if no fertiliser had been used. This condition is not often reached by one excessive dressing, but will inevitably follow if such treatment be applied over a period of years. In such cases the best remedy is to thoroughly dress with lime, as this will have the effect of sweetening the soil. Where the ground has been much over-manured, it will be necessary also to trench it thoroughly in the autumn, and let it lie rough and fallow through the winter frosts, which will complete the purifying process. Some plants may be said to form an exception to the rule, as such strong-rooting products as Onions, Leeks, and Celery seem capable of assimilating any amount of stimulant; in these cases, when particularly fine individual specimens are required for the show-table or otherwise, one may be liberal with the manurial dressing.

WATER.—The storage of water is of great importance, and nothing answers better than a pond or basin in the centre of the kitchen garden. This is not only useful, but ornamental, and the advantage of using water which has been exposed to the air over that drawn from a service pipe or taken from a well is very great. Arrangements should be made for utilising the sewage water from the house, and this may be done by making cesspools in any out-of-the-way corner. No stimulant is more valuable for nearly all vegetable growth. Watering is always best performed during the evening and in hot dry weather, and sprinkling overhead is most beneficial to nearly all crops.

GARDEN PESTS. — These are numerous, and the gardener must always be on the watch for them. Some birds, in a certain degree, and rats, mice, moles, slugs, caterpillars, grubs, thrips, red spider, Onion and Celery fly, and wire-worms may be mentioned; but these by no means exhaust the list of gardeners' enemies. I know it is little use enumerating causes of mischief if one cannot suggest the remedy, and I only regret that I

CARROT, INTERMEDIATE.

have not space to deal more fully with the subject; but I can remind all gardeners, amateur or professional, that frequent dusting of fresh soot in the early stages of growth is one of the safest remedies for the Onion and Celery fly, while finely-sifted cinder ashes placed close round the growth of all kinds of Beans, Globe Artichokes, and Marrows are an almost sure preventive against slugs. As for wire-worms, when the ground is infested with these, dress it lightly with gas lime during the autumn, and trench in the dressing during the winter.

THE WEATHER.—In this uncertain climate few crops can be left to chance, especially during spring and autumn. Cold winds and frosts will often ruin many tender esculents, such as French and Runner Beans, Potatoes, and Marrows, therefore covering material should always be in readiness, or a few hours may completely spoil the whole of the crop. It is better to err on the side of affording too much protection than too little, and a good gardener

A WALK IN THE KITCHEN GARDEN AT HENHAM HALL, SUFFOLK.

will often have to sacrifice his rest to see that this is carried out during the late hours of the night.

WALKS.—No kitchen garden can afford much enjoyment without good walks and paths. It is important that, whatever the material used, whether gravel, asphalte, turf, etc., the foundation and mode of construction should be thorough. Drainage is a necessary factor in any case. My opinion is that no kind of walk is so desirable from a practical point of view (for it is not my business here to talk of appearance) as gravel when neatly edged with blue Staffordshire tiles. By using the now popular weed-killer these may be kept perfectly free from weeds without the slightest damage, but in the case of live edgings, such as Box, weed-killer cannot be used; and, moreover, they are expensive to maintain, and form a harbour for slugs. Grass paths on a light gravelly soil, when well kept, are doubtless a pleasure to the eye, but the necessary wheeling entails the use of boards, which is costly, and in no case are they suited when the traffic is heavy or constant. I can only hope that the faults of style may be in some measure redeemed by the practical

usefulness of the suggestions which a good many years of labour as a gardener enable me to make.

A vegetable garden, systematically worked and carefully tended, is to me at all times a pleasure, and though it is not to be expected or desired that amateurs should forsake the study of Roses for Cabbages, or of Orchids for Parsnips, yet were they to do so, or to allow the kitchen garden some share of their favours, I am convinced that they would find more interest therein than they anticipate. Moreover, they would get solid results in the shape of useful and wholesome food.

GLOBE ARTICHOKE.

The following alphabetical list of vegetables, with details of their cultivation, will, it is hoped, prove of great practical value to all who wish to extend vegetable culture in their gardens. As Mr. Beckett has mentioned, vegetable growing is not regarded as of great importance; but surely no branch of gardening is more closely identified with our physical comforts or provides food so wholesome and natural. If only vegetables were properly cooked and served their value would be much enhanced, but unfortunately even in the best restaurants they are not appetising, either for the reason that they are too much trouble to prepare, or through crass ignorance of the way to cook them, with the unfortunate result that wholesome and nutritious food is wasted.

Artichoke, Globe.—The true Globe Artichoke, a member of the Cynara family, has very noble cut foliage, and even as a hardy plant is worth growing for its leaves. Plants may be raised from seed sown outdoors or under glass, then, when strong, transplanted out on to deeply trenched soil in rows 4ft. apart, the plants in the rows being 3ft. apart. These may carry flowering stems in the autumn, and it is the flower-head—whilst the chokes or scales forming it are still closed, and therefore unformed—that is cut, cooked, and eaten. Those heads which have the most dense or solid substance in the chokes are best. The plants are perennial, and may be increased in the spring by lifting rooted suckers which are thrown up, and planting them out as before advised. The crowns need some little protection, with the aid of straw litter, during hard weather. The Green Globe is one of the best.

Artichoke, Tuberous.—This Artichoke, commonly but falsely termed Jerusalem, is a member of the great Sunflower family, and indeed is Helianthus tuberosus. It is easily grown, the general culture consisting of planting medium-sized tubers in deeply dug and moderately manured soil in February, and in rows 2ft. apart, the plants being 14in. apart in the rows. Single stems only that reach to a great height are thrown up, and these occasionally produce single yellow flowers at the points, but not often. The summer culture consists in keeping the hoe freely used. When in the winter the stems die down the roots of tubers which are in close clusters may be lifted, the smaller ones put by for planting, and the larger ones consumed. These are excellent in soups or broths. The old red skin variety is most largely grown, but the white variety finds much favour, as it is of better shape, though seldom so large as the red one.

JERUSALEM ARTICHOKE.

Asparagus.—See special article at end of section.

Beans. — Very valuable summer podding crops are these, and furnish varying vegetable material of great excellence. The Broad or Long Pod Bean is much the hardiest, and may be sown during the winter months for that reason.

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Somewhat stiff retentive soils suit this form of Bean best, and it is wise to have them planted, well rooted, and flowered ere hot dry weather sets in, as then black aphis becomes prevalent, settles on the plant tops, injures them by great sap absorption, and this absorption conduces to loss of crop through the non-setting of the bloom.

Beans, Broad, are divided into two distinct sections, that called Broad Windsor having short broad pods, each containing usually two large beans, of which there are pale and green kinds. This form is the most commonly grown for market sale, but the Long Pods are most favoured in ordinary gardens. Apart from diversity of pod, the differences in habit and appearance of plants are trifling. The most widely grown of the Windsor type are the Hartington Windsor and the Green Windsor, the latter being by some preferred because of its deep colour. When the Beans are cooked young they are excellent. After the eyes have become black, if well boiled, then have the skins removed and served up to table with gravy and condiments. The Long Pod section includes more varieties; the oldest is the Early Mazagan, a variety once widely grown, but now displaced by the Early Long Pod, and that capital main crop variety, Johnson's Wonderful. But these, excellent as they are, have been proved very inferior for show purposes, at least (though of great garden excellence) to the Spanish Long Pods, known as the Seville, Aquadulce, Leviathan, etc These all closely resemble each other, flower and pod being quite early, and generally they carry long pods, some exceeding 12in. in length. The Beans are tender and pleasant eating, but neither can be described as good croppers. Broad and Long Pod Beans, being hardy, may be sown in January, and up to April, usually in rows 2ft. apart, the Beans being placed 3in. to 4in. apart in the rows. When the plants are well in bloom it is a good practice to pinch out the tops and thus throw the strength of the plants into the production of fine pods.

FRENCH BEAN, EARLIEST OF ALL.

Beans, Butter, are found in both climbing and dwarf sections, but the climbers are the best. These grow to an average height of about 6ft. if well cultivated, and pod freely. When ready for use the pods, about 6in. long, are of a rich golden colour, and very thick and fleshy. They are cooked whole, being stringless, and when properly served are delicious. The best variety is Mont d'Or. General culture for all climbing Beans should be in the form of either deeply-trenched and well-manured soil, or else trenches 2ft. wide should be opened for each row, the top spit of 12in. being thrown clean out, then a thick dressing of manure cast into the bottom, and this should be mixed well, by deep forking, with the bottom soil. The top soil may then be replaced, and have mixed with it some well-decayed manure. The Beans should be sown in drills 3in. deep, drawn with a large hoe, 6in. apart, down the middle of the prepared trench, and the seeds placed in regularly down each drill, but not opposite to each other, fully 9in. apart. So treated the plants later, being properly supported with the aid of tall, stout sticks or sprayed branches, will grow strong and crop for a very long season. Sowings may be made from the middle of May, generally a safe time, to the end of June. The latter sowings will give very late cropping plants, but these should be grown where some slight protection from early autumn frosts can be conveniently furnished. To secure continuous cropping hard gathering of the pods is essential. Where it is desired to save some plants for seed it is good policy to reserve a portion of a row for the purpose, allowing the pods to harden and mature, and then gathering all others produced too late for the purpose. Growers for exhibition invariably save the finest and handsomest long pods for such purpose, as a few seed-beans so obtained perpetuate all the best features of the strain. These Beans bear liberal waterings during hot, dry weather. A liberal dressing or mulch of manure laid along over the soil on each side of the row is very helpful in checking evaporation and keeping the soil cool and moist.

Beans, Dwarf Kidney. These are usually treated as crops of a more fugitive order, and seldom remain any length of time on the ground. The great facility with which sowings can be made renders it needless to preserve the plants after they have furnished good gatherings. Varieties are numerous, some very early and with small pods being best suited for forcing in pots in houses. For outdoor purposes excellent varieties are Ne Plus Ultra, Mohawk, Long-Podded Negro, Magnum Bonum, and Canadian Wonder. These make an excellent succession if small quantities be sown in this order. The earliest outdoor sowing may be made on a warm border early in May, and if the plants be lightly protected at night for a few weeks, until danger from later frosts is past, they will be carrying good pods for gathering at midsummer. Other sowings may be made every fortnight up to the end of August, as beyond that date nothing would be gained. The drills should be 3in. deep, and from 2ft. for the earliest to 2½ft. apart for the latest and strongest, whilst in the drills the seeds should be placed not less than 4in. apart. It is surprising how far a pint will go when thus thinly distributed. Though Kidney Beans do not need deep, rich soil, yet, like all these crops, they thrive best where the ground is at least deeply dug.

Beans, Forced Dwarf.—Where there are at disposal frames, pits, and houses heated, it is not difficult to have Dwarf Kidney Beans for table all through the winter. A sowing may be made in a large movable frame stood on a warm south border, the soil within being raised a few inches, early in September. Ne Plus Ultra is a good variety for that purpose. Later in the month a quantity of 6in. pots, three parts filled with soil, being previously well drained, should be sown each with about seven Beans and be just covered with soil, then watered and placed on a shelf near the glass in a temperature of from 60deg. to 65deg. Syon House Prolific and Newington Wonder are good for this purpose. Similar sowings should be made at least every three weeks up to the end of January, when Ne Plus Ultra may be again sown. Beans grown thus need ample light and warmth, with occasional syringing and fumigations with tobacco smoke, as aphis and red spider soon breed if the atmosphere be too dry or over-heated. Plants raised singly in small pots and planted outdoors in shelter in April fruit very early.

Beans, Kidney.—Under this appellation come all the tender climbing and dwarf Beans so useful in the summer, and furnishing a large supply of pods over a long season. The Runner, or climbing section, is, without doubt, the most useful, and certainly last longer than any other. Of these the old Scarlet or rough Dutch Runner is most in favour, and is by far the most widely grown. This section is very robust in growth, for if sown thinly and in deep well-manured soil the plants will grow to a height of 10ft. on tall sticks or other supports, and fruit for fully three months. The flowers are scarlet, white, and in the case of the Old Painted Lady both white and scarlet. The scarlet-flowered forms are most liked, but in other respects

the whites and scarlets differ only in colour of flower and of seed. Not infrequently scarlet Beans produce plants bearing white flowers, and a white one will often do the reverse. Former old varieties both of scarlet and white have been displaced by the introduction of such long-podded and very productive forms as Ne Plus Ultra, Hill's Prize, Prizewinner, and Best of All; the former produces pods, when the soil is good and the plants thinly placed, from 9in. to 12in. in length, and yet very tender, fresh, and succulent. Of the white forms Czar and Giant Titan have very fine pods. The old case-knife section of smooth-podded Runners, now seldom grown, have been superseded by the introduction of climbing dwarf Beans, especially the running form of Canadian Wonder, which is also known as Tender and True. This produces long, straight, smooth pods in great abundance, and over a long season when cultural conditions are favourable.

The Bean family is unquestionably one of the most useful of all vegetables for medium-sized gardens, and the Runner kinds may be grown for the sake of their beauty alone, without considering their pods. In quite a cottage plot one may frequently see the fence hidden with the foliage of the Scarlet Runner, brightened with scarlet flowers, as pretty as anything one can well get amongst climbing plants, and lasting in beauty for many months. If the Runner Bean were not of such great value for its crop, it would be treasured as a climbing plant for the garden. Many things grown for their flowers are less interesting and beautiful than this familiar vegetable. So many fail to secure a good crop through not gathering the pods as fast as they have attained some size. When permitted to remain until they have become old and stringy, not only is the plant burdened and the production of pods interfered with, but the pods are less wholesome. Frequent pickings should be the rule. Striving to get pods as large as possible is a fatal policy. This pernicious practice is even increasing, and with bad results. There is naturally a smaller crop, because the energies of the plant are directed to a few pods, and hence vegetable growing becomes expensive and unprofitable. Exhibitions frequently teach unwholesome lessons, by promoting amongst competitors a love or desire for mere size against crop and quality, because, as everyone should know, size does not denote good flavour. Big Beans, Turnips, Cabbages, Marrows, and other vegetables should be discouraged, then will the vegetable garden become more profitable. Of all the forms of Bean, the Runners are of the greatest use to the cottager and amateur gardener who cannot spare much space, becaues the plants can be accommodated in odd corners.

Beets.—Very nutritious roots are Beets, and merit far wider consumption than they usually obtain. Habitually used as salading, yet is cold, sweet, soft, well-cooked Beet very delicious and appetising, especially when partaken of with cold meats for breakfast, luncheon, or supper. The best varieties of to-day are far superior in flavour, colour, and refinement of flesh to those of thirty years ago, especially when well grown. Great size of root is invariably allied to coarseness of flesh and bad colour, hence the seed should never be sown where the soil has been recently dressed with strong manures. The best Beets are always obtained from ground which, having been previously well manured and borne such a crop as Celery, Cauliflowers, Spinach, or early Cabbage, is then deeply dug and thoroughly pulverised and levelled ready for sowing seed. The earliest to sow and to produce useful roots is the Red Globe, a fine selection from the Turnip-rooted of the old Egyptian type, and which has bulbs of a very globular form, deep, smooth, and very handsome. The flesh when fully grown is of a deep blood red, very soft, and refined. Seed of this variety should be sown in shallow drills 12in. apart, and thinly, early in April, as the special object in growing it is to obtain early summer bulbs. Provided the plants are properly thinned when young down to 6in. apart, and assisted by having the hoe frequently used amongst them, they should produce good-sized bulbs to pull by the middle of July, and these should be of perfect form a month later. Not only are such roots specially valuable to furnish cooked Beet thus early, the winter stored roots having become useless, but they are also very helpful in a summer collection of vegetables exhibited for competition. Growers should take care to obtain the true Red Globe stock and to sow thinly, as thick sowing means not only waste, but gives needless labour in thinning the plants later. For furnishing a supply of roots for the late autumn and winter, none are better than the long tapering-rooted forms. These are numerous and good, though some have rather coarse leafage if grown in rich soil. Amongst the best are Dell's Crimson, Sutton's Blood Red, Dobbie's New Turpee, Nutting's Dwarf Red, Pragnell's Exhibition, and Cheltenham Green Top. The roots of the latter have very dark flesh, and it is the most favoured variety in the market. Still, all those named are of first-rate excellence. The best average time for sowing these Beets is from the 1st to the middle of May. Young plants raised from such sowings make quick growth, and, when thinned down to 5in. apart in the rows, these being 12in. apart, also kept well hoed and clean, form by October fresh, handsome roots. Good Beets should be about 10in. long, be fairly broad across the shoulder, and taper off neatly to a point, the skins being clean and free from side roots. They may remain in the ground, keeping very fresh and sweet up till the end of the year, then be very carefully lifted, the leaves broken off, and stored away in sand or ashes in a cool shed for the winter, being occasionally looked over.

Borecoles.—These are essentially winter vegetables, and are at that season very useful, especially in severe weather. Their hardiness is a very striking feature, and even hard weather undoubtedly tends to sweeten and intensify their merits when cooked. There are numerous forms, the best known being the Green Curled Scotch, tall and dwarf; Cottagers, tall and somewhat irregular; Asparagus, Buda, Chou de Milan, Labrador, and a few others. Seeds of all should be sown in April in shallow drills 12in. apart, and in the open ground. When the plants are 6in. in height, and portions of ground become cleared from summer crops, or it is found practicable to place plants between rows of dwarf Potatoes, they should be got out as time permits, and, if the weather be dry, watered in once or twice; but it is wise to take advantage of showers to do so, as then much labour is saved. The rows as a rule should not be less than 2ft. apart. Great size is less to be desired than hardy plants that will stand severe frost well, and continue to furnish head or side sprouts far into the spring. The Victoria Tall Scotch is a fine dense-headed selection, and the Dwarf Green Curled Scotch a valuable variety. For giving late and very delicious sprouts, none excel the Cottagers and the smooth-leaved Asparagus and Chou de Milan, both hardy and very productive. Insects seldom trouble these Kales, hard frost and heavy winter rains thoroughly cleansing them.

Broccoli.—These, like Cauliflowers, do not heart as Cabbages, but produce frothy or marrowy heads of great excellence, and during the winter months. All Broccoli are biennial in habit, and fairly hardy. When the summer is cold and wet and a sharp winter follows these plants suffer severely. After a hot, dry summer harm rarely results. It is wise, however, in planting Broccoli after other crops, such as Peas, Potatoes, Beans, Winter Onions, etc., to put them out on the ground as left firm, without digging it, as that conduces to the production of hard stems and less leafy growth than are usually found when the soil is rich and loose. Broccoli seeds may be sown, as previously advised, early in April for the earliest varieties, and early in May for the later ones, the plants being, when strong, planted out as opportunity offers and plots of ground become vacant. Good early varieties are Christmas White, Early White, and Snow's Winter White, and for main crop the Pearl, Mammoth, and Knight's Protecting, with Model and Late Queen for latest cutting, whilst the first-named should, in ordinary seasons, turn or head in during January and

February; others should come in in succession down to the end of May, and more northerly even later; Methuen's June, a fine Scotch variety, often furnishing good heads in that month. The Purple Sprouting Broccoli, something like a Borecole, is very hardy, and is most useful during the late winter. Seeds of this sown in April and May furnish good mid and late winter plantings. This purple variety is universally grown.

Brussels Sprouts.—Few members of the Brassica family are more useful or desirable than the Brussels Sprouts. This is essentially a winter vegetable also, and may easily be made to furnish sprouts liberally from the beginning of October until the end of March, and even giving numerous delicious shoots later. There

BRUSSELS SPROUTS, EXHIBITION.

are several varieties, the best being true Brussels Imported, Exhibition, Dwarf Gem, and Paragon. The former seems to have originated in Brussels, hence its name. Unlike Cabbages, which give all their present edible produce in heads, and these are cut at once, the Brussels Sprouts produces its small, hard, Cabbage-like heads in clusters up the tall stems, and continues to do so for a long season. To have very early ones seed should be sown in a shallow box in March, the plants being thus raised in a greenhouse or frame. But from an outdoor sowing, made in a sunny position early in April, fine sturdy plants are furnished to get out in June, and these should begin to supply Sprouts early in October. A sowing a month later will help to keep up a late supply of the Sprouts. Plants may be in rows 2ft. apart. The soil should be deeply worked, not over rich, and after the planting is done be made fairly firm, as that conduces to the production of hard stems and solid green Sprouts. These should be round, hard, green, and set as thickly as well can be up the stems. The tops or heads should be preserved whilst sound stems continue to grow and produce Sprouts. Generally for ordinary garden soil the Exhibition is best, whilst for deep, rich soil the Dwarf Gem and Paragon are excellent.

Cabbages.—The varieties of Brassicas, as seen in the Cabbages of to-day, differ most widely from the original parent species, but yet have the somewhat harmonious character of smooth leafage, which is in the process of evolution not only greatly enlarged but is made convertible into solid heart, of which the larger portion is blanched, because so closely compressed and hidden from light, hence it is tender, soft, sweet, and of very pleasant texture as food. Cabbages, too, are very hardy, a matter of first importance, as they produce splendid heads or hearts in abundance, even in the winter, fit for use and in greater plenty in the spring. So much, however, may well be looked for from a descendant of a native species. It is one of the products of Cabbage evolution also that we should have many varieties, although differences may not be material. Some are round headed, some conical, some even more so, some are small and precocious, some of medium size, and some very large, yet the same likeness runs through all. But having so many varieties enables gardeners not only to accommodate area requirements, but also those of seasons and successions. Essentially a leaf-producing plant, presenting a large surface area to the sun and wind, it is essential that Cabbages should have ample moisture for the roots, and not less abundant feeding. To that end soils should, for their growth, be invariably deeply dug or better trenched, and have incorporated into them a good quantity of half-decayed animal manure, both to furnish plant food and moisture. Manure partially decayed furnishes excellent food to the plant for a considerable time, a matter of importance to a crop that must of necessity be some time, if a main crop, on the ground. In raising Cabbages the first need is to sow seed, the variety being determined by the time of year required for cutting. Ordinarily the first sowing of the season may be made in the open ground early in April, and for such sowing excellent are Les Etampes, All Heart, Offenham, and Nonpariel. The sowing should be made in shallow drills 12in. apart and thinly, as so raised the seedlings get far more of light and air than when seed is sown in broadcast form in heat, and not only can be allowed to become strong before removing, but can be lifted with more freedom. All these varieties should be planted out into rows 2ft. apart, and under ordinary conditions should heart in during July, August, and September. But it is during these hot months that Cabbages are less in request, and therefore a sowing of Ellam's Early, Atkins's Matchless, Flower of Spring, or Little Pixie, made early in June and a second one early in July, furnishes plants that, put out into rows 18in. apart, should give abundant heads, that, if small, are delicious eating during the last three months of the year, and even into January. If a further sowing has been made of either of these in early August the supply of heads from such plants may be continued until the end of April. Then for the furnishing of good spring Cabbages of larger form than any of the first varieties named, or if rather larger be desired, Defiance, Imperial, Enfield Market, and Manchester Market, from sowings made at the end of August, will give good results. But whilst in the case of the smallest Cabbages it is wise to clear the ground of the stems as fast as they are cut, ready for some other crop, in the case of the larger spring supply the stems may profitably be left on the ground, as, if the heads be not cut too low down, sprouts break out from the stems, and these give a wonderful produce for several months.

Very often a breadth of these Cabbage Sprouts renders the growing of a special supply of plants for summer cutting undesirable. If seeds be sown in May of the St. John's Cabbage a capital autumn heading variety is obtained. White Cabbages suffer somewhat during hot, dry weather from the attacks of the Cabbage moth, which, depositing eggs freely, soon become caterpillars, and these prey on the leaves most mercilessly, rendering them unfit for food. Hand-picking may do much to get rid of these pests, and sprinkling of fine salt on the heads in the evening, followed by washings of clear water in the morning, do great good. Dustings of lime, soot, or similar products are unfitted for Cabbages, which could not well be removed from them. Where the soil be exceptionally hot and dry it is not wise to grow Cabbages in hot weather. Still, the effects of hot sun may be much mitigated by using long manure for a surface mulch about the plants.

Cabbages, Savoy.—These are readily distinguishable from white or other Cabbages by their corrugated or puffed leafage, showing, doubtless, some association with the old curled Kales. They have the credit of being the hardiest of all Cabbages, but that credit depends very much on the time of sowing seed and the variety. The largest of all is the Drumhead, a favourite with the market growers, being so useful for the production of huge hard heads in the fields. But it not unfrequently happens that if the autumn be mild the heads turn in too early, and then sharp frosts materially injure them. The earliest and smallest is Tom Thumb, a variety that can be planted out at but 12in. apart. Next come the Early Ulm, a little later and larger, and also the Dwarf Green Curled, which being a little larger, needs rather more room, and makes a capital succession. These latter three varieties are much the best, and should be alone grown. Seed should not be sown until the middle of June, so as to have strong plants to put out in August and early September. These would heart in from Christmas on to the end of March, and prove to be most acceptable food. The leafage of these Savoys is soft and marrowy, and has a particular flavour. The large Drumheads are rather strong-flavoured, and emit a strong odour when in the process of cooking. As they heart in at a time of the year when other vegetables are scarce they merit high consideration. Of course planting in the summer depends largely on the weather, but if drought renders the work difficult one or two good waterings soon after planting are of great help in securing root action.

Capsicums and Chilis.—There are numerous varieties of the Capsicum, the Chili being practically a section producing somewhat smaller fruits, and of dwarfer habit of growth. The large-fruited Capsicum is represented by the Giant Red and Yellow; also others, both red and yellow, the fruits of which are of moderate size, and when ripe make the plants distinctly ornamental. Of Chilis, the Coral Red, Tom Thumb, Pigmy, and others are very handsome plants. The fruits of the entire section, being very hot, are used chiefly for pickling, but several make pretty decorative plants. Seed may be sown in shallow pots thinly in March or April, under glass and in a gentle heat. Later, when strong enough, the plants have to be shifted into small pots singly; then finally into 6in. pots in which to fruit. So treated they should be kept in a frame or greenhouse. Plants, when strong, may be turned out of pots on to a warm border, where they will fruit freely.

Carrot, The.—This root-vegetable likes a deep sandy soil, but gardens of course vary greatly, and it is an excellent gardening axiom that where soils are unfavourable naturally they must be rendered suitable by cultivation. Thus we seldom hear of Carrots failing. It is essential to well dig the soil by trenching and manuring, but it is not a good practice, in the case of large roots intended to form the main or winter crops, to have the manure near the surface. Bury it well down beneath the top spit of soil, as in that way the main tap root is encouraged to go down deep, and fine straight roots usually result. If the manure be applied fresh near the surface, it tends to encourage the formation of side or forked roots, which destroy a symmetrical appearance and lead to waste. It is well to let Carrots follow after Celery or a similar crop that has been liberally manured, as in such a case the soil is deep and in good condition. In the case of early beds or warm borders, add some warm fresh manure fairly well buried, this promoting quick germination and rapid growth. The variety used for such sowing should be one of the Short Horns, which should be pulled when quite young and succulent. When the soil upon which the Carrots are to be sown is stiff and tenacious, intermix with it a liberal dressing of wood ashes, burnt refuse, old leaf soil, road or street sweepings, or other gritty materials. Cover up the seeds, after being sown in the drills, with such mixture. Well pulverised soils do not need these gritty dressings, but wood ashes are invariably helpful to Carrots. The earliest sowing should be of the little French Horn or Early Gem, made either in a frame placed upon a dung bed to give heat or in a mere wooden frame placed on the ground under a warm wall or fence, this being nearly filled to the surface with fine soil. In both cases sow the seed thinly in very shallow drills drawn by the hand 6in. apart, covered up, gently pressed, and well watered. Then place a glass light over the frame. Carrots thus raised need no other thinning than is carried out by pulling the strongest as soon as they have made roots about 2in. long, as so grown they are of delicious quality. Such sowings may be made early in January. A successional sowing on a warm border, and in drills of 10in. apart, may be made early in February, but this time use the Early Nantes, a pleasing short Carrot, that usually does not exceed a length of 6in. and does not taper. It is very tender, succulent, and superior to any other Carrot for the table. Those who appreciate this Carrot may make yet a further sowing about the middle of April in the same way, but on more exposed ground, for succession, and, finally, a last sowing about the middle of July on well-dug, thoroughly pulverised ground that had previously carried early Peas or Potatoes. Such a late sowing as this will furnish a fine crop of roots to pull from all through the winter. The rows in this case may be 12in. apart to permit cleaning in between, but the thinning should be moderate as before. Should severe weather intervene during the winter, cover the bed with straw litter, fern, or heather, so that the roots can be pulled as required. What is commonly known as the main crop is furnished by a sowing made in a large bed at the end of March or early in April. The soil for this sowing must be deeply worked and the surface made fine, letting the drills be about 1in. deep and from 12in. to 14in. apart. The variety most commonly sown now is the St. Valery, Matchless, or the New Intermediate, a long tapering kind, that usually produces roots of good size and weight. They are rather too large for the table, but are excellent cut up for soups and stews, and many prefer them when cooked whole. The plants should be thinned early to 9in. apart in the rows, and on no account disturb the soil in the process of thinning, so that it is better to cut off the young ones with a sharp hoe. Loosening the soil about the plants facilitates the attacks of the Carrot maggot. The best remedy for this pest is to dust the rows of young plants frequently with soot, as that keeps off, too, the Celery fly, which deposits on the plants the eggs producing the maggot. An occasional liberal watering with soot water is helpful. Use the hoe freely between the rows after thinning is over, but beyond keeping weeds down little else can be done. Lifting of the roots may be done in November, the tops being trimmed off neatly, and the roots cleansed by rubbing off the soil. Then stack them away neatly in a cool, airy shed in fine sand or ashes for the winter. Carrots sometimes suffer from the attacks of green fly or aphis. The best remedy is found in liberal waterings and soot dressings, as the plants then grow too strong to be injured. The best varieties of Carrots are those named, viz., Early Short Horn or Early Gem, Early Nantes or Early French Horn, Scarlet Champion, a thick blunt

root; James's Intermediate, New Intermediate, rather larger; Long Surrey, a very deep-rooted variety; and Altrincham. These long deep-rooting kinds are less grown than formerly, the New Intermediate displacing them.

KING OF CAULIFLOWERS.

Cauliflowers. — As Broccolis are the hardy section, so are Cauliflowers the tender group, of white-headed plants, and are, too, practically annuals, as all produce their heads for cutting in the same year as the seed is sown, and the early varieties also bloom and seed in the year. The season of the Cauliflower is from the beginning of June until Christmas. A sowing made of such a dwarf variety as the Snowball, Early Erfurt, or Early Forcing, all much alike, in January or February in warmth, enables good stout plants to be secured for planting out on to a warm border in April and producing heads in June. Even a forcing made in a cold house or frame in February gives plants that head in very little later. The seedling plants should be, when 3in. in height, lifted from the seed pans, and be dibbled out thinly into shallow boxes filled with leafy soil, and when strong enough to harden will transplant outdoors with good balls of soil and root. These dwarf varieties may be planted in rows 18in. apart and but 12in. apart in the rows. A further sowing made of the same dwarf varieties, or of Early London, or King of Cauliflowers, in April, will give plants similarly treated to head in during July and August, whilst a sowing of the Autumn Giant made on a warm bed in March will give plants to be put out in rows 30in. apart, and some will head in during September. One later sowing of seed will enable a yet later planting to be made, and if the winter be mild the season of fine white Cauliflower heads is continued even to the end of the year. As the winter approaches, it is wise to draw the leaves of plants that have begun to produce white heads into the form of a cone by tying them with raffia grass or bass, thus helping to protect the heads from frost or excessive rains. Even breaking down a few large leaves over the centres is helpful. In some cases Cauliflower plants of the Early London variety are raised from seed sown in a frame or shallow boxes at the end of August, and later planted out in clumps of five on a warm border, and covered up for the winter with *cloches* or hand-lights. These carry fine heads in the early summer. Plants may also be dibbled thinly into a frame, and then be wintered safely.

Celery.—A most valuable winter salad, and very nice also as a stewed vegetable if the plants have been properly blanched. Whilst the leaf stems are in an exposed condition quite inedible, and very acrid and hard, yet when the colouring matter in them is expelled by proper moulding or earthing up to promote blanching, the stems become white and tender, and really delicious food. Celeries are white and coloured, both being good. Some are dwarfer than others, and these are most suitable for small garden culture, needing less space between the rows for earthing up. Of white dwarf varieties, Dwarf White, Incomparable, White Gem, and Sandringham are good; and of coloured ones, the Dwarf Red and Standard Bearer are excellent. Of later whites, Grove White, Giant White, and Ivory White are good; and of coloured varieties, Sulham Pink, Major Clarke's Red, and Manchester Red are of the best. Celery plants are very easily raised from seed. To secure specially early ones a sowing may be made thinly in one or more shallow pans on fine soil, and be stood in a warm house or frame and watered. Growth soon follows. The plants should then be fully exposed to the light to keep them sturdy, and when 3in. in height be lifted carefully from the pans, and dibbled out 2in. apart into shallow boxes in good soil, kept in warmth until well rooted, then be stood in a cold house or frame for a couple of weeks, and by that time should be ready to plant into trenches outdoors. If the sowing be made about the end of February the plants will be strong enough to put out by the middle of May. Later sowings may be treated in the same way, but any made in April or May will germinate freely with ordinary sun warmth. It is, however, always best to raise Celery plants under glass, as good growth is thus more quickly ensured. In the case of later sowings, the plants may be taken direct from the seed pans, and be dibbled out 3in. apart on to a piece of ground specially prepared by burying just beneath the surface a dressing of decayed manure, the soil being gently pressed down and levelled. Here, planted, watered, and shaded for a week or so, the plants soon get hold of the manure, and become very stout and sturdy. They can be lifted with good balls of soil and roots, and be planted into the prepared trenches without suffering from the transition. In sowing seed it is much better to do so thinly, raising 100 plants in a pan where very commonly 300 are found crowded, as crowding and starving them in their early stages is often productive later of soft pithy stems and early bolting off to flower. If Celery be planted out in trenches in hot weather, besides giving the plant a good watering it is well to throw pea sticks across the trenches, and on them mats or canvas during the day to protect the plants from the heat. They recover much sooner from the transplanting if thus protected from the sun. As a rule, Celery is grown in trenches, and for two reasons—first, trenches facilitate moulding up the stems later; and, second, plants in trenches may be more effectually watered in dry weather. Celery plants are gross feeders, and will readily absorb water, whether clear or in the form of liquid manure. But the digging of trenches may much depend on the nature of the subsoil. If that be clay or gravel, or poor and devoid of nutriment, it is often best to plant on the level. But where ground has been from time to time trenched and well manured, the soil is throughout in good condition, or where the subsoil is poor and trenches are desirable, then it is best to throw out the top spit from a trench 18in. wide on to one side and the bottom spit on to the other side. Then throw in the top spit, and with it mix a heavy dressing of half-decayed manure. Then fork in from the sides at top a little more of the soil, and plant. Moulding up should not be hurried. Plants should be well fed, and encouraged to make strong growth, and when that is formed a dry day should be taken advantage of—a good soaking of liquid manure having been given overnight—to first gather the leaves up together and put round them a loose tie of bass, at the same time pulling away from the base of each plant any short leaves or suckers that may have formed. Then with a fork loosen the soil, and place some 5in. to 6in. of it close up to the plants. Repeat this a couple of weeks later, and so continue to do the work gradually, until each row is banked up neatly and firmly on each side, making a sharp solid ridge

of soil well patted and smoothed off to throw off rain. Fully six weeks should elapse from the final moulding before the ridges are broken into. Very fine early Celery for exhibition could be obtained by binding bands of brown paper about the stems, and in such case feeding with liquid manure can go on to the last moment. In very severe winters it is wise to give the Celery ridges some protection by placing against them Fern or long litter, or else thatched wattle hurdles to ward off frost.

Chicory.—A British plant found abundantly on our chalk soils, carrying pretty blue flowers, yet few seem to care to cultivate it. With that great salad-loving people, the French, it is in great favour, and would be in Britain were it better known. The two chief varieties are the common Chicory or Barbe de Capucin and the Witloof or Brussels. The latter is the finest. Both, when well grown in gardens, furnish roots that in warmth and in soil such as is needful for Seakale forcing soon produce blanched leaves and stems some 6in. high that form most delicious salading, and with plenty of roots put into a dark warm place in batches a supply can be kept up for a long time. Of course darkness such as is found in a cellar or other close place is essential to perfect blanching. Seed should be sown in well-prepared garden soil in April or May, in rows 12in. apart, the plants when up being thinned out to 9in. apart. Late in the autumn the roots should be lifted and laid in thickly, then put into boxes of soil and stood in warmth to blanch as needed. A very gentle heat suffices to promote growth, as the temperature of a cellar is always much higher than is that of the open ground in winter.

Coleworts.—These constitute a distinct and very useful section of Cabbages. There are two forms, the Hardy

HARDY GREEN COLEWORT

Green, which closely resembles an ordinary small Cabbage, and the Rosette, which has broad flattish heads. Both are good, and may be planted quite thickly, say 14in. apart each way. The seed should be sown about the middle of June to have strong plants to go out at the end of August or early in September, and these will give off their soft, marrow-like hearts during midwinter. Their flavour is distinct from that of the Cabbage, and, being hardy, they are very valuable winter greens. Red Cabbages grown for pickling are of two forms, the oldest being the Large Red, a very strong, coarse-growing variety, that takes a long season to produce heart, and needs ample room. This variety will, in deep, rich holding soils produce heads weighing from 6lb. to 9lb. But for all ordinary purposes the better one is the Dwarf Blood-Red. This is dwarfer, redder, much less coarse. It occupies less ground space, also hearts in earlier, the hearts being very solid, and of a deep blood-red colour. It is the rule to sow seeds of these varieties in April, as before advised, putting out plants into good soil in June, and they head in early in August and during September and October, according to variety. No one who once grows the Dwarf Blood-Red variety would grow the old coarse red one afterwards. The plants of the one should be put out in rows 2ft. apart, and of the other nearly 3ft. apart, as the leafage is so large.

Cucumbers.—Because a tender member of a large family, the Cucumber must of necessity, in Great Britain, be grown under glass, with the aid of warmth chiefly furnished artificially. Ridge Cucumbers, a rather hardier section, and Gherkins for pickling are grown outdoors under special conditions of culture, such as selecting for them warm situations. Giving them shelter from cold winds, sowing or planting on moderate soil ridges, some 3ft. in breadth, beneath which has been placed some warm stable manure, and securing the best possible growth. After spring frosts are over and before those of the autumn come, the culture is simple, and, on the whole, it is best to sow in small clumps 2ft. apart along the top of the ridge, five seeds, covering them up with hand-lights, or other simple protection, for a time, especially at night, and if all the seeds grow pulling out a couple and leaving three. These having their growths neatly spread out and, if they come too freely, properly thinned, will soon carry fruit. These, however, may be fair or poor according to the season, for it is only during warm summers that outdoor Cucumbers thrive. House Cucumbers include all the very best-known varieties, and generally these produce fruits both smooth and shiny, of divers lengths, ranging from 10in. to 20in., and, if desired, even longer. Fruits, however, ranging from 12in. to 15in. are, on the whole, the most useful and profitable. Colour is an important feature, and the skin should be dense green, but so far as flavour is concerned, little difference is found in pale or green fruits, or in those that are smooth or shiny, whilst excellent Cucumbers may be grown in an unheated greenhouse or frame. During the summer artificial heat furnished either by hot water piping or a dung bed becomes indispensable for their production in other seasons. House culture is the most favoured now, not only because the warmth can be easily and not expensively furnished with a proper apparatus, but it can be regulated according to needs and seasons. That a dung bed cannot be; as a rule it is better at the beginning and becomes cooler as time passes and the plants greatly need warmth. A proper Cucumber house for winter forcing should be either of span form or a lean-to, that is, a house erected against a wall for its back, and should be partially sunk in the ground, as so built much less surface is exposed to the weather. Where there is no south wall to build against in sloping form towards the sun, then it is best to have a low span house about 12ft. wide, the sides standing 3ft. from the surface, and the ridge, or roof centre, some 5ft. high. To give ample head room within, the centre walk or alley of the house, entered by a centre and sunken door, should be quite 2ft. lower, cut literally out of the earth, the soil on each side being left to form stages or shelves. Steps at the door and outside enable the lower level to be reached. The path should be fully 2ft. wide, and the soil on either side fastened by 4½in. brick or concrete walls. Unless the subsoil be naturally well drained, a sunken path should not be made unless beneath a drain put in carries off all water and keeps it dry. In putting in heating pipes, two of 4in. should be run along on the soil bed 12in. from the side of the house and on each side, and return one over the other on each side of the alley or side by side on the top of the brick sustaining walls. Every care must be taken to secure a gentle rise to the farther end of the house, where the turn in the pipes takes place, and a gentle return fall. The pipe force seems considerable, but when in severe weather in the winter it is found needful to keep up a temperature of from 70deg. to 80deg., only by the aid of ample heating force can this be done. On stout cross bearers fixed just over the side pipes may be laid troughs or long shallow boxes with trellis bottoms 20in. wide, and inside 8in. deep. Into these should be placed first coarse pieces of turf to keep in the fine soil and allow the heat from the pipes below to pass into the soil and warm it. Then fill up the troughs or boxes quite an inch higher in the centre with good turfy loam, fairly firm in texture, with

which is mixed a proportion at the rate of one-sixth of half-decayed stable or hot-bed manure. A very light dressing, such as one pint to a barrowload of any artificial manure or guano, will do good. Plants should be raised in a small house well heated. The seeds are best sown thinly in 6in. pots that have been well drained, then filled with light soil. If dibbled in thinly over the surface with the point of a finger to the number of a dozen, there is no fear that the seedlings will be unduly crowded. Good seed in a temperature of 75deg. should have germinated within a week, and the young plants may be lifted with great care and shifted singly into quite small pots at once, using warm soil and keeping them in heat. Ten or fourteen days later these plants, if the fruiting house is ready for them, should be fit to plant out into the troughs, as nothing is gained by keeping them in the pots. In planting, bury the stems 1in. or 2in. in the soil if they be long, as side roots are soon emitted. The plants should be put out about 15in. apart in one line in the centre of each trough, and a little mound of soil drawn up round the stems helps to keep off water and check damping. The water given to the soil, and at first not too freely, should be of the same temperature as the air of the house. Beneath the sloping roof on each side, and fixed by long holdfasts to the bars or rafters, stout wires should be placed at intervals of 10in., running lengthwise. These should be fixed fully 10in. from the glass. The lowest wire will be hardly more than 12in. from the centre of the ridge of soil in which the plants are put out, and as growth ensues the shoot from each plant soon reaches it. This shoot should, for the time, be supported by a small stick. When the wire is over-reached the point of the shoot should be pinched, and almost immediately there will break out two or three shoots. These as they grow must be carried up the wires several inches apart, and be later pinched again to induce side shoots to break out from them, on which fruits will come. It is later essential that these shoots do not become too thick. Any not showing fruits should be pinched out, and where there are many fruits these should also be thinned as they swell, lest the plants be over-cropped. Artificial fertilisation of the female flowers, with pollen taken from the male blooms, is not only needless, but harmful if done for fruits that are required for table use. To obtain seed, however, a female flower must be so fertilised; but, except Cucumbers be grown specially for seed—work best left to experts—one fruit will usually suffice to give many more seeds than any ordinary private grower can need. When the plants become strong, roots fill the soil, and may be seen like white threads on the surface. In such case an occasional very light sprinkling with artificial manure or watering with liquid manure or soot-water once a week will do great good. Plants kept well thinned and not too heavily fruited, also regularly fed with manure, will carry crops over a long season. In such a house one side may be removed and replaced by a fresh lot of plants and with quite fresh soil, and thus carry Cucumbers over the whole year. In the case of a lean-to house only one side-bed for plants is needful, and the treatment generally should be the same.

Cucumber culture in frames, on dung beds, differs from that in houses, as not only have the roots much greater soil room, but the growths run over the bed, and are far less readily looked after. When a dung bed has been properly made up, and a frame placed over it, a body of turfy loam is placed in a mound in the centre of the frame, or of each portion of the frame, some 5in. in depth in the centre. An inch depth of soil may be strewn over the manure when the strong steamy heat which usually results from a fresh-made dung bed has lessened; the plants may be put out in the centre of the mound, either in pairs or trebles, according to the rise of the frame or of each partition. It is best to cause the plants to lie rather slantingly in planting, rather than to be erect, as in that way the shoots that run out over the soil do not bend the centre stem. One or two pinches suffice to cause several shoots to form into branches, but the thinning and general attention have to be the same as in a house. As the roots come through the mound of soil fresh soil should be added. Whether in houses or frames Cucumbers like a moist atmosphere, and therefore should be sprinkled or syringed once or twice a day. A very dry air soon breeds red spider, a pest that is very destructive. Good varieties for both house and frame are Telegraph, Lockie's Perfection, Rochfords, Express, Model, Peerless, and Marvel.

Dandelion.—Although this belongs to a diverse section of root-producing plants to that of Chicory, yet is its general treatment much the same. Seed can be purchased, if needed, although it can too often be easily saved in the country. Sow in April in rows 12in. apart, and thin the plants later out to 6in. apart in the rows. If the soil be deep and well manured, roots will become strong and leaf growth also. But care should be taken to keep all flowers picked out, lest seed be produced that may create trouble. In all other respects treat just as advised for Chicory. The bitter taste found in the leafage when green is almost entirely absent in the white or blanched leafage, and thus it constitutes delicious salading.

Egg Plants.—These are members of the large family of the Solanum, and are best known under the French name of Aubergine. They are easily raised from seed if it be sown in pots in April and stood in a gentle heat to help promote quick germination and growth. The little plants need to be lifted carefully from the seed pots and pricked out into quite small pots singly. The soil used should be one-half well-decayed leaf mould, the rest of loam and sand. As growth ensues, repotting is needful until the plants are finally got into those from 7in. to 8in. in width. When well developed in warmth, being kept near the glass, the plants will fruit freely during the summer in an ordinary frame or greenhouse. They should have for the final potting fully two-thirds loam, the rest being old hot-bed manure and sand. Plants that have flowered will often ripen their fruits if plunged into a warm border or bed of ashes outdoors. Water is needed freely in hot weather. The best varieties are the White Egg and the Long Purple.

Endive.—There are but two really of these leaf salads, the broad-leaved Batavian and the Moss-curled. Both are hardy winter salads, and whilst hard, bitter, and unpleasant to eat in a green state, are tender, crisp, and even delicious as food when properly blanched. Seeds of both may be sown outdoors about the middle of July, and again the first week in August, to furnish a succession. Sow in shallow drills 12in. apart, and thinly. When the young plants are strong they should be put out on to a sloping border or raised bed in rows 14in. apart. It is desirable that the permanent beds be arranged in a sloping way, as otherwise the winter rains might do much harm. In the late autumn the broad-leaved plants may be tied up as Lettuces are, to blanche the hearts, and the dwarf curled ones be blanched by having boards, slates, saucers, or other articles laid over them to exclude light and air, or from time to time as needed. Some of the plants may be lifted with good balls of soil attached, and be transferred to a dark frame for blanching, or into a cellar or dark shed. So long as light and air are absolutely excluded, blanching soon follows, and in that way salading of the most acceptable kind is produced.

Herbs.—Garden Herbs are usually divided into those which are used to furnish flavouring in ordinary cooking, and those which are distinctly of a medicinal order. Formerly this latter section was very extensively grown, especially Rue, Horehound, Tansy, Pennyroyal, Peppermint, and Wormwood. These do not materially enter into the term Herb as understood to-day, for the true garden Herb is employed almost exclusively for flavouring purposes. The best of the garden Herbs now are Parsley, Thyme, Mint, Sage, Marjoram, Savory, Tarragon, and Fennel. Parsley is easily raised from seed if it be sown in shallow drills singly beside walks. The seed should be sown thinly, and the young plants thinned out later to 6in. apart. It is well to make one sowing early in April, and a

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second one in June, to give ample pickings all the year round. Thyme is of two forms, the common, which is rather erect in habit, and Lemon, which has broader leafage, and may be used for edgings, keeping it hard trimmed. Both are easily propagated by means of cuttings put into pots in sandy soil in August and stood in a close frame, or put in under a hand-light. The old plants, if lifted, pulled to pieces, and replanted, also readily increase. The best Mint is that known as the Green Spear, having pointed leafage. This can be easily increased by inserting the shoots, when 3in. high, as cuttings, in sandy soil and under glass. Also if the running roots be lifted in the winter, broken up, and replanted, each piece will soon grow. To make a bed in this way, deeply dig and manure the soil, then shovel off 1in. of the top soil, place the roots thus broken up evenly over it, spread the removed soil over, and gently pat it down. Do this in February. Sage is of a hard and shrubby nature, but it can be raised from seeds, by putting in tops as cuttings early in the spring or in the autumn, or by lifting and pulling plants to pieces and replanting them with or without roots, as they will soon make progress. Marjoram and Savory are easily raised from seed sown in drills 12in. apart in April. The plants should be well thinned whilst yet small. Tarragon can be increased by division of the roots, and Fennel comes easily from seed. The latter is a tall plant, and one or two plants usually suffice to supply all ordinary domestic wants. Most of these herbs are useful for winter purposes; also, in a dry state, if, when the plants seem in bloom or about at their best, they are cut over, or only partially so, and half dried, then tied up in large paper bags and hung up in a dry room; the leafage can be rubbed up small and be used freely in soups or other kitchen compositions. Herbs generally should be grown by themselves, be kept quite clean from weeds, and have such small attention in hoeing and weeding as they may need.

Horse Radish.—This is frequently much esteemed, especially to accompany roast beef; but its method of culture certainly needs improvement. Everything in the garden, no matter whether vegetable or fruit, should be well grown or its culture not attempted. As a rule, Horse Radish is placed in an out-of-the-way corner, where it is almost forgotten, and gives poor sticks, unlike the excellent material obtainable when the soil is well prepared. The ground should be open and good, and well trenched, with a layer of decayed manure in the bottom of each trench. Plant the roots in the early year, and they should be straight and about 1ft. in length. A foot apart each way is the proper distance to put them. The general rule is to dig up the roots as required, but good gardeners lift them and store in sand, when they can be used as wanted. This is a far better way.

Kohl Rabi.—This very curious member of the Brassica family, commonly grown as a cattle root, has undoubted edible excellence, and when seed of such varieties as the Early Green or Purple is sown in April on good garden soil there is no difficulty in securing nice roots that, having developed quickly, are tender and when cooked distinctly pleasant eating. Seed should be sown in shallow drills where the crop is to remain, the drills being 14in. apart. The plants need thinning down to 10in. apart in the rows. But where it is preferred to sow in beds, and transplant, the stems should be fixed into the soil quite shallow, as the edible portion, like the Turnip, swells above the ground. The roots have a distinct pleasant flavour, and should be eaten before they become too hard. Roots may be pulled early, and having been trimmed may be stored in sand in a cool dry place, and thus be available for use during the winter.

Leeks.—These are plants that, whilst easily raised from seed, can only be presented fit for table use after some labour and care have been bestowed upon them. Practically, like some other plants of which the stems constitute the edible part, they need blanching, so that the stems may be tender and pleasant eating. There are two or three varieties of Leeks, but these differ only slightly, and even then much depends on the kind of culture bestowed upon them. The chief difference lies in the length and breadth of the stem, one variety usually having a stout and short stem, the other smaller and longer. Perfect Leek stems, as seen at exhibitions, are about 1in. through, and some 12in. to 14in. blanched, being also perfectly firm and of the purest whiteness. To get Leeks early it is well to sow seed in a pan or box in March, to place it in a warm house or frame, and when the seedlings are 4in. in height to lift them with care from the seed pan, and dibble them out at 2in. apart into shallow boxes in good rich soil, and still keep them in warmth and near the light, so that they keep strong and erect; then, later, put into a cold frame for a week, and when hardened they may be transplanted out into the open ground for summer growth. To secure fine early stems throw out the top spit of soil from a trench 20in. wide on one side, and break up deeply the bottom spit, a good dressing of half-decayed manure being mixed with it; then one-half of the top soil should be put back, and more manure forked in with that. The plants may then be put out in one row down the centre of the trench, a shallow drill being drawn with a hoe for the purpose. The plants, being carefully lifted from the boxes with good balls of soil and roots, should be planted at 12in. apart and firmly, a little top soil being put in about them to keep them erect. As the plants get good root-hold, occasional soakings of liquid manure may be given, but not too near the stems; indeed, a moulding-up process, which may be done gradually; water should be given in furrows made a few inches from the plants on either side. An occasional dusting with lime helps to keep down slugs. In a few months fine, well-blanched stems should result. For succession make a sowing a month after the first, treating the plants in the same way; and for late winter purposes it is well to make a sowing outdoors early in April, so that the plants may be strong to put out on a good deep well-manured soil about midsummer or a little later, these being dibbled out deeply into rows 20in. apart. If the plants be put into the ground several inches, a moderate moulding-up suffices to obtain nice medium-sized stems, well blanched, some 10in. to 12in. long. These, too, will stand an ordinary winter very well, and when of about one-half the dimensions of the large exhibition stems are much sweeter and pleasanter for cooking and eating. Leeks are undoubtedly delicious vegetables when well grown and properly cooked, and should be far more widely grown. Probably too few persons have learned to appreciate them in England, but they are highly esteemed in Scotland and Wales. Popular varieties are: Prizetaker, Champion, and Lyon.

Lettuces.—Whilst of these leaf-salading vegetables there are but two distinct forms, there are many varieties. The forms are the Cos or erect growers, and the Cabbage or close, compact growers. Of the former there are brown or dark coloured, and green; of the latter, brown and pale green, and also smooth leaved and rough or curled forms. Cos or tall Lettuces are most generally grown, the best for winter purposes being Hardy Green and Black-seeded Brown Cos as the hardiest, whilst for summer use none are better than the Paris White, of which there are several so-called stocks, differing only in name, and the Champion Cos, a very tall and superb Lettuce, but rather long in coming to perfection. Of the Cabbage varieties, excellent for winter planting are Hardy Hammersmith, Grand Admirable, and All the Year Round, and for summer use Stanstead Park, All the Year Round, Leyden, Model, Continuity, and Crystal Palace are excellent. The latter three have somewhat curled leafage. Lettuces like rich soil that is deeply worked and well manured. It is important, especially during the summer, the time of year when such cool salading is most in request, that it shall be crisp and tender, and that condition can only be assured when the growth is rapid and unchecked. Sowings should be made in February and March, in shallow pans or boxes under glass, and thinly, to enable the seedling plants to become strong before being planted out. From early in April on to the end of September small sowings

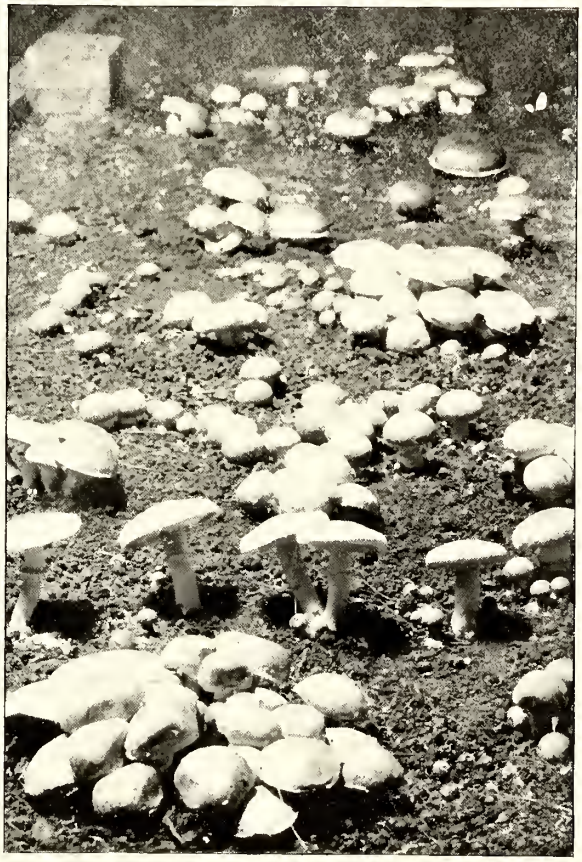
LETTUCE, MAMMOTH WHITE.

should be made, once or twice a month, so as to ensure a constant succession of plants for putting out. These sowings may be made outdoors, the small seed beds being watered and shaded until germination has taken place. One sowing, made in a small frame near the glass or under a hand-light, of Hardy Green or Paris White Cos, the plants being kept in the frame all the winter, furnishes plenty of sturdy plants to go out towards the end of March as a succession to those planted out in the autumn. Cabbage Lettuces heart in of themselves well. Cos Lettuces are helped to heart in if the leaves be drawn together, not too tightly, with bass. But all good strains naturally heart in if time be given them, and on good soil produce large, solid, white hearts, very tender and crisp. Young plants should be lifted from seed pans or beds with the aid of a small stick, the soil being watered a few hours previously to moisten and soften it. The usual rule is to plant in rows about 12in. apart, the plants being the same width apart in the rows. In hot, dry weather it is a good practice to draw shallow drills with a hoe, to flood them with water, then to plant after the water has well soaked in, filling loose soil about the plants afterwards to check evaporation under hot sunshine.

Maize, Green.—An undoubted delicacy in America, yet this vegetable has not caught on in Britain, the result, probably, of the method of consuming it, which is not too refined. The cobs are gathered whilst the corn on them is green but has somewhat hardened; these are stripped of their sheaves, trimmed, washed, then boiled, and served to table whole, usually with melted butter. But it is difficult to remove the corn from the stems, except by holding the ends of the cobs in either hand and biting it off. This is hardly an acceptable process. Nevertheless this green corn is, when well grown and properly cooked and served, delicious. Any early dwarf variety will cob well here if seed be sown in a pan or shallow box thinly in April under glass. When the plants are 4in. in height they should be put singly into small pots, and at the end of May they will be strong enough to plant out singly into mounds 2ft. apart each way, on soil that has been deeply dug and well manured. Late spring frosts should always be avoided.

Mushrooms and their Culture.—There are various ways by which these excellent edible fungi may be grown, though in no case can better produce be obtained than Nature brings so lavishly in certain seasons in meadows and pastures, generally in the autumn. But by the aid of artificial culture Mushrooms may be had almost all the year round. The chief need to this end is found in having a properly constructed and heated Mushroom-house, which should be quite dark, have external air excluded, and be so warmed that a fairly high temperature may be obtained all the winter. The best form of structure is a stout lean-to shed erected against the back wall of a vinery or other forcing house, because in such case one back wall serves for both houses, and it is easy to secure from the same heating apparatus the needful hot-water service and heat. A Mushroom-house may be about 9ft. in width, having stout wooden shelves 3ft. wide, and fixed at about 24in. apart, one above the other. In this way there may be a floor-bed and three shelves at the back, and a floor-bed and two shelves in the front. The alley running down between the shelves should be fully 2½ft. wide to enable a wheelbarrow to be brought in for removing or introducing manure and soil. Beds are made up in succession, the earliest for the winter made perhaps about the middle of August, and fresh ones each month or six weeks as may be found needful or desirable. The shelves should each have a stout wooden edge, some 6in. to 8in. deep, to retain the manure when the beds are formed. The manure with which to form a Mushroom bed anywhere should be from stables, and only where horses are quite healthy. Using manure from horses taking medicine is very injurious to the spawn, often causing complete failure. This manure should be collected fresh every day, and be thrown into a heap, either under a shed, or, if outdoors, where a few mats can be placed over it to throw off rain. The longer portions of straw should be shaken out and dried for other use; then, as the heap accumulates, a long stick should be thrust into it to enable its condition as to fermentation to be discovered. When the stick becomes well warmed the heap should be turned, the outer portion being placed within during the process; and should the manure show signs of dryness, a few cans of water should be poured over it with a rose to distribute it thoroughly as the turning proceeds. It may be needful to turn the heap in this way twice or thrice, but the greater care exercised the longer will the bed when made up retain heat, and the more satisfactory will be the spawning. The manure thus prepared should now be placed on one of the Mushroom-house shelves, and be well beaten down; a solid bed of from 10in. to 12in., if possible, may be made over the entire shelf. It will certainly settle down 2in. or 3in. later. Then, when the heat is well up, which will be in a few days, but not dangerously hot, the surface of the bed may be spawned. For this purpose Mushroom spawn cakes should be purchased, either by weight or number, from some reliable dealer, and it should be fairly new, or at least not more than a year old. These cakes may be each broken or cut into pieces about the size of a hen's egg, one cake making about eight, and these pieces, with the broad flat side upwards, should be hard pressed into the dung about 8in. apart, all over the bed. Then a coating from ½in. to ¾in. in thickness of good loamy soil, free from weeds, seeds, and insects, should be laid on, neatly patted down, and the whole well saturated with tepid water. After drying off a little cover up the bed with the long straw litter shaken from the manure and dried. Occasionally the bed should be examined, and if found dry a gentle watering given, and in from six to seven weeks Mushrooms should appear, and pulling may go on for

some two months. In the meantime, other manure may be collected and prepared for a second bed, and so the process would go on till April. Then indoor bed making must cease, unless a deep cave or cellar is available, as hot dry weather is not conducive to the production of good Mushrooms by artificial cultivation. Mushroom spawn cakes are made by expert manufacturers, and cannot be produced with appreciable success by amateurs. They are fairly cheap, and it is wise to purchase them fresh, as needed. Carefully examined when broken, the cakes are found to contain a quantity of white thread-like growth, which is the fungus mycelium. When put into the manure bed, and warmth and moderate moisture are furnished, this mycelium soon runs all about the bed, producing spores in all directions, and from these spores emanate the clusters of Mushrooms that presently appear. It is not well to cut them, but they should be neatly pulled by twisting the stems slightly, and they then part from the bed and without injuring the mycelium. To have Mushrooms on outdoor beds it is needful that the manure should be prepared in the same way as indicated to secure successful results indoors; but it is desirable that there be greater bulk. In this case beds are usually made up from the beginning of September until the month of April. They are of ridge form, having a base of about 2ft. 9in. broad and the same in height, narrowing towards the top, which is rounded. The beds should be built up on a dry gravel or ash floor, and very solidly, the manure being trodden in the erection. When complete — and the length of the bed must be determined by the quantity of manure provided, then neatly finished off—it should be allowed to heat, which it will do gradually. The stick test may here be easily applied also. When warmth is good the surface should be spawned all over as advised for indoor beds, and also be coated with loamy soil that is fairly adhesive; then give a moderate watering with tepid water, and the bed should be at once covered up with a coating fully 10in. thick of straw litter or similar material. Beds made up in this way to stand through the worst winter months should have mats or specially made canvas covers placed over them to throw off rain and snow, also to protect them from cold winds. Poles or strips of wood tied to the covers keep them secure in windy weather. Much depends on the condition of the weather, but, as a rule, fully two months elapses ere Mushrooms are ready to gather. The usual practice is to begin pulling at one end, clear off all large enough for use or sale, then give the beds a gentle watering and re-cover with the straw. Well-made beds, properly spawned and cared for, will give Mushrooms for from two to three months. Cases have occurred where beds insufficiently protected have been in hard weather frozen right through, then when a thaw has ensued they have gone on cropping for some time after.



MUSHROOMS

Outdoor beds may be made up under a wall, the faces having a slight slope to the front, and when so sheltered prove very successful. No matter how or where made, it is essential that the manure be prepared properly, that the beds be made up solidly, and that heat be gentle and not fierce, as a fierce heat may burn the spawn or mycelium. The spawn cakes must be fresh and good and the spawning properly done. Soiling over is essential, and should always be with mould that is free from weeds and stones and readily adheres to the manure. Finally, there must be no sparing of ample covering. Nothing is better than the long straw shaken from stable manure and dried in the sun. Hay is not advisable, because it is more brittle and often full of weeds. A little experience, provided ample materials be at disposal, soon enables even a tyro to grow Mushrooms outdoors successfully.

Mustard and Cress.—This estimable and rapidly-grown salading can be had all the year round where there are warm glasshouses or frames at disposal. In market establishments it is not the hot and more expensive Mustard, but Rape which is grown as such, and as this is cool rather than hot, and is so much cheaper in seed form, it answers all purposes. Private growers can produce this salading best by using a number of shallow wooden boxes about 3in. deep and of any size. These should be filled with a compost one-half turfy loam, the rest being old hot-bed or Mushroom-bed manure, well mixed and put into a heap, and occasionally turned a few months before using. To keep up a constant supply, a couple of boxes should be filled with soil and sown about every four days, one of Mustard or Rape, the other of Cress. The seeds may be soaked in water a few hours, then drained dry and put thickly over the soil in the boxes. This should be almost level with the top edges and quite even. The seed should be well pressed down, gently watered, and stood in warmth, then covered over with paper to exclude light, as in that case growth is quicker and the stems more tender. The plants will lift the paper, and in some six or eight days, in good warmth, the salad should be ready for cutting. When done, the boxes should be emptied and washed, then dried, and they are fit for further use. Mustard and Cress may be grown in shallow drills outdoors, but should always be covered up with paper. A hand-light or large *cloche* is useful also for promoting rapid growth, but there is no method better than the box system, especially when houses or frames can be utilised for the purpose.

Onions.—Although classed with edible roots, Onions are not only true bulbs but are really distended stems, swollen out into huge dimensions in some cases, and produced on the surface of the soil. In their wild state—and that was long since, for Onions have been cultivated several thousands of years—no doubt the rounded or swollen stem was of small size. Selection and cultivation, however, have changed the nature of the plant so much, that rarely are large stems seen now, the energies of the plant being devoted to the production of fine bulbs. These differ more or less in size, form, and colour, but the growing plant exhibits very little distinctness. The bulbs differ considerably in shape. One variety, the cocoa-nut, is quite long and narrow, being pointed at both ends. The majority of the bulbs of all shapes when ripe are brown in colour, some, however, having on the brown skin a reddish tinge, others a shade of yellow. The ground colour also varies, some being pale, some dark. There are two deep red-coloured varieties, the Old Blood Red and the Crimson Globe. There are several white-skinned varieties, such as the little Silver Skin, the Queen, White Lisbon, or White Tripoli. All these are of a very soft, watery nature, and decay rapidly when once ripe. The brown or shaded brown skinned varieties are those most generally grown, and first-rate stocks are Banbury Cross, Main Crop, Sutton's A1, Lord Keeper, Giant Zittau, and Anglo-Spanish rounds; whilst fine oval or globular stocks are Ailsa Craig, the finest of all varieties, the Wroxton, Cranston's Excelsior, Sutton's Globe, Carter's Record, and Dobbie's Golden Globe. Older varieties, such as Bedfordshire Champion and James's Keeping, whilst still good, do not give such fine bulbs as newer varieties. Onion seed is habitually sown at three diverse periods or seasons—outdoors in August, usually about the 20th, to secure fine bulbs in the following summer, chiefly for exhibition, or in the spring, at the end of March or during April, for the production of fine ripe bulbs in the autumn, for storing through the winter; then sowings are commonly made now at midwinter in pans filled with sandy soil, and placed in a frame or greenhouse where there is a gentle warmth of from 50deg. to 60deg. Such raised plants put out thinly into soil specially prepared by deep working and manuring produce quite large bulbs in the autumn, that fine variety Ailsa Craig often giving produce of the weight of 3lb. and over. Whilst any variety so raised and treated produces fine bulbs, the best are from such superior stocks as have been previously named. Autumn sowings are always made of the large but soft bulbed Tripolis or Roccas. These, however, very soon decay after ripening, and are then often worthless before they can be used. It is now proved that, if autumn sowings be made of the best brown-skinned varieties, whether round or globular, not only are very fine bulbs produced in the following summer, but also that they keep better, and are therefore far more valuable. Still farther, if in thinning the rows of plants in March or April some be lifted with special care to preserve the roots, and be dibbled out 6in. apart in good ground, they will also produce exceedingly fine bulbs. In all cases of open-air-sown Onions the rows should be fully 12in. apart. Spring-sown seed should be got in early if the season be open and the soil fairly dry and in good condition. As in sowing much treading is needful, it is obvious that to do so whilst the ground is wet would be productive of evil. Generally early sowing not only results in giving strong plants to stand the summer heat, but also in making the plants strong and hardy early, enabling them to withstand the attacks of the Onion fly, a pest that never troubles autumn sowings or those plants raised under glass and planted out when strong. Freely dusting the rows with soot when the plants are damp, and washing it in with liberal waterings the next morning, is good practice, as the soot renders the plants nauseous to the insects, and when washed into the ground promotes quick growth. Through the summer, after proper thinning has been performed, the chief need with spring-sown Onions is to keep the surface well stirred with a hoe, as such practice checks evaporation and retains moisture. A thin dressing of sulphate of ammonia applied twice during the summer, and good weeding, are also helpful to bulb production. Winter-sown Onions under glass need much more care and attention than do outdoor-raised plants. Sowings of seed should be made in pans filled with light sandy soil at the end of December or early in January. These pans should be stood near the glass, and in gentle warmth. When the plants are some 3in. high they need to be lifted very carefully and pricked out 2in. apart into shallow boxes filled with good fine soil, and be still kept in warmth until 6in. in height, then placed in a frame looking south, where they can have more air, and finally be by greater exposure well hardened off, ready for planting outdoors in April. Such plants should be quite stout and firm, also erect, and fully 8in. in height. Transplanting should be done with great care, lifting each plant with a good ball of soil and roots, and replanting carefully without disturbing the roots, and not deeply. Commonly when very fine bulbs are desired the rows of such plants are 20in. apart; a very useful breadth is 16in., the plants being 12in. apart in the rows. This form of Onion culture, however, necessitates high-class soil preparation, the ground being trenched from 20in. to 30in. deep, and the deeper the better, ample dressings of good animal manure being buried and mixed with the several layers or spits of soil, whilst that on the surface should have forked in, some time before the planting takes place, a good dressing of well-decayed manure that is short and does not create coarseness. Onions are very deep rooters, and where so much worked soil is furnished, and ample manure is added, roots strike deep in search of it, thus finding good as well as ample moisture when the surface soil is dry. After plants have become well established, a mulching of short manure on the surface not only serves to check evaporation, but also furnishes plant food. When water is given, which may in prolonged drought be needful, it should be in the form of a heavy soaking, as driblets do more harm than good. With such treatment quite wonderful bulbs will be produced in the autumn. Outdoor-sown Onions need deeply-worked and well-

ONION, LONG-KEEPING.

manured soil. The work should be done fully a month before sowing, to enable the soil to settle down, as Onions like a firm soil. When the rows are 12in. apart, and the plants whilst quite young are thinned down to 4in. apart, fine hard long-keeping bulbs are produced in the autumn, and a very heavy crop. When the sample is good, even, clean, and well ripened, few ground crops are more profitable than are spring-sown Onions. In the winter the bulbs may be stored on shelves in an open shed, or be tied thickly round sticks coated with straw, and, in the form of ropes or long clusters, be hung in any cool, airy place.

Parsnip, The.—A valuable winter root is the Parsnip, and it is not encumbered, as so many vegetables are, with numerous varieties. Practically there are but two or three, such as the Hollow Crown, the best known for garden culture; the large Jersey, grown for cattle feeding; and the Student, which seems to be reproduced in Tender and True, a variety of great excellence, white in colour, refined in flesh, and whilst not giving large roots yet furnishing such as are most fitted for ordinary consumption. Seed of Parsnips may be sown early in the spring, as the plant is hardy. When the soil is workable and has been previously well prepared by deep digging or trenching, seed may be sown in drills, 1in. in depth and 12in. apart, at the end of February or during March. The young plants, when well through the ground, should be thinned out to about 6in. apart in the rows, or to 9in. if large roots be desired. Ordinarily, however, fewer roots more thickly placed are best, as these are when cooked so much more acceptable as food. Little culture is needed beyond keeping the ground between the plants quite clean and frequently hoed. As the roots are so hardy they may be left in the ground all the winter, especially if a little soil be drawn over the crowns to protect them from frost. Roots lifted and stored should be kept in sand in a very cool place, but these soon become dry if the place be at all warm and dry. Seed is very cheap and hardy. Sowings may be made thinly. One sowing usually suffices for a season's crop. Roots that have good fleshy matter about 10in. in length, and are smooth, white, tapering, and free from side roots, are much better than those of greater size or with numerous side roots. Those having very long, narrow top or vertical roots are not desirable either, as they usually exhibit, when cooked, a somewhat woody core. Generally Parsnips are not popular root vegetables, because when cooked under ordinary conditions they are watery and devoid of flavour. To have them presented at table in proper condition the roots should be well washed, scraped, and trimmed, but not peeled, and cooked whole in just sufficient water in the pot to cover them. This should gradually boil away, so that the roots are finished off in the steam of the pot, and finally softened by baking. Then when taken out and served they are of delicious flavour, with melting, Marrowy-like flesh, and constitute altogether most acceptable food, far superior to that served when the ordinary method of cooking is adopted.

Pea, The.—Peas are the favourite summer vegetables, and happily, with reasonable care, are easy to produce. It is true that everyone who has a garden can have Peas, but it is not equally true that everyone grows them well or secures the best varieties. It must always be remembered that Peas are in season through the hottest months of the year, and to counteract the evil effects of dry weather certain details must be considered. In the first place, no matter whether soils be naturally holding or retentive or very dry, they must for these pod-bearing plants be deeply trenched from time to time, not necessarily every year, but certainly every third or fourth year. This may seem to demand from the cultivator a considerable expenditure of labour, but all gardening calls for exertion, and the more the ground is tilled so much richer will be the produce.

Trenching soil consists in digging up a certain area of ground 12in. deep and 2ft. wide, breaking up the bottom soil, no matter whether this be clay, gravel, chalk, or

PEA, TELEGRAPH

sand, with a long fork, and then mixing into it at once a good dressing of animal manure. This lays the foundation of the Pea plot. Then the top of the next trench, of a similar area, should be thrown over to fill the first, and the bottom of that broken up and treated on the same plan. When the whole is complete, a further dressing of manure should be forked into the top soil all over. The whole of the work should be completed by the end of the year if possible. It need scarcely be said that ground so treated will carry not only a fine Pea crop, but several other crops in succession, so that the outlay in manure and labour is soon more than repaid. The ground being thus prepared, we must consider the important operation of sowing the seed, and the ordinary plan is to sow seed in rows or drills at about the same width apart as the height to which the plants attain; but this system should not be too rigidly adhered to. If Peas grow only 2ft. in height, they will be all the better if sown some 2½ft. apart, and so on throughout the various classes. The most important point of all is not to sow too thickly in the rows, but amateurs in particular pay small regard to the importance of seed sowing. Not only is seed wasted, but the seedlings get starved because so thickly crowded upon the ground. The taller the plants of any variety, so much thinner should the seed be sown. A very good medium is, in the case of first early dwarf Peas to sow at the rate of one pint to every 30ft., of varieties 3ft. or 4ft. high a pint to 100ft., and of Peas 5ft. to 6ft. in height the same quantity to 120ft. The best growers of tall Peas in private gardens usually, however, dibble in the seed in broad drills, angle fashion, at fully 4in. apart. Those who sow Peas should bear this fact well in mind, because the plants thrive best where they have ample space, light, and air, and continue to give produce over a longer period, as well as producing finer pods. Whether the Peas be supported by stakes, string, or wire frames, or whether left lying on the ground as in the fields, thinner sowing may well be practised than is usually the case.

The position for the Pea crop must be necessarily regulated according to circumstances, but the earliest sowings should always be made on warm borders or where somewhat sheltered, otherwise late frosts will destroy the bloom, and, of course, all prospects of a prolific crop. As the sowing season advances let the position be more open and cool, avoiding, however, much-shaded spots, which simply promote weakly growth. The more holding or retentive of moisture the soil is, so much more likely is the crop to withstand summer drought.

Times for sowing, too, must depend upon circumstances. If a warm sheltered position is at command, then such a variety as Chelsea Gem or William Hirst may be sown as early as January, or in more open positions about the middle of February. It is a very common rule, and one easily understood, to make other sowings for succession as soon as the plants of the previous sowing are well through the ground. When that rule is followed for six or eight weeks, and the Peas grow well, a supply is obtained over

a long season. But when there is no want of space and the soil has been prepared as advised, sowings of moderate quantities may be made from early spring until the end of June, and the latest sowing should, as a rule, furnish good Peas in September. It is far better to sow a pint of any variety of Pea in two sowings and in an interval of two weeks than to make one sowing of a pint in probably the same length of row occupied by half that quantity.

Supports for Peas are usually furnished by hazel or other tree branches. Where obtainable at moderate prices, nothing is better or cheaper, as the wood is worth half its original cost at the close of the season for firewood. Where Pea supports of this kind are expensive, there is the alternative plan of fixing at either end of rows, and also at intervals along the sides, stout stakes or bamboo rods that stand out of the ground to the same height that the Pea growths will reach. Then, as growth is made, run along from stake to stake, about 9in. apart, cheap soft yarn or string. This makes an excellent substitute for the ordinary branch sticks. Wire frames of varying breadths and heights having very large meshes or apertures in them may be purchased and fixed to either side of the Pea rows, secured to stakes. These are expensive at first, but will last many years, and when not in use may be stored in a small space.

Watering during the summer, if drought prevails, is essential. In so doing, however, liquid manure should not be poured in close to the stems of the plants, but in furrows made about 1ft. away, as then the water can soak through to the roots without injuring the stems. The soil between and near the plants should be well moistened, and when so treated a liberal mulching or covering of long manure will certainly check evaporation, retaining the much-needed moisture in the soil. Occasional soakings of liquid manure from cesspools or tanks, etc., given in this way, are of great assistance. Peas have the reputation of creating their own nitrogen, which is scientifically true; but all experienced growers know that the more liberally crops are fed with liquid manure the more abundant is the produce.

Varieties. — These are indeed legion, and for that reason it is not easy to make a good selection. We have happily, however, such splendid first early marrow varieties that it is scarcely necessary to sow any of the old hard round Peas that were formerly our only first earlies. Good kinds are as under:

Variety.	Height.	Season.
Chelsea Gem	20in.	First early
Excelsior	18in.	,, ,,
American Wonder	16in.	,, ,,
English Wonder	20in.	Second early dwarf
Dwarf Defiance	22in.	,, ,, ,,
Daisy	24in.	,, ,, ,,
Sensation	36in.	Second early taller
Bountiful	36in.	,, ,, ,,
The Ameer	36in.	,, ,, ,,

The following are all high-class marrow Peas for succession, and late sowing as placed:

Variety.	Height.
Stratagem	30in.
Triumph	36in.
Magnum Bonum	36in.
Peerless	36in.
Queen	36in.
Autocrat	42in.
Latest of All	36in.

Telephone, Duke of Albany, and Ne Plus Ultra crop in succession, but are tall, therefore need more space.

Potato, The.—The Potato continues to be a national food, and is, therefore, a garden product of importance, deserving the most careful cultivation. It is needful, to secure good crops, to have deep, well-worked soil. Without this assistance the finest varieties raised of recent years will fail. The soil should be moderately manured only. A mass of rank material is hurtful, and another important point is to have good seed tubers. It is difficult to lay too much stress upon the importance of well-hardened tubers, made so by exposure to light and air through the winter. Only cover them when there is danger from sharp frosts. Well-hardened tubers suffer less from frost than those not exposed or seasoned, but it is wise to first exclude frost, if only just doing this and no more.

Seed Tubers.—Wherever Potatoes are grown, and it is determined to plant the same stock the following spring, select the tubers for seed when the crop is lifted. For this purpose they should be of good shape and from 2oz. to 3oz. each in weight, as experience has proved that whilst sets of this size are the most economical they produce the best average crops. Shallow deal boxes, each holding about 14lb. of tubers and having sides admitting air freely and narrow strips let into the ends to form handles, prove excellent store trays for the tubers. These can, in safe weather, be spread out thinly so as to admit ample light and air. If very hard weather comes they can be placed one on the other and be covered up to keep them secure from harm. When thus treated the eyes of the tubers remain dormant longer than if kept in heaps or in the dark. When they break in the spring the shoots are short, stout, and green, and may be easily preserved for planting. When seed tubers are planted in this way not only are the crops more abundant, but they also maintain a robust, healthy stock. When stored thickly, or in the dark, so that premature blanched shoots are made, that have to be rubbed off, deterioration of the stock is the result, with a reduced crop.

Preparing Soil.—Potatoes will succeed fairly well on most soils, but experience shows that the best results are obtained on deep, somewhat light or sandy ground. Soils, however, have to be taken as they are found. To obtain good crops, trenching or very deep digging is essential. The soil can scarcely be too well broken up and pulverised. If naturally poor, or much impoverished by previous crops, a dressing of half-decayed stable manure should be buried when digging is in operation. Winter is the best season for the work, and the manure will then be getting well decomposed before planting is commenced. Besides animal manures, soot, wood ashes, and a mixture of superphosphate of lime two parts, kainit or potash two parts, and nitrate of soda one part, may be forked in at the time of planting. In all cases planting should take place when the soil is fairly dry, otherwise it becomes, especially beneath the tubers, hard set, and detrimental to free production.

Planting.—The time of planting Potatoes necessarily depends upon soil, climate, and general surroundings. In Southern British gardens it may be safe to plant a month earlier than in the North; but in the South late frosts are sometimes sharp, when the tops are severely injured. Potatoes, it must always be remembered, are tender exotics, and cannot withstand frost, and for that reason it is unwise to plant too early anywhere. The case, of course, is different in frames or on warm borders, where a rough framework can be run up, over which at nights mats can be thrown to protect the tops. First early varieties may then be planted in February. Specially prepared sprouting seed for such a purpose should be used, and as moulding up is of little importance the sets may be planted 12in. apart each way to obtain a good crop of medium-sized tubers. Late strong-growing Potatoes when planted often remain from four to five weeks in the ground before coming through. Early varieties are more quickly up, and it is, therefore, well to plant so that all danger from late spring frosts is over before the tops come through. The method of planting is as follows: When the sets are of medium size and the soil well worked and light the labour is soon over by using a large dibber. In planting drop the sets carefully into the holes, keeping the shoots intact and upwards. Where the soil is wet or has not been previously dug, digging and planting must unfortunately go on simultaneously. That is the best way if the sets be large or have to be cut, as it is advisable to lay them close to the bottoms of the trenches. The usual depth

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for covering the tubers is from 5in. to 6in. Early varieties may be planted in rows 2ft. apart and 12in. in the rows. Put tall robust growers in rows 30in. apart and 15in. in the rows.

General Culture. — As soon as the young tops are well through the ground work the hoe freely amongst them, both destroying weeds and loosening the soil. When it is at all set, a second and deeper hoeing will be useful. Earthing or moulding up is a common practice. It helps to sustain the stems, and covers up the newly-forming tubers as they swell, thus keeping from them air and light. Exposure "greens" them, and when in this condition they are unfit for food. Moulding should be done well and before the tops become too tall, otherwise they will be broken. Moulding up is most satisfactory upon a very loose surface soil. As regards other matters, it is needful to keep the breadths free from weeds. Once, however, the tops cover the soil, weeds make little growth.

POTATO, WINDSOR CASTLE.

The Disease.—Although the Potato disease (Peronospora infestans), a minute sporadic fungus, is less virulent than was formerly the case, it inflicts at times severe injury upon late crops, especially in destroying the tops and checking tuber development. To hinder the operation of the disease, apart from accomplishing all that has been so far advised—especially allowing plenty of air and light to reach the plants—it is advisable to dress the breadths once about the third week in July, and again three weeks later, with Bordeaux mixture. This is composed of equal parts of sulphate of copper (blue stone) and fresh lime, each separately dissolved in water in the proportion of 5lb. of each. The blue stone should be dissolved in boiling water, and in a large wooden tub. Mix the two solutions in the wooden utensil, and add from twenty to thirty gallons of water. When ready, cast the mixture over the tops, in the form of a vapour, through the Knapsack Sprayer, when it will be found most effective in checking the terrible disease.

Lifting.—Whilst early varieties may be lifted for use as soon as the tubers are edible, late kinds should be allowed to ripen in the ground, then be got up in dry weather and thoroughly dried and cleaned, if needed. Store in a cool shed, and cover them to exclude light, air, and frost. It is good practice to overlook the stores occasionally to remove diseased tubers.

Varieties.—It is not the intention to weary and puzzle readers with a long list of names. The following varieties are in every way satisfactory, and may be selected without fear of poor results if properly grown: *First Early Kinds*—White Beauty of Hebron, Early Puritan, Ringleader, the Ashleaf Kidney, Early Regent, and Leicester Short-top. *Second Early Kinds*—Snowdrop, Satisfaction, Supreme, and Early Bird. *Late Kinds*—Windsor Castle, Prime Minister, Chancellor, Goldfinder, The Bruce, Up to Date, and Syon House Prolific, all heavy croppers.

Radishes.—Whilst there are numerous varieties of these acceptable salading roots, in diverse forms and colours, ordinarily only three or four find general cultivation, the small round and oval-rooted ones being most in favour. Very popular are the early short-topped French Breakfast olive or oval shaped varieties, of which there are three or four, but both these and the round one differ little in excellence or earliness. They are red in colour with white tops or bases, and when drawn young, neatly washed, and served, are most appetising. The Earliest Dwarf Red, sown in a frame in February or March, will give nice roots to pull in six weeks. The Old Red and White Turnip-rooted varieties are also excellent to sow outdoors in March, April, and May, in small quantities, and in the regular succession of once a fortnight. Radishes need a soil that is light, porous, and well enriched with manure, placed just below the surface, as the roots do not strike deep. Before sowing seed the soil should be gently pressed and levelled, then the seeds sown fairly thickly, well raked, gently beaten down, and watered, then covered up with mats laid over Pea sticks to keep the covering from the ground, or else with straw litter shaken from the stable dung. This should remain on until the seeds have germinated, then removed in the day, and lightly thrown back at night to protect the young plants from frost. Primarily the covering helps to promote equal germination, and keeps the seeds from being eaten by birds. Should slugs harbour beneath the litter, give an occasional dressing of lime or soot. There are long or tapering Radishes, both red and white, that are in good soil, and when quickly grown, very good, but they soon become woolly in hot, dry weather. In hot weather sow in shady places on good soil, and water freely. Sowings may be made at the end of July of the Long White Carmine or Black Spanish Radishes for winter pulling and eating; but their flesh is rather hard and coarse.

Rhubarb.—Roots of Rhubarb are easily propagated by lifting old ones, dividing them with a sharp knife, so that each one or two crowns have a portion of root attached, then planting them in soil that has been trenched and well manured, in rows 4ft. apart, the roots being planted 3ft. apart in the rows. When large roots are lifted in the winter to put into a dark place to produce early stems, and have been well pulled from, they may be thus cut up and replanted. February or March is a good time to replant. Some long manure should be laid about each plant. Whilst good Rhubarb stems can be obtained in the open, earlier and longer ones are secured by covering up roots with tubs, drain-pipes, or similar coverings, as the growth is then much earlier and better. These things may be removed after the first pulling, and then new stems will be made in the summer. Rhubarb is a gross feeder, and will absorb manure, especially in liquid form, freely. The best varieties are Hawke's Champagne and Victoria.

Salsify and Scorzonera.—These roots differ somewhat, the former being white and having long, narrow leafage, and in the latter the roots are dark externally, and the leafage is broad. Without doubt Salsify is the best,

if only because of its colour. The roots are habitually used in the winter, and when properly cooked and served with sauce have been termed vegetable oysters. Seeds of both may be sown in shallow drills thinly in April. These drills should be about 13in. apart. When the plants are a few inches in height they should be thinned out to 4in. apart. The roots are about the size round of a man's thumb, when well grown, and 6in. long. They may be lifted in November and stored in a cool place in dry sand, ready for use as needed during the winter.

Seakale.—The old style of culture of this valuable winter vegetable consisted in planting roots in trebles, and in clumps in some corner of the garden, and then in future winters, after the leaves had died down, placing large pots over the clumps, covering these up with long manure and leaves, and thus causing the crowns to break into growth a few weeks earlier than would be the case if uncovered. The Kale so produced was very good, but too commonly tasted of the manure. The rule now is to start, where there is no root stock, by raising plants from seed sown in drills, 20in. apart, on good deep-worked and well-manured soil. The sowing should be made about the middle of April. When the seedlings are fully up, they should be thinned out to 10in. apart in the rows. Once during the summer a light dressing of salt may be sprinkled amongst the plants, and be well hoed in. Very soon the soil is covered with strong leafage. This will die away in the winter. The roots should then be carefully lifted, and have every side root hard trimmed from them, laying these side roots all one way. The main roots, with crowns attached, should then be laid in thickly in soil where they can be obtained for blanching or forcing as needed during the winter. The side roots should then be made into cuttings of from 4in. to 5in. long, the upper end to be cut level, the lower end rather slanting, then all laid in thickly into soil for the winter, the tops just covered. In March, on ground that has been well prepared, dibble these root cuttings out into rows 20in. apart and 12in. apart in the rows. Treat them through the summer as for seedlings, and thus will result in the winter a fine lot of young roots. These, again, will give plenty of side roots to make cuttings, and so the process of production goes on every year, with the result that on but a few rods of ground set apart for Seakale production several hundreds of fine roots are thus obtained, and every one will produce a good crown, and when blanched a nice white head. Forcing may begin with Seakale in any dark, warm place as soon as roots are lifted, and may go on for several months. In that way a liberal supply of this delicious blanched vegetable is furnished. Its great merit, apart from its own table excellence, is that it is thus provided in the winter when all other vegetables are scarce. A couple of rows, sufficiently wide apart, may, if desired, be left in the ground, and have a ridge of soil placed over the crowns, in which the growths can blanch; but it is better to plant some of the trimmed roots for that purpose in rows 3ft. apart. These then give the latest of cuttings.

TOMATO, PEERLESS.

Shallots.—There are in cultivation two distinct forms of these useful flavouring and pickling bulbs, the true old Shallot and the Large Red or Russian Shallot. Both need similar culture and both are similarly used. The latter is, whilst much the larger, even resembling the old Potato Onion in dimensions, the least pleasant in flavour. The old Shallot has a very nice nutty flavour, and where quality is preferred to size is much the better. Of this old form there are both fawn-coloured and yellowish white-skinned varieties, but the difference otherwise is infinitesimal. Where the stocks and culture are good many fine bulbs of these are produced, the skins being silky, shiny, and handsome. Culture consists in planting, either in the autumn or early spring, scales, off-sets, or bulbs, by whichever name they be locally termed, on well-prepared soil. If it be well drained and porous, planting may be done in October or November, but if the soil be close and damp it is best to plant in March. Many persons, however, plant in February. When the soil has been well manured and deeply dug, and if at all clayey, some sand, wood ashes, or old mortar refuse added, the off-sets should be planted by setting out drills with a line 12in. apart, then pressing the small bulbs into the drills at 6in. apart, fixing them well into the soil. A little sand or ashes may be placed over each bulb until growth begins, when it should be partially removed. It is needful to keep the soil well hoed and clean during the season. The bulbs ripen usually about the end of July, when they can be removed, cleaned off, stored in a cool place, and the soil be replanted with some other crop.

Spinach.—Few vegetables give less trouble than Spinach, which is so easily raised from seed, and needs no transplanting. The earliest sowing of seed may be made in March if desired, and then be followed by others once every two or three weeks down to the end of August, when the customary sowing for a winter supply is made. Let the drills be 12in. apart, and shallow. Seed should be sown thinly, and the plants thinned out to 6in. apart, for the summer, and 10in. apart for the winter, supply. Let the soil be in good condition and deeply dug. The old distinctions of summer and winter Spinach are absurd. The best for the summer sowings is the Longstander, as when thinned the plants give fine leafage and are long in running off to flower. The best winter variety is the Victoria; but both are good for either season, and much superior to the old Flanders. The autumn sowing gives good leafage from October till March.

Tomato, The.—This nutritious fruit or vegetable, whichever one is pleased to call it, needs no introduction. A child knows the shining red fruits that are offered in dainty punnets at the larger railway stations, and used in many ways in the household. Few fruits are so wholesome as this, whether used raw or cooked. Acres of glass have been erected of late years for the cultivation of Tomatoes, especially in the sunny Southern Counties and the Channel Islands. The fruit may be obtained over a long period when the plants are grown in the open

and under glass. Its culture in the open has declined in some measure of recent years owing to the great uncertainty of obtaining crops, whilst the plants are less under control when disease attacks them. The Tomato and Potato were introduced from South America almost together, the latter preceding the former by a year, viz., 1595, but their after histories are very different. Only within recent years has the Tomato become a general food in Britain, although dwellers in Southern European countries more quickly discovered its manifold virtues.

Open-air Culture.—Amateur gardeners with quite small gardens, if a sunny position is available, can grow Tomatoes well, but sun is essential. The time to sow seeds, when fruit is desired the following summer, is about the middle of March. There is no need to sow earlier, as too early sowing means weakly seedlings. Sow the seed very thinly and use ordinary light soil for the purpose. Place the pots on a hot-bed, and when the seedlings are sufficiently large to handle well, pot them on into 5in. size, never allowing growth to get weakly through overcrowding. The great point is to get good-sized sturdy plants, with, if possible, a truss of fruit already swelling when planting-time comes. This is only accomplished by giving timely shifts, never allowing the plants to want for water and not keeping them too close, otherwise weakly growth is the result, which will soon suffer when fully exposed. It is not safe to plant out until the end of May, selecting a warm west wall where the soil is well drained. Rich ground is not necessary, as this induces rank growth. Food can easily be given as the plants need it. It is important to pinch out lateral growths, but only stop the leading stems. This should be done when four or five good trusses of bloom have set. The object of forwarding the plants as much as possible in pots before planting out is to ensure early cropping, otherwise summer suns depart before the fruit has a tinge of colour. Early in September, or before there is any risk of frost visitation, pick off the fruits, whether green or otherwise, and lay them in a sunny window or greenhouse to ripen. There are, of course, many varieties, but the amateur should not be bewildered with names. Hackwood Park is a splendid kind for the open air, and the fruit is shapely. The Old Red also

TYPE OF RIBBED TOMATO.

succeeds well under the same conditions, but the fruit is not so well formed.

Forcing.—There are many gardens in which Tomatoes may be forced, as sufficient artificial heat for the purpose is at command. The seed should be sown in November or December in a brisk heat of 70deg., using soil similar to that recommended above. Sow the seeds thinly, and pot off the seedlings singly before the plants become drawn. Pot culture is the best plan to adopt to get early fruits. In future pottings use loamy soil mixed with rubble, such as old mortar, but no animal manure, which simply fosters a rank growth. When the fruits are swelling food is necessary, and then is the time to apply top-dressings of such artificial manures as Peruvian guano. The flowers must be set with a soft brush, *i.e*, artificially fertilised. Give air, even if a small amount, when the weather is favourable. For the final potting 12in. pots will be large enough. The best varieties for forcing are Sutton's A1 and Chemin Rouge. In the culture of winter Tomatoes take full advantage of the light and always keep the plants near the glass to promote sturdy growth, removing superfluous shoots.

Greenhouse Culture. — Excellent crops of Tomatoes may be obtained in any glass structure during the summer and early autumn. The plants are more under control, and furnish grateful shade for the usual occupants. Pots may be used, 10in. size being sufficiently large. Any other receptacles, such as shallow boxes, about 1ft. wide and 6in. deep, are as serviceable. They may be placed on the ordinary lattice staging. Train the stems to stout sticks in an upright direction or on wires immediately under the glass. Sow the seed in March, and ensure sturdy growth by sowing thinly and potting the seedlings off into small pots whilst quite young. Give them a position near the glass, and subsequently shift into 5in. pots. Use poor soil, such as old potting earth which has done duty for Chrysanthemums and other plants. Do not use animal manures with it. This promotes a gross growth. When planting in the larger pots or in boxes ram the soil down firmly. Merely cover the ball of roots at first, and add by periodical top-dressing until the crop is perfected. Plant out not less than 15in. apart, and train the Tomatoes to a single stem by pinching off side shoots. The large or primary leaves should be left intact until the fruits commence to ripen. Fire heat is not necessary after May, and air must be given in abundance, in fine weather doors as well as ventilators being left open. Remember always that the Tomato is a child of the sun, and therefore the glass must not be shaded in any way. A good "set" of fruits may be obtained by tapping the stems with a stick every day. After the earliest fruits are seen dryness at the root is hurtful, and if left in this condition satisfactory crops are not obtained. It is essential, in fact, to water with stimulants throughout the summer, commencing when the first bunch of fruit is seen to be swelling. Top-dress also the soil, adding a small proportion of bone dust. Soot is also an excellent top-dressing material, so also such well-known fertilisers as Clay's, Thomson's, and so forth. Peruvian guano mixed with water is of much value.

The best varieties are Challenger, Chemin Rouge, Sutton's A1, and for a yellow-skinned kind select Blenheim Orange. Perfection, a smooth red Tomato, wins the majority of prizes at exhibitions, or a selection from it.

Diseases.—The most common disease Tomatoes suffer from is spot in the leaf (Cladisporium fulvum), but it rarely spoils the crop. It generally arises from a close, moist atmosphere being maintained, and by using the same soil more than one year for Tomatoes. When plants are attacked give a little fire heat and more air. The white fly (Aleyrodes vaporariarum) is sometimes troublesome, and, unfortunately, difficult to get rid of. The only means of eradicating the pest is to frequently fumigate the whole house. Wireworm is very destructive. It eats through the stem of the plant when young and destroys it. Always carefully examine the soil when being mixed, as wireworm is usually imported in the fibrous loam used for potting. Sometimes plants are affected with black stripes in the stem—a very bad disease. It spreads to the leaves and fruits, so disfiguring the latter as to render them useless. When a plant is attacked by this disease, root it out at once, removing also the soil. It happily does not generally appear until summer has far advanced, whilst as a rule only overgrown plants are attacked.

Turnips, Garden.—There are numerous varieties of white Turnips, but of those specially fitted for garden culture the range of selection is limited, yet is most

excellent. The very earliest are Extra Early Milan and Dwarf American Strapleaf. Either of these, sown in April and again monthly or more frequently during the summer in small quantities, will furnish an admirable supply for all ordinary requirements. Then early in August and again towards the end of that month sowings may be made of the White Snowball, the very best of all garden Turnips, or, if desired, of the Orange Jelly or Golden Ball, a rich yellow-fleshed variety, popular in the North, and very much like the Snowball otherwise. For a good late winter crop none is better than Red Globe, the seed being sown in the third week of August, as it does not grow rapidly. The plants may not be too hard thinned, as only fair-sized bulbs are desirable. Wherever practicable it is best to sow seed in shallow drills thinly, and these should be drawn at 12in. apart.

TURNIP, WHITE GEM.

So arranged the plants are equally distributed over the ground, and thinning and hoeing become very easy. Snowball needs very moderate thinning, as the plants bulb readily. When once well up, little attention is needed beyond frequent hoeing. When in hot, dry weather the tiny beetle attacks the plants and close watch should be kept on them it is a good plan to very gently water or syringe the seedlings with a mixture of soft soap and quassia chips, soaked all night in boiling water, then to at once strew over the breadth soot, lime, or fine dust, as these keep off the insects. As the winter advances some of the largest bulbs may be pulled, trimmed, and stored in sand in a cool place for use should hard frost set in. Summer sowings benefit by having occasional waterings, and Turnips generally are all the better for occasional soakings with weak liquid manure.

ASPARAGUS AND ITS CULTURE.

ASPARAGUS is a native plant and perfectly hardy. It may not only be grown with comparative ease, but it is the most enduring of all vegetables, as once a bed or breadth is planted in good deep well-prepared soil, and kept properly cared for, such breadth will endure for many years. Plants are easily raised from seed. If that be purchased, and it is cheap, it is usually good. Those who have old beds may save their own seed, selecting growths that are strong and produce berries profusely in the autumn. Cut a few of the strongest of these berried shoots when they turn brown, place out to dry on paper, then rub the berries off and mix with them dry fine sand. Storeaway for the winter in a flower-pot or box, and rub the whole well together in the spring with more sand, and then sow. The middle of April is the best time for seed sowing. Have prepared a piece of ground in the kitchen garden, well dug and manured, also having a fine pulverised surface. On this at the proper time, as mentioned, draw shallow drills with a hoe aided by a garden-line, 15in. apart, and sow the seeds thinly, covering up evenly with fine soil and raking off neatly. Germination takes place in about three weeks. As soon as the seedlings are from 4in. to 6in. in height, run a hoe through freely between the rows of plants, and also cut out the plants to 6in. apart in the rows. Then by keeping the hoe freely used all the summer, the seedling plants will reach a height of from 18in. to 20in. at least, and will produce strong fleshy roots. Cut off the tops when ripened in November, but leave the roots untouched till the spring. Early in April is a good time to plant the roots into permanent quarters. To this end the space of ground to be planted must be efficiently prepared. The work must be thoroughly well done. During the winter the ground allotted should be deeply trenched, throwing out the top spit of 12in., then breaking up the bottom soil, a further 12in. deep, and as the bottom of each trench of 2ft. width, and right across the ground, is thus broken up, a good dressing of half-decayed animal manure should be forked in and mixed with it; then after throwing in the top spit from the next trench on to the preceding one, proceed to break up the bottom and manure as before. Finally, after the whole area is thus trenched, wheel on to the surface yet a further dressing of manure, which spread, and add to this fine crushed bone or bone dust at the rate of 2lb. per rod. Fork this dressing well in, and the ground will be quite ready for planting. To do this mark out the ground in rows, 30in.

apart, with a line, then with a spade throw out on to one side a furrow 4in. deep and 8in. wide. Into this furrow carefully set the young plants previously lifted from the seed rows, the roots being spread out flatwise all round. These should be 18in. apart. The soil may then be filled in round the plants and be gently trodden. So done there should be no difficulty in getting good strong growth from each root the same summer.

Of course, it is not absolutely needful that roots should be thus personally raised. They may be purchased at moderate prices at per 100 from nurserymen and seedsmen, thus saving some trouble, but in any reference to Asparagus culture some detail as to raising plants from seed is essential. The first season's treatment includes chiefly a free use of the hoe between the rows of plants to keep them thoroughly clean and the soil well pulverised. It will be helpful if advantage be taken of a prospective shower to strew either common salt or sulphate of ammonia along the rows at the rate of 2lb. per rod of ground, but this may not be applied until good growth has taken place. In the winter, after the season's tops have ripened and have been cut away, a moderate dressing of animal manure may be spread over all the breadth and allowed to remain or be lightly forked in, but only very lightly, lest the forking injures the roots. The following summer, besides keeping the ground clean and loose by frequent hoeing, the salt or sulphate dressing may be repeated twice. The result of this treatment should be strong growths 4ft. in height, and they would be instrumental in creating very strong and numerous stem crowns on the roots for the next season. Then the earliest of these may be cut for table so soon as they show through the soil. But it may be advisable before doing so to place 2in. of soil from between the rows as a slight ridge over the plants, as in that way more of the stem will be blanched, prior to the tops appearing through the ground. Many of the early shoots may be comparatively weak, but it is best to cut all as they come through, so long as the cutting continues. Good Asparagus stems for cutting should be the size round of a man's small finger at least, and have some 5in. blanched beneath the ground and 2in. green out of the ground. Such stems are usually soft and succulent throughout when well cooked. The cutting in the third season should not continue later than the end of June, but may in future years conclude a fortnight later. From that time all the growths should be left and encouraged, by hoeings and dressings as before, to come as strong as possible. Sometimes plants die out from some other cause, perhaps because too hard cut for edible stems in the summer. When such is the case, if there be any reserve of roots others may be planted in the vacant spaces, the soil being deeply dug and manured. Mending in this way is better than leaving vacant places in the beds. Cutting of stems for table use should always be done with a proper saw-edged Asparagus knife, as in such case other stems receive no injury. Where Asparagus is largely planted it is common practice to make some new beds every year, so that those which have become some seven or eight years old may be lifted and forced to secure very early stems. That is, however, an expensive practice, and one not practicable in small gardens. There are two or three varieties of Asparagus—Officinalis, Argenteiul, Conovers Colossal, and Giant—each differing from the other slightly, but all are good. Seed may be purchased at the moderate cost of about 4s. per lb.

FORCING ASPARAGUS.—There are two methods of forcing Asparagus roots; one common, the other unusual. The latter, briefly dealt with, consists in planting permanent beds of two rows of plants. These beds are about 3½ft. wide, and have between each pair of beds a sunken trench or path 3ft. deep and 2ft. wide. The beds are supported at the sides by 4½in. brick walls, pigeon-holed, that is, have at frequent intervals spaces left in the walls to admit heat. Into these trenches or spaces is placed, early in the winter, a large quantity of stable manure and tree leaves, well mixed, then firmly trodden in. Over the manure sheets of corrugated iron or boards are laid to exclude water. The beds should also have the surfaces dressed with long litter to shut out the cold air. Under such conditions it is possible to obtain

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excellent Asparagus fully two months earlier than can be had under natural conditions outdoors. Beds should be so arranged that by heating one or a pair at a time a long succession may be secured. The plan entails much labour, and a large quantity of manure and leaves is indispensable, although that material is useful for manuring ordinary garden ground later. Without doubt the plan is best, if costly at the first, of having a couple of hot-water pipes running between each pair of beds. In that case the dividing trenches need be of but 18in. width, and may be permanently covered over at the top. For such a heating arrangement it is necessary to have a boiler fixed to heat the pipes. A shallow saddle one is best for the purpose. If the outlay is at the first considerable, in the end it is by far the cheapest and most efficacious method of forcing. Beds once established may remain undisturbed for fully ten years, and thus give great production. The common method of forcing necessitates lifting the roots of Asparagus plants absolutely from old beds and placing them in quantity, as needed, into warm places suitable for the purpose, to force into premature growth. It is essential in such case that a good breadth of Asparagus root should be planted in any garden every year to keep up the supply. So treated there will always be a good breadth of roots some seven or eight years old to lift annually for forcing. This is ordinarily done in some close lean-to shed or house erected at the back of a range of forcing houses, and in which Seakale, Mushrooms, and other products are forced. Asparagus roots are placed on a thin layer of soil on the floor under the upper shelves, and very close together. Good pure soil is then strewn in about the roots, covering the crowns, and the whole are watered. Shutters are fixed to the sides to enclose the Asparagus, and if the temperature of the shed is kept at about 60deg. growth soon ensues. The shoots have to be cut when about 7in. long. No sooner has one bit of root begun to push out shoots than it is needful to get in others, and thus a succession of forced shoots is kept up until the stock of roots is exhausted. This plan is practicable only where abundant means are available. The plan of making up a dung bed and filling a frame on it with roots to force is hardly productive enough to repay labour and cost.

THE TERRACE GARDEN, DRUMMOND CASTLE.

A Useful Time-table for Amateur Gardeners.

Showing when to Sow, Varieties, and Their Season.

This time-table, a handy reference to those who are not well versed in vegetable culture, will, it is hoped, prove of much value to beginners in the culture of garden crops.

What to Sow.	*Time of Sowing*	*Varieties.*	*Season.*
Asparagus	April	Giant or Conover's Colossal	April to July.
,, to plant	April or earlier	,, ,, ,,	,,
Artichoke	March or April	Globe	July to October.
,, Jerusalem	February and March.	White and Common	Winter.
Beans, Dwarf	April	Ne Plus Ultra	June.
,, ,,	May	Early Favourite	July.
,, ,,	June	Ne Plus Ultra	August.
,, ,,	,,	Canadian Wonder	,,
,, Runner	April and May	Scarlet Champion	,,
,, ,,	,,	Excelsior	,,
,, ,,	,,	Tender and True	September.
,, ,,	,,	Epicure	,,
,, Broad	February	Early Long Pod	June.
,, ,,	March	Monarch Long Pod	July
,, ,,	April	Windsor	August.
Broccoli	February	Self Protecting	October.
,,	March	Michaelmas White	November and December
,,	April	Main Crop	January to March.
,,	May	Model and Late Queen	March to May.
Brussels Sprouts	March	Paragon	September to November.
,,	March	Dwarf Gem	December to March.
Beet	April	Crimson Ball	June to August.
,,	May	Excelsior	September to November.
,,	,,	Cheltenham Green Top	December to April.
Borecole or Kale	April	Dwarf Green Curled	December.
,, ,,	April and May.	Asparagus Kale	January to March.
,, ,,	,,	Cottager's Kale	March and April.
Cabbage	February.	Sutton's Favourite	July.
,,	March	Matchless	August.
,,	July	Ellam's Dwarf	March and April.
,,	,,	Colewort Rosette	October.
Carrot	March	Early Gem	June.
,,	April	Matchless	November.
,,	,,	Model	April.
,,	,,	Early Short Horn	June.
Cardoon	March	Spanish	November.
Cauliflower	March or earlier	Snowball	July.
,,	April	Favourite (Sutton's)	August.
,,	,,	Autumn Giant	September and October.
Chicory	May	Wilton.	Winter.
Celery	March or earlier	White Gem	October.
,,	April to June	Standard Bearer	Winter.
Cucumber	February for frames	Market Favourite	April to June.
,,	April to July	Telegraph or Progress	June to October.
Endive	June	Green Curled	September.
,,	July to August	Batavian	Winter.
Leeks	February or March	Lyon and Musselburgh	,,
Lettuce, Cos	February to August-Sept.	Hick's Hardy	June.
,, ,,	,, ,, ,,	Alexandra	July to September.
,, Cabbage	February	Golden Queen	April.
,, ,,	March to July	All the Year Round	Summer.
Onion	February and March.	Main Crop	August.
,,	,, ,,	Bedfordshire	November.
,,	August	Ailsa Craig	Winter-Spring.
Parsley	February to August	Garnishing varieties	June to May.
Rhubarb	March and April	Victoria or Hawke's Champagne	February to May.
Parsnip	February to April	Student	Winter.
Radish	February and March.	White and Red Olive	April.
,,	April	Early Frame	May.
,,	May	Long White and Scarlet.	June.
Salsify	April or May	Mammoth	Winter.
Scorzonera	,, ,,	Russian	,,
Peas	February	Chelsea Gem	May.
,,	March	May Queen	May or June.
,,	April	Duke of Albany	July.
,,	May and June	Late varieties	August to September.
,,	June and July	Early varieties	Autumn.

What to Sow.	*Time of Sowing.*	*Varieties.*	*Season*
Savoy	April and May	Early Ulm	September.
,,	,, ,,	Drumhead	Winter.
Seakale	March or April	Ordinary Purple	,,
,, plant	,, ,,	Lily White	March to May (*not forced*).
Spinach	March to August	Victoria	May to September.
,,	,, ,,	Long Standing	Winter.
Tomatoes	January	Early Ruby	June.
,,	March	Conference varieties	August to November.
,,	April	Duke of York	,, ,,
,,	July and August	Laxton's Open Air	Summer.
,,	,, ,,	Conference	March to June.
Turnips	March	White Nulen	June.
,,	April	Snowball	Summer.
,,	August	Red Globe	Autumn.
,,	,,	Model	Winter.
Vegetable Marrows	April	Long White	Summer.
,,	,,	Prince Albert	,,
Herbs	Spring	In variety	Winter.
Potatoes	February for very early dishes if protected	English Wonder	May to July.
		Snowdrop	,,
		Ashleaf in varieties	,,
,,	March	Early Puritan	,,
,,	April	Windsor Castle	September.
,,	,,	Up-to-Date	November.
,,	,,	Syon House Prolific	Winter.
,,	May	Triumph	Spring.

FORCING TOMATO.

FORCING VEGETABLES.

THESE are not numerous, the chief being as under:

Asparagus.—Where annual plantings are made of young roots in breadths then it is possible to have a good stock of old roots to lift each winter, and place in quantities thickly into beds of soil, either in close covered-up frames on dung-beds, or in brick pits, or in close places beneath shelves in Mushroom houses. Thus enclosed in warmth and well watered, growth in the form of blanched stems soon result, and these, kept cut, are made into bundles and consumed. The old roots are of no value when done with, but may be put aside to decay, whilst other roots should be at hand ready to take their places.

Beans, Dwarf Kidney.—These are grown in good warmth all the winter, usually in pots. These pots, well drained, are then three parts filled with soil, into which from six to eight seeds are placed, then just covered with soil. Pots about 7in. in diameter are best. The soil should be two-thirds loam, the rest being old hot-bed manure and leaf mould. These Beans need a temperature from 60deg. to 70deg. to grow them well. Sowings should be made once a fortnight to maintain a supply. Water must not be freely given, but the plants like gentle syringings. They, when well grown, fruit freely and quickly. Good varieties for early winter forcing are Early Forcing and Syon House, and Ne Plus Ultra is the best for late winter forcing. There must be no failure to make frequent sowings to keep up a supply.

Cucumbers.—Whilst Ridge varieties will do very well outdoors, frame or house varieties can be grown well only in warmth, in close structures. The bulk of Cucumbers are grown in low glass houses, which are in winter maintained at a temperature of from 70deg. to 75deg., but in summer obtain ample warmth from the sun's rays. Soil beds, narrow and shallow, furnish ample

root room for house Cucumbers, the plants being trained upon trellises fixed about 12in. under the glass roofs; the branches must be kept well thinned. Dung beds, properly made up, on which frames are placed, do very well to force plants in from March onward, but they do not retain enough warmth in the winter. In these frames the Cucumber plants are put out in pairs on mounds of loam, and then ramble over the soil in the bed. Having so much root room it is needful to keep the shoots well thinned. A little ventilation is essential in considerable warmth.

Peas.—Very Dwarf Peas grown in pots or long boxes can be induced to pod fairly well if kept on shelves near the glass and given ample light. Sowings may be made in January and February, for this purpose, of Chelsea Gem and American Wonder, both quite dwarf kinds. The best position is on a back shelf very near the roof, on which boxes 6in. deep and as wide inside, and filled with good loamy soil, may be stood after a row of Peas has been sown in them. As growth ensues the haulm hangs down in front of the boxes, and thus pods freely.

Potatoes are commonly forced for very early consumption in brick pits, heated by hot-water pipes, or in hot-beds of manure covered by large frames. Sometimes they may be very successfully grown in 10in. pots, stood on the floor of an early warm vinery or other warm house. For forcing only first early varieties, such as the Ashleaf, Ringleader, Victor, or other Potatoes, are employed. Planting often takes place as early as December, but as a rule the middle of January is early enough. It is well to have several frames planted at intervals of ten to fourteen days to keep up a succession of tubers until there are others fit to lift on warm borders outdoors.

Rhubarb.—Roots of this useful product, lifted in the winter, and placed in any dark enclosure where some warmth is furnished, and with soil about them, then watered, soon push stems, and in about three weeks have plenty, from 12in. to 15in. in height, to draw for use. It is needful to plant young, small roots or divided crowns every year, then old roots of about four years can be lifted and treated as advised. But if forcing begins early, plenty of roots should be available to give a good supply of Rhubarb until stems are fit to pull outdoors.

Seakale.—Where roots of this valuable vegetable have been grown in quantity for lifting and forcing, as previously described, it is easy in any dark place, where gentle warmth is furnished, to have blanched heads of Seakale all the winter. The roots need to be set thickly into soil, then well watered, and shut up very close and dark. With a temperature of from 60deg. to 65deg. there should be an abundance of heads, 7in. long, fit to cut for table in about three weeks. Once the tops are cut the roots are of no further use.

Tomatoes.—Whilst these are habitually grown under glass they bear forcing in strong heat indifferently. During the winter a temperature of from 60deg. to 65deg. usually suffices, but the plants are apt to become drawn and weak, unless they can have plenty of light and air, and those essentials cannot be well furnished in mid-winter. Plants from a July sowing get well into fruit in October, and will ripen very well in mid-winter. It is difficult to get fruits in February and March, but January-sown plants should begin to fruit in May if in gentle warmth.

The forcing of vegetables is not difficult, as the foregoing notes show. It is pleasant also to get a change in the vegetable diet by introducing wholesome Seakale, early Rhubarb, and, where possible, Asparagus, though this requires a more elaborate system of culture than the other kinds. In many small gardens early Rhubarb could be obtained at small cost, and it is surprising that it is not more grown in this way for the sake of its juicy stems.

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THE LOWER YEW AVENUE, ROUS LENCH COURT, WORCESTERSHIRE.

"COUNTRY LIFE."

AN IRIS BED IN A HERTFORDSHIRE GARDEN.

INSECT ENEMIES AND FRIENDS.

By G. S. Saunders.

BEFORE giving an account of the various insects that attack plants in gardens, I think it will be well to insert a short general description of insects, as so many persons, including some first-rate horticulturists, are very ignorant of all that appertains to entomology, even of such a very elementary fact as that a caterpillar does not lay eggs. A certain amount of knowledge of the life history and formation of the various kinds of insects will enable persons to apply remedies with greater success than would otherwise be possible. The word "insect," in common parlance, denotes almost any small living creature. This is, of course, by no means true, as will be seen presently. To begin with the life history. The perfect female lays eggs, from these are hatched larvæ (caterpillars, grubs, etc.), which, when full grown, become chrysalides, and from which the perfect insects emerge; so that there are four distinct stages—the egg, larva, chrysalis, and perfect insect. With butterflies, moths, beetles, flies, ants, bees, and wasps, these changes or transformations are well-marked, the caterpillar, grub, or maggot, which is hatched from the egg, being unlike its parents or the chrysalis. With other insects—such as green fly, scale insects, cockroaches, crickets, grasshoppers, bugs, earwigs, and thrips—the transformations are not clearly marked, though they exist, for the newly-hatched insect is more or less like its parents, and, at every change of skin, the resemblance becomes more evident. When first hatched from the egg there is no appearance of wings, but when the chrysalis state is reached the rudiments of wings are visible; but in this state the insect is very active, and does not become dormant, as it were, like a chrysalis.

When the insect emerges from the chrysalis it is in its mature or perfect state, and can then propagate its species, which it was unable to do before. A typical perfect insect has four wings and six legs, but in some there is only one

pair of wings, and in others there are none at all, but there are always six legs. It has now attained its full size, and does not grow any larger; it should always be remembered, therefore, that a small beetle never grows into a large one, or a small fly into a bluebottle, but, as they come out of the chrysalis, so they remain, after they have stretched their limbs. Though a typical perfect insect has two pairs of wings and three pairs of legs, some insects (flies, for instance) have only one pair of wings, and others have none, while beetles and earwigs have only one pair that they can use for flight, the other pair forming wing coverings or cases. All, however, have six legs. All perfect insects are formed in three divisions, which are usually very easy to distinguish—namely, the head, the thorax or fore body, and the body or abdomen. The head carries the feelers or antennæ, the mouth organs, and eyes; the thorax bears the legs and wings; and the body contains the digestive and other internal organs. Although spiders, mites, millipedes, centipedes, and woodlice are commonly spoken of as insects, they are not so really, as they do not undergo well-marked transformations; they never have wings, have always more than six legs, and are not composed of three easily distinguished divisions.

Insects do not breathe through their mouths, or by the aid of gills, as so many animals do, but by means of a series of pores that are on either side of their thorax or abdomen. These pores are easily seen in any large caterpillar as a row of dark dots just above the legs, and communicate with a series of air tubes which permeate the insect in all directions, carrying the air to all parts of the body, so as to ensure a proper supply of oxygen to the blood. The chief organ connected with the circulation of the blood is a long vessel, which may, I suppose, be called the heart. It is situated near the back of the insect, and forces the blood into the head, whence it returns, flowing among all the different internal organs. It comes into contact with the various air tubes, and eventually finds its way into the heart again. The blood is usually colourless, but is sometimes yellowish or reddish. It is well to bear these facts in mind, as it is the position of the breathing pores at the sides of the insects that makes it so desirable in the case of many insects—green fly, for instance—to add soft soap to any wash that may be used to destroy them, as the soap forms a coating over the insect, which closes the breathing pores and the insect is stifled. It is also well to remember that there are two quite different kinds of mouths among insects, for some bite and can eat the leaves, flowers, and shoots, and can even bore into hard wood, others can only suck the juices of plants, while others again can both bite and suck. Those that bite, such as beetles, grasshoppers, earwigs, and caterpillars, may be killed by covering their food with some poisonous substance. Those that can only suck, aphides, plant bugs, and froghoppers, for instance, cannot be killed in this manner, as it is impossible to introduce poison into the sap of plants.

PREVENTING INSECT ATTACKS.—Though it is most desirable when possible to use certain means to destroy the insects while attacking the plants, it is even more useful to take steps to prevent the attack being made, and a great deal may be done in this way by taking a few precautions. Never allow weeds to grow in a garden (this is perhaps easier said than done), as all plants have insects that feed on them, and these frequently leave the weeds for the cultivated plants; odd corners, covered with grass and weeds, should be dug up and kept tidy, otherwise they are a perfect paradise for insects to breed in unmolested. Nothing in the way of stones or rubbish of any kind should be allowed to remain on the beds or near any plant, as various insects are very fond of hiding under them. The refuse of all crops or plants that have been infested with any insect or fungus should never be put on the rubbish heap, as these pests will often come to maturity there, nor should they be allowed to lie about on the ground on which the crop has grown, but they should be burnt immediately. When trees or shrubs are pruned it is always safer to burn the prunings, as there are often eggs of insects upon them. The chrysalides of many insects are formed in the ground, and these should always be looked for when garden ground is being dug up. When

a plant or crop is found to be infested by any insect something should be done at once, without loss of time, to destroy the pest, for the rate at which some insects breed is almost incredible. The common green fly will give birth to living young ones at the rate of one every half-hour, and these will begin to breed when they are three days old, so it is no wonder that they sometimes seem to appear as if by magic. When quite young plants are attacked by insects it is desirable to force them into a healthy rapid growth as quickly as possible, by judicious watering or manuring, as they then feel the attack less. Many gardeners do not realise what assistance they receive from the natural enemies of insects. Most birds, toads, and even moles, and several kinds of insects that will be mentioned later on, are of great use in gardens. Birds, as a rule, feed their young entirely on insects, and the amount of food required by a nestful of young birds every day is astonishing. Sparrows and bullfinches, however, I am afraid, do more harm than good. Moles, though almost intolerable in gardens, on account of the way they disturb the soil, kill an enormous number of grubs that are very difficult to destroy otherwise, as they live under ground. Toads—except that they are repulsive to some persons—are perfectly unobjectionable in gardens, and kill an enormous number of insects, woodlice, etc.; they should be encouraged in every possible way. Tame seagulls and rooks are also very useful in destroying many kinds of insects, particularly those grubs and caterpillars that live on the roots of plants, and which are so difficult to kill by other means.

In the following list are the names of certain plants and the pests that most often attack them:

In the Flower Garden.

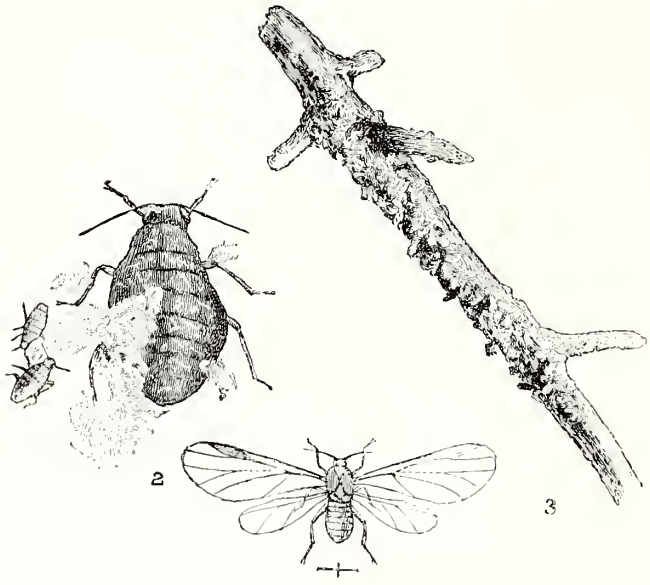
Anemones	Snake millipedes and wireworms.
Asters	Dart moth and caterpillars of other moths.
Auriculas	Dart moth and caterpillars of other moths.
Balsams	Dart moth and caterpillars of other moths.
Begonias	Black vine weevil.
Carnations	Aphides, bulb mites, carnation fly, eelworms, earwigs, froghoppers, red spider, thrips, and wireworms.
Chrysanthemums	Aphides, earwigs, Marguerite daisy fly, plant bugs.
Cyclamens	Aphides, black vine weevils, wireworms.
Dahlias	Various caterpillars, earwigs, thrips.
Ferns	Black vine weevils, froghoppers, plant bugs, and various caterpillars.
Fuchsias	Aphides, red spider.
Gladiolus	Red spider, wireworms.
Honeysuckles	Aphides, froghopper.
Hyacinths	Bulb mites, narcissus fly.
Lilies	Aphides, bulb mites, wireworms, snake millipedes.
Mignonette	White butterflies.
Narcissi	Bulb mites, narcissus fly, snake millipedes.
Peonies	Rose beetles.
Pansies	Snake millipedes.
Phlox	Froghopper, thrips.
Roses	Aphides, bell moths, rose beetle, rose saw flies, red spider, scale insects.
Stocks	Snake millipedes.

In the Kitchen Garden and Orchard.

Apple Trees	American blight, apple weevil, codlin moth, scale insects, winter moth.
Asparagus	Asparagus beetle.
Broad Beans	Aphides.
Cabbages	Aphides, white butterflies, various caterpillars.
Celery	Celery fly.
Currant Bushes	Currant saw fly, magpie moth.
Nut Bushes	Nut gall mites, nut weevils.
Parsnips	Celery fly.
Pear Trees	Apple weevils, pear gall mites, pear saw flies, winter moths.
Peas	Pea weevils.
Plum Trees	Winter moth.
Strawberries	Cockchafers, ground beetles, snake millipedes.
Turnips	White butterflies, turnip weevil.

It is impossible in the present work to mention all the insects that attack plants cultivated in gardens, but a selection has been made of those that are generally the more injurious. Descriptions are also given of certain insect friends that are most useful in destroying insects that prey upon vegetation.

American Blight (*Schizoneura lanigera*).—Among the numerous pests to which Apple trees fall a prey, few, if any, are more injurious than this member of the family of aphides. When once the American blight gets a footing in an orchard it is very difficult to eradicate, so that the owners of orchards that are free from this pest should do all they possibly can to keep them so. One of the most important things to do in this matter is to keep a sharp look-out for the foe, and immediately the smallest patch of the cottony substance, with which these insects are covered, is seen on a tree, some means should be taken to destroy the latter, as they spread very quickly from one part of a tree to another, and even from tree to tree. When only a few small patches are to be found, a thorough wetting with methylated spirit, applied with a small brush, is quite sufficient; but when the insect has spread over a tree, the rough bark of the parts affected should be scraped off, cloths having first been placed so that all that has been scraped off may be collected and burnt. It is also well to wet the bark first with soapsuds, so that nothing scraped off may blow away; the affected parts should then be scrubbed with a stiff brush dipped in a solution of paraffin emulsion, and take particular care that the mixture penetrates into any crack



AMERICAN BLIGHT.

1. Winged female. 2. Wingless females 3. The Aphides on a twig.

or crevice in which these pests may have taken shelter. Quassia extract, and tobacco water, mixed with soft soap, are also good for this purpose. One of the most effective remedies is a caustic wash, which should be applied in the winter (see the list of insecticides). These aphides at times also attack the roots of the trees. When this is the case, the roots near the surface should be exposed, and painted with one of the above-mentioned insecticides. These insects are of a slaty, leaden black or dark brown colour, the full-grown females being sometimes as much as ⅛in. in length. They have very long suckers, with which they draw off the sap of the trees, and are generally found in regular colonies all huddled together as close as possible. The action of so many suckers in such a small area causes an abnormal growth of the bark and the tissue just below it, which takes the form of swellings and knobby protuberances. The white woolly substance with which their bodies are partly covered is principally secreted by the posterior half of the body. Some of the females are winged.

Ant, Common Garden (*Lasius niger*).—One can hardly help placing these insects among those that are injurious in gardens, though the amount of mischief they do is very small, and it is only when they make their nests at the roots of a plant that any harm is done, and that only indirectly, as they do not feed on the roots; but these are injured by not being in such close contact with the soil as they should be. It will nearly always be found that if an ants' nest be made among the roots of any plant the roots are attacked by one of the root-feeding aphides. This position has been selected in order that they may the more easily feed on the sweet secretions of these insects. When this is the case the plant should be taken up, its roots carefully washed, and freed from the aphides, and then replanted elsewhere. The ants' nest may then be destroyed by pouring boiling water, diluted carbolic acid, or paraffin oil into it. If it be undesirable to remove the plant, take a largish garden pot, stop up the hole at the bottom, fill it half full of leaves, and place it bottom upwards on the ground close to the plant, then water the plant copiously every day, so as to keep the soil thoroughly saturated. The ants will soon begin to move their nest to the shelter of the pot, which in about a fortnight's time may be taken carefully away, when it will be found to contain the nest. Ants are often of service by showing when a plant is attacked by aphides or scale insects, for if several ants are found on a plant it is almost certain that it is infested by one of these insects.

Aphides (*Green fly, Black fly, and other Aphides*).—Of all the numerous pests in gardens these are, perhaps, the most troublesome and annoying, as they attack so many different kinds of plants, and some increase and multiply in such an extraordinarily rapid manner, as I mentioned in my preliminary remarks, that they are exceedingly difficult to keep in check. These insects are too well known to render any minute description of them necessary, but I may say that there are a very large number of species; some individuals are winged, while others are wingless. They secrete a liquid commonly known as "Honey dew," which is much sought after by ants, and in many species is exuded through two little horn-like organs situated on the back of the insect towards the tail. These insects injure the plants on which they feed by drawing off the juices from the young shoots and leaves, which they do by means of a long proboscis. The best remedy for plants grown in the open air is spraying with some insecticide containing soft soap, such as paraffin emulsion, quassia extract, soft soap, etc.; dusting with snuff, tobacco powder, or insect powder is also useful. Sometimes it is easiest to dip the ends of the shoots in a basin containing some soapy insecticide. In the case of Broad Beans being attacked by black fly or black dolphin, the tops of the shoots should be cut off and put into a basket and burnt, or buried so that the fly cannot make its way to the surface. These pests may also be killed by tobacco smoke if the plant can be enveloped in some comparatively air-tight material. Under glass, fumigation with tobacco smoke, or vaporising tobacco water, two or three times,

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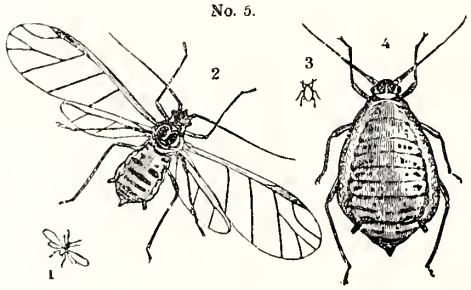


APHIDES.

1 and 2. Winged females. 3 and 4. Wingless females.

with an interval of four or five days between each operation, are the best remedies. Whatever means are used they should be applied without delay as soon as the insects are noticed on a plant, the old proverb of "A stitch in time, etc.," being particularly applicable in this instance.

Asparagus Beetle, The (*Crioceris asparagi*).—Asparagus plants are often considerably injured by the grubs of this insect, which feed upon the foliage, and therefore weaken the plants. The beetles lay their eggs on the young shoots, the grubs are hatched in the course of about a week or ten days, and at once begin to feed on the "grass." The best way to destroy this insect is by spraying the plants with Paris green or paraffin emulsion. The shoots on which the grubs are feeding may be cut off and placed in a basket, to be afterwards burnt or crushed. When Asparagus is being cut, a good look-out should be kept for the beetles, which will then be just beginning to make their appearance, or later on they can easily be shaken off the plants into an open umbrella. At the least alarm they fall to the ground feigning to be dead, and lying quite motionless. The eggs may easily

be found after a little practice, as they are of a dark shining brown colour, skittle shaped, about 1-20in. in length, and stand out at right angles to the leaves. The grubs, when they have attained their full size, are about ⅜in. in length, their heads black, and their bodies of a greenish slate colour, and gradually increase in size until quite close to the tail. The beetle is ¼in. long, the head and legs are bluish black, the fore body reddish brown in colour, and the wing cases are yellow. When closed there is a bluish black central stripe, and there are three spots of the same colour on each wing case. The chrysalis is formed in the ground within a thin cocoon, and there are probably two or three generations in the course of the year; but as beetles, eggs, and grubs are all found on the plants at the same time, it is almost impossible to be certain on this point.

ASPARAGUS BEETLE.

1. Asparagus beetle enlarged. 2. Grub enlarged. 3. Egg enlarged. 4. Sprig of Asparagus, showing eggs and grubs natural size.

Bell Moths, or Rose Tortrices.—Rose growers often find that the leaves of their Rose bushes are rolled up and eaten and that the flower buds are gnawed and have holes made in them by the caterpillars of these small moths, of which there are several kinds. They belong to the family Tortricidæ, and are known by the name of bell moths, on account of their shape when at rest with their wings folded over their backs, as they then very much resemble a bell in form. As the caterpillars live in positions in which it is almost impossible to make any insecticide reach them, the easiest way of killing them is to crush the rolled leaf between the finger and thumb, taking care that the culprit does not drop out before it has received a fatal pinch, as will sometimes occur as soon as the slightest pressure is felt; perhaps a more certain method is to hold a basket or box under the leaves and then to cut them off with a pair of scissors; the pests can then be crushed or burnt.

Bulb Mite, The (*Rhizoglyphus echinopus*).—This mite is one of the most destructive pests when once it attacks a bulb, and probably few, if any, kinds are free from its attacks; but it is most frequently found in the bulbs of Eucharis Lilies, Hyacinths, Daffodils, and Amaryllis. Bulb mites have also been found injuring the roots of Begonias and in the lower part of the stems of Carnations. I know no reason why they should not attack any tuberous-rooted plant, as the mites live between the scales of the bulbs and at the base of the roots; it is clear that no insecticide is of any use while the bulbs are in the ground, and even after they have been taken up they must be allowed to soak many hours in the insecticide before it can reach them, as fluids will not easily pass between the scales, particularly if any air be imprisoned there, as is often the case. The best insecticides for this purpose are 3lb. of sulphide of potassium dissolved in 1 gallon of water, or the extract from 2oz. of quassia chips in 1 gallon of water. Soaking the bulbs in warm water of 120deg. Fahr. for, say, 15min. or 20min. would I believe kill them, for the mites immersed in water at 115deg. Fahr. were killed in less than 5min. I cannot imagine that the bulbs could be injured by this process. The mites are very small and may easily be mistaken for grains of sand, as they are of a milky white colour, with brownish heads, and only measure when fully developed 1-20in. in length.

Carnation Fly, The (*Hylemyia nigrescens*).—Carnations are not infrequently attacked by the grubs of this little fly; it feeds on the pith of the stems and is fatal to the plants. No method has been devised for killing this pest except burning the plants. If the pests are only in one part of a plant it is not necessary to destroy the whole specimen, but unfortunately they generally attack the main stem. The grubs are about ⅜in. in length, legless, and white, with dark heads.

Caterpillars of Various Moths, The.—The number of different kinds of caterpillars that attack the various plants under cultivation is very large, and it is impossible here to mention them all. Probably no plants are free from the attack of one kind or another. Unless a plant is infested by an unusual number of them (when syringing or spraying the plants with paraffin emulsion may be of service), hand-picking is by far the best remedy, and though at first the caterpillars may be difficult to find, one's eyes soon become accustomed to the work, and then few will escape detection. When ground is being turned up in the winter near plants that have been attacked by these insects a good look-out should be kept for any chrysalides that may be brought to light.

Celery Fly, The (*Tephritis onopordinis*).—The grubs of this fly injure the leaves of Celery, Parsnips, and other umbelliferous plants by feeding on the interior substance of the leaves; the leaves of these plants towards the end of the summer often have a withered and blighted appearance, which is caused by the action of the grubs working their way between the skins of the leaves. On holding one of the leaves so that the light shines through it the position of the grub is easily seen. The grubs may be found in the leaves from the middle of June until the beginning of December. If the attack is noticed when the leaves are quite young, a firm pinch, but not hard enough to injure the leaf, will kill the grub. Later on, when the injury is more extensive, the entire leaf had better be cut away and burnt, as it is of little use then and will only decay before the others. There is more than one brood of this insect, so that it is most desirable to prevent the grubs of the first brood from undergoing their transformations. No insecticides have been found of any use in killing the grubs, but spraying or syringing with some soapy insecticide when the flies are wanting to lay their eggs is useful in preventing

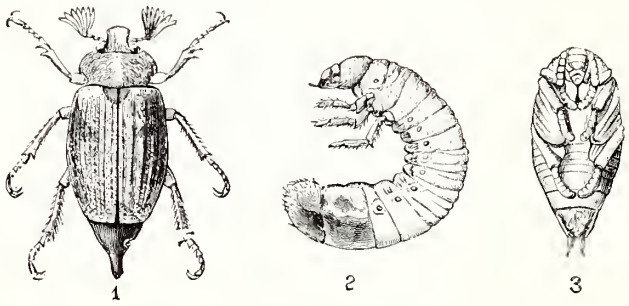
CELERY FLY.

1. Celery fly. 2. Grub. 3. Chrysalis.

them from doing so. The difficulty is to know when to make the application, for the flies may be found from the beginning of June until the end of July. When full grown the grubs bury themselves in the ground and become chrysalides. After the crop has been taken off, the upper part of the soil should be buried as deeply as possible, so as to render it impossible for the flies to reach the surface when they leave their chrysalides. Every bit of the crop that is left should be burnt. The fly is a pretty little brown insect with brilliant green eyes; it measures nearly ½in. across the wings, which are clouded with yellowish brown markings.

Cockchafer, The, or May Bug, and other Chafers.—This insect is a pest in many places, though fortunately not to the same extent in this country as it is on the Continent. Both the cockchafer and its grubs are destructive to trees and plants, the former by feeding on the leaves and the latter on the roots. As the beetles feed almost entirely on the leaves of forest trees, the damage done by them is not much noticed unless they are unusually abundant. The injury caused by the grubs, however, is considerable, as they feed on the roots of most plants, and do not attain their growth for three years, so that they have the opportunity of doing much mischief in the course of their lives. Their vitality is so great that it is useless to try to kill them with an insecticide, as none can be made to reach them of sufficient strength. Watering with gas liquor, diluted with ten times its bulk of water, or strong salt and water, if used in large quantities, is useful in driving the grubs away; but turning up the ground and picking them out is far more efficacious, and by no means difficult, as they are when full grown about 2in. long and ½in. in diameter. They are nearly white, but their tails—which are usually curled under their bodies, and are thicker than the rest of the grub—are bluish. The cockchafers are usually very sluggish in the middle of the day, and may then be shaken or beaten off the trees, and collected or crushed on the ground.

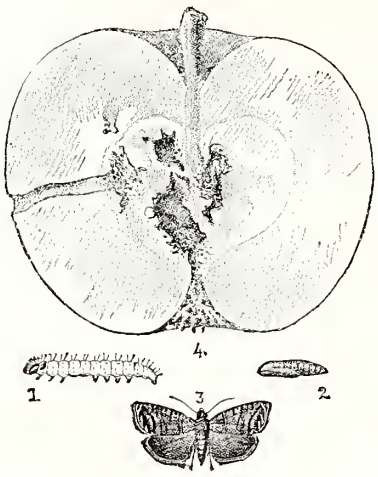
There are other chafers whose grubs feed on the roots of plants, which very much resemble those of the cockchafer, but they are smaller, varying in size according to the species. The grub of the green or rose chafer (*Cetonia aurata*), a brilliant metallic green beetle, often found on Roses and other flowers, closely resembles that of the cockchafer, and is equally injurious to plants. The grubs of another much smaller species, the garden chafer (*Phyllopertha horticola*), are very injurious to grass. The beetle is only about ½in in length.



COCKCHAFER.

1. Cockchafer. 2. Grub. 3. Chrysalis.

Codlin Moth, The (*Carpocapsa pomonella*).—Growers of fruit are only too well acquainted with this very common pest, whose caterpillars feed on various fruits. They have been found in Apples, Pears, Quinces, Plums, Peaches, Apricots, Sweet Chestnuts, and even Walnuts; but Apples are the most commonly attacked. The eggs are laid usually in the eye of the Apple, and the caterpillar works down the core, feeding on the pips and on the adjoining flesh of the fruit, leaving small masses of brown droppings in the gallery that it forms. When full grown it eats its way out of the Apple, falls to the ground, and makes its way to the stem of the tree, or of some other that happens to be near, and, finding a suitable crack or crevice in the bark, spins a thin cocoon within which it becomes a chrysalis. The moths leave the chrysalides in the spring, and lay their eggs as soon as the fruit has set. There are various ways in which this insect may be destroyed. If many of the fruits are seen to be injured, the tree should be well shaken, and all that falls (which has probably been attacked) should at once be picked up. The injured fruit may be generally known by having some of the droppings of the caterpillar on it, and it should be destroyed before the caterpillar has time to make its escape. All the fruit that falls from the tree should be collected at once for the same reason. All the loose rough bark should be scraped off the stems and branches as far as it is possible to reach them, and in the course of the winter, before the buds begin to open in any way, the trunk and branches should be sprayed with a solution of paraffin emulsion, or, better still, with a caustic alkali wash (see insecticides).



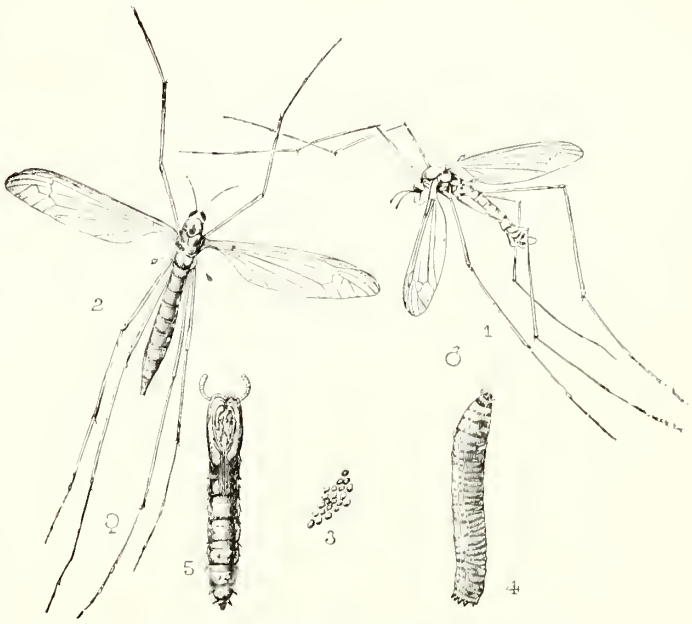
CODLIN MOTH.

1. Caterpillar. 2 Chrysalis. 3. Codlin Moth. 4. Apple showing injury done by Caterpillar.

It is advisable that early in June bands of some material should be tied round the stems so that the caterpillars on crawling up the trees can find convenient places to become chrysalides in. Some persons use hay-bands wound two or three times round the stem, and tied as tightly as possible so that the insects shall not crawl underneath. Others use strips of old canvas or some other material. The strips should be about 8in. wide, folded in half, and the folded edge again turned down for about 1½in. The band should then be tied or wired round the tree with the doubly folded edge uppermost, and the fastening should be near the top of the band, which, of course, must reach all round the tree and lap over a little. The object of the bands is to furnish the grubs with a suitable shelter within which they can undergo their transformations, and in case the caterpillars should pass over one band another should be placed about 1ft. above it; the lower one should be about 2ft. from the ground. Examine the bands occasionally and destroy any caterpillars or chrysalides found in them. The moths measure hardly ½in. across the open wings. Their general colour is brown, the fore wings streaked with grey or brown, and near the tip is a brown patch marked with gold lines; the lower wings are brown, but paler towards the base. The caterpillars, when full grown, are ¾in. in length, and are white or flesh coloured, with eight black dots on each joint of their bodies.

Daddy-long-legs, or Crane Fly (*Tipula oleracea*).—Though this insect is perfectly harmless in the fly or daddy-long-legs state, the grubs are among the most destructive that infest our gardens. They feed on the roots of most plants, but are particularly fond of the roots of grasses, and often do much damage to lawns by killing the turf. The grubs often cause the death of plants that have tap

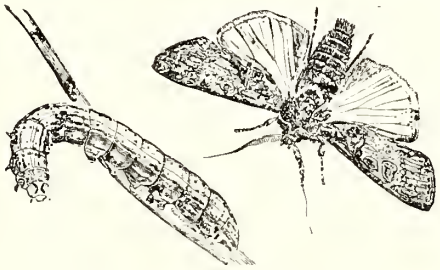
roots by eating right through them. These grubs are generally known by the name of "leather jackets," on account of the toughness of their skins. This peculiarity prevents insecticides from having much effect on them, and they seem to be indifferent to drought or moisture, and may be frozen until they are quite stiff without being killed. When the grubs are underground no insecticide can be made of sufficient strength to kill them, but a heavy watering with liquid manure, such as a solution of guano, nitrate of soda, or common salt has been found very useful. It is disagreeable to the grubs, and is of assistance to the plants. The grubs may be trapped with slices of Carrot, Turnip, or Mangold, which should have a small wooden skewer thrust into each. They should then be buried about 1in. below the surface, the skewer being placed uppermost, to show where the bait is. Leather jackets are very fond of moving about at night, and if bricks, boards, tiles, slates, or pieces of turf are laid near their haunts, and turned over in the morning, these grubs will often be found hidden underneath. The other traps should also be examined every morning.



DADDY-LONG-LEGS, OR CRANE FLY.

1. Male Daddy-long-legs. 2. Female Daddy long-legs. 3. Eggs. 4. Grub. 5. Chrysalides.

Dart Moth, The (*Agrotis segetum*).—The caterpillars of this moth, as well as those of several nearly-allied species, feed on the roots of various plants grown both in the flower and kitchen garden. Auriculas, Balsams, China Asters, Turnips, Cabbages, and all plants of that nature are their special favourites. As they feed at night, hiding themselves in cracks in the ground, under stones, clods, and rubbish during the day, they are not so often seen as many other pests that do less mischief. They usually attack the plant at the collar, or just below it, and frequently eat right through the tap root. The best way of destroying them is by turning over anything near the plant under which they might hide and digging up the surrounding soil with a small spud. Thoroughly soaking the ground with warm soap and water, so as to fill the cracks, will bring the caterpillars to the surface, when they can easily be picked up. The caterpillars of the Dart Moth when full grown are about 1½in. or 2in. long, dusky yellow in colour, with paler longitudinal stripes, and various small black spots or dots. Like many caterpillars they vary considerably in colour. The other caterpillars that I alluded to are about the same size, but differ in colour, all being sombre in hue, with rather indistinct markings. They all make their chrysalides in the earth, and a sharp look-out should be kept for them when the ground is being dug in the winter. They are of a bright brown colour, about 1in. in length, and are sometimes surrounded by a rough earthen cocoon.

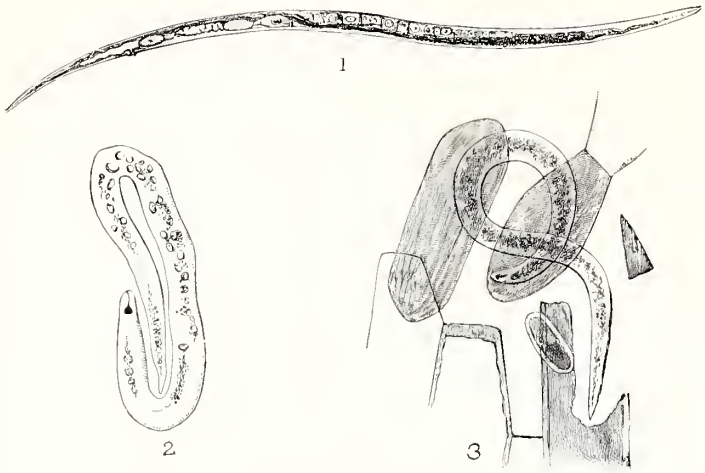


DART MOTH.

1. Dart Moth. 2. Caterpillar.

Earwig, The (*Forficula auricularia*).—This well-known pest is very injurious to the flowers of various kinds of plants, those of the Carnation, Chrysanthemum, and Dahlia being their favourites. As they are very active insects, being able to run and fly well, and as they generally manage to hide themselves during the day, the only practicable way of destroying them is by means of traps, in which they can hide themselves in the morning after their nightly depredations. For this purpose the hollow stems of Sunflowers or of Broad Beans are the most useful. They should be cut into lengths of from 6in. to 9in. and hid among the shoots of the plants so that the insects can crawl into them. In the morning the contents of each stem should be blown or shaken into a vessel containing water on which a little paraffin oil has been poured. Good traps can also be made by crumpling up pieces of paper, or by tying up pieces of canvas or sacking so that they hang in folds, or they may be folded and laid on the ground. The insects are not particular where they hide so long as they can creep in somewhere out of sight. Small garden pots, partly filled with hay, placed on the top of the stakes supporting the plants, are well known and useful traps.

Eelworms (the Stem Eelworm, *Tylenchus devastatrix*).—This pest has only lately come into notice, but this is due to a considerable extent, I expect, to their minute size, for they are quite invisible to the naked eye when among the tissues of the plants they are attacking, though they may be detected with the aid of a strong magnifying glass. A large number of different kinds of plants are known to be infested by them, even those of such diverse natures as Clover, Hops, Carnations, various corn crops, and bulbs, so that most things are probably liable to be infested. This eelworm is about 1-25in. in length, very long and narrow, being only 1-1000in. in diameter, and tapers gradually to a fine point both at the head and tail. When under a microscope with a low power it looks like a thread of clear glass. As these creatures live and breed in the tissues of the plants it is impossible to reach them with any insecticide, so that practically the only way of destroying them is by pulling up the plant and burning it, or, at any rate, cutting off the affected parts and burning them. This, with such plants as Hyacinths and Onions, or where the main stem of a plant is infested, is impossible. A good dressing of suitable manure will, of course, greatly help a plant that is attacked; the vitality of these worms is astonishing, and they have been known



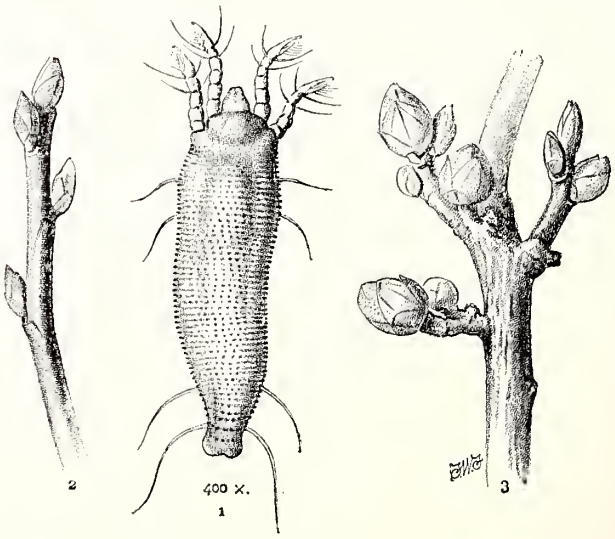
STEM EELWORM.

1. Stem Eelworm. 2. Stem Eelworm just emerged from the egg. 3. Stem Eelworm egg in tissues of a plant; all highly mag.

to revive after having been dried up for more than two years. They will pass quite unhurt through the body of an animal that has been fed on an infested crop, so that it is most unwise to use manure from animals that have been fed with anything the Eelworm has attacked.

Froghopper, The (*Aphrophora spumaria*) — Everyone must have noticed little masses of froth on different kinds of plants during the summer, which are generally known as "cuckoo spit" or "frog spittle," but comparatively few know in what way, or by what means, they are produced. Those who only know the froghopper in its mature condition will be surprised to find that it spends the whole of its youth in this spittle, which it forms as a protection to itself. It will be at once seen that the insect must subtract a considerable amount of sap from the plant to provide not only for its own sustenance, but also for the formation, and to supply the waste which must occur from evaporation, of these masses of froth. When a plant, therefore, is attacked by several of these insects, the injury it sustains is very great. Carnations, Honeysuckles, Lavender, Lilies, Phloxes, and Grasses are among those that are most frequently infested. The simplest way of dealing with this insect is to take a small vessel of water (a mug is as good as anything) and a small stiffish brush, and with the latter to take off the froth in such a way as to remove the insect at the same time; the brush should then be dipped in water to cleanse it before using it again, or the infested part of the plant may be drawn through the fingers and the insects crushed. The application of insecticides is not of much use, but if there be an unusual number of these insects on a plant, syringe it with paraffin emulsion, taking care that it is applied with sufficient force to wash away the froth and wet the insect. The young froghopper is of a pale green colour, with rather large prominent dark eyes, and may measure almost ¼in. in length. The mature froghopper is rather larger, and varies in colour from yellowish brown to almost black.

Gall Mites (*Phytoptus ribis*) **and others.**— There are several kinds of gall mites, but only three are interesting to gardeners from a horticulturist's point of view—the Currant Gall Mite (Phytoptus ribis), the Nut Gall Mite (P. avellanæ), and the Pear Gall Mite (P. pyri). The first two attack their victims in a similar way, so much so that one may employ the same methods of destruction in both cases; the mites themselves are so much alike that they may be really the same species. These mites live in the buds, and a large number generally may be found in the same bud. The result of these pests feeding on the juices of the unopened leaves is that the latter do not open with the others, but merely swell to a certain extent. When, as is sometimes the case in a bad attack, nearly every bud on a Currant shoot is rendered "blind," the injury to the crop is very severe. Black Currants are much more frequently attacked than red or white ones. This is a very difficult pest to get rid of, for as the mites are so small as to be invisible without a magnifying glass, and as no insecticide can reach them when they are within the buds, it is a matter of some difficulty to know how to proceed. When a shoot has several infested buds on it, cut it off and burn it; if only one or two, pick off and burn them. When pruning bushes that have been attacked, cut them back very hard, and the stumps of the shoots should be dressed with paraffin emulsion. The galls leave the old and then dying galls about the end of June, collecting at the base of the leaf stalks, and infesting the new buds as soon as they are large enough. This would appear the time to apply an insecticide to the bushes, but as the fruit is ripening it is difficult to do so. These mites are long, narrow, and somewhat cylindrical, and about four times as long as they are broad. They are very minute, being not more than 1-200in. in length and of a milky white colour. They may be distinguished from other mites by having only two pairs of legs instead of four, and these legs are placed close to the head, but at the other extremity of the body there is a kind of sucker foot. The Pear-leaf blister mite (Phytoptus pyri) greatly resembles the foregoing species in appearance, but it attacks the Pear leaves in a very different manner, as it forms small blisters like galls on them. The mites begin to attack the leaves when they are unfolding, and the galls show as small thickened spots, in the centre of which, on the under-side of the leaf, is a small opening; the eggs are laid in these blisters, and the young mites soon leave the gall and begin to form fresh ones. In this way the leaf quickly becomes covered, and so rendered useless. The best remedy is to pick off the infested leaves as soon as the attack is noticed, and trees that are too large to be treated in this way should be sprayed with paraffin emulsion, diluted with five times the amount of water, any time

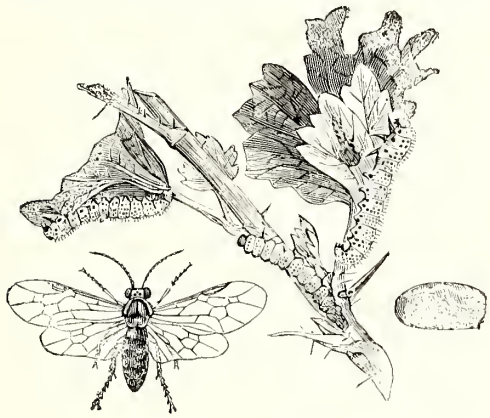


GALL MITE.

1. The Black Currant Gall Mite, mag. 400 times. 2. Twig of Black Currant with healthy buds. 3. Twig of Black Currant with infested buds.

during the winter, that is, before the buds begin to swell in the spring. Take care that every part is wetted, and particularly the terminal buds, which are most liable to be attacked.

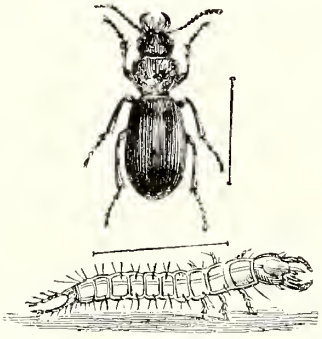
Gooseberry and Currant Saw Fly, The (*Nematus ribesii*).—Gooseberry and Currant bushes suffer more from



GOOSEBERRY SAW FLY.
Gooseberry Saw Fly, Grubs, and Cocoon.

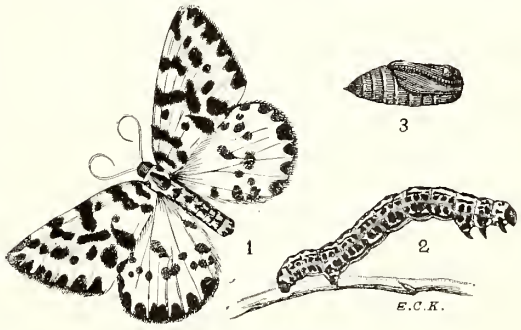
the attacks of this than of any other insect, and at times the leaves are literally stripped off by their grubs. The saw flies lay their eggs on the under-sides of the leaves near the veins as soon as they begin to expand, and the grubs lose no time as soon as they are hatched in beginning to feed on the leaves. They are full grown in about three weeks, then bury themselves in the ground and become chrysalides, from which the second brood of saw flies emerge in about a fortnight, and the second brood of grubs may be found in July. These, in due course, become chrysalides in the soil, but remain in this condition until the spring, when the saw flies are developed. The grubs are often confused with the caterpillars of the magpie moth, but are, however, perfectly distinct, as pointed out in the note on that insect. The methods of killing both insects are the same while they are feeding, namely, dusting with a mixture of lime and soot when the leaves are wet, or syringing with paraffin emulsion or quassia extract and soft soap. Many may be shaken down and then killed with the back of a spade. The winter treatment, however, is quite different, for the saw fly grubs, when they are full grown, bury themselves in the soil, and each forms a papery cocoon round itself. Within this it becomes a chrysalis, from which the saw fly emerges in the spring. The best winter treatment, therefore, is to remove the soil to a depth of about 4in. from under the bushes, and then burn it, or bury it not less than 1ft. below the surface, so that the flies will not be able to reach the open air when they leave the chrysalides. The earth also may be spread about near poultry, which will soon pick out all the cocoons. The saw flies measure about $\frac{3}{4}$in. across the wings, their bodies being yellow, with a black patch between the wings; their heads are black. The grubs when full grown are rather more than $\frac{3}{4}$in. in length, of a greenish grey colour, covered with small raised black dots, from which grow fine black hairs; the cocoons are not quite $\frac{1}{2}$in. in length, and are black and papery.

Ground Beetles (*Carabidæ*).—The beetles belonging to this family are as a rule decidedly useful in gardens, as both they and their grubs are carnivorous, feeding on small insects, grubs, worms, etc. But a few species have lately become notorious by attacking ripe Strawberries, and in some places to such an extent that crops have been practically destroyed. The ground beetles are very active, and may often be seen running swiftly across garden paths. There are a large number of species, and they vary very much in size (from $\frac{1}{8}$in. to more than 1in. in length), nearly all being of a glossy brown, black, metallic blue, green, or copper colour. The four species that have been found attacking Strawberries are Harpalus ruficornis, Pterostichus melanarius, madidus, and Calathus cisteloides, the first three being much alike to the ordinary observer. They measure from $\frac{1}{2}$in. to 1in. in length, and are shining black in colour; the fourth species is also black, but considerably smaller than the others. These beetles injure the fruit by gnawing the surface, removing the seeds, and eating holes in the flesh. They feed at night, hiding in cracks in the ground or under stones and litter during the day. The only way, apparently, to destroy them is by trapping, which may be done by burying small basins or other vessels nearly full of sugar and water and bits of offal so that their brims are level with the surface of the soil. Pieces of meat, which need not be of the freshest or primest cut, may be hidden under old sacks or mats, as these will attract numbers of them. A spade or something of the kind should be at hand when the shelter is lifted, for the beetles run very fast, and many would escape while they were being caught by hand. If straw is laid on the ground they will hide in the earth beneath it and may be turned out with a spud or trowel.



GROUND BEETLE.
Ground Beetle and Grub (Pterostichus madidus).

Magpie Moth, The (*Abraxas grossulariata*).—The caterpillars of this common moth are very destructive to the foliage of Gooseberry and Currant bushes, and to a certain extent to the flowering Currant, commonly known as Ribes, and Euonymus; they are often confused with the grubs of the Gooseberry saw fly, and it is certainly curious that there should be a considerable similarity in their colouring, for both are of a pale colour with black spots. The caterpillars are, however, nearly as large again as the saw fly grubs, their spots are much larger in proportion, and they have only five pairs of legs, while the grubs have ten pairs. When full grown they bury themselves in the earth and become chrysalides, while the caterpillars form their chrysalides on the bushes. It is important to note these differences, as after an attack the winter treatment, to prevent a recurrence of the insects the following season, is quite different. As soon as the young leaves begin to appear in the spring, the caterpillar which have passed the winter in the shelter of crumpled leaves begin their work of destruction, and feed on the young leaves until they are full grown in May or June. Each caterpillar then spins a thin web-like cocoon on the stems or among the leaves, within which they become chrysalides. In the course of about a month the moths make their



MAGPIE MOTH.
1. Magpie Moth. 2. Caterpillar. 3. Chrysalis.

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A VIEW IN THE GARDENS. BLICKLING, NORFOLK.

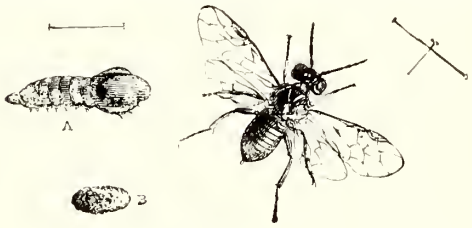
"COUNTRY LIFE."

appearance, and lay their eggs near the midribs of the leaves. The caterpillars are soon hatched, and at once begin to feed on the leaves. They soon, however, spin some of them together, and in this shelter pass the winter or fall to the ground, hiding themselves under the fallen leaves, rubbish, or in some crack in the soil. In the winter all fallen dead leaves and rubbish should be removed from under the bushes and burnt, and any dead leaves which have not fallen with the others should be picked off and destroyed, as they often contain caterpillars. In the spring or summer, when the caterpillars are feeding on the leaves, they may be killed by dusting the bushes with a mixture of lime and soot when the foliage is wet, or spraying with quassia extract and soft soap or paraffin emulsion. These remedies should not be used too late in the season, or they will give the fruit an unpleasant flavour. The moths fly very slowly, and may easily be caught in a butterfly net. They vary in colour from black to nearly white, and are usually creamy white, with black spots, as shown in the figure. The caterpillars, when full grown, are about 1¼in. in length, and of a pale buff colour with black spots, whilst the chrysalis is black with yellow bands.

Marguerite Daisy Fly, The (*Phytomyza affinis*).—The blisters and discolourations on the leaves of Chrysanthemums, Cinerarias, Marguerite Daisies, and other plants of the same natural order are caused by the grubs of this fly, which burrow between the skins of the leaves, feeding as they go on the inner part of the leaf. This renders the leaves unsightly and of little use to the plant, which suffers in consequence more or less, according to the severity of the attack. If the leaves are much injured before the attack is noticed, they should be cut off at once and burnt, as they can be of no further use, whilst the grubs will be most effectually destroyed. If, however, the attack is noticed at once, or before much injury has been done, the leaves may be saved by pinching them firmly at the part where the grub is so as to crush it. By placing the leaves with the light behind them, the position of the grub will easily be seen. Insecticides are of little use, as they cannot reach the grubs, though their application at the right time would no doubt prevent the flies from laying their eggs. It is difficult to know when the right time is, as there are two or three broods of this insect during the year, and for this reason it is most important that the grubs of the first brood should be killed, to prevent as much as possible an attack by a subsequent one. The flies are small, inconspicuous insects, measuring only ¼in. across the open wings. The grubs are greenish, and about ⅛in. in length.

Narcissus Fly, The (*Merodon equestris*).—This insect is at times a great annoyance to those who grow many bulbs. Daffodils, Narcissi, and Hyacinths are the kinds most frequently attacked. The grub makes its way into the centre of the bulb, and there remains feeding until it is full grown. It is then about ¾in. in length, nearly as thick as an ordinary lead pencil, and tapers somewhat towards the head and tail. Such a grub feeding in a bulb naturally destroys it, and the insect cannot be reached without injuring the bulb. When it has attained its full size it generally becomes a chrysalis in the soil. Ground that has had infested bulbs grown on it when dug up should be examined, in case any of these chrysalides are present, and the ground kept well broken up, to expose them as much as possible to the birds and weather. The flies are largish insects, and much resemble small bumble bees. They are, however, more elegant in their proportions, and have only two wings, while the humble bee has four. They may be caught in the spring with a butterfly net whilst flying about the bulbs.

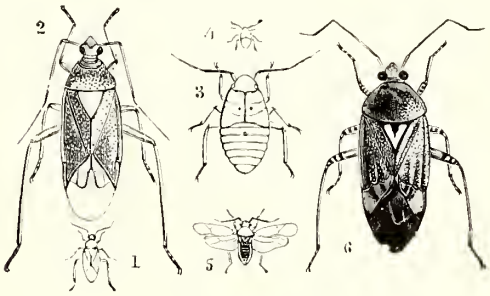
Pear Saw Fly, The (*Eriocampa adumbrata*).—The grubs of this insect are the well-known pests that attack the leaves of Pear and Cherry trees, often known as "slug worms," on account of a certain resemblance they bear to small slugs. They also attack the foliage of the Quince, Plum, Blackthorn, and Whitethorn. The grubs are about ½in. long, and covered with a thick greenish slime; they feed on the upper surface of the leaves, which they gradually eat away, leaving only the ribs and the lower skins of the leaves, remaining almost motionless during the day and feeding at night. One of the best means of destroying this insect is by dusting the leaves with finely powdered lime or gas lime. A single application, however, will not kill the grubs, for they have the power of exuding a fresh supply of slime, so that when they are covered with any obnoxious substance they immediately



PEAR SAW FLY.
A. Grub. F. Cocoon

secrete a fresh amount, which prevents them from feeling any bad effects from the insecticide. This secretive power is limited, and a second application soon afterwards kills them. Syringing with a solution of paraffin emulsion, soapsuds, or lime water and soft soap is also useful. When full grown the grubs fall to the ground and bury themselves. After a bad attack it would be advisable to take away the surface soil under the trees to a depth of 4in., and burn it, or bury it not less than 1ft. below the surface, or place it somewhere so that poultry can pick it over; the chrysalides are formed within a thin papery cocoon about ⅜in. in length. The saw flies are small insects measuring ⅝in. across the wings, and shining black in colour.

Plant Bugs (*Hemiptera*).—In using the word "bug," I do not do so in the way that is so common now, as a term for insects in general, but in its proper sense, to denominate insects belonging to the family known to entomologists as "Hemiptera," or, in the vulgar tongue, "the bug family," of which the best-known species is that which infests houses, and bedrooms in particular. There are a large number of different kinds, nearly all living on the juices of plants, but few, fortunately, are often present in such numbers as to inflict much harm upon plants in cultivation. The leaves of Cabbages, Chrysanthemums, Ferns, Hops, Peas, and Potatoes are attacked by certain species, and also the buds of Chrysanthemums. They may



PLANT BUGS.
1 Lygus solani, nat. size. 2. Lygus solani, mag.
3 and 4. Lygus solani, immature.
5 and 6. Lygus umbellatorum nat. size and mag.

be killed by syringing or spraying the plants with paraffin emulsion or quassia extract and soft soap; the shoots may also be dipped in either of these mixtures, or shaken over an open umbrella. The insects injure the plants by sucking out the juices with their long proboscs, which are well adapted to pierce the tissues of any plant. When in the perfect state nearly all the bugs have wings, but some species, the "bed bug" among the number, have never been found winged; the different species vary considerably

in size, few, if any, exceeding ¾in. in length. Anthocoris nemorum, the species that attacks Chrysanthemums, is hardly more than ⅛in. in length. The immature insects are very much like their parents, but are wingless.

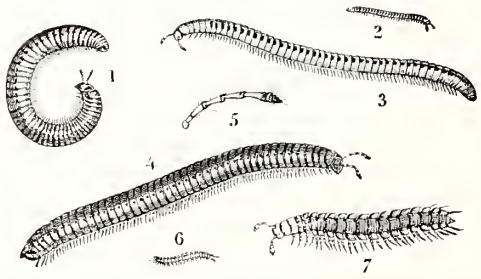
Red Spider, The (*Tetranychus tellarius*).—This well-known pest is at times very troublesome, as it attacks plants in the open air as well as those grown under glass, but the latter, no doubt, suffer most from this little mite. There are several species, but as they are much alike, and their methods of life and the means for their destruction are the same, I shall allude to them as if there were only one species. The red spider seems to delight in warmth and dryness; and, as a rule, the plants that suffer most from their attacks are those which from some cause or another are drier at the roots than they should be. When this is the case the foliage is no doubt in a more suitable condition for their use than when it is well supplied with sap from the roots. Plants attacked by this pest should be at once noticed, and if a specimen is suffering from want of water it should be attended to. In the case of those grown under glass want of ventilation often promotes an attack of red spider. These mites may be killed by spraying or syringing the plants with one of the following insecticides (it must be remembered that the red spider will always be found on the lower sides of the leaves, and that the application will be of little use unless it is directed to that part). Paraffin emulsion, to which add 1oz. of sulphide of potassium (liver of sulphur) to every 5 gallons of the wash; 1lb. of flowers of sulphur, and 2lb. of fresh lime, boiled in 4 gallons of water, then add 1½lb. of soft soap, mix thoroughly, and add 4 gallons more water, or 2oz. to 3oz. of Gishurst compound to 1 gallon of water. As these mixtures will not kill the eggs, they should be applied two or three times at intervals of three days. These creatures are very minute, and hardly visible to the naked eye; they spin a very fine web over the undersides of the leaves, in which they live. It is very important to apply the remedies with sufficient force to break the webs and therefore reach the mites.

Rose Beetle, or Green Rose Chafer, The (*Cetonia aurata*).—*See* Cockchafers.

Rose Saw Flies (*Hylotoma rosarum*), **and others.**—The saw flies are a very destructive family of insects, as there are a large number of species, and their grubs feed on the leaves of various plants. The Roses perhaps come in for an unfair amount of their attentions, as their foliage is injured by several species and in various ways. Hylotoma rosarum and some other species eat the entire leaf, with the exception of the thicker ribs. Another species curls up the leaves into regular rolls about the size of a pencil, or somewhat smaller, and lives and feeds within this shelter. Others feed only on the upper part, without injuring the lower side or the veins. Another lives inside the young shoots, feeding on the pith. The grubs should be picked off the leaves by hand; they may be rather difficult to see at first, but as soon as one or two are found the others will be discovered without difficulty. If so many bushes are attacked that hand picking is impracticable, the bushes should be sprayed with paraffin emulsion, the extract of quassia and soft soap, or Paris green. Most of the grubs bury themselves in the earth before turning into chrysalides, but those that attack the shoots undergo their transformations in the shoot. If a bush has been badly attacked by those species that bury themselves in the ground, remove the earth from under the bush to the depth of at least 3in., and burn it, or bury it not less than 1ft. deep, the object being to prevent the flies leaving the chrysalides in the spring. Any shoots that appear withered in the autumn should be cut off and burnt. The grubs, when full grown, vary in size according to the species, but many are about 1in. in length. They resemble much the caterpillars of moths, but may be distinguished by the number of their legs, which is greater than in the case of caterpillars.

Scale Insects (*Coccidæ*).—These insects are not, as a rule, very injurious to plants grown in the open air, but Apple trees, Roses, Cotoneasters, and some other plants often suffer from their attacks. When this is the case the best remedy is spraying, or syringing with paraffin emulsion or some other soapy insecticide. If possible, the scales should then be scraped off, and in the course of four or five days repeat the spraying, so as to kill any young that might have escaped the first application. When Apple trees are attacked by the "Mussel scale" in the winter, before the buds have commenced to open, they should be sprayed with a caustic wash (see Insecticides).

Snake Millipedes (*Julus, Blanjulus, and Polydesmus*).—These creatures are sometimes known by the name of "false wireworms," but this is a wrong designation, as they have nothing to do with wireworms. They are not even insects, but belong to the class Myriapoda, or creatures with many feet, and may always be known by this character; they are most destructive pests, and, once a garden is infested, it is difficult to eradicate them. They have such hard shiny skins that insecticides are not of much use, but they may be killed by a strong solution of salt or nitrate of soda, if it can be made to reach them; but as they are generally feeding at the roots of plants below the surface of the ground, it is difficult to make the solution reach them of sufficient strength, and to remain long enough to have a fatal effect. A heavy watering with either of the above-mentioned insecticides would probably be of use in making the millipedes shift their quarters. They feed on the roots of a number of plants, and seem particularly fond of Anemones, Lilies, and other bulbs, Pansies, and Stocks. One species, the spotted snake millipede (*Blanjulus guttulatus*) delights in ripe Strawberries, and a dozen or so may sometimes be found on one fruit. They may be trapped by laying bricks, tiles, cabbage leaves, or pieces of turf or board

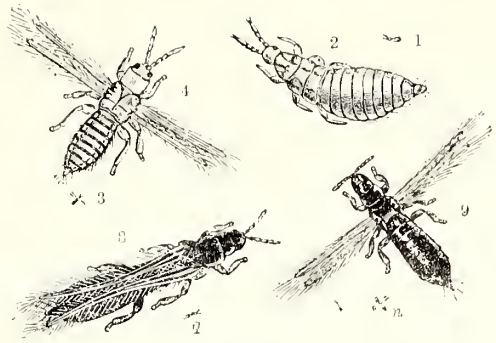


SNAKE MILLIPEDES.

1. Julus londinensis. 2 and 3. Blanjulus guttulatus, nat. size and mag. 4. Julus terrestris. 5. Feeler. 6 and 7. Polydesmus complanatus, nat. size and mag.

on the ground where the pests are, as they will often creep under them. The snake millipedes vary in size when full grown, according to the species, from ½in. to 1in. in length. They are usually of a dark brown colour, but one, the spotted snake millipede, is nearly white, with a deep red spot on either side of each joint of the body. This species is only ½in. in length, and is one of the most mischievous. They are all, with the exception of the flattened snake millipede, nearly cylindrical, and composed of a great number of joints, each of which bears two pairs of legs. These creatures are sometimes mistaken for centipedes, but the latter (with the exception of one species) all move with great rapidity, whilst the former move very leisurely.

Thrips (*Thrips adonidum and other species*).—The genus Thrips contains a considerable number of species, all of which are known to gardeners as thrips. It matters little how many kinds there are, as they all injure plants in the same manner, and may be destroyed by the same means. These little insects are often very troublesome in gardens, but they are far more mischievous in greenhouses and stoves than they are out of doors. Nevertheless, Carnations, Phloxes, Dahlias, and some other plants are at times attacked by them in the open air. When this is the case, syringe or spray with paraffin emulsion, quassia extract and soft soap, or some of the insecticides sold for this purpose. These insects are very small, none of our

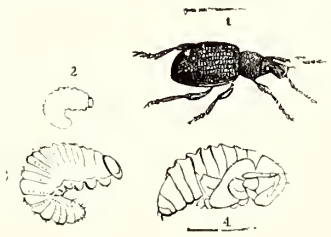


THRIPS.

1 and 2. Thrips minutissima, immature. 3 and 4. Thrips minutissima. 8 and 9. Thrips cerealium.

English species being more than 1-10in. in length. When mature they are furnished with two pairs of wings, which are very narrow and fringed, and when at rest lie folded over their backs. They injure the plants by sucking out the juices of the leaves by means of a short proboscis, and their droppings, which are of a glutinous nature, clog the pores of the leaves, thus destroying their usefulness.

Weevils.—Few families of insects are more destructive than the weevils. Several members attack the plants in our gardens and glasshouses. The weevils, as a rule, feed on the leaves, and their grubs on the roots of plants. These little beetles may be distinguished by their heads being produced into a more or less elongated proboscis or snout (at the end of which is the insect's mouth, which carries the feelers); these are not straight, as is usually the case, but have a decided elbow or knee about halfway in their length.



BLACK VINE WEEVIL.

1. Black Vine Weevil. 2. Grub, nat. size. 3. Grub, enlarged. 4. Chrysalis, enlarged.

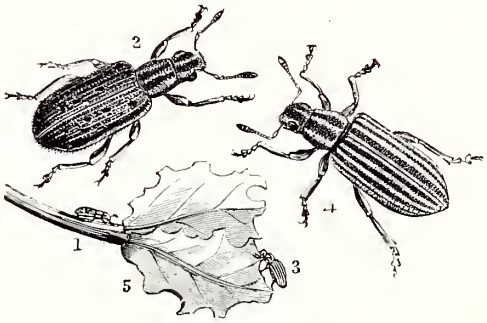
The Black Vine Weevil (*Otiorhynchus sulcatus*) is one of the most destructive, and the clay-coloured weevil (*Otiorhynchus picipes*) is almost as great a pest. They feed on the leaves of the vine and various plants, and are more mischievous in vineries and greenhouses than they are out of doors, feeding on the leaves and sometimes cutting the young shoots of vines right through. The foliage of Peaches, Roses, Ferns, and many plants with ornamental leaves is also injured by them, and their grubs attack the roots of Ferns, Cyclamens, Sedums, Saxifrages, Strawberries, Begonias, etc., Raspberries, Gooseberries, and Currants. The red-legged weevil (*Otiorhynchus tenebricosus*) much resembles the above-named species, but is considerably larger and by no means so common. Its habits and manner of life are identical. These insects are very difficult to destroy, as the grubs are comparatively safe, living as they do at the roots of plants, and the weevils hide themselves most carefully during the day, only coming out at night to feed. The only way of destroying the grubs is to examine the roots of the plant that they are attacking and pick them out. The weevils may be shaken off the plants at night into an open umbrella or on to boards or canvas stretched on a frame which have been newly painted or tarred, so as to catch the pests when they fall, which they do very readily when disturbed, or if a bright light is suddenly thrown on them. In May and June, when the weevils are very active, dress the soil just round the plants that are attacked with lime and soot, sand, or sawdust which has been soaked in paraffin oil, carbolic acid, or gas lime. In the case of plants grown in pots, the best way to catch the beetles is to place a white sheet on the ground, and to lay the plant on its side on this during the day. Soon after it is dark throw a bright light on it, and the weevils will be easily seen on the sheet when they fall. If they do not do so readily, shake the plant. When vines are grown on the roof of a house the sheet should be spread under them and the same tactics employed. Small bundles of dry moss or hay make very good traps, and should be tied to the stems of the plants, so that they can easily be used as hiding-places. The black vine weevil is about ⅜in. in length, and entirely black in colour. The clay-coloured weevil is about ¼in. in length, and of a pale brown colour. The grubs of both species are so much alike that it is almost impossible to distinguish one from the other. They are hardly ½in. long, white, fleshy, much wrinkled, and sparingly covered with stiff hairs. Their heads are dark brown, and they have no legs; they generally lie in a somewhat curved position.

Apple Blossom Weevil (*Anthonomus Pomorum*) is another destructive member of this family. It sometimes entirely destroys a crop of Apples or Pears. The females lay their eggs in the young fruit buds, and the grubs feed on the unopened or opening blossoms, which causes them to be barren and to turn brown and wither as if they had been caught by the frost. The young grubs require shelter, so if the weather be warm and fine at the time the buds are opening, so that they soon burst out into full flower, the grubs when hatched will not live, and the crop is not nearly so much injured as when the weather is not favourable and the opening of the buds is delayed for several days. The weevils have then, moreover, more time in which to lay their eggs. When once the eggs are laid there is nothing to be done, as no insecticide can be made to reach the grubs. If many of the weevils are noticed on the trees, they should be shaken from the branches on to cloths spread under them, or on to a light wooden frame with canvas stretched over it. Two laths about 5ft. long, connected at their centres by another of the same length, would be quite strong enough, and the canvas should not be stretched too tight. The weevils can easily be poured from an arrangement of this kind into a vessel of water. As they pass the winter under stones, rubbish, clods, etc., at the foot of the trees, and also under the rough bark, the ground underneath them should be kept free from anything under which they could hide. In the autumn scrape the stems and the branches so as to remove any rough projecting pieces of bark which might afford a shelter. Cloths of some kind should be laid round the stems before commencing this operation, so as to catch all that is scraped off. Then paint the stems and branches over with a wash made from fresh lime, to which should be added a little paraffin oil. Collect and burn any of the flowers which have been attacked and fall. Pick over the remaining ones on the tree, as they will probably contain the chrysalides of this insect. The weevils are about 2-10in. long, and are dark brown, covered with a greyish down, the wing cases being reddish with a somewhat V-shaped white band across them.

Nut Weevil (*Balaninus nucum*).—Everyone who has gathered or eaten Nuts fresh from the tree is aware that they often contain grubs; these are the progeny of the Nut weevil. At times they are very destructive to crops of Filberts and other Nuts, and are difficult to destroy, for when once the egg is laid within the Nut nothing can be done to prevent it from hatching, or the grub from feeding on the kernel. By the time the grub has attained its full size it will almost have finished the kernel. It then eats its way through the shell and falls to the ground, or if the Nut has already dropped it merely crawls out and buries itself in the soil, and there makes a little cell in which it passes the winter. In the spring it becomes a chrysalis, and in June the weevils make their appearance, whilst in July they lay their eggs in the Nuts. The weevil has a remarkably long slender

proboscis, or snout, at the end of which is the mouth; the insect eats a small hole right through the shell of the Nut and into the kernel, and then lays an egg at the entrance to the hole and pushes it to the bottom. The grubs are hatched in about a week or ten days, and attain their full size in September before they leave the Nuts; the ground underneath the bushes should be well dressed with gas lime or ashes, or sand soaked in paraffin oil, so that the grubs may not be able to bury themselves in the soil. In the winter well trench the ground, the surface soil being turned to the bottom, to bury the chrysalides as deeply as possible, or the soil may be only just broken up so as to bring the chrysalides to the surface, where they will be under the influence of the weather, and be within reach of the birds. Small birds should always be encouraged among the bushes, as they, and particularly the titmice, kill numbers of the weevils. Any Nuts that fall prematurely should be collected and burnt.

Pea and Bean Weevils (*Sitones lineatus*). — These weevils are very injurious to crops of Peas and Beans by feeding on the leaves. When the plants have attained some size this does not so much matter, but whilst quite young they suffer very much, the weevils only leaving the midribs of the leaves; as these insects generally feed at night, hiding themselves in cracks in the earth during the day, it is by no means easy to kill them, particularly as they resemble the soil so much in colour that they are very difficult to detect when they fall and feign to be dead, as they do at the slightest alarm. Dust the leaves when wet with powdered soot or lime, or a mixture of gas lime, lime, and soot. Spraying with paraffin emulsion, properly diluted, would be very useful, and press the soil firmly round the plants by walking slowly up the rows with one foot on either side. This will prevent the weevils to some extent from coming up out of the ground. Sand, soaked in paraffin oil, strewn on each side of the rows is also useful. The young plants should be pushed into rapid growth as quickly as possible by watering with liquid manure, or any other suitable methods of cultivation. The genus to which this insect belongs contains a considerable number of species, several of which attack Peas and Beans, but by far the commonest one is Sitones lineatus, which is about ¼in. in length, and of a greyish brown colour, striped longitudinally with yellow. The



PEA AND BEAN WEEVILS.
1 and 2. Sitones crinitus, nat. size and mag.
3 and 4. „ lineatus. „ „

grubs feed on the roots, and are white, legless, and about ¼in. long.

The Turnip Gall Weevil (*Ceutorhynchus Sulcicollis*).—There is yet another weevil that at times is decidedly injurious in our gardens, as its grubs form galls on the roots of Turnips and Cabbages of all kinds. These galls vary much in size, but sometimes form a knob on the root ¾in. in diameter, and the roots at times are covered with them. The weevils lay their eggs in the roots in May or June, and as soon as feeding-time comes the galls begin to grow. Generally there is only one grub in each gall, but sometimes there are several. When the grubs are full grown they make their way out of the galls and form cells in the earth, in which they eventually become chrysalides. It is only when the insect is in this condition that one can destroy it, unless the roots are used before the grubs leave them, so that as soon as an infested crop has been removed the soil should be well dressed with gas lime and thoroughly broken up, and no plants that the weevils are likely to attack grown on it for at least a year. Particular care should be taken in this respect with seed beds. The weevil is about ⅛in. in length, very broad in proportion, and glossy black in colour; the grubs are nearly 2-10in. long, and white with yellowish heads.

White Cabbage Butterflies (*Pieris brassicæ and P. rapi*).—The caterpillars of these two common butterflies, besides attacking Cabbages of various kinds, Cauliflowers, Turnips, etc., are very destructive to the leaves of Mignonette, Tropæolums of various kinds, and Horse-radish. When plants are infested, pick them

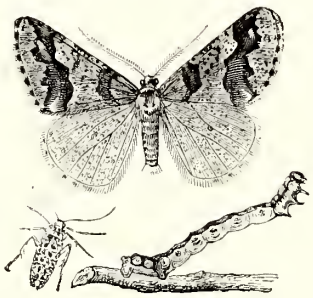
WHITE CABBAGE BUTTERFLY.
1. White Cabbage Butterfly (Pieris brassicæ). 2. Eggs.
3. Caterpillar. 4. Chrysalis.

off by hand, unless the pests are very abundant, when the plants might be sprayed with paraffin emulsion or salt and water, or pyrethrum powder might be sprinkled into the heads of Cabbages. The butterflies may be caught in nets. The chrysalides may often be found on posts or palings, and under the eaves of outhouses, and should always be destroyed. These butterflies are too well known to require description, and the two species may be easily distinguished from one another by their unequal size. The Cabbage butterfly is considerably larger than the other, measuring about 3in. across the wings when fully expanded, while the Turnip butterfly is not more than 2in. The caterpillars of the former species when full grown are 1½in. in length, of a pale blue or green colour above and yellow on the under-side, there being down the middle of the back a yellow stripe. There are various black spots, dots, and hairs scattered over the body. The caterpillar of the Turnip butterfly is about 1in. long and of a dull green colour, with a yellow stripe down the back and one on either side; it is so covered with short hairs as to be quite velvety.

Winter Moth (*Cheimatobia brumata, and other species*).—The caterpillars of this moth, and some nearly allied species, are among the most destructive pests to the leaves and flowers of Apple, Cherry, Damson, Pear, and Plum trees and Nut bushes. They attack the young leaves and flowers as soon as the buds begin to open, so that at times after a severe visitation the trees appear to be scorched by fire. There are fortunately various useful methods for keeping these insects in check, perhaps the most efficient being that which prevents the females from reaching the buds to lay their eggs; the females are wingless, or have such very rudimentary wings that they are perfectly useless as organs of flight, and as the chrysalides are formed in the ground the females have to crawl up the stems before they can reach their destination. Therefore the application of sticky bands which the

insects cannot pass over to the stems of the trees is a most effectual protection. Whatever sticky substance may be used, it is not advisable to apply it to the bark, as it may injure the tree, but a band of common grease-proof paper about 8in. in width should be fastened round the stem 1ft. or more from the ground, and on this spread the cart grease or whatever else may be preferred. The bark if at all rough should be scraped smooth below this band, so that the moth may not be able to pass under it, and it should be sufficiently long to lap well over. It is perhaps easier and better, on the whole, if the "smear" be spread on a strip of calico, sacking, etc., of the same width as the paper band, over which it should be tied. These bands should be fastened both at top and bottom. Of the various substances, such as cart grease, tar, soft soap, etc., really good cart grease appears to be the best, on the whole, but it must be renewed as soon as it becomes hard, or so clogged with insects that it is no further use. Of course if trees are supported by stakes, or in any other way by which the females might gain access to them, they must be treated in the same way as the stems. These bands should be put into position quite early in October, and be kept in working order until the middle of January. In spite of all precaution, some females may find their way to the buds, some no doubt being carried there by the males when pairing is taking place. If this be the case, in the spring, as soon as any injury is noticed, the trees should be sprayed with Paris green or paraffin emulsion, properly diluted. The male winter moth measures about 1in. or rather more across the wings when expanded, the upper wings being reddish brown or light grey in colour, and marked with fine transverse undulating dark lines; the lower pair are rather paler than the others, the body is slender, and of a yellowish grey colour. The female is stout, about ½in. in length, brown or grey in colour, and, as before mentioned, has no proper wings. The full-grown caterpillar is about ¾in. in length, and is green or yellowish green in colour, with several pale longitudinal lines. It is hatched just as the buds are opening, and is full grown in June. It then drops to the ground, buries itself, and becomes a chrysalis, from which the moth emerges in October, November, or December, and at times in January. The mottled amber moth (*Hibernia defolaria*) is almost as great a pest as the winter moth, and its habits are just the same. It is, however, a larger and handsomer insect.

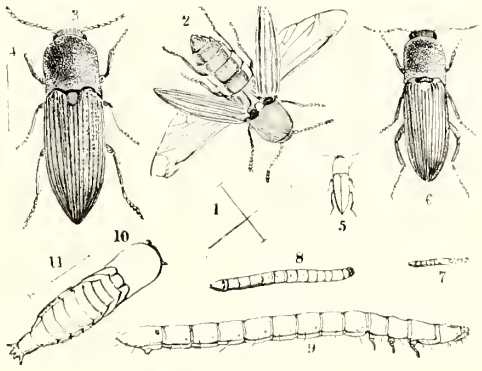
THE WINTER MOTHS
Male and two females.



MOTTLED AMBER MOTH.
Male, Female, and Caterpillar.

Wireworms (*Athous and Agriotes, several species*).—These pests are the grubs of beetles belonging to the family Elateridæ. There are a considerable number of species, and they are commonly known as click or skipjack beetles, on account of the power they possess of springing away with a click when disturbed. The wireworms attack a great variety of plants, and are especially fond of Carnations and other nearly allied genera. Insecticides have little or no effect on them, so that trapping must be resorted to. The best traps are slices of Carrot, Mangold, Potato, Turnip, or pieces of Rapecake, buried about 1in. below the surface of the ground. Each slice should have a small wooden skewer stuck into it, so that it may be the more easily found. Examine the traps every morning, and it is often said that wireworms are so fond of Rapecake that they will eat it until they burst; but this is a pure fiction, as they have been fed only on cake for some weeks, and have thriven wonderfully well on it. Strewing the ground, however, with small pieces of cake will often draw the wireworms away from a crop. Most birds are, fortunately, very fond of them. These grubs vary somewhat in size according to the kind; but the largest species is hardly more than ¾in. in length and ⅛in. in diameter; they are of a yellowish colour, with brown heads and legs. The latter are short and placed near the head. The click beetles are long narrow insects, of a dull brown, grey, or yellowish brown colour, as a rule, but some are more brightly coloured.

Woodlice.—These well-known creatures are very destructive, and many persons will be surprised to learn that they belong to the same class as shrimps, lobsters, and crabs, namely, the Crustacea, but so it is. They do an immense amount of mischief in gardens, greenhouses, Melon frames, Mushroom beds, and to Peaches and Strawberries; in fact, nothing in the way of vegetable matter that is soft enough for them to gnaw comes amiss. Out of doors they usually attack the collar of the plant, which is a very vital part, and fruit grown against a wall is often much injured by them; woodlice also sometimes gnaw Strawberries and open the seeds It is very difficult to exterminate these creatures, as their skins are so hard, and impervious to any insecticide, and as they only feed at night one cannot catch them easily. If, as is often the case, they congregate at the bottom of a wall in cracks in the earth they may be killed wholesale by pouring boiling water along the soil where it touches the wall, and walls on which fruit trees are grown should be kept well pointed, so that there may be no cracks or holes in which the woodlice can hide. Small bundles of dry moss placed near the fruit provide handy places for them to hide in, and where they may be easily found. Bricks, tiles, slates, and boards laid on the ground and left undisturbed for a few days make excellent traps, as they form dry places to shelter under. Woodlice detest moisture and tidiness, so that no rubbish should be allowed to lie about. It is said that they may be poisoned by laying pieces of Potato about that have been boiled in water with arsenic. Toads are their sworn enemies and kill numbers of them. It is a mistake to regard toads as enemies. In the case of woodlice, for instance, as we have said, they are the friends of man, as toads relish the strange pests that infest plant houses, and are of great use generally in gardens. When the garden is large, several may be obtained to assist in keeping down insect foes.



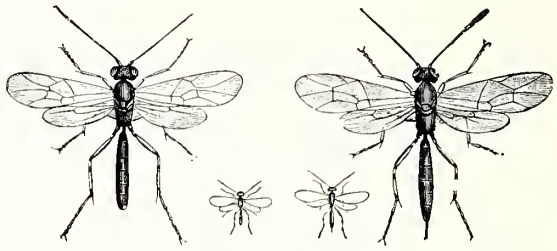
WIREWORMS.

1 and 2. Agriotes lineatus. *3 and 4. Agriotes obscurus.*
5 and 6. Agriotes sputator. *7 and 8. Wireworms, nat. size.*
9. Wireworm, magnified. *10 and 11. Chrysalis.*

INSECT FRIENDS.

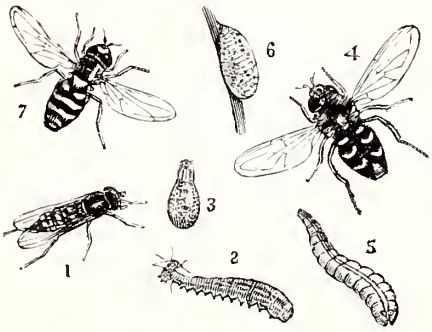
VARIOUS insects are of the greatest service possible to the horticulturist—in fact, without their assistance it would be almost useless to try to cultivate plants at all. These insects belong to several orders, perhaps those that could least be spared being

The Ichneumon flies and their near relatives; these insects usually lay their eggs in the bodies of caterpillars, grubs, and aphides, but some species deposit their eggs in chrysalides and in the eggs. These insects, though called ichneumon flies, do not in any way belong to the order of flies proper, which are two-winged insects, but they are classed in the same order as the saw flies, ants, bees, and wasps, and, like them, have four wings. They are nearly all slender in form, and have long legs—the upper pair of wings being considerably larger than the lower pair—whilst the end of the body in the females is furnished with a long pointed organ, known as an ovipositor. In some species this organ is of great length, being longer than the rest of the insect, and enables the possessor to reach its victim, which may be a wood-boring grub, or so placed that it would be inaccessible to the insect otherwise. In other species it is quite short, and may be entirely hidden in the body of the insect when not in use. The ichneumon flies do not try to kill their victims by piercing them with their ovipositors, their only desire is to lay their eggs within them; as soon as the grubs are hatched, they begin to feed on the juices of their host. Caterpillars attacked by these parasites live and feed for some time, and have been known to become chrysalides, but this effort on their part is generally more than they can manage. Several of the smaller species attack various kinds of aphides. One may often see on plants a large brown aphis with a swollen rounded body—the result of infestation by one of these parasitic insects; the latter vary much in size, from insects somewhat larger than those shown in the figure to others about the size of a midge. They are generally black-brown or some dull colour, though some have a bright band across the body.



ICHNEUMON FLIES.

The Hoverer flies (Syrphus pyrastri and other species) are very common, and may often be seen hovering, apparently motionless in the sunshine, near trees or basking on leaves with their wings outspread. Their grubs are most voracious, and feed entirely on aphides. They are quite blind, though, having neither eyes nor legs, they manage to kill an enormous number of aphides. They cling on to the leaf or stem on which they are by means of certain tubercles near the end of their bodies; raising their heads and the first few joints of their bodies, they strike about until they touch an aphis, when they immediately seize it, hold it up in the air, and suck the contents of its body completely out, which is only the work of a minute and a-half. They then turn their heads on one side, drop the empty skin, and at once search for another aphis. These grubs are about ½in. long, the widest part being at the tail, and gradually taper to the head. Their mouths are furnished with a double hook, with which they secure their prey; they are of a greenish or yellowish



HOVERER FLIES.
1. Scæva balteata. 4. Scæva pyrastri. 7. Scæva ribesii. 2 and 5. Grubs. 3 and 6. Chrysalides.

colour, the chrysalides being pear-shaped and of a brownish colour. They are formed on the stems where the grubs have fed.

The Lace-winged or Golden-eyed fly (Chrysopa perla), though not so common as the lady-birds, is by no means unusual, and their grubs, as well as those of some nearly allied species, destroy an enormous number of aphides. The parent insects have small slender bodies, and two pairs of large pale green gauze-like wings, which measure about 1½in. from tip to tip when open. The eyes are prominent, and of a very brilliant golden colour. Notwithstanding the size of their wings, these insects fly very slowly and in a fluttering manner, so that they are an easy prey to their enemies. They are protected, however, to some extent by having the power of emitting a most disgusting smell when touched; the eggs are very beautiful and curious, and are often mistaken for fungi or the seed-vessel of a moss, as each is perched on the top of a long stalk sometimes 1in. in length. These eggs are laid in a cluster of a dozen or so together. The female, when about to lay an egg, probably touches the leaf or stem with the end of her body, and, exuding some sticky substance, raises the end of her body in the air, and so draws out a fine thread, which soon dries, and on the top of which an egg is placed. It is supposed that the object of this peculiarity in the position of the eggs is to prevent injury when amongst a crowd of aphides. The grubs are somewhat like those of the lady-bird in shape, being, when full grown, about ⅜in. in length, and of a dirty white or pale brown colour, with brownish or orange spots. There is a row of tufts of hair on either side of the body; the grubs of some species cover themselves with the dead bodies of their prey, or with bits of lichen. Their chrysalides are small white cocoons, about the size of a small flea.

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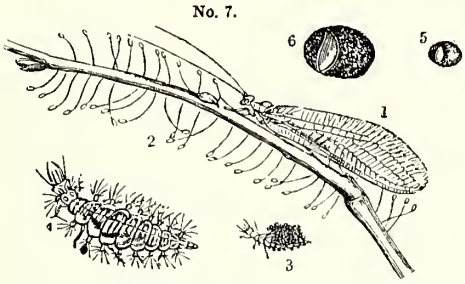
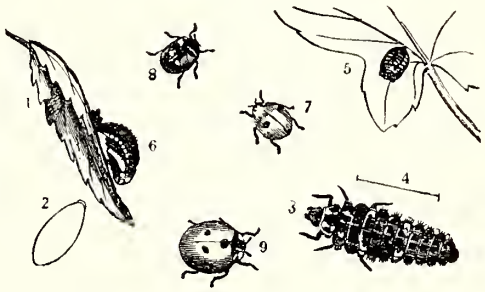


THE LACE-WINGED FLY.
1. The Lace winged Fly. 2. The Eggs.
3 and 4. The Grubs. 5 and 6. The Chrysalis.

Lady-birds (Coccinella septempunctata and C. bi-punctata). The grubs of these insects are most useful in destroying aphides. The parent insects are too well known to require any description, as every one is familiar with the seven-spotted and the two-spotted lady-birds; the grubs are known in hop gardens as "Niggers." They are flattish, of a leaden grey colour, and ornamented with black and yellow spots; the grubs of both species are very much alike, but those of the two-spotted species are considerably smaller than those of the other, being not more than ¼in. in length. It is unfortunate that when destroying aphides on a plant by means of an insecticide it is impossible to help killing useful insects at the same time, but if noticed they should always be removed before a plant is syringed. It is a pity that all the friends of the gardener are not as well known as the pretty lady-bird, which every child is taught not to crush, but to preserve because it is not harmful. There is a sad want of knowledge of the friends and foes of the gardener. Everything that is an insect is considered an enemy and treated accordingly, with the result that many things are exterminated which are actually of great benefit to our crops. We hope that these few notes about the friends will do much towards promoting a better knowledge. The excellent illustrations which accompany these articles are reproduced by permission from the leaflets issued by the Board of Agriculture and from "Curtis' Farm Insects," published by Gurney and Jackson.

No. 6.



LADY-BIRDS.
1 and 2. Eggs (nat. size and mag.)
3 and 4. Grub " "
7 and 5. Two-spotted Lady-bird and Chrysalis.
9 and 6. Seven-spotted Lady bird and Chrysalis.

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AN OLD GARDEN IN IRELAND.

INSECTICIDES.

BEFORE selecting an insecticide it should always be remembered that some insects feed by sucking the juices of plants, others by eating away the part of the plant on which they are feeding, and that some insecticides are destructive to insect life by poisoning the food, others by choking up the breathing pores of the insects, or acting as a caustic to their skins. Those insects that have jaws and eat their food can be poisoned, but those that live by suction cannot, for it is impossible to impregnate the juices of a plant with a poison. Whatever insecticide be used will probably not kill the eggs (except the very caustic ones), so that, particularly in the case of those insects that undergo their transformations very rapidly, it is essential to use them two or three times, with an interval of three or four days between each application, so as to make sure of killing the young as soon as they are hatched. An ordinary syringe, as a rule, is not a very good instrument to apply insecticides with, as they are not thrown on to the plants in such a finely-divided form as when a spraying machine or a syringe with a spraying nozzle is used, and more of the insecticide is wasted than when applied as a spray. There are various spraying appliances sold by those who supply horticultural implements; perhaps the most useful are the "knapsack" sprayers, so called on account of their being carried on the back like a knapsack. They hold about 3 gallons, but spraying nozzles are sold that can be attached to ordinary syringes or garden engines. Whatever form is used, it is important that it should be capable of applying the spray to the under sides as well as to the upper sides of the leaves, as it is there that red spider, thrips, aphides, etc., most frequently congregate.

In making up the following recipes, soft water should always be used; if it is impossible to procure this, a little soda should be added to the water before it is used. The following are the insecticides which are generally found most useful, and instructions for making them

should be carried out as closely as possible, as otherwise the result may be different to what was expected.

ARSENATE OF LEAD.—Dissolve 1oz. of arsenate of soda in a little water and pour it into a vessel containing 16 gallons of water, dissolve 3oz. of acetate of lead in a little water, pour it into the solution of arsenate of soda, and stir in 2lb. of treacle or some paraffin emulsion in order to make the mixture adhere better to the leaves. Used to kill young caterpillars and slugworms.

CARBOLIC ACID.—One pint of crude carbolic acid, 1 quart of soft soap, well mixed in 2 gallons of hot water, used as a winter wash on the stems and boughs of trees, one part of the acid to 50 or 100 parts of water. Sometimes useful in destroying insects at the roots of plants.

CAUSTIC ALKALI SOLUTION.—Dissolve 1lb. of caustic soda in 1 gallon of water, then add ¾lb. of carbonate of potash, stir until all is dissolved, and add 9 gallons of water; last of all add 10oz. of soft soap which has been dissolved in a little boiling water, mix thoroughly, and the solution is ready for use. This mixture is often used without the soft soap, but the soap makes it adhere much better. This mixture is very caustic, and should not be allowed to get upon the skin or clothes. It is used as a winter wash for trees infested with American Blight and other insects.

GAS LIME.—If soil that is infested with wireworms, other insects, and snake millipedes, is dressed with gas lime, at the rate of ½lb. to 1lb. per square yard, the pests will be killed, but nothing should be planted in the soil for at least nine months afterwards.

NITRATE OF SODA.—A strong solution of nitrate of soda is said to kill snake millipedes if they are immersed in it; it is useful to water plants that are attacked at the roots by these creatures or by grubs with it.

PARAFFIN EMULSION.—This is one of the most useful insecticides. It may be made by dissolving 1 quart of soft soap in 2 quarts of boiling water; while the water is still boiling add 1 pint of paraffin oil (it is not safe, however, to do this over a fire), and at once work the mixture through a syringe for 5min. or 10min., when there should be a perfect emulsion. To 1 pint of the emulsion add 10 pints of soft water before using it. A mixture very like the above, but with the addition of a certain amount of naphthalene, has been devised by Mr H. H. Cousins, of the Agricultural College, Wye, Kent, which is said to be a great improvement on the ordinary emulsion. Full instructions for its preparation for private use can be obtained from him, and it is sold in "the market" under the name of "Paranaph." Paraffin simply mixed in water is not a good insecticide to use, as it is so difficult to keep it properly mixed, and if it is not, much injury may be done to the plants to which it is applied. All kinds of sucking insects may be destroyed by this emulsion.

PARIS GREEN.—This very poisonous substance is most useful in killing all kinds of biting insects, but it should always be used with care. It is better to purchase it as a paste than as a powder, as it does not then blow about when handled. "Blundell's Paste" is highly recommended. One ounce should be used with every 12 gallons of water, and two parts of lime should be added for every part of the Paris green (bulk for bulk). Paris green is very heavy, and unless the mixture is kept constantly stirred it will sink to the bottom of the vessel, and the quantity used will not be all of the same strength; some will be too weak and will not kill the pests, the remainder will be too strong and will injure the foliage. Some of the knapsack sprayers are fitted with a device for keeping the liquid properly mixed. This insecticide should not be used when trees are in flower, or bees which are visiting the blossoms will be killed. Nor should it be used on fruit trees or bushes within a month of the fruit becoming ripe.

QUASSIA AND SOFT SOAP WASH.—One pound of quassia chips should be soaked in cold water for three hours, and then boiled for at least twelve hours in a gallon of water; strain out the chips, add 10oz. of soft soap, and enough water to make 10 gallons of the mixture.

Quassia extract may be bought, but the strength of it is uncertain. This is a very useful insecticide for use in attacks of aphides and thrips, and, if 1lb. of flowers of sulphur be added, for red spider.

RESIN WASH.—One pound of resin, ¼lb. of caustic soda, and 1½ gills of soft soap should be put into a closed vessel, covered with 4in. or 5in. of water, and boiled for an hour or more, until the liquid has a dark brown colour like coffee. Before using, add four parts of water to one of the mixture. This is strongly recommended by the American authorities as a wash for plants, etc., attacked by scale insects.

SOOT.—This, when fresh, is useful in keeping grubs away from plants if laid thickly on the soil round the plants and then worked in the earth.

TOBACCO.—This is one of the best-known, and at the same time one of the most useful, insecticides. To make tobacco water, boil ½lb. of tobacco in 1 gallon of water. The liquor, when strained off, should be diluted with water if necessary until it is of the colour of tolerably strong tea. Soft soap may be added at the rate of 2lb. to every 3 gallons. It may also be used powdered, or in the form of snuff, to dust plants with that are infested with aphides. It is also used in greenhouses for fumigation, and a very strong tobacco liquor is effective in killing most greenhouse pests when gradually evaporated over a small stove.

Besides the insecticides already enumerated, there are various others sold, with directions for their use, which are more or less useful. They are, however, generally more costly than those that can be made at home, and it is difficult to be certain that the ingredients are quite fresh, but then there is no trouble in making them up. Insecticides must be used with extreme caution, otherwise the remedy proves worse than the evil. Many failures may be attributed to their reckless use. Always apply them according to the printed directions, and it is better to use them too weakly than to apply a strong dose. It must be remembered that the insecticides are strong, and hurtful if overdone.

A GARDEN SEAT.

TWIN TREES, BURNHAM BEECHES.

FUNGI.

THE number of fungi that attack our cultivated plants is almost as great as that of the insect pests, and their attacks at certain times are even perhaps more difficult to combat than those of insects. It is asserted by many persons that healthy plants are not attacked by fungi, that it is only in the case of a plant being diseased that fungi can find in it a congenial habitat, and that they are not the cause of the disease. I do not think that this can be proved. Doubtless plants in an unhealthy condition are more liable to, and suffer more from the presence of, parasites than those in robust health, and certain conditions of the atmosphere are favourable to the growth of fungi, and detrimental to our plants. But very often when a plant is infested by a fungus it appears to be quite healthy until the attack has made considerable progress. Fungi vary very much in appearance, from the ordinary Mushroom and Toadstool to minute and very delicate moulds. The part of the fungus that we see is, as a rule, only that part which is concerned in the reproduction of its species by means of spores, so that it represents, to a certain extent, the flower of an ordinary plant, the real fungus being composed of a number of fine root-like organs within the substance on which the fungus is growing. For instance, in the case of the common Mushroom, the real plant is the "spawn," and the umbrella-shaped Mushroom is only a spore-bearing organ, and may be destroyed without any injury to the fungus. Thus in many cases a plant is infested by a fungus without any sign of the attack until some of these spore-bearing organs are pushed through the leaf, stem, or whatever part is attacked, when the presence of the fungus is noticed for the first time, and when it is often too late to do more than prevent the pest from spreading by dispersing its spores. Many fungi live only on dead matter; these are, of course, perfectly harmless to living plants, though when found on a dead plant they are often

accused of having killed it. Many are true parasites, and can only exist in the tissues of living plants; some, however, during certain times of their lives can live on both dead and living vegetable matter. It is impossible and needless on the present occasion to describe the different kinds of spores borne by fungi, some species bearing as many as three and even four different kinds. One kind, known as resting spores, may remain for two years without germinating. It is impossible to do more than just mention that some fungi infest two perfectly different kinds of plants, and in quite different manners. From their appearance no one would imagine that they were different forms of the same fungus. The spores of fungi are very minute, and are easily carried about by the wind or by anything that happens to touch the plant on which they are formed. Those which then come into contact with a suitable position for their germination at once start into life, and the contents of the spore pass into the leaf or other part of the plant which is affected by the fungus. The spores of some fungi will not germinate unless they are able to gain access to the tissues of their host, through some wound or injury to the bark. Others which live in the ground on decaying vegetable matter, if they come in contact (as they will do by spreading in all directions) with the roots of a suitable plant, enter them and eventually infest the whole plant, causing its death.

In the present work I cannot attempt to enumerate, much less to describe, the various kinds of fungi which at times attack our cultivated plants. I can only call attention to some that are particularly destructive or common, and mention the most useful recipes and methods for dealing with them, as so many fungi only attack one kind of plant. I have given the plants in alphabetical arrangement, and afterwards alluded to certain fungi that are by no means particular in their choice of a host.

APPLE TREES are attacked by several different kinds of fungi. The most important one, canker, is only too well known. This is caused by a fungus known as Nectria ditissima. The spores usually gain access to the tissues through some wound or abrasion of the bark, which may be very slight, for some have suggested that even the punctures made by aphides are sufficient. The spore, having reached the growing cells, germinates, and the fungus grows in the branch, bursting through the bark here and there in order to produce fresh spores on the surface. The little coral-like round dots that are sometimes seen on the cankers are little capsules containing a large number of spores. When branches are badly attacked there is no cure for them, and they had better be cut off. If the canker is small and isolated it may be cut out and the wound tarred over. There is a fungus that attacks the leaves badly, sometimes known as the leaf scald fungus (Entomosporium maculatum). It begins as small red spots on the upper surface of the leaves, which afterwards become larger and turn brown. When these spots are very numerous the leaves are so affected that they fall, in very bad cases leaving the trees almost bare. All the leaves from a tree which has been attacked should be collected and burnt, and the next spring, as soon as the leaves have expanded, they should be sprayed with Bordeaux mixture, and once or twice afterwards. When the fruit is attacked by fungi, those that are not fit to eat should be burnt, and on no account be allowed to remain on the ground under the trees, as is so often the case.

CABBAGES and plants of a similar nature are very liable to be infested by the finger and toe fungus (Plasmodiophora brassicæ), which is too well known to require any description. The life history of this fungus is a curious one. The swelling of the roots is caused by the action of the fungus in the cells, those which are attacked becoming much larger than the others; eventually some of these cells become filled with spores, which, when the roots decay, find their way into the soil and burst or open, so that their contents, which consist of minute masses of a jelly-like substance, are quite free. These little masses have the power of moving about on damp substances, and when they come across the roots of a suitable plant they are able to enter, and these roots are in turn attacked. It is quite

clear that it is foolish to plant another crop which is liable to the attacks of this fungus in soil that is impregnated with its spores, so that the ground should either be given a heavy dressing of lime, or, better still, of gas lime, and no cruciferous plants should be grown on it for at least two years. Every morsel of an infested crop should be removed from the ground and burnt, not thrown on rubbish heaps.

CARNATIONS.—The leaves of these favourite flowers are liable to the attacks of two or three different kinds of fungi. Cutting off the diseased leaves and spraying the plants afterwards with Bordeaux mixture or sulphide of potassium every ten days until there is no more sign of the fungus is the best cure. Care should also be taken that the proper amount of water is given to the plants.

CHRYSANTHEMUMS are often injured by one or more of these parasites attacking their leaves. The Chrysanthemum rust (Puccinea hieracii) is perhaps the most destructive. This forms small dark brown masses of spores on the under-sides of the leaves, being sometimes so numerous as to almost entirely cover them. As soon as the attack is noticed the plants should be sprayed with a solution of sulphide of potassium every ten or fourteen days until the disease entirely disappears. Isolate the plants that are attacked, and pick off all the affected leaves. The same treatment will be appropriate for other fungoid pests.

HOLLYHOCKS are very subject to a fatal pest, the Hollyhock rust (Puccinea malvacearum), which a few years ago rendered the cultivation of Hollyhocks a very difficult, if not an impossible, task in some parts of England. It forms a number of small round excrescences on the leaves, stems, and fruit. Pick off all the infested leaves and burn them, and on no account allow them to lie and decay on the ground. Spray the plants with Bordeaux mixture as soon as the slightest sign of the disease makes its appearance, and keep spraying every now and then until it disappears.

LILIES.—These favourite flowers, particularly the Madonna Lily (Lilium candidum), are liable to be attacked by the Lily disease (Botrytis cinerea), which has proved very fatal in many parts of the country. The best remedy appears to be spraying with Bordeaux mixture occasionally, and picking off and burning the affected parts. A correspondent of one of the gardening papers took up his bulbs which had been attacked, put them into a brown paper bag with a quantity of flowers of sulphur, and shook them well up until the sulphur had worked between the scales of the bulbs, which were then replanted, and showed no signs of the disease the next season.

PEAR TREES.—These trees and their fruit suffer from much the same pests as Apples.

POTATOES.—The Potato disease (Phytophthora infestans) is too well known to require any description. The best means of preventing an attack are to grow the kinds that are least liable to be attacked, and not to grow them again on ground that has borne an infested crop for at least two years. Every scrap of such a crop that cannot be used for human food should be burnt, and not given as food to any animals, and if a crop is attacked, the leaves should at once be sprayed with Bordeaux mixture.

ROSES.—There are at least three well-known fungi that attack these plants—the mildew (Sphærotheca pannosa), the Rose rust (Phragmidium subcorticum), and the black spot (Actinonema rosæ). Spraying with sulphide of potassium checks the mildew, and the affected shoots should be cut off and burnt. The leaves which have been attacked by the rust should be collected and burnt as soon as they have fallen, and the bushes well sprayed the following spring with sulphate of copper before the buds open. The infested leaves should be sprayed with Bordeaux mixture. The best remedy for the black spot is to pick off the leaves that are attacked and burn them.

TOMATOES.—The sleeping disease of this plant is one that does an immense amount of injury at times, and it is one for which no remedy is known, as the fungus finds its way into the plants through their roots, and no outward application of an insecticide can be of any use. After a bad attack, the best thing to do is to clear both plants and soil out of the house

altogether, and to wash the house out well with a solution of sulphate of iron. The black spot (Macrosporium tomato) should be met by thorough spraying with sulphide of potassium and the removal of the diseased parts.

FUNGICIDES.

THE following are among the best-known and most efficacious remedies: Ammoniacal solution of carbonate of copper.—Carbonate of copper 1oz., carbonate of ammonia 5oz., mix these together in a quart of hot water and then add 16 gallons of water; or 1oz. of carbonate of copper made into a paste with ½ pint of water, then slowly add ½ pint of strong ammonia water (26deg.), then add 9 gallons of water. This is almost as good a fungicide as Bordeaux mixture, and does not leave any sediment on the plants.

Bordeaux Mixture.—Dissolve 10oz. of sulphate of copper in a little boiling water and add 5 gallons of water; slake 6oz. of lime in some water, when it is cool pour it into the solution of copper, and stir all well together. To test the mixture, so as to be quite sure it will not injure the foliage, hold the blade of a bright knife in it for a minute; if the blade is unchanged it is all right, but if the steel shows signs of a deposit of copper more lime must be added.

Sulphide of Potassium.—Dissolve 1oz. of sulphide of potassium (liver of sulphur) in a quart of hot water, and dilute it with 2½ gallons of water.

FROM TERRACE TO TERRACE, CLEVEDON COURT, SOMERSET.

Sulphur in powder (flowers of sulphur) is useful in attacks of mildew to dust plants with, and in greenhouses and vineries, mixed with a little water, to paint the hot-water pipes with as a remedy for mildew, but it should not be used on flues. Flowers of sulphur is a very common remedy, but known more amongst professional growers than to the amateur, which is a pity, as it is very simple and efficacious when applied in good time. That is the point—not to wait until the disease has made serious inroads, as then it is of course more difficult to overcome. Roses are frequently attacked, some varieties being more subject to it than others, but flowers of sulphur is a very good remedy. Amateurs should use more frequently the simple remedies so easily at command, and immediately the presence of the disease is detected. Once a plant becomes much diseased, it rarely indeed recovers health and vigour.

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A LAVENDER WALK AT STRATHFIELDSAYE.

"COUNTRY LIFE."

THE PEAR WALK, PRESTON HALL, AYLESFORD.

FRUIT TREES FOR ORNAMENT AND BEAUTY.

By George Bunyard, F.R.H.S., V.M.H.

It is so generally the custom for fruit trees to be relegated to the kitchen garden or some other out-of-the-way spot that it will appear to many an innovation to mention them in connection with pleasure gardens, lawns, and shrubberies. But they combine so much beauty in their vernal flowers and autumnal fruit, that they can be, and are, made use of by many first-rate amateurs and gardeners to furnish subjects of interest which appear in striking contrast to their surroundings. For instance, in the Shirley (near Croydon) Vicarage Gardens fruit trees play no inconsiderable part in the general effect presented by that admirably planned and beautiful place, simply because the Rev. W. Wilks, the well-known secretary of the Royal Horticultural Society and Vicar of Shirley, has placed them artistically in their proper positions, and I shall take his garden as a text upon which to pen a few words on the possible uses of fruit trees and bushes as ornamental subjects in large or small gardens. Isolated trees should stand, preferably, as a background to shrubberies, a few being dotted on the lawn at its outside boundary (as viewed from the house), and, taking the latter purpose first, a Dutch Medlar should be one; its large white flowers nestling on the rich foliage are very conspicuous, and the natural weeping habit of the sort renders it suitable as a good protection for a garden seat, while its broad and closely-set foliage forms a deliciously cool shade in the summer months, while in autumn its fruits are very acceptable when bletted (ripened) in a cool store, and they also make admirable jelly for game.

If there is a pond or damp corner on the lawn, a Quince would thrive on the banks

of the water and hang gracefully over the pool, and such a tree is very beautiful, either in June with its large white and blush cupped flowers, or in October with its golden fruit, which the cook will utilise for various purposes. If the garden is of sufficient extent a Black Mulberry should be planted; if possible a low standard, as that form is less liable to breakage when the tree gets old.

In growth the Mulberry is not elegant, as its foliage is large and lumpy, but its rigid outline can be used as a contrast when surrounded by upright or slender-growing trees, such as the Acacias, Mountain Ash, Silver Birch, or cut-leaved Beech. For early spring blossom and autumn fruit combined there are no better subjects than the John Downie and Dartmouth Crabs. The former is best as a standard, as its numerous long oval fruits cause the tree to weep, and when ripe, in September, they present a rich appearance, as the tree bears profusely. The Dartmouth Crab is better as a pyramidal tree, when it should be pruned hard for two or three years and then be allowed to extend itself. The fruits are large, and assume a rich dark Mulberry colour when ripe, covered with a dense bloom. They are handsome on the trees, as also when used for table decoration.

Near the sea, or along the Southern and Western Coasts of Britain, the Cherry Plum, or Myrobelle bears fruit, and is hardy in Britain. Its snowy white blossoms greet us in February and March, along with the Blackthorn, giving us a welcome foretaste of spring, and if the flowering season is propitious fruit frequently sets. There are trees with red and yellow fruits, both very handsome, and I find when they are grafted with scions from free-bearing trees they produce fruit more freely than seedlings. An example in my nursery, with both red and yellow fruits on the same tree, is interesting and profitable.

A PATTERN OF WISE PRUNING, SHIRLEY VICARAGE.

At the same time the lovely purple-leaved kind, Prunus Pissardi, in which the port wine-coloured foliage forms such a pleasant contrast to its snow white flowers, must not be overlooked. The fruit of Mirobelles seldom becomes sufficiently dainty for the dessert, but is nevertheless valuable for tarts. It is probable that in selected situations the Japanese varieties, Satsuma, Masu, Botan, Burbank, and other hybrid varieties which Mr. Luther Burbank has raised in California, may become useful.

INSIDE THE PRESTON PARK PEAR WALK.

Among Apples there are many kinds well worth cultivation for their blossom alone, but we will now take those of value for their beauty and utility. Standard trees of the weeping sorts are most suitable for lawns. Gascoyne's Scarlet Seedling forms a perfectly shaped tree, lovely in its profusion of blossom and striking when its scarlet fruits are ripening in October. If the boughs are spur pruned they carry festoons of fruit which, in the South at least, colour to perfection, making them available for decorations in a high degree when gathered, and striking objects upon the tree. Cox's Pomona also makes a fine lawn tree, and Peasgood's Nonsuch produces very large noble flowers; the three kinds named have fine bold foliage, and if a fourth should be desired Stone's or Loddington Seedling, with its large foliage, brilliant pale flowers, and handsome fruit, may be added. The dessert sorts, with smaller foliage, are not so well adapted for our purpose; moreover they are more readily affected by blights and mildew, and then assume a ragged appearance.

There are a few Pears which produce a profusion of large pendent flowers, which with a suitable background of taller trees seem worthy of a garden space. Jargonelle, Catillac, Beurre D'Amanlis, and Pitmaston Duchess have ample foliage and produce a prodigious number of conspicuous white flowers.

In preparing stations for these subjects, a 6ft. circle 18in. deep should be provided in order to start them well, and the grass should not be allowed to approach within 2ft. of the stems for the first five years. After that period they could take care of themselves, and if at any time they carry a large crop some liquid manure will ensure all the nutriment necessary, while bulbs for spring show and sweet-scented annuals, as Mignonette, Mathiola Bicornis (Night-scented Stock), or showy annuals, as Godetias, Clarkias, Candytufts, Viscarias, etc., could be grown on such cleared spaces.

It will also be well to introduce some of the more upright-growing kinds of Apples

A PEAR WALK AT MADRESFIELD COURT.

and Pears at the rear of shrubberies. The trees planted in this position at Shirley make an admirable background, and Apples are preferable to Pears, while Plums cannot be recommended for these positions, as the birds, proteced by the shrubs, too often reward us by picking out the flower buds, so that these subjects look weedy and lose their beauty.

A few Pears, as Beurré Claurgeau, Beurré Capiaumont, Duchesse d'Angoulême, and others of upright growth may be used for contrast, but choice Pears cannot be expected to succeed under such conditions so far as fruit is concerned. It is also hopeless to expect a crop from Cherry trees planted on a lawn, as the fruit is especially tempting to birds; but, on the score of beauty, room must be found for a standard tree or two, preferably those of spreading growth, as they exhibit their festoons of flowers in the most graceful manner. Elton Heart, Governor Wood, Bigarreau Napoleon, River's Early, and Black Tartarian are best, the Duke family being too close in growth and too short in the flower stock. Although this is a fruit paper, I cannot refrain from recommending the Double Bigarreau Cherry (C. Avium flore-pleno), which is the most beautiful and graceful of all white-flowered trees.

By the kindness of Mr. W. Crump, of the famous Madresfield Court Gardens, I am enabled to give illustrations of the Pear-covered walks in the kitchen gardens there, but I would suggest the erection of such arches (where not too exposed) outside and leading to kitchen gardens. With regular attention to root pruning they are most charming when in flower, and then more interesting when in fruit. It is, however, best to confine one's choice to the free-growing kinds possessing good foliage, and Pear trees should be on the Quince stock and planted in pairs opposite each other to give a uniform appearance. At Madresfield Court these arched walks meet in the centre of the four-quartered garden, and the views from the centre, up these vistas, are delightful; they are backed by tall pyramidal trees, which at Madresfield relieve the formality of set arches, and it would be as well to plant a few trees of columnar form when the arched walk is not in the kitchen garden.

Cordons are used to form arches quickly, but, as shown in the view taken at Preston Hall Gardens by the owner's kindness, the trees were there first planted as espaliers and then trained in that form laterally to the crown of the arch, while to make a variety after

the fifth horizontal tier had been reached, the top or fifth rod was allowed to throw up perpendicular shoots, which were disposed at equal distances and then arched over. The best Pears for this purpose will be found, either for cordons or espaliers, in Colmar d'Ete, Louise Bonne, Durondeau, Emile d'Heyst, General Todleben, Fondante de Thirriott, Beurré Hardy, Beurré Superfin, Pitmaston Duchess, Clapp's Favourite, Conference, Beurré Jean Van Geert, and Belle Julie; all tender kinds, and those making long joints (between the eyes) should be avoided; Doyenné du Comice, however, is worth a trial.

Apples for the same purposes must be free bearers and upon the Paradise stock, those of compact growth being preferable, such as, for dessert kinds, Red Quarrenden, Worcester Pearmain, Wealthy (American), Colonel Vaughan, Emperor Alexander, King of the Pippins, Calville Rouge Precôce, Cox's Orange Pippin, Cockle Pippin, Ross Nonpariel, Mabbott's Pearmain, Allington Pippin, Christmas Pearmain, Golden Reinette, Baumann's Reinette, Fearn's Pippin, Sturmer Pippin; and for kitchen kinds, Duchess of Oldenburgh, Pott's Seedling, Stirling Castle, Grenadier, Golden Spire, Lord Derby, Bismarck, Lane's Prince Albert, Belle de Pontoise, etc.

NOTE.—These culinary Apples produce very large fruits, and form an interesting contrast to the smaller dessert kinds.

All the above are specially suitable kinds for arches; a few others might be added if espaliers are desired, but avoid Ribston Pippin and those kinds liable to canker.

In forming wide herbaceous borders, espalier fruit trees form a good background, but flowering plants should not be nearer than 3ft. from the trees, or the taller subjects will shade the fruit too much. For this purpose a greater variety of fruit can be utilised and space thus saved in small gardens.

Special features can be made by forming pavilions of iron with a central garden seat, and if such are four or five or seven sided the panels upon which the plants are to be trained are best fitted with wooden lattice work, as this suits the climbing plants better than iron. Such an erection placed at the junction of three or more walks will form a pretty object when covered with the cut-leaved Bramble, the Logan Berry (a new hybrid from America), the Wine Berry (Rubus phœnicolasius), the purple claret Vine (Vitis purpurea), the glorious Japanese Vine (Vitis Coignetiæ), whose brilliant foliage in the autumn vies with the Virginian Creeper.

A CROSS WALK AT MADRESFIELD COURT.

There are also the Parsley-leaved Vine (Vitis apiifolia) and the pretty old black cluster Vine; the foliage of the latter is very rich in autumn.

For approaches to a summer-house, especially if a stone one, a pergola, formed of the subjects mentioned for a pavilion, would create a new feature, while Figs could also be introduced as a change, and, if desired, any of the free-growing Clematis, with Aristolochia and other climbers, might be introduced.

As I am now writing upon fruit outside the kitchen garden, I would suggest that here and there on the grass lawns beds should be made of Gooseberries, with Currants and Strawberries, which the little folks of the house might gather for themselves, as it is frequently a case of friction when they pluck indiscriminately in the fruit garden proper. Gooseberries are most readily gathered when trained in a fan or cordon form (see figures), and if needed are more easily protected from birds by netting. Strawberries should be of the smaller free-bearing kinds, as Vicomtesse de Thury, Victoria, Goliath, etc. Beds for Strawberries 2ft. wide with a grass path between give facility for gathering, and many besides the young folks will appreciate the free liberty of gathering for themselves. A few Raspberries, especially white ones, will be appreciated. Cultural details are very simple for all the subjects named, and if the beds and stations are well prepared at first, little after care is needed, as it is only when a heavy crop is set that summer nutriment is necessary. Strawberries need not be in rows or isolated, as a "lazy-bed," so called, where the ground is covered, with plants, answers as well, and produces freely if heavily mulched in February.

A PORCH OF PEARS.

The porch of a country cottage, as the illustration shows, may be made unique and useful. The photograph speaks for itself, and its beauty can be imagined when the Pear trees of which it is composed are in flower, while the fruit may be easily protected by a light netting.

FRUITS FOR MANSIONS.

IN taking my second subject, let me at once observe that as far as the culture and selection of fruit trees for the largest gardens are concerned, I am aware that these matters are usually left to the head-gardener, whose experience as the "man on the spot" will undoubtedly be of more value than any suggestions of mine. But there is a side to the question which I can take up without in any way usurping the functions of the gardener, and I hope even to give him a few new ideas and hints, as necessarily my long experience over a very large and varied area gives me an advantage which many

gardeners cannot possess. My reason for writing this chapter is because on all sides I notice that of late years far greater personal interest is taken in fruit culture by the owners of large gardens; they watch with keen interest the growth of the various kinds, the pruning, and, above all, the fruiting of the newly-introduced varieties, and fruits now often appear at dessert with names attached, and form a regular matter for discussion at the dinner table and all other meals where fruit is placed before them. This spirit is very helpful to the gardener, and, as a rule, he rises to the occasion, and the talks with his employers on fruit are one of his greatest pleasures among his many anxious duties.

"I say, when I was at Lord X.'s place last month I tasted one of the most delicious Pears I ever ate, and the gardener named it Comice. Can you supply trees, etc.?" This is such a frequent remark, both in letters and personally, that I further infer from it that the culture of fruit is becoming of much greater interest to the upper classes. So much for a preface. I have dealt with fruit for beauty and pleasure outside the kitchen garden proper; let us, then, open the door and pass inside, and for the moment we will suppose we have to form a modern fruit garden in a two-acre wall space. First, let us divide it into four equal quarters, reserving space for glasshouses under the south wall, and then, in order to make it an interesting resort, we will mark off a 6ft. path from the door by which we enter to the opposite door, and when halfway branch off at right angles (both right and left) with a path of the same width, forming a cross. We then set back an 8ft. border from the path on each side of the cross to form a continuous mixed herbaceous border on the inner faces of the four quarters. This flower border we will back with espalier Apples and Pears, at 15ft. apart, of the most useful kinds, choosing those that possess beautiful fruit in preference to dull green and yellow kinds. These can be trained to wires 1ft. apart, and if of five tiers they will appear like the illustration, and make an admirable background to throw up the showy herbaceous plants in the borders. In order not to shade these espaliers too much, Hollyhocks, Harpaliums, Delphiniums, etc., should not be placed within 2ft. of the fruit trees. For this purpose the following are suitable:

APPLES.—Mr. Gladstone, Duchess of Oldenburgh, Wealthy, Cox's Pomona, Peasgood's Nonsuch, Gascoyne's Scarlet Seedling, Cox's Orange Pippin, Worcester Pearmain, Lady Sudeley, King of Pippins, Golden Spire, Stone's or Loddington, Lane's Prince Albert, and Allington Pippin.

PEARS.—Clapp's Favourite, Durondeau, Beurré Jean Van Geert, Triomphe de Vienne, Belle Julie, Colmar d'Ete, Beurré Clairgeau, Petite Marguerite, Conference, and others will meet our wants, while other desirable kinds can be placed elsewhere.

Nothing is more appreciated than good turf to form these central walks, and it is easily kept in good condition by the machine; but in order to provide a sound path for use in wet weather, make the outside paths, which follow the line of the walls at a distance of 12ft. from them, of gravel or some convenient material. We will presume that in the centre of the south wall there are a set of glasshouses, more or less ornamental, with a tasteful entrance from the centre walk to a corridor in the middle of the range of houses, where a few of the handsomest greenhouse plants shall welcome the visitor, and that the range of houses will contain a house for Muscat Grapes, another for late-keeping Grapes, such as Alicante, Lady Downes, and Gros Colman, and one for early forcing vines of the Hamburgh class, with Foster's Seedling and Madresfield Court. There will also be a Fig house, for which structure, if flat trained, St. John's, Brown Turkey, and White Ischia are the best; if grown in pots add Osborn's Prolific, Bourjasotte Grise, Violet Sepor, Monaco Bianco, and White Marseilles. Pot culture is preferable, as the plants can be removed, in order to ripen the wood, to outside quarters, and the house can then be used for Chrysanthemums, etc.; an early Peach house, and a late house for Peaches and Nectarines. These houses should be lofty at the back and some 18ft. wide inside. It is found that Peaches and Nectarines, planted in borders from back to front as trained flat trees, ripen

their fruit as well as those trained 1½ft. from the glass as flat-trained trees, and in that manner greater variety can be introduced with an arrangement of sorts after this plan. A supply can be obtained from June to October by planting such as the following: Starting at the warmest end, we begin with Amsden June Peach, Waterloo Peach, Cardinal Nectarine, Early Rivers' Nectarine, Early York Peach, Condor Peach, Lord Napier Nectarine, Early Grosse Mignonne Peach, Goshawk Peach, Royal George Peach, Violette Hâtive Peach, Dryden Nectarine, Bellegarde Peach, Humboldt Nectarine, Pitmaston Orange Nectarine, Dymond Peach, Barrington Peach, Spenser Nectarine, Newton Nectarine, Sea Eagle Peach, the Nectarine Peach, Princess of Wales Peach, Late Devonian Peach, Gladstone Peach, Victoria Nectarine, Lady Palmerston Peach, or others of like season.

The illustration, kindly supplied by Mr. Challis of the noted Wilton House Gardens, will show better than words what may be accomplished, but most of the fruit had been picked before the photograph was taken. In front of these glass erections there will be

PEACH HOUSE WITH DOUBLE TRANSVERSE TRELLISES AT WILTON HOUSE.

outside borders for the Grape Vines, and the fronts of the other houses can be filled in with annual flowers, Begonias, Geraniums, Asters, etc., especially such kinds as can be used to cut for decoration. On the Vine borders masses of Mignonette and the sweet-scented Mathiola bicornis will not injure the vine roots. The 6ft. outside path of gravel will serve for wheeling in manure, etc., so as to avoid cutting up the grass paths, but when manure is needed for flower borders it will be easy to lay down boards to run the barrow upon.

THE WALL TREES.—We have presumbly a part of the south wall to fill, and upon this plant some Apricots at 15ft. apart, for choice Precoce de Boulbon, Frogmore Early, Large Early, Early Moorpark, Blenheim, Moorpark, Hemskirk, and Powell's Late. In the next selection the fruits are for outside walls.

Peaches and Nectarines for outside walls: Earliest, Amsden June, Waterloo, Hale's Early; early, Rivers' Early York, Early Grosse Mignonne; medium, Goshawk, Violette

ESPALIER APPLE FOR BACK OF BORDER.

Hâtive, Noblesse; rather late, Bellegarde, Dymond, Late Devonian, Barrington; latest, Gladstone, Princess of Wales, Golden Eagle. Nectarines, Early Rivers', Lord Napier, Elruge, Pine Apple, Dryden, Pitmaston Orange, Humbold, Newton, Spenser, and Stanwick Elruge. Golden Eagle, Pine Apple, Pitmaston Orange, and Humbold are yellow fleshed, the others white.

It is now becoming the custom in many gardens to plant young one year trees of Peaches and Nectarines, and to train the side branches right and left, when they soon attain a height of 6ft. to 8ft., a spread of 3ft. to 5ft., and fruit quickly. Such trees can be planted 6ft. apart, and by regular root pruning be kept in good condition for some years, while by annual lifting the trees can always be so regulated as to keep the wall clothed. On the other hand, fan trees should be placed some 15ft. apart as dwarf-trained examples, and as this wall is lofty it will be well to plant one 6ft. stem-trained standard tree between each dwarf, and thus clothe the upper portion of the wall rapidly. If dwarf-trained trees are used the space between each tree may be filled up with Tomatoes for a year or two until the trees require all the space. It is presumed that the potting sheds, boiler house, bothy, Mushroom house, and fruit rooms will be at the back of the Vinery and the Cucumber and Melon houses near. We will next take the aspect facing west. Here we have a stretch of wall rather lower in height than the south, and this is suitable for Apricots if more are desired, and also for dessert Plums, which, as fan-trained trees, can be planted at 15ft. apart. We here introduce the following Plums, as well as a few choice Pears: Rivers' Sturt, Czar, Denniston's Gage, Belgian Purple, Jefferson's Gage, Kirke's Blue Gage, Early Transparent Gage, Comte d'Hatthem's Gage, Oullin's Golden Gage, Golden Esperen, Old Green Gage, Bryanston Gage, Anna Spath, Bonne Bouche, Late Transparent Gage, Coe's Golden Drop, Monarch, and Rivers' Golden Transparent. Pears: Durondeau, Emile d'Heyst, Beurré Hardy, Doyenné du Comice, Olivier des Serres, Easter Beurré, Beurré Superfin, and Winter Nelis, and to fill the spaces between the trees at once plant some early Gooseberries as cordons or three-branch trees to give early green fruit for tarts, and also some good ripe fruit for early dessert; and for this work our choice falls upon Keepsake, Whitesmith, and Crown Bob. We next come to the north wall. This position is usually relegated to Morello Cherries as fan trees at 15ft. apart, but one can also introduce a few stewing Pears, such as Catillac, Gilogil, and General Todleben; and also some late Plums to continue the supply after the wall trees and open pyramids are over. Coe's Golden Drop, Jefferson, Rivers' Late Orange,

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APPLE WALK AT LILLIESHALL, SHROPSHIRE.

"COUNTRY LIFE."

Reine Claude de Bavay, and Bonne Bouche will answer this purpose, and with the Morellos plant a few of the Flemish and Kentish Cherries for tarts. Few are aware of the delicious flavour these latter give under such treatment, and they are well worthy of a wall; all require 15ft. spaces. The wall spaces between the trees can be filled with late Gooseberries, say Warrington, Rifleman; Red Currants, as Fay's Prolific and Raby Castle; and White Currants for late use, as it may be some years before the Cherries, etc., require all the space.

On the east wall place the choice Pears, although in cold weather and northern positions they may be better placed on the south and west walls; but supposing the garden to be in the South or West of England, Pears will succeed on the east wall better than in warmer spots, and for preference cordons at 2ft. apart. For a supply of choice sorts select two or three of each of the following, merely omitting those that may be depended upon as pyramidal trees in the open:

Earliest: *Clapp's Favourite, *Souvenir du Congrès, *Williams's Bon Chrétien. Early: (September-October), *Triomphe de Vienne, Marguerite Marrilat, *Fondante d'Automne, (October-November), Marie Louise, *Conference, *Louise Bonne, *Durondeau, *Emile d'Heyst, *Pitmaston Duchess, *Belle Julie, *Beurré Hardy, *Beurré Jean Van Geert, *Beurré Superfin, (December to March), Knight's Monarch, *Doyenné du Comice, Beurré Dubuisson, Beurré de Jonghe, Nouvelle Fulvie, *Josephine de Malines, *Zephorin Gregoire, Easter Beurré, *Doyenné d'Alencon, and *Duchess de Bordeaux. (Those marked * also succeed as pyramids and bushes.)

Start these Pears as upright cordons, and by the time the trees reach the top of the wall they are ready to be taken up, root pruned, and reset on the walls at an angle. The walls are now clothed, but it is a good plan to enclose them also on the outside with a good fence, in order that similar trees may occupy positions before named, although probably one side may face the mansion, when naturally good and effective climbers would take the place of fruit trees.

The inside borders must now be dealt with. The 12ft. spaces from the walls may, on the south side, be planted with Strawberries to the gravel path, but this position is also most useful to grow bush trees of the choicest Apples, such as Cox's Orange, Ribston Pippin, Mother, and Allington Pippin, also nearest the wall Calville Blanc may be grown to a good size and perfected.

CORDON PEARS.

Many place double cordons next the path (at 18in. distance) to form an edging, which may be continued both east and west, and also on the northern side. It is, however, important that the 3ft. to 4ft. next the walls be left entirely free for the wall tree roots; and where the soil is poor or not suitable for fruit make a border of new soil of this width, and confine the fruit trees to this space, as they all rejoice and flourish in hard soil. Nothing is more fatal than a crop of highly-manured vegetables grown in the borders next to the fruit wall. I should leave the borders next the north and west walls for Strawberries, planting the earliest upon the south side. For this purpose Royal Sovereign, Vicomtese de Thury, and King of the Earlies are most desirable, and under the east wall such kinds as President, British Queen, and Doctor Hogg should be planted for main crop, while the north wall will be valuable for the later sorts, of which Latest of All, Queen of Denmark, Eleanor, Waterloo, and Frogmore Late Pine or Loxford Hall are the best. We have alluded to double cordons for edging the paths beneath the walls, and here we enumerate a few kinds that lend themselves to this restricted culture, and omit others which are long jointed, and thus do not make well-spurred trees. The latter are therefore best treated as pyramids and bushes, which we shall deal with later on. We select then for double cordons:

A FRUITING BUSH APPLE.

APPLES (Dessert).—Mr. Gladstone, Devonshire Quarrenden, Peter the Great, Lady Sudeley, Kerry Pippin, Yellow Ingestrie, Margil, Calville Rouge Precôce, Cox's Orange Pippin, Ross Nonpareil, Allington Pippin, Hubbard's Pearmain, and Baumann's Reinette. Kitchen Apples: Duchess of Oldenburgh, Pott's Seedling, Lord Grosvenor, Grenadier, Mrs. Barron, Calville Rouge, Stirling Castle, Golden Spire, Lord Derby, Bismarck, and Lane's Prince Albert.

PEARS.—Colmar d'Ete, Emile d'Heyst, Dr. Jules Guyot, Petite Marguerite, Belle Julie, Durondeau, and Louise Bonne.

The borders formed by the cross grass paths must now be dealt with. It may be necessary to plant them with certain vegetable crops, and therefore we will now indicate such fruits as may be grown in them if desired. It is well to increase the stock of Strawberries by planting a continuous row next the gravel paths. This should include the Alpine White and

Red, the Hautbois, the new autumnal kinds, such as St. Joseph and Oregon, with a larger bulk of some kinds other than those provided for in the outside wall borders. A selection can be made from: Kitley's Goliath, Wonderful, Sir Charles Napier, Auguste Boisselot, Elton Pine (late), Dumbarton Castle, Trollope's Victoria, Sir Joseph Paxton, and Countess (very fine); and to provide runners for early forcing: Auguste Nicaise, Edouard Lefort, La Grosse Sucree, and Vicomtesse de Thury.

At 6ft. from the Strawberries some fruit trees in bush form, or pyramidal if preferred, of the leading Apples and Pears should be planted, and to give a character to the work the portions where the grass walks end should have pairs of some free-bearing, neat-growing kinds introduced, such as Pott's Seedling, Grenadier, Mank's Codlin, Seaton House, Golden Spire, Bismarck, Cockle Pippin, or Baumann's Reinette, which naturally form pretty pyramids, and four of the same kind should be placed in the centre, while for the bushes or other trees confine the selection to such as are fruitful and handsome in growth, as many others can possibly be planted in the orchard near to provide good store fruit. For example, Plums are not, as a rule, satisfactory as pyramids, nor are Cherries. For bushes and pyramids the following can be recommended to give the best results: Kitchen kinds: Ecklinville, Gold Medal, Emperor Alexander, Stone's or Loddington, Peasgood's Nonsuch, Warner's King, Lord Derby, Gascoyne's Seedling, Beauty of Kent, Tower of Glamis, Lane's Prince Albert, Alfriston, Newton Wonder, Bramley's Seedling; for dessert: Kerry Pippin, Lady Sudeley, James Grieve, Cox's Orange Pippin, Ribston Pippin, Allington Pippin, Egremont Russet, Hubbard's Pearmain, Adams' Pearmain, Mannington Pearmain, Rosemary Russet, Sturmer Pippin, and Allen's Everlasting.

In addition to those named previously, the following good kinds of Pears make handsome and prolific pyramids and bushes: Thompson's, Beurré Fouqueray, Fondante de Thirriott, Hacon's Incomparable, Directeur Hardy, Beurré d'Amanlis, Doyenné Boussoch (bush), with Bellissime d'Hiver, and Vicar of Winkfield for stewing, and stewed Pears are often highly appreciated.

DESSERT WALL CHERRY

Cherries of the May Duke and White Heart families can be planted on the east and west walls outside, or introduced inside on the same aspects. They should, however, be placed together, as it is necessary to net them to protect the fruit from birds, and the following are best for the purpose: Belle d'Orleans, Early Rivers' Black, Ludwig's Bigarreau (white), Guigne d'Annonay (black), May Duke (red), Royal Duke (red), Frogmore Bigarreau, Archduke (red), Elton Heart (white), Waterloo Black, Black Heart, Kent Bigarreau (white), Napoleon Bigarreau (white), Bigarreau Emperor Francis (red), Bigarreau Noir de Schrecken (black), Reine Hortense (red), Late Duke (red), Noir de Guben (black), Geant Hedelfingen (black), and Black Tartarian (late).

In the quarters also a selection of bush Gooseberries and Currants must be provided, and preferably they should be planted so that an overhead netting can be placed to protect the fruit from birds. Many make a permanent enclosure of wire netting, and that is, after all, the cheapest. The large Gooseberries are handsome on the table, but not so good in flavour as the smaller kinds. The following will be found reliable: Yellow, *Champagne, *Ball, Leveller, Leader, Drill, Ringer; red, Crown Bob, *Ironmonger, Whinham's Industry, *Warrington, Lord Derby, Lancashire Lad, Rifleman, Bobby, Dan's Mistake, Monarch; white, *Cheshire Lass, Lancer, Careless, Whitesmith, Alma; green, *Hedgehog, *Rosebery, Keepsake, Philip the First, *Greengage, Telegraph, and Ocean. (Those marked * are the high-flavoured, small kinds).

The modern system of getting standard Currants and Gooseberries by grafting on Ribes aureum is a pretty way of growing these subjects; they can be planted next the paths in the same way as standard Roses.

CURRANTS.—Scotch Red (early), Raby Castle (red), Prince Albert (late red), New Dutch (red), Fay's Prolific (red), White Dutch, White Versailles, Black Naples, Black Boskoop Giant, and Black Baldwins.

RASPBERRIES.—Bunyard's Superlative (red), Bunyard's Guinea (yellow), Baumforth's Seedling (red), and Golden Queen. Autumnal Raspberries: Perpetual de Biilard (red), Belle de Fontenay (red), and Fourseasons (yellow and red).

In an orchard should be cultivated the hardier kinds of fruits, such as Damsons, Plums, kitchen and dessert Apples, Medlars, kitchen Pears, etc. For Damsons I recommend Frogmore Early, King of Damsons, Hereford Prune, and Cheshire (late Damson). For Plums, Rivers' Early Prolific, Czar, Belle de Louvain, Victoria, Pond's Seedling, and Wyedale, and a tree or two of the white Damson and Shepherd's Bullace. For standard kitchen Apples, Grenadier, Golden Spire, Lord Derby, Golden Noble, Blenheim Orange, Bramley's Seedling, Newton Wonder; for dessert, Beauty of Bath, King of the Pippins, Cox's Orange, Allington Pippin, and other good useful kinds. This orchard should be of dwarf trees on Paradise stock in bush form.

On the borders outside the walled gardens plant Rhubarb in variety, such as St. Martin's, Paragon, and Victoria; also such outside fruits as Quinces, Siberian and Dartmouth Crabs, the cut-leaved Blackberry, the Wine Berry, Logan Berry, Barberry, and the various Nuts, the prolific Filbert, Kentish Cob, and Kentish Filbert being the best.

It is natural that those who have read my notes to this point should say, "Oh, yes, but we are not making a new place, but want to improve the garden we have." Yes, certainly; but the lines of culture, together with the choice sorts named, will give one an idea to work on, and an old garden can be altered when desired, retaining any feature that is in keeping, and yet improving it to such an extent that the new may not clash with the old associations, rather supply new life and interest. In many gardens there are scores of useless trees that may be well destroyed and their positions filled with young and healthy specimens, taking care, of course, to introduce fresh soil in replanting, and, in cases where the fruit supply is not abundant, working piecemeal so that the new trees come to cropping age before the old are rooted out.

ORCHARD HOUSES.—It may be remarked that, so far, I have catered for the best fruit districts, so that a few words should be given for the Northern Counties and Scotland. It is here that orchard house culture finds its greatest utility, as a crop of the finest fruit can always be depended upon. In the South one prefers to have a house without artificial heat; but in cooler climes it is as well to have some command of hot-water pipes, as a fall in the temperature may prove fatal, if it occurs when the trees are in flower, and possibly artificial heat may be also needed to finish the later Apples, Pears, and Peaches.

We prefer a large house, say, 100ft. by 20ft., with ample side ventilation, and a pitch of some 12ft. or 15ft. in the centre. The illustration gives an idea of the structure and its contents in September. The trees should be in pots, as they are readily moved outside in summer to complete the ripening of their woody growth, and by October the fruit is nearly gone, so that this lofty house can be used as a show structure for Chrysanthemums. When the trees are placed outside in a sunny position on an ash bottom, stable litter should be placed over and around the pots, as they will otherwise suffer from exposure, and the syringe may be freely used if the weather be hot and dry. The trees may be kept outside until January, when the Chrysanthemums are over. Peaches and Nectarines should be kept together, as they require more syringing than the other fruits; and Pears, Apples, and Plums can all be grown in the same house. The kinds should be selected for beauty, ornament, and flavour, and to ripen when other outside fruits are not plentiful, therefore early Apples, Pears, and Plums may be omitted, but the whole range of Peaches and Nectarines can be included. Illustrations are given of pot trees to show how fine the fruit can be grown even after the tree has been in a pot for eight to ten years. Beyond the removable trees in pots, the supports can be covered with choice cordon Pears, planted out, which, although on ecannot depend upon them for a regular yield, will give a few extra fine examples, and prove ornamental.

AN ORCHARD HOUSE INTERIOR.

The beauty of fruit tree blossom has not received that attention it deserves, and I was struck with the remark of a first-rate gardener when looking through a fine establishment where a lot of worn-out trained, pyramidal, and bent trees were in evidence. "Why don't you cut down all this rubbish and plant some useful trees?" "Oh! I can't do that, because her ladyship comes every day to see them when in blossom, and says, 'Never mind, gardener, they are so beautiful, that I am quite repaid by their blossom without the fruit to follow.'"

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FRUITS FOR VILLA GARDENS.

I PROPOSE here to confine my remarks only to such cultural details as the possessor of a small villa garden may have at his command, and to a limited selection of really useful trees, which with ordinary care and attention will give a good return for labour expended.

In old and worn-out gardens it is really fresh and loamy soil that is required more than manure, as the land, from frequent working and heavy manuring, at last becomes so porous and light that fruit trees fail to find sufficient food for their wants. Thus they get out of health, and frequently fail to perfect the fruit which the trees or bushes may have set. In other words, the difficulty lies beneath the ground. In starting, it will be as well to root out all cankered and unhealthy large trees, and when a space of ground is cleared the soil should be trenched 2ft. deep, and as the work proceeds sprinkle in bone dust and kainit in the proportion of 1 gallon to a barrow-load of soil. This will make the soil more binding, and if very light and gravelly some rock salt may be sprinkled in, say 1 pint to a barrow-load of soil, while the trees that remain can have the top soil removed beneath them 1ft. deep, and some fresh loam placed on the surface. This will cause roots to form, and thus invigorate the trees. If it can be arranged all new trees should have some fresh turfy loam worked in at planting time. Plant all trees so that the roots are near the surface and each root and rootlet must be carefully spread out. When the trees are planted, if dry weather ensues a good soaking of water will help them. These remarks also apply to wall trees, espaliers, and standards, and to Gooseberries and Currants.

SINGLE POT PLUM.

SINGLE POT PEAR.

Should the soil prove heavy, some moss manure used in trenching will open and lighten it, and in such soil there is always a danger of the trees rooting too deeply, so that all tap roots must be shortened in before planting new trees, and root pruning of the existing vigorous unproductive trees be carried out, say, half the trees can be root pruned the first season, and the rest another season, as if the following spring prove dry the fruit may drop; but if regularly root pruned every two or three years the trees will remain fertile and give a yearly return. This root pruning is best done in late

October. There are frequently large pyramidal trees in town gardens which have been over-pruned, and the best way to treat them is to take out half the main boughs and then allow the trees to grow naturally, when they will commence to bear the second year on the young two year wood, the inner shoots or spray being kept down by pruning back the shoots to four eyes about August 1st.

I must here give a few words of warning to those who are not conversant with sorts. The shops and hawkers sell their fruit by labelling it with a popular name, which is seldom correct, a William Pear serving for any autumnal kind. I shall only recommend, therefore, planters to purchase such sorts as are naturally prolific, which require a minimum of pruning, and also to avoid late sorts, as they are useless for those who have not a proper cool store. Too often late sorts are gathered before they are fit and stored in a dry room or cellar, and soon get shrivelled, so that they become useless.

I think the best friend of the villa gardener is a good syringe, as a spraying in the early morning and evening will keep the trees healthy and prevent attacks of red spider, which so frequently occur in the close walled gardens around our towns. Gooseberries and Apples are specially liable to this pest, and care should be taken to syringe the under-sides of the leaves freely as well as the upper. Where Apples and Pears set a crop, thin the fruits as early as possible, and those retained should be allowed the best positions to receive all possible light and air.

POT CHERRY (SINGLE TREE).

With these precautions very fine fruit can be grown even in the Metropolitan district, as demonstrated at the shows near London. In dry seasons water the trees freely, and once a week some nitrate of soda or Clay's Fertiliser, guano, or like manures may be added to the water, say 2oz. to 4 gallons of water; it is a good plan to make a hole in the earth near the trees so that the water can proceed direct to the roots rather than cake the surface soil, and thus lose a large proportion of the stimulant. This plan is also admirable for Strawberries. It should also be remarked that not only does a tree require attention when it is in fruit, but that the care bestowed upon it after the fruit is gathered, more particularly during hot dry seasons of July, August, and September, will be amply repaid, as it is then that the subject is preparing to produce the crops of the following year. When the foliage is destroyed by red spider and drought the necessary action of the leaves cannot be carried on, and thus the crop fails. An idea of the forms of trees can be gathered from the preceding chapters.

With these preliminary remarks I will proceed to select the kinds of fruits best suited to villa gardens, and give a few hints as to the best form of tree. I select only those that bear freely and regularly.

DESSERT PEARS (all succeed as pyramids and bushes on Quince or as cordons).—July-August: Beurré Giffard, the best early Pear; Souvenir du Congrès, large and good. October-November: Triomphe de Vienne, large and good; Louise Bonne, a constant bearer; Durondeau, large and handsome; Emile d'Heyst, good as Marie Louise; Beurré Clairgeau,

enormous, not first rate, but good if gathered before it is ripe and stored a few days; Belle Julie, very fine bearer; Doyenné du Comice, the finest Pear grown.

DESSERT APPLES (best on the Paradise stock; they are all suited for amateur standards, bushes, or pyramids, and those marked * for arches and cordons).—July-August: Mr. Gladstone, a free bearer, prune sparely, as it bears on the points; *Devonshire Quarrenden, very handsome and fertile; *Sugarloaf Pippin, an enormous bearer. September-October: Kerry Pippin, rich flavour and fertile; Yellow Ingestrie, a children's fruit, very prolific; *Worcester Pearmain, handsome and good when fresh from the tree. November December: The New Allington Pippin and *Cox's Orange Pippin, best for small trees and for flavour—several of these should be planted; *King of the Pippins, very prolific; *Ross Nonpareil, russety and delicious. The following come in after Christmas: Adams' Pearmain, Egremont Russet, and Sturmer Pippin.

COOKING APPLES (best on the Paradise stock).—August-September: White Transparent, most prolific; *Duchess of Oldenburgh, very handsome and fertile; *Cellini Pippin, very prolific and handsome. October: *Lord Grosvenor, fine; *Pott's Seedling, large and very prolific; *Grenadier, best of all the Codlins; *Stirling Castle, enormous bearer. November-December: *Lord Derby, the finest Apple of its class, most productive; *Bismarck, fine and productive; Warner's King, the largest, best as bush or pyramid. January: Lane's Prince Albert, an enormous bearer of fine quality. For very late fruit, choose Bramley's Seedling, Newton Wonder, and Alfriston.

SELECT PLUMS.—(1) Rivers' Early Prolific, purple, very early; (2) Rivers' Blue Prolific, an early Damson Plum; (3) Rivers' Czar, rich flavour, fruit in clusters, purple; (4) Denniston's Gage, early, and very rich; (5) Belgian Purple, very heavy cropper; (6) Victoria, large pink, free bearer in any form; (7) Jefferson's Gage, a luscious dessert fruit; (8) Smith's Purple, cooking or dessert; (9) Belle de Louvain, large, for cooking; (10) Rivers' Early Transparent Gage, very rich; (11) Pond's Seedling, very large, pink; (12) Rivers' Monarch, rich purple, and latest good Plum; (13) Bryanston Gage, late and fine. For wall use Old Green Gage and Nos. 3, 5, 6, 7, 10, and 13; all are suitable for pyramids and cordons. For columnar trees, Nos. 1, 2, 5, 8, 9, and 12.

GOOSEBERRIES.—Whitesmith, Yellow Champagne, Industry, Lancashire Lad, and Warrington.

RED CURRANTS.—New Dutch and Scotch.

BLACK CURRANTS.—Baldwins.

WHITE CURRANTS.—Dutch or Versailles.

RASPBERRIES.—Superlative.

STRAWBERRIES.—Vicomtesse H. de Thury (early), Trollope's Victoria, President, Royal Sovereign (early), Dumbarton Castle, and Eleanor for late. A succession of Strawberries is important.

Further particulars can be found in the best fruit tree nurserymen's catalogues, where advice is given to amateurs. As regards the time of planting, the season begins in November and extends to April. If the land is properly prepared, any opportunity can be seized in open weather, and if the work is well done success will ensue. If simple directions for planting and pruning are required, consult the pamphlet (price 2d.) issued by the Royal Horticultural Society. This little pamphlet will be found of great value to amateur fruit growers, as it contains sound information. Fruit culture is simple enough if proper care be taken in the selection of varieties and their after management, otherwise, of course, the results will be unsatisfactory.

[Mr. Bunyard's articles upon fruit culture should be read with profit, as the work of one whose experience is extensive, as evidenced by the successful cultivation of fruits of all kinds in his Kentish nurseries, where, besides the collections of well-known kinds, extensive trials are made of new varieties to prove their value.—ED.]

A FINE CROP OF APPLES.

FRUIT FARMING.

WHERE profit is looked for, one's methods and varieties differ from those previously advised, as in the growth of fruit for our home markets we must, in order to command success, grow those varieties which have a well-known market name, or else have special qualities, colour, size, or season to commend them to the popular taste. For this reason, although some of the kinds recommended may be identical with those already discoursed on, we shall now introduce others of fair quality, but which are heavier bearers, and require less attention than the best garden fruits. It is a common remark, "Oh! fruit growing is overdone now, or soon will be." The same pessimistic cry arose fifty years back, and yet to-day the average price of fruit is higher, notwithstanding the enormous increase in acreage. There is ample room yet for well-grown fruit. It is only the mass of inferior fruit, carelessly gathered and marketed, that cannot be sold at a paying figure. Experts are fully confident that when our British markets are better supplied with home-grown fruit, the foreign imports will cease to pay, as British produce excels that from abroad, and we must get home-grown fruits and so oust other productions. The most profitable form of fruit culture is that known as a plantation, where there is a top crop of Apples, Pears, or Plums, and a ground crop of Strawberries, Raspberries, Gooseberries, or Currants, or where all four are combined. Such a plantation never fails to yield a good return, and that within a short period after planting; but it will be noted that Cherries are omitted, as they are best alone or in a grass orchard. But both Cherries and hard fruits are best raised in arable or cultivated land, and start off better; but at the same time Cherries require special care, as they root upon the surface, and do not do so well if over-manured.

Initial mistakes are often made in planting too many kinds, and too few of one kind for profit; not less than twenty-four trees of one variety should be planted, or less than five hundred bushes, and selection of sorts must depend upon whether the growth is for local sale or distant markets. A further mistake is made by planting out before the land is in good

order. It is far better to lose a year in the proper preparation of the soil, merely cleaning and deeply ploughing and preparing it for a heavy manurial dressing, than to plant on land that is foul with weeds or sour from want of drainage and tillage. Another error is often committed by purchasing job lots of trees at sales by auction. Select young healthy trees from a good nursery, as they are then true to name and will prove profitable more quickly than the stunted examples offered at auction sales. In short, the cheapest trees are generally the most expensive in the end.

Again, planters must not "stick in" the trees, but plant each one carefully, never too deeply, and as soon as they are placed the whole should be protected from stock—rabbits and hares—either by single wires to orchard trees, or if in plantation form the holding should be wired all round the outside, including the gates, before planting commences. The wire should be 3½ft. high, and 6in. of it must be beneath the soil, so that the game cannot burrow under it. If not wired at once, a fall of snow, which renders the food of rabbits and hares scarce, makes them search further for sustenance, and they will often ruin hundreds of trees in one night.

Provided the proposed fruit plantation or orchard is protected from prevailing winds the position is not material; but it is better to avoid bleak spots or those facing east which catch the early morning sun, which often destroys the blossom. Where shelter is needed the Italian Poplar is the fastest-growing tree to plant, or Elms, but the Quick hedges which divide the fields can be encouraged to grow rapidly by cleaning out the base and digging in some rough manure and thus form a wind break. Care should always be taken to cut these hedges in the form of the letter A, as otherwise the base will become bare, and if the hedge be cut close, and the netting fixed as near as possible to the main stems of the hedge, the growth will come through the meshes, and thus in a few years form a grand fence against mischievous boys and all ground game.

GATHERING.—It pays well to have all the fruit gathered in baskets lined with soft sacking or in lined open Sussex baskets. The old form of plucking and carrying in bushel bags slung on the gatherer's back is the worst possible way, and in getting it to the store or packing shed only spring vans should be used, as "condition" on its arrival at market is an all-important factor towards obtaining good prices. In packing, discard all the small fruit and any specked or malformed examples, and make firsts and seconds of the remainder, and the fruit will command a much better price than if mixed. In marketing, consign to a respectable salesman, and let each basket be labelled with the name of the fruit, and the salesman should also be advised by post of the number of baskets, the sorts of fruit, and the mode of conveyance.

Summer culture consists in keeping the land thoroughly free from weeds in the plantations, and the orchard trees free from grass or weeds next their stems (say a 3ft. to 6ft. circle), and proper attention must be given to early thinning of the fruit when a heavy crop is set. Gooseberries may be gathered at three or four pickings. Apples pay handsomely for early thinning; the immature fruit sold covers the cost of labour, and the remaining crop is so much better perfected that it makes more money than if it had not been regulated. The summer pruning consists in removing useless spray and suckers that arise from the stocks on which the trees are worked.

The winter work consists in pruning back such wood as is not required for the extension of the trees, and further to form them in a regular basin-shape manner. In the case of bush soft fruits, prune severely but carefully, and after this work is done, collect all the prunings and burn them at once, to destroy insect eggs, etc. The plantation can then be dug over with a short tined fork, and be left rough for the winter frosts and snows to sweeten the soil. Manure is usually got in before this digging is commenced, but on light soils it is better to place it on the surface after the winter digging is completed.

Artificial manures are decidedly preferable, as they do not bring weeds on the land;

but once in four years a good dressing of strong farmyard dung is recommended, say at forty loads to the acre, in a plantation, and a dressing of a cartload to twenty young trees in an orchard. In the latter case, it is best placed on the surface a short distance from the stems, so that the feeding roots may at once assimilate it. In a short paper of this description it is not possible to give full details, but enquirers are referred to Pearson's "Hardy Fruits for the Midlands," Wright's "Profitable Fruit Culture" (the prize essay of the Fruiterers' Company), and Bunyard's "Fruit Farming for Profit," fourth edition.

TENANCY OR FREEHOLD.—It is at once evident that planters should be owners of the land they propose to plant, but this is not always possible for a novice. While he may have enough capital to carry on a fruit farm until it pays its way, he cannot always purchase the fee simple. There is, however, a growing disposition on the part of landlords to meet enterprising clients, either by supplying trees which the tenant plants and maintains, or by allowing a tenant a lease on lower terms, if the tenant does all the work and also purchases the tree and bush fruits. In Kent the landlords find the orchard trees and the tenant the bush fruits, which will be a fair arrangement on a fourteen years' lease; but in any case a business-like arrangement should be embodied in the lease before a tenant risks his money or before a landlord enters into outlay. If a novice has a small capital he might buy a little farm, and pay down part of the purchase money and mortgage the rest at 4 per cent., which would yet leave him a small rent; but he would retain the power of redemption and be his own master. After a long experience, I have never known an energetic man fail in fruit culture. There are some failures, such as a bad season overtaking a farmer who has borrowed money to start with; but that event arises rather from speculation than business-like foresight. With attention to small details, with industry and energy, there is a fair return for outlay, and sometimes beyond that a bumper profit to be made; when a good season comes a careful man will lay by a nest egg to meet a possible adverse season in the future.

BEST MARKET FRUITS.—I now give a list of the best market fruits in each family, and I keep to as few kinds as possible:

APPLES.—Early dessert kinds: Mr. Gladstone, Worcester Pearmain, Lady Sudeley, Beauty of Bath, Duchess Favourite, Devonshire Quarrenden. Store dessert: King of the Pippins, Allington Pippin, Cox's Orange Pippin, Baumann's Reinette. Early cooking: White Transparent, Lord Grosvenor, Grenadier, Stirling Castle; and for northern districts, Ecklinville, Domino, Golden Spire. Store cooking: Warner's King, Bismarck, Newton

A MODEL FRUIT ROOM.

Wonder, Lord Derby, Lane's Prince Albert, and Bramley's Seedling. Lady Sudeley, Allington Pippin, Cox's Orange Pippin, Baumann's Reinette, Stirling Castle, Bismarck, and Lane's Prince Albert are better grown in bush form on Paradise stock or in half-standard form for plantations, but all can be cultivated in this manner as well as orchard standards.

PEARS FOR ORCHARD TREES.—Dr. Guyot, Beurré Capiaumont, Williams's Bon Chrétien, Hessel, Fertility. For bush culture on Quince, Dr. Guyot, Williams's Bon Chrétien, Beurré Clairgeau, Durondeau, Louise Bonne, Emile d'Heyst, and Pitmaston Duchess.

PLUMS.—For standards all are suitable, and they can be grown also as half-standards or bushes, the latter by preference for exposed situations. Early: Rivers' Prolific, Early Orleans, Rivers' Czar. Medium: Belle de Louvain, Jefferson Gage, Victoria. Later: Kent Bush Plum, Monarch, Pond's Seedling.

CHERRIES FOR ORCHARD (Standards only).—Black: Early Rivers, Waterloo, Black Heart. White Hearts: Elton Heart, Bigarreau Napoleon, Kent Bigarreau, Frogmore Early Bigarreau. Reds: Flemish or Kentish, Morellos (as standards and bushes in some situations), May Duke.

DAMSONS.—Bradley's King, Shropshire (late), Frogmore Early, and Prune of Hereford.

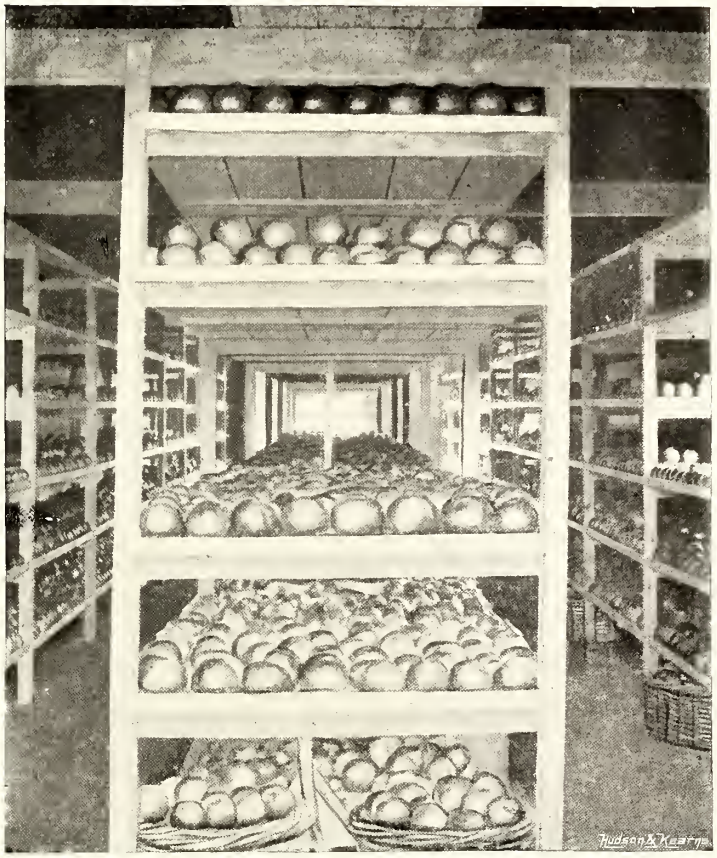
GOOSEBERRIES.—Crown Bob, Whinham's Industry, Whitesmith, Lancashire Lad, Warrington Late (ripe), and Keepsake.

RED CURRANTS.—New Red Dutch, Scotch or Cherry, and Raby Castle.

BLACK CURRANTS.—Baldwins and Black Naples.

RASPBERRIES (Red).—Bunyard's Superlative and Norwich Wonder.

STRAWBERRIES.—Royal Sovereign, Eleanor (late), Sir J. Paxton, and Elton Pine (late).



INTERIOR OF THE FRUIT ROOM.

KENT COB NUTS for stony banks and land full of stones. These form an important crop.

It would not be difficult to make a list of 100 kinds of fruits that are grown in Kent and that pay well for culture; but I strongly advise growers to gain experience by planting a selection of kinds upon half an acre or larger plot for experiment, when they can plant extensively those kinds that succeed best in their district, but at starting it is far better to grow only a few recognised sorts with a view to profit. If this is done the chances of failure are not, of course, so great as when trying experiments, and one must at first commence with the idea of profit, not merely to gain a few richly-coloured fruits of varieties that never bear freely. Studying the district to see the kinds that are most happy in the soil and climate is an important point. Unless fruit farming is thus commenced failure will result,

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A SCOTCH ORCHARD IN SPRING.

"COUNTRY LIFE."

FRUIT CULTURE.

MR. BUNYARD in his excellent practical articles upon various phases of fruit culture has given almost all the information readers could desire, but as fruit culture is an important industry a few more articles follow to give further assistance, in case any be needed after the foregoing practical information.

THE APPLE.

If the Grape is the prince of hothouse fruits, the Apple is certainly king amongst hardy fruits. None can equal it in point of usefulness; it is a fruit for the cottager as well as for the rich. Apples can be had in use for fully ten months of the year if space is available to plant sufficient trees and a wise selection of varieties be made. Dessert Apples are ready for use at the end of June, and these and the kitchen varieties last until the end of the following April. Apples can be grown almost anywhere, provided the weather at the time of blossoming is favourable. No matter the sorts and how well they are attended to, if the weather is not suitable for, say, one week at the time the blossoms are expanding, success cannot follow. It would be quite useless to plant some varieties in certain kinds of soil, but in the same soil others would grow; therefore, it is plain that a judicious selection of varieties must be made, as this has such an important bearing on the results.

Varieties are chosen sometimes that are not suitable for the kind of soil in which they are to grow, the trees are not of the right character, and the planting of them is ill-managed, while the after attention is faulty. When all these points are borne in mind, what wonder if we are told that Apples will not grow in a particular neighbourhood.

Selection of Varieties.—Although there are many important details in connection with successful Apple culture, the selection of suitable varieties demands unusual consideration. As previously stated, it is possible to grow Apples in any soil; but where this is naturally unfavourable special preparation must be made and the after attention must be of the right kind. Soil that is of a heavy and retentive nature, especially during the winter, is a troublesome kind to deal with. In such a soil as this canker is prevalent with some sorts. The reason for this is, that the bark of the branches does not mature thoroughly, owing to such soil being cold and retentive of moisture during the winter and early spring. Severe frost coming then often injures the bark tissues, causing canker to spread over such parts as are affected by the frost. In such a soil the varieties named will generally succeed if the details given as to planting and after management are carefully carried out. Except for special needs, such as forming a collection, it is a mistake to grow many varieties. For home use or for market requirements it is far better to plant several trees of one variety that is well known to be desirable and that will succeed in the soil to be employed. If varieties succeed in unfavourable soil, they are certain to do so in that which is favourable to their requirements.

Kitchen Varieties.—The sorts named in this section will give fruit from July until May, thus covering a long season. Lord Grosvenor, July and August, is an Apple very similar in character to the well-known Lord Suffield, and, like it, is of the Codlin type. It is, however, superior to that old favourite, because the trees do not canker as in the case of Lord Suffield. Ecklinville, September; Mank's Codlin, September. This is a capital sort to plant where space is limited, as its growth is not vigorous, and it succeeds also raised from cuttings. Warner's King, Golden Spire, and Stirling Castle, October; Lane's Prince Albert, New Hawthornden, and Bismarck, November; Golden Noble, Alfriston, and Mere de Menage, December; Wellington, Annie Elizabeth, and Royal Jubilee, January and February; Bramley's Seedling, Sandringham, and Northern Greening, March; French Crab and Newton Wonder, April and May. If a lesser number only is required, select from the above Lord Grosvenor, Ecklinville, Warner's King, Lane's Prince Albert, Alfriston, and Bramley's Seedling.

Dessert Varieties.—Irish Peach and Devonshire Quarrenden, August; Lady Sudeley, Worcester Pearmain, and Red Astrachan, September; King of the Pippins and Benoni, October; Cox's Orange Pippin, Blenheim Orange, and Cockle Pippin, November; Baumann's Red Reinette and Claygate Pearmain, December and January; Sturmer Pippin, D'Arcy Spice, and Fearn's Pippin, January and February.

For a less numerous selection the following are desirable: Irish Peach, Lady Sudeley, Worcester Pearmain, King of the Pippins, Cox's Orange Pippin, and Sturmer Pippin.

The kind of trees to be planted is an important detail. Circumstances in all cases will decide this point. If an orchard in grass is to be formed where cattle can graze under the trees, standards are preferable, and so they are if small fruit is to be grown in amongst the Apples. Standard trees are best budded or grafted on the Crab or seedling stock. The roots of the Crab are stronger and more rambling, which is a point in their favour, as standard-grown trees require more nourishment, therefore the far-reaching roots of the Crab are desirable.

If a quantity of fruit is required in a small space bushes are preferable; they are more easily managed and more suitable for small gardens. The stock best suited for these where the varieties are of strong growth, like Warner's King for example, is the English Nonsuch Paradise. The roots of this stock are fibrous, and are generally close to the surface. In strong soil the Paradise stock is not so suitable as the free stock, or what is known as the seedling stocks, which are really the result of sowing the seeds as taken from the cider mills. As an illustration of what is meant, Lane's Prince Albert, which is of moderate growth, should be grown on the seedling stock, while Bramley's Seedling, a vigorous-growing sort, succeeds on the Paradise where bush trees are required.

Bush-grown trees are those whose branches start within a few inches of the ground and never grow high, obviating the use of ladders to gather the fruit. Pyramid-trained trees are not so much in request as formerly; they are more remarkable for the symmetry of their branches than for the fulness of their fruit crop. To obtain really perfect pyramids training and pruning are necessary before the final shape is assured. It is not by vigorous hand pruning that heavy crops of fruit are obtained, rather the reverse. Horizontally-trained trees are really a desirable form of training, especially where a suitable situation can be found. For instance, alongside paths in the kitchen or fruit garden well-trained trees are prolific, and certainly are neat in appearance. Upright cordon-trained trees have much to recommend them; they are well adapted for filling in vacant spaces between other trees when new ones of the ordinary fan-trained kind are planted. These cordon-trained Apple trees fruit freely, and form a feature also where they can be planted at the side of the garden paths and trained over them in arch fashion. Cordon-trained trees are those restricted to one stem.

The situation for the production of Apples is an important point, and is nearly always dominated by circumstances. Shelter from south-west and east winds is very important. The former exposure results very often in a loss of the fruit when attaining full size and approaching maturity in October. Easterly winds are very often to blame for a thin crop if it comes when the trees are in full bloom.

Planting.—The best time to plant the trees is early in November, or directly the leaves fall, so that the trees will have time to settle down thoroughly to enable them to make

roots quickly, and thus grow away freely the first season. The time named is undoubtedly the best, but one would rather plant in March than wait until another season. Trees planted in March make roots freely the first season if moisture is supplied to them in the case of a drought setting in. If these trees do not make much top growth the first year the roots progress, and surely trees with an abundance of newly-formed roots are in a better condition than those recently planted.

The preparation of the site for planting the trees, no matter of what form of training they are, is an important detail. Too often the failure of trees to grow might be traced to faulty methods of preparing the holes or stations. In all cases it is wise to deeply dig the soil. Where it is heavy and retentive of moisture, and a quick percolation from heavy rains would be difficult if the subsoil is not moved, it is wise to trench the soil 2ft. deep. If a plantation is to be entirely made, it is a good plan to trench the whole of the soil, but in the case of planting one or a few trees, holes 4ft. square on the surface should be taken out 2ft. deep, thoroughly breaking up the subsoil another 6in. deep and leaving it there. Return the remainder of the soil in exactly the same way as it was taken out. In this way the surface soil will remain on the top. The holes should be got ready fully a month before the trees are planted, to allow time for the soil to settle down to somewhere near its proper level. When the trees are received from the nursery the roots should be examined, any bruised or fibreless ones being pruned to induce fibrous roots to form. Instead of pruning the roots in a downward direction, as is frequently done, the cut should be made upward. The reason for this is that at the extreme portion of the cut roots push most strongly. It is easy to see the object of cutting upwards, viz., inducing the roots to grow near the surface, where they should be, to receive full benefit from the sun's warmth. When cut downwards the roots penetrate more deeply to the cold subsoil. This is a fruitful source of canker in some soil. Some growers advise a free use of farmyard manure to be added to the natural soil at planting time. This is, however, unwise, as richness of the soil incites a too free growth, which is liable to be soft and sappy, and is more troublesome to ripen.

A SINGLE POT APPLE

The thorough ripening of the wood of all fruit trees, whether in the open or under glass, is absolutely necessary to ensure a full crop of fruit. The foundation for this is or should be laid at the time of planting by keeping the roots near the surface. A compost of roadside refuse, decayed vegetable matter, and wood ashes is a great encouragement to quick and free root action. Into this the roots run freely, making much fibre.

Choose a dry day for planting, and spread a small quantity of the prepared compost over the natural soil immediately where the tree is to be planted; stand the tree upon the compost, spread the roots out as thinly as possible, cover them with the compost named, and well work the soil in amongst the roots so that they are evenly distributed. Add some of the natural soil and a small quantity of half-rotted horse manure if the soil is poor in quality. If turf is obtainable chop it fine and add that instead of the manure. Tread the soil firmly down to keep the tree in position. As a guide to correct planting the uppermost roots ought not to be more than 4in. from the surface.

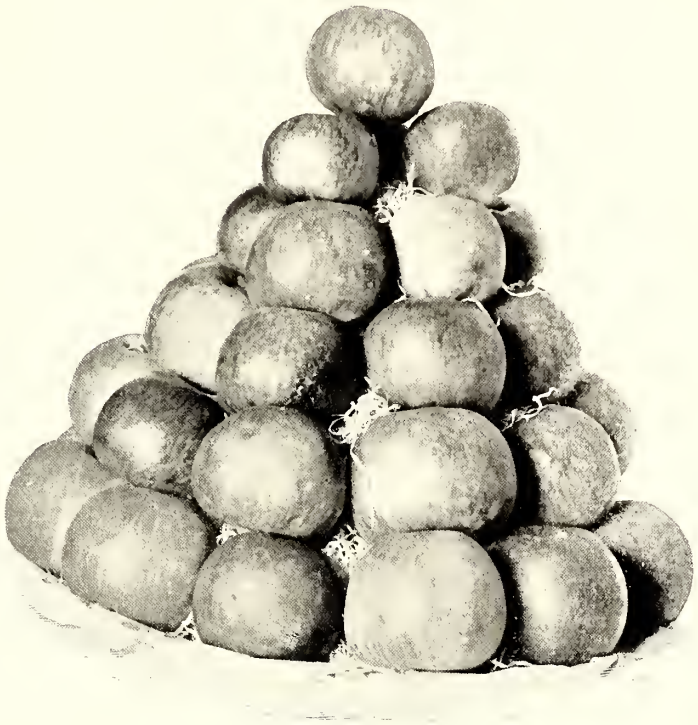
Standards or tall bushes will require some support for a year or two until the roots have taken full possession of the soil. If they are allowed to sway about after planting, a quick root action cannot take place, and consequently retarded growth follows. Stout stakes driven deeply into the soil 6in. away from the stem of the tree will be necessary for standards. These stakes need not be more than 4ft. out of the ground, as taller stakes possess no advantage.

In the place of the orthodox piece of sacking, hay or cloth tied ground the stem of the tree opposite to the top of the stake will prevent the stake injuring the tree itself. Withes made by twisting small Hazel or Willow shoots are useful to tie with. In the absence of these small galvanised wire is a good substitute. First place a small wisp of straw on each side of the tree to prevent the ligature bruising the bark, make this fast round the tree by the withy or wire, and bind this also round the stake, making the whole—bandage and tree—quite secure to the stake, yet at a distance away. The continual swaying to and fro of the tree is sure to loosen the bands when the stakes are put in in the orthodox manner.

All newly-planted trees should be mulched at once. This really means covering the surface with half-decayed horse manure 3in. thick for a distance of 2ft. around each tree. This surface covering prevents the roots being frozen during the winter. Not that such a thing would kill the tree, but it is severely checked. The evaporation of moisture from the soil the following summer, if it be a dry one, is all against free root action. The roots under a covering of this sort are kept cool and moist during the hottest weather, enabling the tree to make satisfactory growth. A mulching of any kind of material, even if it be straw, encourages surface root action. The absence of it drives the roots downwards in quest of moisture denied them near the surface.

Pruning the trees the same season they are planted is a

moot question amongst experts in Apple culture. Some advise that no pruning be done the first season, except, perhaps, that the extreme tip of each shoot should be taken off. The opinion of the non-pruning section is that two checks to a tree should not be given at once; the tree having been replanted, pruning at the same time would be an additional check. Pruning should be deferred until the following season, until the trees have had a season's growth to recuperate themselves somewhat. Other advice and practice is quite the opposite, for two strong reasons. In the first place, a full season's growth is lost by deferring the pruning. This is a serious matter in these go-ahead days. If the shoots are cut back to within 6in. or so of their base the growth will be certain the first year, and it will be stronger, by limiting the weakened energy of the plant to the few eyes retained after pruning. In many cases shoots that are not pruned pretty close fail to push their base eyes into growth, as the sap naturally rushes to the extreme point of the shoots. Any base eyes remaining dormant tend to make an ill-trained tree by leaving a gap. The main object a planter has in view the first season is to encourage growth for the production of the future fruit crop. The larger the area the heavier the crop. The summer treatment of the trees makes all the difference to their future welfare; if this be well carried out greater success must follow. Many persons in their eagerness to gather a crop allow the trees to form fruit the first year of planting, which they frequently do This is regarded by some as fatal to a free growth, except an odd fruit or two to prove the variety. It is a good plan to remove all blossom buds directly they are large enough to handle, thus concentrating the whole energy of the plant into growth only. Should the weather be hot and dry for any length of time, a thorough soaking of the soil will be an immense advantage. During the month of May the mulching should be removed for a few hours during the day to admit the sun, for the purpose of warming the soil and roots. Any surplus shoots made during the summer should be shortened back to within 4in. of the base.



A DISH OF DUCHESS OF OLDENBURGH APPLES.

The following year the trees will come under the ordinary treatment afforded established specimens. The winter pruning is perhaps the most important point to study in the cultivation of the trees. Some neglect this phase entirely, allowing the trees to grow away at will. Others prune their trees much too hard for a number of years, especially if the shoots made are very strong. If this latter be the case, the first crop is certain to be a thin one. Such close pruning of the shoots aggravates the evil, as greater energy to make stronger growth is thus afforded, by limiting the number of shoots the growth has to sustain. To draw a simile: A hedge of Quick, Holly, or Laurel having become thin and bare at the base, advice is given to cut the whole down to within a few inches of the soil. The result is increased vigour in the new growth, which eventually, by careful management, grows into a perfect hedge once more. Trees with shoots 3ft. long, instead of being cut back to within 6in. of the base, should have 2ft. of the growth of the leading shoots retained. Where space is no object this plan answers capitally. The excessive growing energy of the tree is gradually exhausted by this retention of more growth, until a full fruit crop is obtained from these hitherto bare shoots. The salient point to observe in pruning the trees is to afford abundant space for all inside branches, so that maturity of growth is an easy matter, as an excess of growth does not prohibit the admission of air, light, and wind to the innermost parts of the tree. One of the greatest mistakes made is in overcrowding the branches. Trees planted two years will need special care in pruning to preserve their shape and give a crop. The leading shoots should be left from 1ft. to 15in. long, and weaker ones cut to within 9in., which will give increased vigour. The future shape of the tree has an important bearing upon the length of shoots retained.

The end of September or October is a good time to prune established trees, and there seems to be no reason why we should wait until the leaves have fallen. With the foliage on the trees, the distance from one shoot to another can better be gauged. Any surplus shoots should be cut back to within a single eye of the base. From here fruit spurs will eventually form. Pruning should not be done in frosty weather, as some injury might accrue by the practice; newly-made incisions might produce canker. If pruning is done early ample time is allowed for the proper healing of the cut parts.

Summer pruning of all fruit trees is a good practice. If there are surplus shoots, why should they be retained until November and then cut away? Why not relieve the trees in July of surplus growth, and thus admit air, sun, and wind to assist maturation, without which no crop is assured. Cut all shoots back that are unnecessary for the proper shaping of the trees to within 4in. If cut lower the chances are that the eye nearest the apex will push into growth and thus spoil next season's progress for a time. The leading shoots must not be cut, but allowed to grow away uninterruptedly until autumn, when they will be winter pruned.

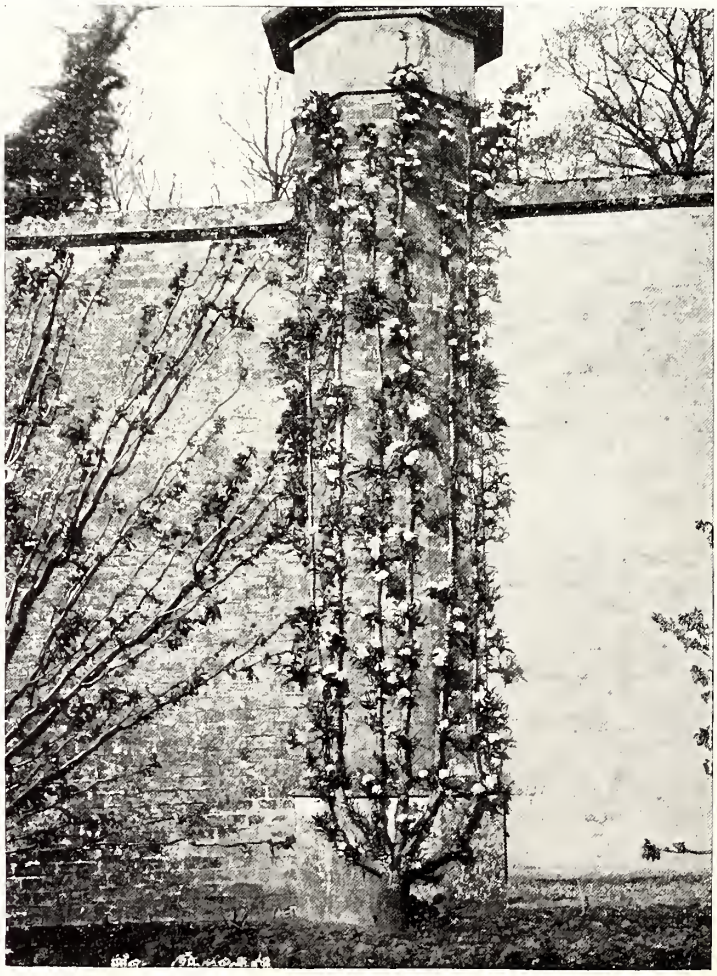
Sometimes established trees will produce a quantity of wood—long thick shoots—and no fruit for years. Such trees cannot be brought into a bearing condition by closely pruning the branches. If space for the tree to expand in width and height is available, allow the leading shoots to remain for a length of from 18in. to 2ft., cutting away all shoots that are not required for furnishing the tree. Such

a method of managing the branches will produce a crop of fruit in two or three years' time without any interference with the roots.

Root Pruning.—If the desired space is not available for branch expansion the roots must be corrected. The cause of so much growth in the branches and no fruit is that the roots run so deep and are devoid of fibre. A check to the rampant growth of both branches and roots is then necessary; this is best done by root pruning. The proper method of root pruning is to cut a trench around the tree at a distance from it proportionate to its age and size at the end of September. For instance, for a tree planted three years 2ft. from the stem would suffice; one planted ten years should not be interfered with nearer than 4ft. from the stem. The trench need not be cut wider than necessary to ascertain the depth of the roots. The object of digging the trench is to sever all fibreless roots that one comes in contact with, these being the cause of coarse growth. When the roots are neatly pruned in an upward direction small fibres push from their extremities. Such a check to growth induces fertility in the formation of fruit buds instead of rank growth only. Fill up the trench, treading the soil in firmly. A small portion of such a compost as previously advised put about the severed roots will induce a quicker growth than the ordinary soil and encourage more fibre to form.

Canker in Apple trees is an evil difficult to overcome. Some sorts are more prone to it than others. Trees of any variety that are deeply planted in cold wet soil are always more liable to this disease than others properly managed. Trees up to ten years of age that exhibit signs of canker should be replanted, removing the bulk of the soil from the roots, lifting the tree on to the surface, and substituting entirely fresh soil. Roadside refuse will cure canker, anything that will tend to encourage improved root action being desirable.

Apple trees, like all other fruit trees, require stimulating food at some time or another. The manner in which they progress is the best guide. Trees that make shoots over 1ft. long annually and are not overburdened with fruit, require little or no aid. On the contrary, trees that make less growth than that suggested do require a stimulant. Half-decayed farmyard manure, wood ashes, and decayed vegetable refuse, forked into the soil amongst the roots in November, cannot be excelled as an aid to improved growth. Basic slag and kainit, 4oz. of the former and 2oz. of the latter to one square yard, form useful aids, and so does bone meal or superphosphate or dissolved bone. Liquid manure is a capital stimulant, even if applied during the winter months when the weather is dry. This is an excellent method of renovating old trees or grass where the roots are too far from the surface to admit of solid manure ever reaching them.



ESPALIER ON PILLAR.

THE APRICOT.

The Apricot is a delicious stone fruit, as rich in flavour as in colour. In this country it is impossible to grow standard trees. They must receive the protection of a wall, and during the spring frosts must be kept away from the expanded flowers. Another important point is to secure a good aspect, though in sheltered gardens the trees need not have a full southern exposure, as success will come on an east wall. Some of the strongest and most fertile trees are upon this aspect. Always remember that the Apricot resents much pruning by "gumming," which results in ultimate collapse. It is a tree that will thrive against the gable ends of buildings where the eaves project a few inches.

The best soil is a deep, well-drained loam, preferably on limestone. If the subsoil should be either clay or gravel, some means must be taken to keep the roots out of it, or in the future with little warning the trees may collapse. There are several ways of managing the roots. The best plan is, after excavating the site for the trees 2½ft. deep or so, to place a bed of concrete 6in. in thickness and about 5ft. or 6ft. square. On this, when the concrete is dry and firm, make the bed for the tree. Any soil that will grow good crops of Wheat or Beans will produce an abundance of Apricots. Borders have been made for these luscious fruits with old turfy loam from a pasture, but the result did not answer expectations; the rotten turf was too rich. The trees grew away fast — too fast, indeed; and when they should have been in their prime the branches commenced dying in a way unfortunately too common with Apricot trees which have had a too vigorous youth. Better plant in the natural soil if it is good and suitable, otherwise cart some in from a Wheat or Bean stubble, mixing with it, if deficient in lime, some old plaster or mortar rubble from demolished buildings.

Whatever manure Apricots may require should be given

on the surface when the trees reach a bearing age and need more support. Bone meal mixed with burnt earth or wood ashes forms a useful top dressing for Apricots when the trees are in free bearing, but when young the trees, if the soil is of the character already described, do not require manurial stimulants. In purchasing Apricot trees it is a wise plan to visit, if possible, the nursery, and select only those trees which have clean healthy stems and are making thoroughly healthy growth of moderate strength. Maiden trees, if there is time enough, generally succeed, but cut back ones will do well if carefully selected. Examples are, however, sent out from some nurseries even now that cannot have a long existence, either owing to imperfect unions or unsuitable stocks. In good nurseries these trees are chopped up and burnt.

Pruning.—The young trees must at first be headed back to secure shoots sufficient to form the base. Four or five on each side will suffice, and afterwards, by selecting the right shoots to lay in, the wall may be filled up without any severe pruning. The fan system of training is the best for Apricots, and the one generally adopted. If the centre of the tree be kept open until the base of the wall is well furnished, handsome fertile Apricots will be the reward in a few years. The Apricot begins to bear when young if it is succeeding, but over-cropping in youth must be avoided. The trees, as in the case of the Plum, will bear on both natural and artificial spurs, the former forming on the sides of well-ripened young wood. Artificial spurs are created by summer pruning or stopping back the breast wood at that season. Both these kinds of spurs should be encouraged, but it is not well to let the artificial spurs get too far from the wall. Prune as much as possible in summer by stopping the young shoots (except those required for extension) to four leaves. In June and in the autumn, when the leaves have fallen, finish the pruning by shortening long snags left from the summer shortening back. Cut out dead wood at this time, too. If shreds are used in training, be sure that they are sufficiently loose to allow for growth, and remember that nails must not be driven in near enough to a branch to cause injury. Healthy trees not grown in a too rich soil are not likely to "gum"; but if there is any tendency to undue luxuriance, excessive pruning, or injury from nails, the careless use of the hammer, or even ladder, will bring on gumming. Apricots use up a considerable amount of lime in the formation of the fruit stones, and fruit dropping when this takes place may be due to an absence of lime in the soil.

Insect Pests.—The trees are not very subject to insect attacks. When in decrepit condition they are sometimes attacked by green fly; but these can soon be destroyed by using tobacco powder or syringing over them a mixture of tobacco powder and soft soap in solution. Two ounces of soft soap and the same quantity of tobacco powder in a gallon of water, applied through the syringe or by dipping in the young shoots, will soon vanquish insect pests. Maggots are sometimes found curled up in the leaves, but these may soon be destroyed by hand picking.

Thinning the fruits should be partly done when they are small, and completed later, at the time stoning is finished. The "thinnings" will be welcomed for tarts. It is difficult to define what should be a good crop of fruit, as assistance can be given to a well-loaded tree by mulchings and liquid manure when the fruit is swelling freely, especially during the stoning period and until ripening commences.

In a fairly sheltered garden a single, or in the case of severe frost a double, thickness of fishing nets will suffice to keep the flowers safe. The nets are cheap, and if taken care of they will last many years, and may be used for other purposes, such as protecting ripe fruit from birds. Wasps relish Apricots, and in a warm season, when these fruit robbers are likely to prove troublesome, hang up bottles partly filled with honey and beer in good time.

Varieties.—The Apricot most largely planted is the Moorpark. It bears large handsome fruits of delicious flavour freely, but, unfortunately, the tree is much subject to disease. Branches die away suddenly without apparent reason, more so than in the case of any other variety. The Peach Apricot is a fine handsome fruit related to the Moorpark. Royal George, a hardy free-bearing variety, ripens before Moorpark. Hemskirk makes a good tree, and bears heavy crops, which usually ripen early in August. The fruit is not quite so large as that of Moorpark, and the tree is less subject to the branches dying.

BUSH FRUITS.

Gooseberry, The.—The soil should be deep and well broken up some time before planting, and well manured. Well-developed Gooseberry bushes will require spaces 6ft. square, to give room to move among them to gather the fruit, and do the necessary pruning and top dressing. If less space is allowed, a good deal of the bearing wood has to be pruned away to give the necessary access to the plantation. Gooseberries may either be planted round the margins or the border near the walks, or be gathered together into one plot. The latter plan is the most convenient, as if necessary the bushes can be more easily netted up. Under favourable conditions the Gooseberry bears very heavy crops, especially when space enough is allowed for full development, and consequently annual top dressings are very desirable. If the ground be well trenched before the bushes are planted, the steel fork will do all the digging required afterwards. In hot weather, a light mulch of manure or compost of some kind is very beneficial. But if nothing can be given to check evaporation, keep the surface loose by using the hoe.

Pruning.—It is better to do the pruning as soon as the leaves fall, as this permits of the cuttings being cleared away and burnt, and the space between the bushes manured if necessary, and lightly forked over to aerate the soil. If birds are troublesome, dust the bushes when damp with a mixture of soot and lime; or the bushes may be syringed first with a solution of sunlight soap and dusted with soot and lime immediately. The soapy water will cause the soot and lime to adhere better. In pruning a Gooseberry bush, first look over it and remove dead wood, if any. If there should be a dead branch, removing it first gives a chance of leaving a young shoot to take its place. Next go round the bottom of the bush, and take off all branches which are too near the ground; then go regularly over the bush and thin out the young wood, leaving sufficient well-placed young shoots to give a regular crop all over the bush. The centre of the bush should be left open, and in pruning all crossing shoots should be cut out. The young shoots removed will be spurred in to within ⅛in. of the old wood. The Gooseberry bears on spurs, but if a heavy crop is wanted, leave in a young shoot wherever there is space for it to grow freely without obstructing the sunshine and air. After the pruning is finished and the symmetry of the bush has been considered (and a properly pruned fruit bush should always be well balanced), shorten the ends of the leaders a little, always considering that the more young wood there is left the heavier the crop will be. It may be mentioned that liquid manure or house drainings may be applied beneficially at almost any season, but especially during the time the berries are swelling.

Varieties.—For gathering green, plant Whinham's Industry, Crown Bob, Whitesmith, Keepsake, and London. The above are also of fine flavour when ripe. If more are wanted, add Companion, Broom Girl, Ironmonger, Antagonist, Snowdrop, Dan's Mistake; and for preserving, Red Warrington and Champagne.

Propagation.—Take cuttings of the longest and straightest young shoots in autumn. Have them at least 1ft. long. Remove all buds but the three upper ones. Cut the bottom clean across just under a joint. Plant very firmly in rows 1ft. apart and 4in. apart in the rows.

Currants, Black.—The Black Currant does best on moist ground, and will do in partial shade. In poor, shallow land the fruit is small and inferior. A mulch or top dressing of manure before the hot weather sets in is very beneficial. If the bushes are not over-pruned, 6ft. will not be too much space for each. In crowded plantations the fruit is never so fine or the crop so heavy.

Pruning is on the same lines as recommended for Gooseberries, as the Black Currant bears chiefly on the young wood. And it is not so necessary to keep the centre open;

in fact, all parts of the bush should be thinned sufficiently to let in air and sunshine, and occasionally an old branch should be cut out to let up young shoots. Keep the bush well furnished with young wood in such a position that air can circulate freely to ripen the wood, and there will be a heavy crop. It is best to keep Black Currant bushes on single stems, though many-stemmed bushes sometimes bear a lot of fruit. Keep a little nursery of bush fruits by patting in a few cuttings occasionally, and when the old bushes are getting past work, make a new plantation, and when they come into bearing grub the old bushes up. Bush fruit should not be regarded altogether as a permanent crop. When a bush becomes old and the berries small, plant young bushes and clear them off.

BROWN TURKEY FIG (Reduced).

Varieties.—Victoria and Champion are new varieties, and are very large. Lee's Prolific and Black Naples are useful sorts for preserving.

Currants, Red and White.—These will not require so much space as Gooseberries, as they are more easy of access and the growth is less spreading The best results are obtained from bushes 5ft. apart, either in lines round the borders by the side of walks, or in quarters 5ft. apart each way. A deep sandy loam is the best soil, though, if well cultivated, Currants may be grown in any good land. Plant, early in autumn, bushy and clean stems 8in. or so in length. Mulch after planting, and prune to three buds the first season to get shoots to form the base of the bush.

Pruning.—Red and White Currants bear freely on spurs, therefore the side shoots are usually spurred in to ½in. or 1in.; this should not, however, prevent a young shoot being left wherever there is room for one, but the centre of the bush should always be left open and clear, so that sunshine and air may penetrate freely. White Currants usually make less wood than red kinds; therefore it will be better to keep them distinct, as in that case the white will do with a little less space. But the white is not so much grown as the red, not being so generally useful.

Varieties.—Red: Fay's Prolific, Raby Castle, Red Dutch; White: Transparent and White Dutch.

Raspberry, The.—The Raspberry is not always grown so well as many other fruits, but given good culture, few, if any, fruits afford better returns. As most growers well know, the Raspberry succeeds best in a loamy soil, not clayey or too light, and with a good depth the plants will crop well for many years. On the other hand, much better results are secured by frequent renewal of the beds and, if possible, fresh quarters provided. Of late years considerable attention has been paid to the introduction of new kinds, and the white or yellow fruits now find more favour, and rightly so, as in my opinion the latter are delicious for dessert and should be encouraged. Cultivation is simple. Anyone with sufficient space can grow these fruits. Many think they can be grown under trees, and though they succeed fairly well with partial shade, they are much better in an open position for late supplies. A north border is best, providing the plants are not grown too close together. Planting to form new quarters should be carried out in October or early November, just as the leaves begin to fall, and though anyone may plant up to the end of March, should a dry summer follow late planting there is less growth, and of course the crop suffers the next season. A good system is to plant new canes every three or four years, destroying the oldest border or plantation, and of course planting as far as possible in soil that has not borne a similar crop for some time. New canes are produced so freely that it is easy to get new planting canes, but at the same time it is well to obtain fresh stock, as these are more robust and the gain in fruit soon makes up for increased outlay.

Varieties.—Of course it is also well to give new kinds a trial, and those that thrive well in most soils should be selected. For instance, Superlative is a splendid introduction; it grows freely, and the fruit is large, having a long stalk, so that it is easily gathered. This variety resists drought as well as any. It makes a large cane, fruits late, and its strong growth renders it more suitable for poor soils. Another new variety, the Guinea, is also very fine; its yellow fruits remind one of those of Superlative in size, and the growth is very free. There are some excellent older kinds. Hornet is reliable, a large red fruit, very sweet and early; Baumforth's Seedling, a very productive variety, is good for deep, well-worked land, whilst such kinds as Norwich Wonder and Carter's Prolific are both free growers and give excellent fruits.

For preserving no fruit is equal to Semper Fidelis; it bears abundantly, grows freely, and though the fruit is more acid in flavour than others, on account of the better quality it is excellent for preserving, and, what is so important to many growers, is a continuous cropper, coming in after all others are over.

The new kind named Guinea is not yet much known, and there are others that are worth noting; for instance, the White Magnum Bonum is an early fruit, very sweet, and of good flavour. The Yellow Antwerp is also worth room if variety is needed; it is a large early pale yellow fruit, sweet, and of good flavour for dessert, though a little smaller than the white kinds named above.

Of autumn-fruiting Raspberries there are quite half-a-dozen, and mostly good. A few of the best are worth describing. These need somewhat different culture to the others.

The red kinds are most satisfactory, in my opinion, for autumn, as for tarts or compotes the reds are in greater demand, and one of the best is the Perpetual de Billard, a very large dark crimson fruit of brisk flavour; it is excellent for cooking, a good grower, and one that fruits well into the autumn. The Belle de Fontenay is likewise a large deep red fruit, and for its late season, October, well flavoured. It grows and bears freely, succeeding in most soils and situations. The October Red is also good, and the Noir d'Automne is distinct from the kinds named above, being a large blackish red fruit, and one of the most highly-flavoured autumn kinds. It is a great favourite on the Continent, as, indeed, most of the autumn varieties are. Doubtless in a drier atmosphere, with more sunshine, it is more reliable. Of white kinds, the October Yellow and

the Yellow Four Seasons are the best, the fruits remarkably sweet and good, and very prolific.

Planting.—The time to plant is just when growth ceases at the end of October, or even earlier if the plants make an early growth, which is sometimes the case. October planting is preferable for various reasons, the most important one being that the plants grow away more freely the next season, as, having a fibrous root growth, they make new roots or get hold of the soil as soon as planted. At the same time these fruits, like all others, may safely be planted until the end of March if they are well attended to as regards moisture during the summer months. The distance between each plant should not be less than 2ft. in the row, with 4ft. to 6ft. between the rows. Less will suffice, but when given more space, say 9ft. between the rows, it is easy to crop with small-growing things between the rows—for instance, Salads in summer and Coleworts or dwarf Savoys in winter. Train Raspberry canes as little as possible, as by good culture the canes will be sufficiently strong, and little training needed. If three canes are left at a stool, and loosely tied, that treatment will suffice. This is not the most tidy method. The best, and probably the neatest, is to strain a couple of wires from supports at each end of the row, with the lower wire at 2ft. from the soil and the upper one at 4ft. Grown thus, the fruits are more readily gathered and ripen better, whilst there are fewer losses from decay in wet seasons.

Pruning and feeding are simple details. After planting early in the spring, cut down the canes to within 12in. of the soil, as this will induce stronger shoots to come from the base, and only two should be encouraged the first season. These by the end of August will be 4ft. to 6ft. in height, and will fruit well the following summer. Early in March they may be topped to the top wire, or say not less than 5ft. in height, and, given support, little attention will be needed the first season other than keeping clear, if land be well trenched and manured, and when planted a mulch of short manure may be given in the shape of a top dressing the second year, about November. When the plants are in full vigour and bearing finely, they are greatly benefited by applications of liquid manure during the growing season, especially if the soil is at all light or porous.

The after management is simple. Every season, as soon as the crop is taken—indeed, the earlier the better—cut out the old fruiting canes, and retain four to five of the strongest current season's growth for next season's crop. Every year, therefore, the old fruiting canes are taken out, new ones occupy their places, and the plants are wonderfully prolific. They always make a quantity of new growths at the base. These must be reduced in the summer to four or five, as if all are left until autumn those required for fruiting are greatly weakened. A strong fruiting cane is important. It has been mentioned that the canes should be reduced to four or five, but there may be losses during the ripening of the fruit, such as breakages, and it is well to have an extra cane to fall back upon. Those not needed after the strongest have been selected may be cut out when the old fruiting canes are removed.

RASPBERRY YELLOW, ANTWERP.

The autumn-fruiting Raspberries require quite different treatment, as the pruning is done in the spring. A good system is to cut down all the canes to the ground at the end of February or early in March, according to the season, and they then produce the fruit on the new growth. Thin out the canes to, say, three to five at a stool, and train these to a fence or wires, as already advised, as, making their growth later and ripening with shortening days, it is essential to give them ample space and light to mature. Like the earlier fruits, these will repay food in the shape of a liberal top dressing, or liquid manure during the summer. It is also well to grow these more thinly than the summer-fruiting varieties.

THE FIG.

Forced and on Open Walls. — Doubtless the readiest way to grow Figs is either in pots or tubs, or in what may be termed a restricted root space, as few fruits need more attention in this matter. On the other hand, splendid results are obtained from trees planted out, providing there is ample room for the top growth to develop and plenty of new wood yearly, at the same time cutting out useless growth to prevent overcrowding.

Pot Culture may be taken first, as many can grow Figs thus who cannot devote a house to the trees. In growing Figs in pots, the trees at certain seasons of the year may be placed in the open and the house used for other purposes, so that they do not require space indoors during the whole twelve months. One need not describe the raising or propagating of the trees, as they are grown at a small cost, and if purchased in 6in. or 7in. pots are in condition to build up into good forcing material, as the cuttings are usually struck early in the spring, and the plants grown on a single leg or stem. This is the best method to adopt with all kinds of Figs, as these fruits are much inclined to produce sucker growths, which are difficult to keep down if not restricted to a single growth at the base. One season's growth will produce a good-sized tree for the start, but of course not large enough for forcing. Quite two seasons' growth would be needed, but even when purchased of this size the trees are not expensive, and what is so important to the purchaser is that they are sturdy and have well-balanced heads, that give little trouble in future if the shoots are kept well pinched back. With pot or other trees it is important to stop new growths closely; indeed, few, if any, fruit trees require such close attention in this respect as the Fig. Once the shoots or main branches are formed, all side growths must be kept short to produce good fruit. A too liberal top growth means few fruits, and all wood

made must be well matured, not soft, green, and sappy. When Figs are required in quantity over as long a period as possible, not only are the trees forced in pots, but also planted in a narrow border on the back walls of forced vineries. Though no fruit of any value is obtained from the lower part of the wall, as this is shaded by the vines at the upper portion, a fair crop is secured, the fruit being of excellent size and quality. On the other hand, of course, the Vine must not be allowed to grow to the top of the house, but give 4ft. space for light to reach the Figs, and do not let the Fig-wood get at all crowded. Many fail with Fig trees in vineries, as too much is attempted. The Figs do not succeed when entirely shaded, and must have close attention in the way of stopping and pruning.

Pot trees started, say, in November, will produce ripe fruits at the end of March, if such varieties as the St. John and Pingo de Mel are grown. As regards quality they do not approach the Negro Largo, or even Brown Turkey, but the latter are less reliable, as the fruits of the two early kinds named remain on the trees when others drop. Unfortunately, early forced Figs are liable to drop from the trees just at the time they make their final swelling, and the two kinds advised do not do this. For later forcing, say started early in the year, these remarks do not apply. For that period there is abundant choice, and if few trees are grown there is no better all-round variety than Brown Turkey, a large, excellent fruit, that gives two crops a year. To this may be added Bourjassotte Grise, a large dark fruit with deep red flesh, very juicy and rich. Violette Sepor is a large fruit, and though distinct from Brown Turkey, one of the best for forcing; it is of luscious flavour, and bears very freely. For late pot work Negro Largo is one of the best; indeed, it is more suitable than for early forcing. This is one of the richest of the dark-coloured fruits, and most of them succeed better when given ample time to mature.

A few words as to temperatures. A low one at the start is advisable, but at the same time much depends upon the weather. If mild, 10deg. more is safe; that is, if the glass stands at 45deg. in the open, 55deg. to 60deg. must be given. At the same time it is well to give extra warmth in the way of bottom-heat if it can be afforded, say 70deg. to 80deg. This pushes out the embryo fruits and the growth is stronger. In six weeks from starting the heat may be increased from 5deg. to 10deg., and avoid always a high night temperature. This must always be 10deg. lower, and in fine weather, after the trees are in their forcing quarters, syringe over them twice daily until the fruits are of good size, as red spider and scale are troublesome pests when the trees are grown in a dry house.

Thinning the fruit on pot trees should not be overlooked, as it is better to have three fine fruits than a dozen poor ones. Figs also crop too freely, hence they need severe thinning after they have attained the size of Walnuts.

Stopping and feeding are equally important. Rub off small weak shoots in the centre of the trees, and those with fruit on must be stopped, that is, pinched at the fourth leaf or point from their base. When the shoot is allowed to grow the fruit will probably refuse to swell, but in time turn yellow and drop. By stopping, fruit will appear at the axil of each leaf. These will form the second crop, and, say, if the first crop is taken in May, the second, with good culture, will be ripe ten weeks later, and the same process as regards stopping must go on as above; indeed, at all times, unless a new leader is needed or the trees are required larger, shoots should be stopped at the fourth or fifth leaf during growth. Feeding with pot trees is important, as the root, having a small rooting space, needs plenty of food. Liquid manure and top-dressings of rich fertilisers are the best. From the start to the finish pot Figs should never be dry at the roots, especially whilst carrying a crop. Repotting every autumn is also needed until the trees become too large, when feeding and top-dressing must suffice. A large shift should be avoided, and over-rich soils also. Good loam with mortar rubble will be best, with a sprinkling of bone meal and of wood ashes. Thoroughly ram the soil as the work proceeds. At the start little root moisture will be needed, the daily syringing keeping the trees sufficiently moist.

Planted-out trees in houses need much the same treatment as regards temperature, soils at planting, disbudding weak shoots, and rigid stopping; but it will be necessary to allow shoots to develop their full length in various parts of the tree if trained on a trellis or wall. Each year some old fruiting wood must be cut out, and tie in the new wood trained in for this purpose. This new wood, if the trees are at all thick, will be poor, as it needs light and sun to get properly matured. As regards varieties, planting, and cropping, most of the varieties recommended for growing in pots will succeed well planted out, but a few may be omitted; for instance, the Brown Turkey is the best of all the large black fruits. Such as Negro Largo need more care, as if they have a free root run there will be few fruits; indeed, even for Negro Largo a restricted root run is best, and this applies to all varieties more or less. Trees fifty years old in a 3ft. border will crop well. It is well to only give a small border at the start, as it can be added to if necessary as the trees attain size. Planting should be carried out, say, in March or April, and the trees only slightly forced the first season. The aim of the cultivator should be to get the shoots well arranged over the trellis, as it is an easy matter to fill in afterwards, and, of course, main shoots or leaders must not be stopped, unless it is necessary to get more breaks from the base, but the latter will readily fill in later. Unlike the Peach, the Fig makes wood freely from all parts of the tree.

In planting, use the same compost as for pot trees, and avoid rank manures at the start, which promote gross wood. Stopping fruiting shoots is equally important as in the case of pot trees. Once sufficient leaders are obtained—and sucker growth from the base is not advisable—it is far better to get all growths from one centre, or at least in the case of trees planted out from three, and all shoots or stems issue from these. Trees forced will produce two crops of such kinds as White and Black Ischia—a small but delicious fruit and an enormous cropper—also Osborn's Prolific, which is much like Brown Turkey in quality, whilst also may be recommended the Early Violet, a small fruit, Black Marseilles, Brunswick, and the White Marseilles; indeed, there is no lack of variety, but avoid overcropping, as these kinds bear heavy crops.

As regards varieties for the open wall, one must exercise care, as in many parts of the kingdom Figs cannot be successfully grown, and in others Brown Turkey, Brunswick, and White Marseilles are the best kinds; but in Sussex, not far from the coast, they do well as standards or bush trees, with a single stem a few feet from the soil. Few can rely upon bush trees, but must trust to wall culture. Much the same advice is applicable as for forced trees as regards soils and thinning of wood. Of course in the open less wood is made, as growth does not commence until late in the spring, and there is stopping at the same time. It is advisable to train in young wood to allow old barren wood to be cut away. A south wall should be given, and planting be done just before growth begins. Give the trees ample space, 15ft. to 20ft. apart. A raised border is preferable in heavy soil, and a liberal addition of old mortar rubble, as lime or chalk is necessary. Train the main shoots 18in. apart, and do not stop any side ones needed to fill in space. Others may be stopped as advised for pot trees. Of course only one crop is obtained, and this needs the best attention. A wide root-run is not required. Superb fruits may be obtained on walls even close to a gravel path with only a 4ft. border. In one case the trees were 20ft. high against a building and bore grand crops annually, as each year new wood was laid in, old shoots being removed. The fruits ripen in August and September, and the trees well repay for copious supplies of liquid manure after the fruit is formed. The latter shows on the points of last season's wood, and in cold districts or on exposed walls it may be necessary to detach the branches, tie in bundles, and cover over with plenty of bracken or long straw to protect the wood. The trees are sometimes thatched over, but most of the losses in severe weather occur from bad ripening, and permitting the trees to be too thick with wood in the summer. It may be well in the case of very old trees to occasionally cut out old wood and train in new branches, as the latter give the finest fruit.

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Nectarines, Forced and on Open Walls.—Nectarines are better than Peaches when well grown, and in considering varieties and culture, those kinds of the finest flavour will be first thought of. Take forcing first, and as a few kinds force well which do not thrive satisfactorily on open walls, it may be well to describe them. The management of the Nectarine is so like that of the Peach, to which it is closely allied, that one need not dwell at length upon soils, temperatures, and best positions, as frequently even those who have poor houses secure a good crop. A great deal depends upon the management of the trees. Much of the success is due to small details. Although an ordinary garden soil will grow trees, more satisfactory results will be secured by the use of what is called good loam with such additions to make it suitable as are known to encourage fibrous root growth and good wood—not the strong barren wood which is at times seen when large quantities of manures are used at the start. It is an easier matter, some will say, to recommend the best soil than it is to secure it, but this need not deter planters, as very fine crops are obtained from what are termed made-up borders. For instance, heavy clay soil may be made good by the liberal addition of burnt refuse, road scrapings, and old mortar rubble; the last-named used freely is just the material the roots require. Of course very light soils can be improved by adding heavy materials; indeed, many trees go wrong through the soil being too porous, gravel or sandy soil being by no means the best. It needs more feeding, moisture, and frequent renewal. Of course in the case of newly-planted trees it is not advisable to force much the first season, but to build up fruiting wood for another year. Avoid overcrowding the trees with wood at the start, *i.e.*, take sufficient leaders and give them space to develop. Constant attention is also needed as regards disbudding or removal of surplus buds, as if all were left, the tree in a trained condition could not mature the wood, so that the surplus ones must be removed.

With regard to position, always choose a south or west aspect, even under glass, as though the trees may thrive elsewhere, the crop will be more scanty, and in wet, dull seasons the fruits need all the sun and light possible. Another point is to give ample space for the growth, as severe cutting back yearly promotes canker. Avoid high temperatures at any time, as the trees, especially at the start, resent this; indeed, high temperatures are more harmful with stone fruits than with others.

For open walls a south or south-west position is best, as one cannot always rely upon summer weather. Nectarines, unless they get plenty of sun, often crack badly and refuse to ripen. Much the same remarks apply to trees on walls as under glass as regards soil, but one may plant in the natural soil, and give such aids as previously advised, according to the nature of the soil; but avoid badly-drained soil, which is fatal to success, more so in the case of the Nectarine than other fruits. In soil at all wet, dig it out to a depth of 3ft., then place in at least 6in. of brick rubble, and over this some finer drainage material, to obtain a raised border say quite 6in. from the wall and above the surrounding soil. Grown thus there are better surface roots, and without these the trees do not last many years, though the Nectarine will thrive well under hard gravel walks. Upon examination, the roots have been found close to the surface, and doubtless the hard walk was their salvation, as it threw off the superabundant moisture. When planting on an open wall, put the trees 15ft. to 20ft. apart, but one may give 25ft. and plant what are called riders between. These are fan-trained standards, with 5ft. to 6ft. stems, according to the height of the wall. These in a few years are taken away, and the dwarf trees allowed the full space. By adopting this plan the wall is furnished quickly and there is no waste, as the tall trees, when removed, are in excellent condition to place elsewhere if carefully lifted. Transplanting also causes a more fruitful growth if the trees are inclined to make too much wood. Even with dwarf-trained trees on a wall it may be necessary to lift them, say, at the third or fourth year or later, as in good soil the roots get too strong. This results in fat wood and few fruits. The Nectarine, like the Peach, fruits on the small shoots made the previous season. These will not be fruitful if too strong, and this is one reason why at planting such aids as will induce fibrous root growth and well-formed fruiting wood are advised. Strong shoots have to be severely cut back, and this is the beginning of canker.

Varieties for Forcing.—The following are the best varieties for forcing. These are not numerous, as in the case of the Peach, but ample, some being much better than others, especially those introduced of late years by the Messrs. Rivers.

Cardinal.—This fruit was introduced about 1896, sufficiently long to test its merits; it is a splendid introduction, and though the Messrs. Rivers do not recommend it for open walls, it is of great value for forcing. It is the earliest Nectarine grown, at least a fortnight earlier than any other kind, of beautiful colour, large, excellent in quality, and of free growth.

Early Rivers' is also one of the newer introductions, and the best all-round variety we have on account of its earliness, good quality, and usefulness for open walls. In cold, late districts this will mature when others fail. It was only introduced in 1894, yet has become the most popular Nectarine in cultivation. The fruit is large, skin rich crimson on the sunny side, green flesh, and of rich, delicious flavour.

Lord Napier.—Previous to the advent of the two named above, Lord Napier occupied the premier position, and for general culture it is a fine fruit; it is about ten days later than Early Rivers', a beautiful, highly-coloured fruit of rich flavour, and forces well. It deserves special culture in any position.

Elruge.—A medium-sized fruit, excellent for forcing, rich in flavour, and crops freely under glass, but is less reliable in the open in exposed positions.

Pitmaston Orange.—A reliable kind for forcing, and, like those named earlier, rarely fails. It is a yellow-fleshed fruit of splendid flavour, very handsome, and a mid-season variety, coming in after Lord Napier.

Humboldt.—A late yellow-fleshed Nectarine of splendid quality. It produces very large fruits of rich colour, bears freely, and is in season after those noted above.

Victoria.—The latest Nectarine, a large green fruit. The tree should be quite near the glass. It is a first-class Nectarine for latest use.

For Open Walls.—Early Rivers' is the best variety for forcing, and, indeed, the leading kind. Few can rival it for earliest supplies, but it needs a warm position.

Lord Napier.—This is one of the best for forcing for open walls, and is invaluable for August supplies.

Rivers' Orange.—A beautiful yellow-fleshed Nectarine, not unlike the Pitmaston in colour and quality, but the hardier of the two, and a delicious fruit grown on a warm wall.

Humboldt.—This has been described for use as a late variety for forcing, and for open walls it is an excellent early September fruit, and crops bountifully on a warm wall.

Spenser.—One of the newer fruits, but a splendid open-wall variety, very large, and ripe in the middle of September. It is one of the best of the later kinds, a lighter-coloured fruit than some, but very handsome, having a mottled red skin.

Pine Apple.—Few more reliable, being a large, oval, late September variety, a good grower, and very handsome fruit of a distinct, peculiar rich flavour, and with yellow flesh.

Newton.—One of the latest, and not safe in a northern or cold locality, but most useful on a south wall for use during late September and early October. It is a large handsome fruit of great excellence.

Peach Culture on Walls.—That Peaches can be grown on open walls there is no room for doubt if rational treatment be given the trees, and the locality is a suitable one. Cultivators living in the country, away from the smoke line of towns, have a distinct advantage. Their culture in or near a smoky town would hardly be advisable. The southern counties, too, possess advantages that their northern brethren cannot hope to obtain in the matter of warmth and immunity from late spring and early autumn frosts,

Many failures to grow outdoor Peaches might easily be traced to want of knowledge in the cultural details rather than any defect in climate. Those who set themselves the task of securing a crop of Peaches from an open wall are sure to succeed if they follow diligently the plain rules here given.

The Aspect and Wall are important. A southern aspect is of course the best, although trees can be successfully managed on both eastern and western positions. Trees growing against a south wall derive more advantage from the sun early in the spring than do those growing against any other wall. Such a summer as the last and that during Jubilee year are the seasons for outdoor Peaches. Our summers are never too hot for this fruit. Trees on an east wall are rather more liable to "blister," as they are more exposed to cutting winds in April and May. A western exposed wall is capital for giving a succession of fruit, as the trees planted in such a position ripen a trifle later.

Peach culture, like all other things in the garden, is made easier and more successful by having a good selection of varieties. Some Peaches are magnificent when ripened under glass, but in the open would be quite a failure. Select the best, then, is the proper advice to give. Unfortunately, some of the earliest ripening Peaches are of poor quality. Alexander will ripen its fruit in the South of England against a south wall in July, but the quality is but poor. Waterloo, a few days later, is to be preferred. Hale's Early is another good early Peach. Dymond is one of the best. Barrington, Grosse Mignonne, Bellegarde, and Violette Hâtive are all worthy of attention. A more limited selection would be Waterloo, Grosse Mignonne, and Dymond.

It is useless planting Peaches on walls less than 6ft. high, as by the time the trees reach less than that in height they are early crippled. The best kind of tree is that known as dwarf fan-trained, obtainable from any fruit-tree nurseryman. They are generally furnished with from three to seven branches quite near the base. They should be well furnished with fibrous roots. Standard-trained trees are useful where a high wall has to be covered quickly. For instance, if the gable of a house, say 20ft. high, is available, a tree with a 4ft. or 5ft. stem may be planted between two dwarf-trained. Space is thus quickly utilised and time is gained.

Soil in which Peaches succeed best is an important item. The best kind of soil is a deep loam; rather heavy in character is better than the reverse. Chalk, peat, and sand are objectionable for Peach culture. Where this predominates more trouble will be experienced in obtaining success, although this can be achieved. The whole of the soil of the last-named type must be removed to the depth of 2ft. and replaced with some other compost. Freshly-cut turf 2in. thick is lasting, and beneficial to the trees where such can be had. If, say, from one to four bushels of such material can be added to the ordinary garden soil at planting time, so much the better. Roadside refuse, decayed vegetable matter, and wood ashes are all valuable constituents to add to any kind of soil for Peach culture. Manure in any form ought not to be added at planting time, as it is liable to induce too strong and gross a growth, which invariably ends in the gumming of the branches and the entire failure of a fruit crop. Stimulants are much better added later, when it is plainly seen that the trees are in want of it; this is easily determined by the state of the growth they make.

Planting is a most important detail in culture. Early in November, or directly the leaves turn yellow, is the best time for planting. If planted then, the soil has not lost all its summer warmth; the trees may then make new roots, and be in a good condition to start freely into growth when the spring comes round. Far better to plant then than wait till January, but it is better to plant in March than not at all. When the latter date is chosen, if the trees receive attention in watering and mulching, the following summer abundance of roots are formed, and surely such trees are in a better condition in November than newly-planted ones can be.

A PEACH TREE IN FLOWER.

One of the greatest mistakes made by the amateur is that of planting fruit trees too deep. The roots are then so far from the surface that they lose all natural benefit available by the sun warming the soil near the surface, and which so much assists the maturation of the branches, without which a fruit crop is not obtainable. The roots nearest the top ought not to be more than 2in. deep. This may serve as a guide to planters. Choose a dry day for planting, spread the roots out evenly, and cover them first with a compost of soil, vegetable refuse, old potting soil, and wood ashes. Work this well in amongst the roots, and finish off with some of the ordinary soil if of a sandy or loamy nature. Tread the soil quite firm if it is not in a wet condition, otherwise leave it for a few days until it dries gradually. If the subsoil is of a heavy, retentive character, like clay, or even approaching that, where the percolation of the water from heavy rains will of necessity be slow, provision should be made to drain the site by placing at the bottom of each hole stones, clinkers, or broken bricks 1ft. thick. Cover these with freshly-cut turf or a layer of straw to prevent the fine soil washing down into the drainage and choking the passage-way for water. Under the drainage break up the subsoil 6in. deep to assist percolation. It is only in retentive, adhesive soils that this drainage is required. In the ordinary garden mould which is not of a wet character artificial drainage is not needed. Finish off with a mulching of half-rotted horse manure 2in. thick; this preserves the roots from frost during the winter, and arrests evaporation of moisture from the soil should the

following summer be a dry one. Encouragement of root action is the all-important point to study the first season.

Pruning the trees after they are planted is an important detail. If they are not pruned at all, the future furnishing with suitable branches is much hindered. When the shoots are not cut pretty hard back to the base the basal eyes lie dormant and do not push into growth; consequently gaps at the base of the tree are visible and detrimental.

The month of February is a good time to prune newly-planted Peach trees. Cut all the shoots back to within 9in. of their base, always choosing a growth bud on the upper side of the shoot to prune to. Growth buds are easily discerned from blossom buds. The latter are useless, of course, to form shoots. As growth proceeds there may be too many shoots push from the eyes, so that overcrowding may be the result, as in some instances two shoots spring from one base bud. Select the most promising, that is, generally the one on the upper side of the branch; rub off the other when 1in. or so long to avoid overcrowding.

Early in May, or even later if the weather is bright and warm, remove the mulching of manure during the daytime to admit the sun to shine upon and warm the soil, replacing it at night for the first two or three days, and finally altogether should a drought set in. If the mulching material is allowed to remain from the time it is placed there at planting time until it decays, the soil is kept in a cold and wet condition all the summer. Fibrous roots are not then made in the same way as when the surroundings are made more congenial by warming the soil. A little attention to such an apparently trifling detail is of the utmost importance.

The pruning of established Peach trees is but indistinctly understood by the amateur. The wrong time is often chosen. The majority of gardeners err in this detail; they prune their trees in March when the blossom buds are pushing. All the pruning a Peach tree requires should be done in September or October after the fruit is gathered. Why wait until the spring when the work can be so much better done when the leaves are on the trees? The latter are a guide to the pruner. The main point is to allow sufficient space between the branches. Overcrowding of the shoots is a mistake; maturity is the point to aim at. Never allow the leaves of one shoot to overlap those of its neighbour. Cut away all superfluous growth, selecting for removal those shoots that are weak, and also those that are extra strong, as these do not mature so readily, and never show as many bloom buds as the medium-sized shoots do. Those of the thickness of an ordinary cedar pencil are preferable. Shoots of this size and 2ft. long may be shortened back to 6in.; those 18in. long may simply have their point removed; those less may be left intact. When shortening a shoot always cut to a wood bud (not a flower bud) on the upper side of the shoot, as then the shape of the tree is so much better preserved than when the shoots come from the under side.

Disbudding is important, and, if properly done, lessens the necessity of much pruning in the autumn. In disbudding or thinning the shoots, the aim should be to leave all that is necessary to fill up gaps consequent upon the removal of useless growths in the autumn. It is better to err on the side of thinness than overcrowding. Directly the shoots can be handled the trees should be gone over, as then the shoots rub off easily by bending them in the opposite way. Go over them several times, removing a few shoots at a time rather than taking all off at once, as then no check is given.

The summer treatment consists in supplying the trees with water at the roots when required, and keeping down insect pests. Seldom do the trees require water before July; if they do, they must not be neglected. It is surprising how quickly the leaves are infested with red spider if the roots are allowed to become dry. When the fruit is swelling, abundance of water is a distinct gain, as finer fruit is obtained and the trees make better growth. It is upon the current season's growth that next year's crop is obtained; therefore if this is unsatisfactory, the fruit crop cannot be otherwise. After the fruit is gathered, should the weather be dry, a good soaking of the roots weekly will much assist the swelling of the buds in the embryo state. If the trees are not making satisfactory growth, apply liquid manure freely, or, failing this, sprinkle the surface with bone meal or some other artificial manure, washing it down to the roots with clear water.

The soil for fully 1yd. from the wall on which the trees are growing should not be dug, much less cropped with anything else. Peaches prefer a firm soil. The surface may be pricked up 2in. deep with a fork in the spring to admit of the stimulative food being washed more readily to the roots, but these must not be seriously interfered with.

Insect pests are a source of annoyance to the cultivator; none is worse than black fly, which infests the tender, half-developed leaves, causing them to curl inwards. These check the growth and entirely spoil the trees if means are not taken to prevent them from spreading. The remedy is to thoroughly syringe the affected parts with an insecticide in the afternoon, and to well wash the trees the next morning with clean water. Bentley's quassia extract is perhaps the best insecticide for the purpose. This is a good remedy also for green fly and red spider, none of which should be allowed to spread.

THE MELON.

Without doubt the Melon is one of the most delicious of our tender summer dessert fruits. It is only during the warmer months that the Melon is fully appreciated, as later in the year its flavour is not so fully developed. Originally a native of Persia, the Melon has for a long time been cultivated in many warm countries throughout the world. Several forms of it have been introduced into this country at different periods. The earliest of which we have any record is the Musk Melon, said by Phillips, in his "Pomarium Britannicum," to have been brought here in 1520, probably from Italy, though for some time its cultivation was confined to the Royal Gardens at St. James's. Another account gives the date of its introduction as 1570, and Jamaica as the country from which we received it.

The Cantaleupe Melons, so called from their having been grown for a very long time at Cantaluppi, near Rome (though coming in the first place from Armenia), and the Romanos, also from Italy, were introduced from the Continent at a later period.

By the intermingling and frequent intercrossing of these various forms, innumerable varieties were raised, which, though popular for a time, have since been superseded by countless others.

The general character of the Cantaleupe is a roundish form, with a rough, irregularly netted surface; that of the Romanos, an oval shape with regularly netted skin, and a prolific bearer.

The Persian and Water Melons are not now cultivated in our glass houses, although the latter are still imported in considerable quantities from the Continent for sale in our markets. The Water Melon is a distinct species.

Though cultivated with us as a luxury, in the East the Melon forms one of the necessaries of life; in both Persia and Cabool it is, perhaps, most extensively grown in the open air. The minimum temperature in which the Melon can be successfully grown may be put down at 65deg. Fahr., but to properly ripen its fruit greater heat is necessary. To be able to furnish a supply of Melons from May until October the cultivator will have little time unoccupied between those months, for the first sowing of seed should be made early in January if the seedlings are to produce ripe fruit by May.

Nothing is gained by sowing the seeds earlier than the above date, for if they germinate during the dark sunless days of December the young plants will become weak and spindly, and most probably will be overtaken by those from the later sown seeds; the latter would also have the advantage of having made a quick growth under more favourable conditions, resulting in the production of better plants. Different cultivators usually have their own particular methods of sowing the seeds and growing on the plants before finally planting them out.

Sowing the Seeds.—Sow these singly in small 60-sized pots, in preference to either sowing them in pans or at once in the permanent bed, as some recommend. The disadvantage of the last method is that much of the heat of the hot-bed is spent just when it would be of the greatest assistance to the plant. Those who follow this practice claim for it that by so doing there is no danger of injury to the roots of the Melon plants by removal, as is easily possible when they have to be transplanted from the seed pots. It is for this reason that many do not sow the seeds in pans, as then the risk of injury to the roots of the seedlings is much greater than if the seedling, well rooted in the pot in which it was sown, has only to be transferred from it to another pot or bed of soil.

This brings the question as to whether it is advisable to plant out the young Melon plants from the seed pots, or to repot them into a larger size before finally planting them. Unless it is intended to fruit the plants in large pots, place them in their permanent quarters directly from the small ones, as they then have a better opportunity of getting established before coming into flower than if allowed to remain in pots for a longer period. Fill the small pots in which the seeds are sown with a rather light compost, consisting of loam and leaf mould in equal quantities. Afterwards make use of nothing but loam for Melon culture, and, provided the loam is good, it cannot be improved for this purpose by the addition of any other material.

Place the seeds in the pots about ½in. deep, and plunge the latter closely together in a mild hot-bed, and cover with a piece of glass. Make the soil moist before the seeds are sown, so that no more water is required until they have germinated, except an occasional damping with the syringe. When the seed leaves are seen pushing through the soil take up the pots and place them on a shelf close to the glass; here they soon strengthen and make good progress.

Very little water will be needed until plenty of roots are made. At night, if the weather is at all cold, throw a mat on the glass outside, directly over where the seedlings are, for being so near to the glass if not thus protected they would probably suffer.

A MELON HOUSE.

In the early part of the year about four months elapse between the sowing of the seed and the ripening of the fruit, though in the warmer weather so long a time is not necessary. By the beginning of February the young plants for the early house should be sufficiently well rooted to place in their permanent quarters. It is a great mistake to plant Melons, especially early ones, in too large a body of soil. Finer fruits are obtained if the roots are confined to a comparatively small area. This latter does not become sour, for it is so full of roots that the water given to it is quickly absorbed. At a later stage the plants can also be more efficiently assisted by stimulants when their roots are confined than if allowed to ramble over a larger area

Having made up a hot-bed of stable manure (about 2½ft. deep and 2ft. wide) in the house or pit intended to be filled, cover the surface with three rows of turves, grass side downwards. Upon the two outer rows place a second layer, thus leaving a space between the two in the centre of the bed. Fill this afterwards with chopped loam, from which the loose soil has been shaken, so as to leave only the fibrous portion for use.

Before planting the Melons the whole bed of soil requires to be made firm. If the young plants are carefully removed from their pots, and have not been allowed to remain in them long enough for the roots to have become matted together, they will not suffer to any extent. Make a hole in the loose soil of the centre of the bed to comfortably receive the plant. Then plant and make firm.

Planting and General Culture.—For a few days after the hot-bed is finished it will probably be too hot to allow of the Melons being planted. A thermometer should be inserted in the bed to ascertain its heat; when 80deg. are registered, with the temperature decreasing, the work of planting may be safely commenced. Sufficient warmth for the well-being of the Melons is maintained by the bed without any further addition of heating materials.

It should, however, be mentioned that in our case two rows of hot-water pipes run the whole length of the bed underneath it. For the first month keep the night temperature of the house at 68deg., and then raise it to 70deg. When the fruits are well set raise it to 73deg., and finally to 75deg. A light spraying, with the syringe, of tepid water several times daily, when the weather is bright, greatly assists the plants. If possible the house should also be moistened late in the evening, otherwise before morning the atmosphere becomes very dry. This has much to do with the appearance of red spider, which evidently thrives where such conditions prevail. When this pest appears heavy syringing is usually resorted to in the day, but at night the atmosphere of the house is again far too dry for the good of the plants, especially when in cold weather the pipes become very hot. As soon as the Melons are established in their new quarters, place the wire trellis on which to train them in position, suspended about 1ft. from the roof. Before the young plants reach the trellis pinch out the points. This causes them to push forth several side shoots, the two uppermost of which are tied to the trellis and the remainder rubbed off. When these two have grown about 18in. along the trellis they are also stopped. Several laterals will again soon be produced, and most probably some of these will bear female flowers. The word "probably" is used, because it is characteristic of some varieties to rarely produce fruit upon the first lateral growths; it is not until these have been stopped and the sub-laterals appear that female flowers are obtained. When the flowers are seen to be opening the atmosphere of the house should be kept drier, and more air also is necessary. The Melon plant is monœcious, that is, the male and female organs are enclosed in separate flowers, although both flowers are on the same plant. In order, therefore, to obtain properly-developed fruits it is necessary that the pistillate or female flowers be fertilised by the pollen of the staminate or male flowers. This is best accomplished by plucking one of the latter, and after removing its corolla, place it upon the stigma of the former. The pistillate flower, which afterwards develops into the fruit, is easily distinguished from the pollen-bearing flower by the ovary (resembling a miniature Melon), which may be seen below the corolla. It will be noticed that when these first commence to open not more than two or three will be in the same stage of development; some will be fully open, while others have not yet begun to expand.

Unless a few fruits are required very early, it is not advisable to "set" or fertilise any flowers until several are as nearly as possible in the same condition, for if one fruit

starts to swell much in advance of the others, it will continue to develop at the expense of these, and probably only one perfect fruit will be obtained.

Of course, it is not always possible to find more than two or three flowers in exactly the same stage, but if the plants are pinched and trained as advised, the number of ensuing laterals will invariably give a good choice of flowers. Not less than four or five should be set, if this is possible, as in the course of a day or two it can easily be seen which are likely to develop into the finest fruits; those not required may then be removed. Early in the season three are quite sufficient to leave on the plant if they are to properly grow and mature; sometimes only two can be obtained. Later in the year four fruits may remain on each plant. The ultimate size of the fruit, however, needs to be considered when deciding how many fruits to remove.

Some varieties of Melons produce small fruits; therefore in such a case rather more might profitably be allowed to ripen than if the plant were a large-fruited variety. Where possible it is preferable to choose fruits that are some distance up the trellis rather than those low down near the stem, for the former can be more easily attended to as regards tying, etc., and would also receive more sunlight than the others.

The appearance of the Melon house, too, is much improved if the fruits are regularly distributed over the trellis than if all are together at the base of it. After the fruits are set and have been thinned to the required number, they should be encouraged to swell as quickly as possible. The Melon, being but a short-lived and tender plant, is most easily injured if its growth is checked in any way. It will be necessary to support the fruits in some manner as soon as they become at all heavy. If they develop as they ought to do, the above operation need not be done until three or four weeks after they are set.

In some gardens the fruits are supported by means of a small piece of board placed underneath and suspended from the trellis by four strings, one at each corner. Moisture, however, frequently settles on the board, and is the means of causing many of the fruits to prematurely decay. A better way is to make use of string alone, which answers the purpose equally as well. Use only two strings; tie them to the trellis so as to cross each other under the fruit, thus forming a sling for the latter to rest in.

MELON (Hero of Lockinge).

During the time the fruits are swelling the plants will need copious supplies of water, as the soil will dry up quickly. Applications of liquid manure are very beneficial at this period, and may be given at least twice a week. Regulating and stopping of the shoots are necessary when the plants are in full growth. Each shoot that bears a fruit needs pinching one leaf beyond this, and all laterals and sub-laterals that eventually appear require to be regulated by stopping according to the amount of room vacant on the trellis. All leaves allowed to remain must have sufficient space for their proper development; if they are crowded together they will be unable to perform their functions, and the plants will consequently suffer.

It is well to pinch the shoots when they are young and to do so gradually, going over them every day. By this means the vigour of the plants, though not checked in any way, will be directed to those parts where most needed. When the fruits approach the ripening period there are several cultural details that ought not to be neglected, as fruits at this stage are easily spoiled. As soon as signs of ripening are noticeable, less moisture and more air should be given.

In a hot and moist atmosphere the fruits may split. Some varieties will behave thus even when great care is taken to prevent it. If an excess of moisture be present, it also invariably settles around the collar of the fruit, *i.e.*, where the latter is joined to its stalk, and speedily causes decay. Less water at the root is necessary at this time; some cultivators cease watering altogether when the fruits begin to ripen. Although a certain dryness both of soil and atmosphere with an increase of air are necessary for the full development of the flavour of the fruit of the Melon, if these measures are adopted before the fruit is fully grown, it would probably be found that instead of this having increased in flavour, it was wanting in that most necessary quality.

Cutting the Fruit.—When the stalk partially leaves the fruit, a good indication is given that the latter is in a fit condition to be cut. This does not always hold good, for some varieties take a longer time to ripen than others. If the top of the Melon, when pressed gently with the thumb, feels slightly soft to the touch and a pleasant smell is also emitted, one may be fairly sure that the fruit is ripe.

The most suitable place in which to keep Melons when they are cut is a cool, airy fruit room, though if they are still rather hard, and yet have become detached from the stalk, they ought to remain for another day or two in a sunny position under glass. If the fruits are turned on their sides instead of remaining upright when in the fruit room, and tissue paper is placed over them at night, they keep much longer. This latter precaution prevents moisture settling around the collar of the fruit, while it often happens, especially if a Melon is fully ripe, that if stood for any length of time in an upright position the base of it becomes quite soft, thus rendering the fruit useless. A few of the leaves may be stripped off immediately around the Melon when ripening, in order to admit air and all possible sunlight.

Diseases.—Of all diseases to which the Melon plant is subject, that known as canker is undoubtedly the most destructive. The part of the plant affected becomes soft, and, if preventive measures be not taken, quickly decays. The base of the stem is usually the portion attacked. To avoid this malady the cultivator should endeavour to keep the stem hard and strong. All growths which push from the axils of the leaves on the stem ought to be removed when the plants are young, for if allowed to remain until well grown they prevent a free circulation of air around the stem, thus causing the latter to become soft and flabby. When watering the bed, great care is necessary to ensure that the stems of the plants remain always perfectly dry. No water should fall within 1in. of the former. When the shoots are allowed to grow and develop before stopping, or removing a lot of foliage at once, canker is promoted; the shoots often die back to the stem instead of healing.

An atmosphere continually saturated with moisture will also weaken the plants, thus rendering them more liable to canker. A good cure is Portland cement rubbed well upon the parts affected; it arrests decay and causes the stem to become hard and dry again. Red spider also frequently attacks the foliage, greatly disfiguring and injuring it. Regularly syringe with clear water, and occasionally with a solution of soft soap and water. Take care also that the house does not become hot and dry

Melon Culture in Frames.—Melons may also be successfully cultivated during the summer months on hot-beds under frames. The plants should be ready for planting out by the middle of May; seed must be sown, therefore,

about a month previously. Admit no air for a few days after planting; if the sun is bright, shading will be necessary. It is important to close the frame early in the afternoon, so as to harbour as much sun-heat as possible, as none is available from hot-water pipes. The plants have necessarily to be trained on the surface of the soil, so that the fruits ought to be placed upon tiles or slates, as it is of course impossible to suspend them. As they approach the ripening period, the Melons need to be well exposed to the light. If mats are thrown over the frame at night, the temperature will be increased by several degrees. The cultural details advised for the plants grown in houses, with regard to regulating the growths and the proper conditions to maintain at certain periods, etc., apply equally well to those in frames.

THE PEAR.

Though the Pear does not reach so high a state of perfection in this country, generally speaking, as the Apple, it is one of the most valuable and highly esteemed of our hardy fruits. By many it is preferred to the Apple for dessert. Though not so largely used as the latter for culinary purposes, some varieties of the Pear when stewed are delicious. As a press fruit for the manufacture of perry it is in some parts of this country largely cultivated, and this beverage is by many persons considered superior to cider. The climate of some parts of the Continent—notably France and Belgium—and of the Channel Islands produces finer Pears than we, as a rule, are able to furnish from trees in the open ground and upon the walls of our home gardens. Early in the present century many new varieties were raised and introduced to cultivation by Knight, Van Mons, Duquesne, and others. These were of such a high quality, that with few exceptions they superseded the older ones. From "The Book of the Garden" we learn that in the course of a few years the Abbé Duquesne and Professor Van Mons fruited no less than 8,000 varieties. Van Mons alone raised 80,000 seedling Pears, and spent the greater part of his life in carrying out this his favourite study.

In its wild state the Pear tree is thorny, with upright branches and of a pyramidal form, in which respect it differs from the Apple tree. Burnet observes that the cultivated tree differs from the Apple not only in its tendency to a pyramidal form, but also in being more liable to send out tap roots, as a seedling much longer in coming into bearing, and when on its own roots or grafted upon the Pear stock of being much longer lived. In a dry soil it will exist for centuries and still keep its health, productiveness, and vigour.

The first accounts we have of the Pear are of great antiquity; it is mentioned by the earliest writers as growing abundantly in Syria, Egypt, and Greece. From the latter country it was imported into Italy, and though we have no record of the date of the introduction of the cultivated Pear into this country, it is generally thought to have been brought here by the Romans.

Propagation.—There are various methods of propagating the Pear, but the best and most generally practised are budding and grafting. The raising of seedlings is only resorted to for the purpose of obtaining new varieties and for raising stocks. If it is sought to raise a new, or improve an existing, variety by selection, then the finest fruit should be chosen from the healthiest trees; if, on the other hand, the pips are saved from a fruit whose flower was impregnated with the pollen of another variety, no choice of course will be possible. The seed is best sown in the autumn, either on a sheltered piece of ground known to be free from injurious insects, or in 8in. pots, covered over with slates or pieces of board, and placed outside on tiles or ashes to prevent the entrance of worms, etc. It will not be possible to obtain the pips from late Pears in the autumn, as they are not thoroughly ripe at that time.

The autumn-sown seeds begin to germinate, as a rule, in the month of March, whilst those sown in February will probably not commence to sprout before May. Throughout the summer the seedlings may be allowed to remain in their pots, a sunny position and plenty of water at the root being necessary for them in the growing season. In October they are planted in the open ground at a distance between each plant of 18in., and in rows 3ft. apart.

Where stocks are simply required, the seed is generally sown in drills, about 9in. apart, prepared in ground that has been well broken up; this latter remark applies equally to the seedlings above mentioned. The following winter they may be transplanted and grown on until large enough for grafting upon.

The question of the stock to be used for grafting the Pear is important, for the nature of this affects the future well-being of the tree. Of the several stocks employed, that of the Pear itself is undoubtedly the most natural; trees worked upon this live the longest, and are also the most vigorous. The roots, however, are naturally long and fibreless, and are liable to grow downwards into the cold subsoil, and require frequent prunings; for the same reason the trees ought to be often transplanted, otherwise they move badly. In poor soil the Pear stock is to be preferred to the Quince, as its roots roam further afield, and are able to find food where only surface roots would perish. In selecting stocks from amongst the seedlings, all but the strong and erect-growing ones should be rejected.

The graft may be affixed quite close to the ground or at some distance away, as this stock and the graft increase in size about equally. For standard trees the most vigorous should be selected, as only these are suitable for grafting at some distance from the ground. In deciding whether a standard tree is to be grafted near the ground or some distance up the stem, the habit of the variety to be grafted must be considered. It would be useless to join the scion of a weakly sort on to the stock near the ground and allow it to form the stem. With a strong-growing, healthy variety it does not matter where the union takes place, as either stock or scion would make an equally good stem. Before the sap rises the stock needs to be cut down to the point at which it is intended to graft, and the scions also should be cut off and partially covered in on a cool border before they show any signs of starting.

The Quince stock is of quite a different nature to that of the Pear. Trees grafted upon this become dwarfed in habit, and start into growth and bear earlier, their roots being more fibrous and keeping near the surface, and the fruit is often

PEAR, LOUISE BONNE OF JERSEY.

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larger and better ripened. From its shallow rooting habit the Quince stock is especially valuable in cold and damp soils, and for trees that are to be planted in limited space, as in cultivated garden soil. Another good point of the Quince is that trees worked upon it transplant readily even when fairly old. The increased size and colour of fruit produced by Pear trees on the Quince is considered to be the result of the check experienced by the returning sap when it reaches the Quince stock, which does not become so large as the Pear. For this latter reason the union should always be made quite close to the ground. It is not the stem of the Quince that is required, but its surface-rooting fibrous roots. If the graft were placed some distance up the stem of the Quince stock, it is most probable that eventually the scion would enlarge more quickly than the stock, thus leaving the lower part of the stem thinner than the upper.

The Hawthorn (Cratægus Oxyacantha), the Mountain Ash (Pyrus Aucuparia), and the Medlar (Mespilus germanica) are also sometimes used as Pear stocks, though not nearly so extensively as the Pear and the Quince.

Soil.—The Pear appears to thrive in any good loamy soil, providing it is sufficiently well drained to allow of no stagnant moisture being present. The nature of the soil where Pear trees are to be planted must necessarily determine whether these shall be upon the Pear or the Quince stock. It has been already mentioned that the roots of the former reach further, and therefore require a greater depth of soil than do those of the Quince. It will also be easily understood that as the roots of the latter are so near the surface, they will need to be assisted by top-dressing and mulching, especially when the trees are bearing a heavy crop of fruit.

When young Pear trees are planted they make a better start if, after the roots have been laid out carefully in the hole made to receive them, a few barrow-loads of fresh loam are used to mix with the garden soil, placing it more especially round about the roots. All thick, fibreless roots, and also any that are bruised or broken, need shortening back with a cut commenced under the root. In planting the Pear tree, regard must be had to the particular variety, whether the fruit is required early or late in the season, if it is of a weak or a strong habit of growth, etc. Local circumstances also have to be considered. The fruit gathered from wall trees is generally superior to that picked from trees in the open. Walls having a south or a west aspect should be chosen if possible. Wall trees have the advantage of those in the open of not being so liable to suffer when in flower from spring frosts. The wall itself gives a certain amount of protection, and more can be easily afforded by means of canvas blinds.

Training.—The methods of training Pear trees are numerous, and depend upon the uses and positions for which the trees are intended. For covering a wall, horizontal-trained trees are often employed, though formerly, to judge by the many specimens now existing in gardens, fan training was more extensively practised. Cordon-trained trees furnish the wall more quickly than either of the above-mentioned, and are to be recommended, especially for temporary fruiting, until the larger trees are well grown. For very high walls fan-trained trees are suitable, as the upper part of the former is more quickly covered than by horizontal training.

With regard to trees trained in the last-mentioned manner, those grafted on the Pear stock will need more room for development than if worked on the Quince. From 12ft. to 15ft. apart for those on the latter, and from 18ft. to 20ft. for those on the former, according as the soil is rich or poor, are suitable distances to allow between them. The branches of trees horizontally trained should be at least 12in. apart; this may appear to leave a large amount of vacant space between, but it will be found that a sufficiently heavy crop of fruit can be produced under good cultivation. The wall also becomes warmer from the heat of the sun when not so heavily covered by foliage.

The formation of the horizontal-trained tree is thus described by Thompson:—"When the young plant consists of a single upright shoot or stem it is cut down above three buds, one on each side situated at the proper height for originating the two lower horizontal branches, and the third one for the upright leader. When the shoots push, the latter, of course, is trained upright, and the other two at some elevation in order to strengthen them, for they cannot be too strong, provided they can be bent down easily towards autumn."

The following winter the stem will be pruned back to such a distance as will allow a space of 12in. between the buds, from which the second horizontal branches will be produced, and those branches already formed. The top bud will again be trained upwards for the leader. From this we see that only two horizontal shoots are made every year, so that some time must necessarily elapse before the top of the wall can be reached. Some cultivators, if their trees are growing very strongly, retain four of these branches annually, two on either side of the stem. This is done by stopping the leading shoot, so as to cause it to push lateral growths. Two of these at a proper distance from the lower branches are then allowed to extend.

When dealing with trees with the lowest branches almost at right angles to the stem, if the flow of sap is not checked in some way the top of the tree will benefit to the detriment of the base. In forming the bottom shoots, therefore, instead of training them immediately right away from the stem for a few inches, they should be allowed to rise, as the sap is then encouraged to flow to them. Of course, near to the top of the tree this will not be necessary; the branches there should be as level as possible.

To encourage the lower shoots to grow strongly, allow the laterals to develop, and pinch them late in summer. They must, however, be cut within ½in. of their bases at the winter pruning. For several reasons the laterals on the horizontal branches may be allowed to grow during the summer without stopping (unless they become unduly crowded, when pinching must be resorted to). After several branches have developed on either side and the tree is well formed, the side shoots ought to be shortened in summer to five or six leaves, going over the upper half of the tree one day and the lower half after a few days' interval. The formation of fruit spurs will be greatly assisted by the free admission of sun and air thus made possible.

In forming a fan-shaped tree, commence by first producing three shoots as advised for the horizontally-trained one. At the first winter pruning cut back the leading shoot to three properly developed buds a few inches above its base. The resulting growths at the end of the second season will then number five. At the following pruning, again shorten the leading one to three buds, and the two shoots made the previous summer also cut back to two eyes, and these will in their turn produce shoots.

Those obtained first of all, after allowing a slight rise from the stem, should be trained at right angles to this, and the others as they are produced a few inches above them in an oblique direction. Until the wall space is filled, the more the branches extend the farther apart they will become, thus leaving room for more, which are easily produced by shortening others back to suitable buds.

Cordon trees may be trained in an upright or in a slanting direction. When planted temporarily between other trees, or permanently against a fairly high wall, the former method is usually adopted. For furnishing a low wall the latter system is preferable, as it allows of more extension than would be possible if the upright method were practised. When the Pear tree is confined to a single stem, if the length of this is limited the tree is apt to prematurely die. There are other forms of cordons besides the single ones; they may be double, treble, or even five-stemmed.

The principal forms adopted for the formation of Pear trees for planting in the open are the standard, the pyramid, and the bush.

In cultivating a standard tree first develop a straight, strong, and healthy stem. A thin and weakly one will always be a source of danger to the tree, especially in rough weather. It is well known that the stem or shoot of a tree is stouter at the base than at the apex. This should be the case with the stem of our standard Pear, and by care and proper treatment it may be obtained. Unless a plant has a certain amount of well-developed foliage, the food absorbed by the roots cannot

be properly utilised. All leaves and side shoots which are produced upon the maiden shoot, *i.e.*, the first shoot made after grafting, must, during the first two years of its existence, be allowed to grow freely, so long as the leader is not made to suffer thereby. About midsummer the laterals may be pinched and pruned back to one eye in winter. After two seasons' growth the leader ought to have reached a length of 6ft., and should then be strong enough to form its primary branches. To accomplish this the leader is pruned to three buds above the point where it is intended that the stem shall terminate.

PEAR, BEURRE CLAIRGEAU.

This, however, must be some little distance below the extreme end of the leader, as that portion is usually anything but hard and strong. If it be seen that the two year old shoot, when cut down to the well-ripened part, will not be long enough to form the stem, the only course open is to allow it to grow for another season. From the three remaining buds shoots will push in the spring, and it is important that these be encouraged to grow strongly, and also evenly, as they really form the foundation of the tree. The future shape and beauty of the latter depend largely upon the care bestowed upon the training and regulating of the first shoots. They should be as nearly as possible the same distance apart, and if one grows stronger than the other it should be pinched.

As leaves are now produced in greater numbers at the head of the tree, the shoots that push from the stem may be pinched hard, and at the following winter pruning remove those upon the lower half altogether, and the remainder at the next pruning. The three branches formed are shortened to within 12in. of their bases in January, and when growth again commences, two shoots only from each of these are allowed to push. Six branches are thus produced, and more will not be necessary for some years until greater space is available, for all the efforts of the cultivator to obtain a good crop of fruit will be defeated by the crowding together of the branches.

Instead, therefore, of again shortening the main branches, allow them to extend, and shorten any side shoots to five or six eyes during summer, and prune them back to three eyes in winter for the formation of fruit buds. The aim of the cultivator should be to keep the tree as open as possible, to admit the sun and air; the principal branches must not cross each other, nor be allowed to grow inwards.

For those whose space is limited, the best form of Pear tree to plant is the

Pyramid.—Grafted on the Quince stock, they may be planted at from 6ft. to 8ft. apart, and they do not obstruct the light in the same way as standard trees. The true form of the pyramid is an upright stem with horizontal side branches, each tier of these being gradually shorter than the one immediately below. This is important, for if the upper branches are allowed to become stronger, and to reach over so as to destroy the pyramidal form, the lower ones will inevitably deteriorate, and probably eventually die away. The method of training to obtain this particular shape is as follows: The plant, having made one year's growth from the graft, is cut back to within 15in. of its base. In spring several shoots will develop, the uppermost of which is trained perpendicularly; if not perfectly straight, it must be tied to a stake to make it so. In order to encourage the remaining shoots to grow as vigorously as possible, leave them untouched until the end of August, and then bring them down to a horizontal position, attaching them to stakes placed in the ground, if necessary, for a few weeks.

At the next winter pruning shorten the leader to within 15in. of where it was cut to previously, and prune back all laterals produced on the side branches to ½in. From the buds upon the recently formed leader shoots to form more side branches will push the following spring, and the one from the uppermost bud will again be trained perfectly upright to continue the stem of the tree. Continue this system until this latter has attained the desired height. As the tree increases in size and vigour, the upper branches will naturally grow so strongly as to destroy its pyramidal shape; this, however, must be prevented by stopping them in summer at the required point. Gross strong shoots are usually unfruitful, so that by allowing these upper ones to extend beyond their proper limit, another evil is added to that of weakening the lower branches.

The bush form, or open dwarf, is more generally made use of in the training of Apple trees; still, it answers well for the Pear also, especially in small gardens, as they can be planted closely together. The maiden plant in this case must be allowed to grow for two years before it is pruned back. At the end of the second year cut the shoot down to within 6in. of its base. In spring, when the buds below begin to push, select four shoots to form the foundation of the tree. At the end of the second year, "Lindley's Guide to the Orchard" recommends that two or three of the best placed shoots from each branch should be selected and shortened back to 9in., 12in., or 15in. each, according to their strength, taking care to keep the head perfectly balanced, so that one side shall not be higher nor more numerous in its branches, and all must be kept as close as possible at an equal distance from each other. If this regularity in forming the head be attended to and effected at first, there will be no difficulty in keeping it so afterwards, by pruning either to that bud immediately on the inside next to the centre of the tree, or that immediately on the outside. This has reference only to the leading shoots, which are always produced from the terminal buds when pruned, and which alone form the figure and beauty of the tree. The intermediate space must of course be provided for at the same time, having regard to the number of branches thus employed, that they do not crowd each other. On the contrary, they must be kept thin and perfectly open, so as to admit plenty of sun and air; the middle of the tree must be kept quite open from first to last.

In pruning the supernumerary shoots, they should be cut down to within 1in. of the bottom, which will generally cause the surrounding eyes to form natural blossom spurs; but where the tree is in a vigorous state of health, branches will probably be produced instead of spurs; if so, they must all be cut close except one, which must be shortened as before.

Another excellent method of growing the Pear is as an espalier. The necessary fence is made by means of stout wires, about 1ft. apart, stretched between poles 6ft. in height. This system has much to recommend it, as little space is occupied by trees thus trained. The latter are fully exposed to the influence of the sun and air, the flowers are easily protected from the spring frosts, and the fruit is not damaged so much during the rough weather generally experienced in November as is that upon unsupported trees in the open. Horizontal and fan-trained trees are both made use of for espaliers. The first-named form, however,

is the most generally practised, and is to be recommended. The latter are well adapted for training upon curvilinear trellises, similar to the famous ones in the Royal Gardens at Frogmore. Trees fan-trained upon these are now still in good bearing, though planted when the gardens were made fifty or more years ago.

Spur Pruning Wall Trees.—The Pear tree in a wild state has thorny branches. These, however, under cultivation are replaced by short branches, technically known as spurs, upon which are produced flower buds. Spurs may either be simple or compound. If not pruned they would soon be too far away from the wall to derive any benefit from its warmth and shelter. In spur pruning, the object then should be to keep the spurs as near to the wall as possible, and also to thin out and regulate to a suitable distance any that may be crowded. As already mentioned, natural spurs are formed by the Pear, and these should always be retained in preference to artificial ones. Some varieties produce fruit spurs more easily and numerously than do others. On trees of this latter kind it is more profitable to train in young wood, upon which fruit buds will form readily. "The Pear and the Apple will both produce better and more abundant crops of fruit from natural buds formed on shoots of two years' growth, if of a proper character, and duly exposed to light during the growing season, than upon all the artificial spurs that can be created" (McIntosh). To obtain this young wood, as many firm, short-jointed shoots as can be conveniently laid in between the older branches should be tied down in the summer, at the same time removing all others likely to shade those tied in.

Pear Trees in the Open.—If the summer management of Pear trees in the open is properly attended to little pruning will be necessary in the winter-time. If the shoots are allowed to grow unchecked during summer and the following winter are cut back to within 1in. or so of their bases, from these remaining buds shoots will again push the ensuing season, and a mass of crowded growths will result. All summer shoots for which no room can be found without causing overcrowding should be removed altogether when growing, or, if there is still sufficient space for the formation of more fruit spurs, as soon as they have made six or seven leaves they may be stopped. Some side shoots will push as a result, and these also should be pinched after having made two or three leaves. At the winter pruning cut back those that were checked when six or seven leaves had developed to three or four buds. In all probability some of these will form flower buds. If, however, it should happen that each proved to be a wood bud when these pushed forth in the spring all should be removed except the lowest. This would require to be stopped after having made about six leaves, and in winter pruned back to three or four eyes to encourage the formation of flower buds at its base. The old wood projecting beyond would, of course, be cut away.

Unless the sun and air are able to have free access to the branches of the Pear tree an unfruitful state will ensue. It is by pruning that we endeavour to bring about the former, so preventing the latter; by summer pinching we prevent the shoots growing too strongly, thus overcrowding and weakening each other, and also check the sap with the object of causing fruit buds to form.

At the winter pruning the shape of the tree should be properly regulated, removing all weak and badly placed shoots; leading branches growing inwards are shortened to an outside bud. When spurs extend too far away from the branch they need to be pruned back, as well as removed when too close together. The buds of a spur may either be flower buds or imperfectly formed ones that produce leaves only. This latter kind, if allowed to become numerous, will probably increase in vigour, thus tending to prevent the formation of blossom buds. Such spurs, therefore, must either be thinned out or shortened back at the winter pruning, to encourage fruit buds to form. Those on the upper part of the tree may be cut nearly close, while on the central and lower parts they must not be quite so severely shortened. An equal flow of sap to all parts of the tree will thus be encouraged.

Root Pruning.—The practice of root pruning is often most beneficial if judiciously carried out. Its object is to check gross and luxuriant growth, or to prevent the roots descending into a cold, damp subsoil. Trees worked upon the Pear stock are more liable to both of these conditions than those on the Quince. With regard to old

CORDON FRUIT TREES AT LILFORD HALL, OUNDLE.

and large trees, it is, of course, impossible to lift them and cut back the offending roots; the best plan to adopt with them is to dig a trench all round at a distance of about 6ft. from the stem, and to shorten back with a sharp knife all the thick and fibreless roots that are found. In the case of younger trees the roots are naturally much more approachable. By making a trench a few feet away from the stem the soil can be worked away from the roots by means of a fork, the gross roots traced, pruned, and if possible replaced.

Thinning the Fruit.—It is the practice of all good cultivators to thin the crop of fruit produced, if this is necessary. When conditions are favourable, a heavier crop is often "set" than can be profitably brought to maturity, and if thinning is not practised, the over-abundant fruit will not only be inferior in quality, but the health and productiveness of the tree will probably be seriously weakened for the next season or two. As soon as the fruit is well set thinning should be commenced.

Sometimes it may be necessary to remove a whole bunch (especially on wall trees, where a better "set" is usually procured), but usually it is sufficient to thin out the fruits to two or three on each bunch in the case of the larger varieties, allowing rather more to develop upon trees bearing smaller fruits. Of course, on many trees, especially in unfavourable seasons, thinning is totally unnecessary; probably not more than one or two fruits will swell from each corymb of flowers. Unless the necessary thinning is performed, the energies of the tree are almost entirely used up in nourishing its burden of fruit, so that the requisite amount of elaborated sap is not stored up in the buds for the production of leaves and flowers the following year.

Gathering and Storing.—The time when Pears are in a fit condition to be gathered may be ascertained by lifting up the fruit; if ready to be picked, the stalk of the Pear will part quite easily from the spur. This, however, is not the case with all varieties. Some, if left until they are in this state, become soft and mealy, and ought to be picked some time before if their full flavour is to be developed. Such are Williams' Bon Chrétien, Easter Beurré, Doyenné Boussoch, and Flemish Beauty.

The early Pears, as Jargonelle and Citron des Carmes, require to be eaten almost as soon as gathered, for they will not keep. The late Pears are best left on the tree as long as possible, although it is not wise to leave them after the first or second week of November, as much damage ensues during a rough, windy night. When picking Pears intended for keeping, avoid bruising them by squeezing with the hand. A Pear that has not been carefully gathered will, before long, show signs of this by becoming discoloured where bruised and commencing to decay. A cool, regular temperature seems to be the requisite condition for successfully keeping Pears for any length of time.

The fruit-room of the writer is fitted with stages—in tiers one above the other—around the sides, and a larger arrangement of similar design in the centre. These stages have shelves about 1½in. wide and 1in. apart; the fruit is placed so as to rest between the two pieces of wood. Pears may be made to ripen a few weeks before their proper season if a deficiency in the supply necessitates this. The best method of hastening the ripening process is to place the fruits in a basket inside a warm, airy glass-house. It is important that the Pears in the fruit-room be frequently examined, so that all decayed fruit may be removed; if this is neglected, others quickly become contaminated.

The varieties of early Pears upon which chief reliance should be placed are Jargonelle, Citron des Carmes, and Doyenné d'Eté. The two latter are invariably ripe in July in the open, and the former also on a south wall. Beurré Giffard and Clapp's Favourite are two good-flavoured Pears, which ripen at a most useful time—in August. The last-named keeps well for a short time. Williams' Bon Chrétien, Souvenir du Congrès, Autumn Nelis, Beurré d'Amanlis, and Mme. Treyve are excellent September Pears, of which the first three should be consumed soon after being gathered. In October, Louise Bonne of Jersey, Fondante d'Automne, and Beurré Hardy ripen, all of which are excellent Pears.

PEAR, WILLIAMS' BON CHRETIEN.

Thompson's (in the opinion of many the best-flavoured Pear in cultivation) is ripe in November, together with Seckle, Marie Louise, Conseiller de la Cour, Van Mons, and Beurré Bosc. This latter, although delicious when properly ripe, is often met with of inferior quality. It requires a warm situation to be developed as it should be. In November and December there are: Forelle, the beautifully speckled Trout Pear, of good flavour; Glou Morceau, one of the best, though to be well grown it requires wall protection. Doyenné du Comice, the favourite Pear of many persons, succeeds well as an espalier, as does also General Todleben, a large and delicious fruit. Beurré Diel, Beurré Bachelier, and Chaumontel are all good December Pears.

The best late Pears are: Winter Nelis, an abundant cropper and of excellent flavour; Beurré de Jonghe,

Knight's Monarch, Nouvelle Fulvie, a delicious late Pear; Bergamotte d'Esperen, another prolific bearer; Beurré Rance, Olivier de Serres, Ne plus Meuris, Passe Crassane. Easter Beurré and Doyenné d'Alençon are the latest of all. The last mentioned cannot always be depended upon to produce a satisfactory crop, for though it is one of the last Pears to ripen, the tree is invariably in flower very early—one of the first, in fact, and so the blossoms are liable to suffer from frost.

Catillac, Verulam, Vicar of Winkfield, and Uvedale's St. Germain are the best stewing Pears, the first-named, perhaps, the best of all.

THE PLUM.

This is one of the most esteemed of hardy fruits, and there are many forms of it—Bullace, Damsons, and so forth.

Propagation.—The usual way is by budding and grafting, and sometimes by suckers and seeds. It is for raising stocks that the latter method is usually employed. Plum stocks are required in large numbers, for they are used for grafting Peaches, Nectarines, and Apricots, besides Plums. Suckers should not be used for producing stocks, as the tendency of the Plum to form numerous suckers would then probably be still further increased

Damsons are often raised from stones, and the Green Gage Plum comes fairly true in the same manner. The stones may be placed in a prepared bed of soil outside when taken from the fruit, or may be kept in dry sand and sown in November. The seedlings ought to be ready for transplanting in the winter following their first year's growth into rows 3ft. apart, there to remain until large enough to be budded or grafted. The green tops of the leading shoots should be cut off, and, after another year's growth has been made, the stem pruned down to the two or three lowest buds; the best shoot from these is selected the next spring, and the other two pinched off. When transplanted the previous autumn, the tap root requires shortening. The best stocks for the Plum are the White Pear Plum, St. Julien, and Mussel. As mentioned when writing of the Pear, if the variety to be budded or grafted is a strong-growing one, the scion may be worked on the stock low down, and itself form the stem for a standard tree; if, however, the variety is weakly, it should be budded or grafted higher up the stock.

It is important to carefully distinguish between a wood bud and a flower bud, and to insert only the former when performing the operation of budding in July. Stocks upon which it is intended to graft should be cut down early in January, and also cut the scions then and lay them in the soil on a north border, until required for grafting in March.

The Plum is not fastidious as to soil, providing that this is of ordinary fertility and the subsoil is not wet and cold. The fruit produced on trees which make a strong growth in too rich a soil is not of such a fine flavour as that upon trees of moderate growth in lighter soil. The roots of the Plum do not go very deep, consequently a great depth of soil is not necessary. In soil that is trenched the roots will naturally extend farther than in soil not dug; and in the former case the trees would not be liable to suffer so much from drought in a dry season; it is important, therefore, to well prepare the soil before planting. To have the finer dessert Plums in perfection, the trees should have wall protection, and in cold, bleak situations a southern aspect is required. The majority of our Plum trees are planted against walls facing east, and a few varieties upon north walls—this in the South of England.

THE FAMOUS VICTORIA PLUM.

The Plum tree succeeds well as a standard and bush in the open, although the blossoms are very liable to be nipped by spring frosts. On several occasions disappointments of this kind have been experienced. Those on walls are easily protected when in flower, and a crop is almost always to be depended upon. Another method to be recommended is to train Plum trees against espaliers, made by stretching stout wires between poles 6ft. high. Standard Plum trees are generally planted about 20ft. apart, and espaliers and wall trees 15ft.

Mulchings of manure are most beneficial to the Plum, especially in dry seasons. The roots, being for the most part near to the surface, quickly suffer, and such a state of affairs tends to produce the gum disease so prevalent amongst Plums and Peaches. The stem of standard trees should be not less than 6ft. high; this and the first branches of the tree may be formed in the same manner as advised for the Pear.

As the tree increases in size any branches which cross others, or tend to grow inwards, must be removed or shortened back to a suitably placed bud. All shoots having a tendency to become gross and over-luxuriant should be stopped or rubbed off in summer. The fan-trained tree is the one to be preferred for wall planting, as in the event of a branch dying, which is liable to occur occasionally, it is more quickly replaced than upon a horizontally-trained tree. Mr. Rivers states "that Plums form most fertile oblique cordons. No matter how the shoots are pinched, they will produce remarkably fine crops of fruit, and continue to bear in spite of excessive pinching, forming cylinders of fruit. Their worst tendency is to excessive growth, which must be checked by root pruning."

The fruit of the Plum is borne upon natural spurs, which form on the ends and along the sides of the bearing shoots from one to three years old generally, though fruit is not produced before two years. Young shoots should be laid in upon old naked branches, and between these where there is room; old and weakened branches ought to be cut out if there is sufficient young wood to replace them. When spurs project too far from the wall they must be shortened back, otherwise they cannot take advantage of the warmth and shelter of the latter. During summer those shoots which push upon the front and back of the branches need removing (unless there is an empty space to be filled); other side shoots not needed to form branches should be pinched after half-a-dozen leaves have formed, to be reduced at the winter pruning to encourage the formation of fruit buds.

Remove wood that is weak and improperly ripened. As a proper distribution of the sap to all parts of the tree is necessary to the health and fruitfulness of the latter, the cultivator should do his utmost to bring about such a condition. This is greatly assisted by equalising the amount of foliage throughout the tree. If left to themselves the shoots on the upper branches will naturally grow more freely than the lower ones, and soon cause the latter to become weak and eventually useless. To avoid this, when summer pruning the upper shoots must be first stopped, and also more severely than those towards the bottom of the tree.

Gathering the Fruit.—Dessert Plums ought to be allowed to hang on the tree until quite ripe. The delicate bloom of the fruits is easily rubbed off if these are not gathered very carefully; the stalk only of the fruit should be taken hold of. Some late varieties, of which Coe's Golden Drop is one of the best, will keep for some time if carefully gathered, wrapped in tissue paper, and placed in a dry, cool, airy room.

Though the varieties of the Plum are now so numerous, certain of the older sorts still hold their own, and many of them are not surpassed by more recent introductions. Those upon which we depend for our early supply are Rivers' Early Favourite, a dark purple, juicy Plum, ripe in July (perhaps the earliest of all), and Early Green Gage, followed by Angelina Burdett, a round, purple fruit; Early Transparent Gage, Denniston's Superb, a most delicious Plum, bearing well as a standard; Green Gage, Jefferson, one of the best for dessert, of a beautiful golden yellow colour, mottled with red; Kirke's, a deep purple; and Transparent Gage, considered to be the finest of this section. Coe's Golden Drop, Golden Transparent Gage (Rivers'), Bryanston Green Gage, Ickworth Impératrice, Nouvelle de Dorelle, and Reine Claude de Bavay, a large, highly-flavoured variety of the Green Gage, form a selection of our best late Plums. For culinary purposes Autumn Compote, Pond's Seedling, Victoria, White Magnum Bonum, Belle de Septembre, and Large Black Imperial are six of the most useful.

THE VINE.

Much has from time to time been written about the Grape Vine, but new and inexperienced gardeners are constantly increasing, so that to them these notes will prove doubtless of some value.

The Border.—The Grape Vine, when in suitable condition, grows very freely, and requires during its growing season abundant supplies of water. From this, then, it follows that the border must be of sufficient size to properly accommodate the far-reaching roots, and water, when applied, must pass away readily. It is impossible to successfully cultivate the Vine in a border of heavy and sour soil, through the presence of stagnant water; therefore provide good drainage. Most cultivators agree that the border should be from 2ft. to 3ft.; anything either deeper or shallower than this is not advisable.

Presuming that a glasshouse measuring 15ft. wide by 40ft. long is to be planted with Vines, the first thing to do would be to remove the present soil to the depth of 3ft. for a distance of, say, 4ft. from the front of the house. For the first year a border 3ft. wide will be sufficient, so this distance should be marked off. In the bottom of the border have drain-pipes, placed so as to form rows about 4ft. apart along the whole length of the border, and sloping to the front of the house, where they should communicate with a main drain. Over these place 9in. of brick rubble, to be again covered with two layers of turves, grass side downwards.

To complete the border, provide a sufficient quantity of maiden loam, chopped roughly, to fill up to the required level, a few barrow-loads of lime rubble, and a good sprinkling of ½in. bones, to be mixed in with the soil as the border is made. Tread the soil firmly as it is filled in, and the outside layer should consist of turves, firmly placed, so as to strengthen the bed and keep the loose soil in position. The soil, when being used, must be neither too wet nor too dry. A few days before it is required, mix it as advised above, and at that time give it sufficient water to render the whole suitably moist. When this operation is completed, 1ft. of space between the old border and the new one will still remain. The following year, if the condition of the roots of the young Vines warrants such a proceeding, this space, or more if necessary, should be filled with new material for them to push into, and more of the old soil removed, so as still to leave an opening between the two borders.

This is considered a far better arrangement than that of making an entirely new border. Plant Vines in an inside rather than an outside border, for the temperature of the former is much more regular than that of the latter, and it is also capable of being more directly controlled, so far as watering is concerned. The outside border requires far less attention in this respect, for it receives the full benefit of the rain, which is far better than the hard water so often applied to inside borders. Examine the border outside a year or two after the Vines have been planted, and if any roots appear to be making their way through the arches in the foundation wall of the house encourage them by adding new soil.

Planting.—Vines may be either planted whilst in growth, or when dormant. The former method should be adopted whenever possible, and endeavour to have the Vines planted by the end of the month of June, before the canes have completed their growth. Then they have an opportunity of becoming, in some measure, established in the new soil before winter, and will be, therefore, in proper condition to make a good start when the growing season returns again in spring. But it is often more convenient to plant the Vines when dormant, and this method is practised by many growers, with perhaps equally good results, although the former is the better plan where it can be adopted. Vines in a growing condition are best planted (when ready) as soon as possible, but dormant plants may be planted in November, or any period between then and the month of March.

With regard to the proper distance at which to plant, several points must be considered. If the vinery to be planted be one for early forcing, then it will not be necessary to leave so large a space between the rods as when the plants are intended for a mid-season or later vinery. The growths made during the early and comparatively sunless months of the year will not be so vigorous, and will consequently not require so much room as the shoots of Vines allowed to break almost naturally.

The variety must also be thought of, some growing

much stronger and having larger leaves than others, so that to plant different varieties indiscriminately at the same distance apart would be unwise. Such kinds, for instance, as Gros Guillaume and Gros Maroc require more space for the development of their foliage and thorough ripening of their wood than West's St. Peters, Lady Downes', and Foster's Seedling. Usually when a vinery is planted one rod only is left to each cane, though some of the best cultivators allow every Vine to furnish two rods. Of course, if from each cane planted two rods were allowed to develop, twice the amount of space would be required, and the plants consequently must be placed twice the distance apart.

Taking first the vinery for early forcing, 2ft. 6in. should be allowed between each rod, while in the later houses the Vines ought not to be less than 3ft. 6in. or 4ft. apart. Before removing the plants from the pots in which they have been cultivated thoroughly water them, preferably an hour or two before planting, so that the soil may not be too wet when the Vines are turned out from their pots. Previous to making the holes to receive the Vines, sticks should be placed in the border at certain distances apart, measured according to circumstances, as explained above. Each of these sticks serves to indicate the centre of the future position of the plant, around which should be made a hole of sufficient size to accommodate any roots that need spreading out and deep enough to allow of a covering of 2in. or 3in. of new material over the old soil.

Between the hot-water pipes and the stems of the Vines (if the former run along the front of the house) there should be a distance of at least 12in. After the young Vine has been carefully removed from its pot, and the pieces of crock, etc., which have served as drainage are extracted, some of the soil needs working away (commencing at the base of the ball), so that the roots may be more easily spread out. This is an important detail, and the young Vine does not suffer from want of water after planting, which would be great if the ball of soil—generally hard and one mass of roots—were allowed to remain intact. Cover the roots first with fine soil, and work this gently in between them so as to leave no spaces. The correct way to do this is, after having laid out the roots, to place the soil near the stem of the Vine, and with the hand draw it towards the extremities of the roots; by this means the fibres are thoroughly covered and kept in proper position. Of course the whole of the roots must not be on one level; they should be laid out in separate layers, in a slightly upward direction, and each layer covered over and made firm before the next is placed in position. When this stage of the work is completed, rougher soil may afterwards be used to finish off with. If, as advised in the preparation of the border, the soil employed is moist, the Vines will need no water for at least a week, beyond a slight application to settle the disturbed soil.

THE VINERY AT CHISWICK (Probably the largest in the World).

Treatment after Planting.—For a few weeks after planting shade the Vines from the bright sun, close the house early in the afternoon to take full advantage of the sun heat, and keep the Vines well syringed. So soon as signs of the ripening of the wood are apparent gradually lessen the moisture and give more air, until eventually the house is quite cool and dry. This latter condition ought to be maintained throughout the winter; even in frosty weather the ventilators need not be closed.

We will now follow briefly the treatment of the young Vine during the second year. As soon as the cane has apparently finished growing—towards the end of September—cut it back to about half its length, and eventually, in the month of December, give the final pruning. In some cases cut back to the last two buds, while again four buds may not be too many to leave on the shortened shoot. Usually, however, the best practice at the pruning of the first year's growth, unless this be exceptionally strong, is to leave only two eyes—providing they are good and sound — as the canes resulting are stronger, and furnish a better foundation for the Vine than if the shoots were allowed to remain longer. Keep the vinery perfectly cool until late in the spring, when close it and encourage a quick and vigorous growth. This is assisted, as before mentioned, by maintaining a moist genial atmosphere in the house, and by making the most of the sun heat during the summer months. If the Vines have grown well the cane made during the second year should be of sufficient size and strength to be left, say, 5ft. long, when cut back in December. By that time it ought to be about the thickness of one's thumb; if not so thick as this, further shortening is required, viz., to 3ft. or even less, according to its condition.

BLACK ALICANTE GRAPES.

At pruning time all the side growths made during the summer must be removed from that portion of the Vine allowed to remain, for they are useless as permanent wood. We now arrive at the time when the Vine has sufficient vigour to produce fruit—not much, certainly, but the fact of its having been successfully brought to a bearing condition is some slight reward for all the care bestowed upon it.

Summer Culture.—Commence by shutting up the vinery on the 1st of April. At that time the outside night temperature is usually about 40deg. Fahr., so that no difficulty will be experienced in keeping the house at 45deg. during the night. For the next fortnight maintain the thermometer as nearly as possible at 45deg. at night, and in the day, if the weather be dull, a temperature of 55deg. will be high enough. On a sunny day a little air must be admitted when 60deg. are registered, and as the house becomes warmer give more air proportionately, sufficient, say, to prevent the glass rising above 75deg. Great care is necessary in ventilating the vinery, especially after the buds have burst into growth.

The weather in the month of April is most changeable; more often than not bursts of sunshine occur, then cold showers of rain, or perhaps a bright sun shining with a keen, cold wind prevailing. It is during these trying periods that the vinery needs careful attention.

Until the buds show signs of breaking syringe the Vines six or seven times a day if the weather be bright, and at least three or four times if the sun is not visible; keep the evaporating tanks on the hot-water pipes filled with water, as the vapour given off counteracts the drying influence of the hot pipes and produces a more genial atmosphere. After the second week the night temperature of the vinery may be raised to 48deg., allowing also a rise of 3deg. or 4deg. in the day temperature before air is admitted. In the course of another ten days keep the thermometer at 50deg. during the night, and give no air in the daytime until it has reached 65deg. These conditions prevail for the following fortnight.

The tender shoots should have made their appearance by now, and great care will be necessary in syringing and ventilation. If the walls and paths of the house are well damped, the Vines themselves, after the shoots are a few inches long, need not be syringed so much as previous to breaking. As soon as the side shoots have grown a few inches, remove some of them, for those retained form the foundation of the permanent fruiting spurs, and require to be at least 16in. apart; the side growths, therefore, must be regulated to as near that distance as possible. Next give a further rise of 5deg., advancing this, after being maintained for about ten days, to 58deg., which, after a week's duration, gives place to a night temperature of 60deg. From this time until the Vines have flowered and the berries are set no increase need be made in the temperature of the house. As soon as the shoots are about 15in. long tie them to the trellis to keep them away from the glass. This requires extreme care, as the young shoots are easily broken off at the base. Loop a long piece of matting (raffia) over the shoot about halfway between the middle and the growing end, and tie it to the trellis sufficiently tight to keep it well away from the roof. When the shoots have become stronger and harder, and again need tying, they can be brought much lower without fear of breakage.

As before mentioned, not more than two or three bunches must be left for the young Vine to bring to maturity, so that as soon as it is possible to distinguish the three best cut off all the remaining ones. If more than one bunch appear on the same shoot, that nearest to the base of the latter should be left.

The stopping of the shoots needs attention. Pinch the fruit-bearing shoot two leaves beyond the bunch of fruit. With the Vines planted at the distances apart already mentioned, and a proper distance allowed between the fruiting spurs, there will, in the case of most varieties, be no room for the proper development of healthy foliage if these shoots are allowed to remain a greater length. Stop them while the shoot is still very young, so that only the point is really removed. All should not be pinched on the same day. A better plan is first to go over the strongest ones, and then allow two or three days to elapse before stopping the others.

The lateral growths, which afterwards develop from the shortened shoot, need stopping after they have made one leaf. The sub-laterals will also appear in due time, and these, too, must not be allowed to make more than one leaf. The atmospheric moisture in the house should be greatly diminished when the Vines come into flower, for in order that the flowers may be fertilised, or "set," a rather dry and buoyant air should prevail. This condition facilitates the

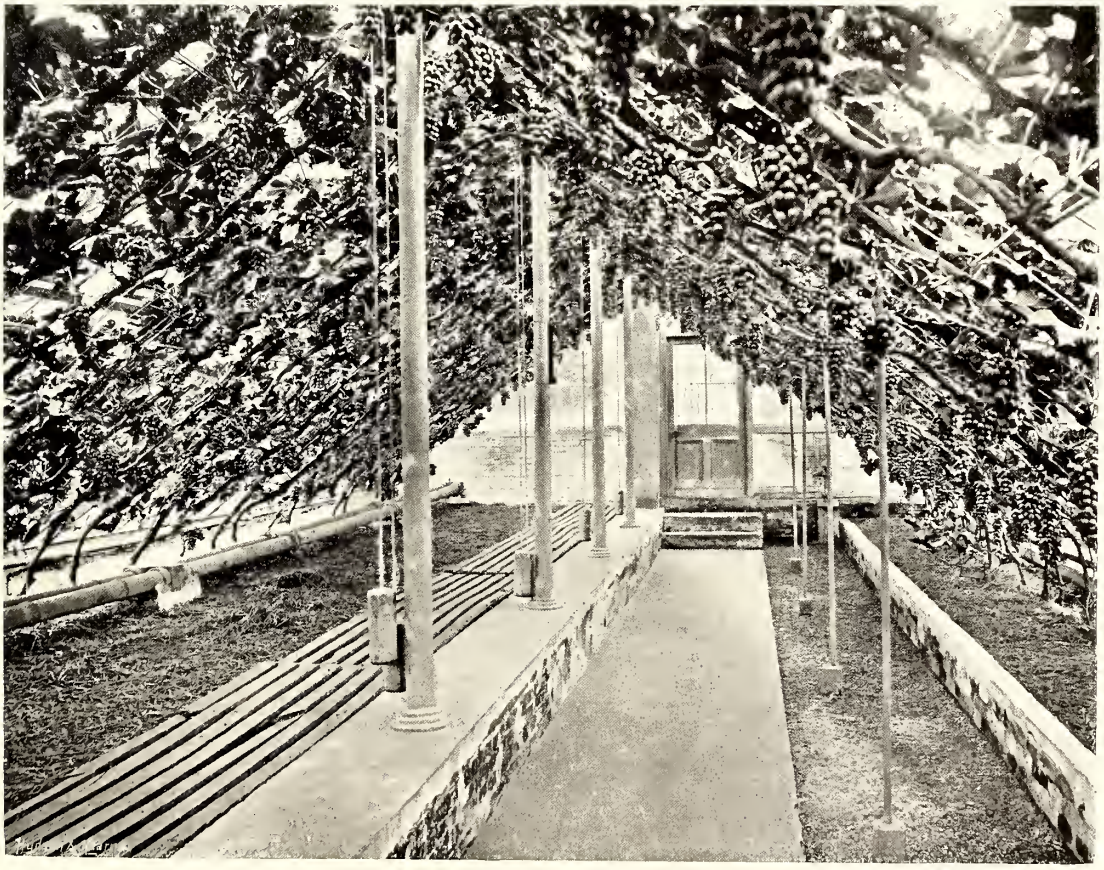
dispersion of the pollen and so tends to bring about the flower fertilisation.

A high temperature occasioned by fire heat is injurious to the Vine at this critical stage; the night temperature, therefore, must be carefully regulated so that it does not rise above 60deg. Shaking the rods and gently drawing the hand down the bunches when in flower help to disperse the pollen. Many cultivators make use of a small and very soft brush for passing over the bunches in order to promote "setting." This is more necessary in early forced vineries, when external conditions are unfavourable, than in the one now under consideration. In about a fortnight after the Vines are in flower begin thinning, and raise the temperature at night from 60deg. to 65deg., keeping it so for another three weeks. When the berries are formed they swell rapidly, and encourage them to do so, for if their progress at this stage is checked in the least they will never attain their proper size. On no account allow the border to suffer from want of water. Water it thoroughly with weak liquid manure. With the temperature at 65deg. at night, it may be allowed to rise to 80deg. on a sunny day before air is given. This must, of course, be gradually increased as the house becomes warmer. After closing on a bright afternoon the thermometer may even reach 90deg. Plenty of moisture is required again, and should be supplied by the water in the evaporating tanks, by damping the paths, etc.

In thinning a bunch of Grapes, the object in view is to remove certain of the berries, so that the remaining ones may develop properly. The number of berries to leave on a bunch depends largely upon the variety. Closely clustered bunches, such as Alicante and Madresfield Court, need to be more severely thinned than, for instance, Black Hamburgh. Proficiency in Grape thinning, as in most other work, comes only after practice; it is impossible to say how many berries should be removed, about half the number usually, unless the fully-developed berries become very large or are closely set together in the bunch. In thinning, hold the bunch by means of a small forked stick with the left hand, while the right hand remains free to use the scissors. By gently tapping the stick with the scissors the remains of the stamens are shaken out, and one is able to see more clearly what should be done.

First remove the small seedless and badly-formed berries, then as many of those remaining as will leave them about ½in. apart. In performing this operation most of the inside berries must be cut out, and as many as possible of those on the top shoulders of the bunch should remain. The shape of the bunch needs to be considered, and the terminal side berries regulated accordingly. If the upper shoulders be rather large and heavy, slightly raise them by passing a piece of matting underneath and fastening this to the trellis above. Avoid touching the berries with the head or hands (as may easily happen if care be not taken), for the bloom is very quickly rubbed. As a rule the bunches have to be gone over a second time before stoning to properly regulate the bunches.

In a few weeks the first swelling will be over, and the stoning period then commences. It is easy to ascertain when this takes place, as the berries no longer continue to swell. Endeavour to keep the temperature very regular during the time of stoning; it is useless attempting to force the berries to swell. After another fortnight has elapsed signs of swelling will again be apparent, and the berries have commenced their second and final swelling. Raise the night temperature for the last time to 70deg. In the course of a few weeks some of the bunches will commence to colour. When this is perceived admit rather more air during the day, though the night temperature must be maintained until the end of August. After then gradually lower it and give more air, until by the middle of October the thermometer at night registers but 55deg., this a



VINERY AT HECKFIELD.

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fortnight later being finally reduced to 50deg., with plenty of air both day and night if the weather be suitable.

After Gathering the Fruit.—When the Grapes are cut from the Vines, part of the shoot is usually cut with the bunch, thus shortening it considerably; one may also semi-prune—*i.e.* partially cut back—those shoots which have not borne fruit, as by this practice the back buds are much strengthened. Leave the Vines until finally pruned in December, if possible. One will now be able to understand the meaning of the fruit spurs alluded to earlier; it will be remembered that the side growths from the two year old Vine rod were thinned out to about 16in. apart. If these are now examined buds will be seen to have formed in the axils of the leaves, and it is to one of these buds that the shoots made during the summer must be pruned back; thus the beginning of the spur is formed. Much depends upon which of the buds is chosen. Cut back the wood to a good eye or bud as near to the base of the shoot as possible. There will be no difficulty in finding a properly-developed bud well back upon Vines that are allowed to break almost naturally, though of early forced ones the same cannot be said. The growth from the bud that is left will in its turn produce leaves and buds in the axils, and the following year also requires to be pruned to the best back bud. It is not always the largest bud that produces the best shoot; rather choose one that is firm, even though it is smaller. In pruning, the cut should never begin lower than the bud, always slightly in front of it, and commence on the opposite side to the bud.

Unless the buds are chosen as near the stem of the Vine as possible, the spurs, in a few years' time, become very long, thus taking up much valuable space, and also a certain amount of the food supply. With regard to the pruning of the third year's leading shoot, forming the Vine stem, the point to bear in mind is that the portion left must be able to produce good spurs from every bud. It is useless to leave a long rod with the upper buds perhaps alone developing, or if the lower ones do so at all the growth will be weakly. If the Vine is thriving well 3ft. or 4ft. would be sufficient to leave annually until the top of the house is reached. This method of pruning the growths of the Vine hard back every year, spurring the Vine, as it is called, is the most generally practised, and is by far the most useful practice for ordinary purposes. Another, known as "the Long Rod System," and practised largely before the spur system became known, is also sometimes useful.

Spurs on some varieties frequently die away, so that new wood must be frequently introduced to ensure a crop of fruit; this really explains the Long Rod method, which simply consists of training and cropping a quantity of young wood instead of pruning to produce spurs.

In an early forced vinery, too, bring in as many young rods as possible, as the spurs, when they become old, frequently die away. A Vine, instead of being confined to one or two rods, may be made to fill a whole house by allowing the leading shoot to run along the front of the house, and by training shoots, at right angles to this, up the trellis, the same distance apart as would be allowed for single rods. Treated in this way, the Vine continues in a healthy bearing condition much longer than when its vigour is restricted to one or two canes.

Many cultivators object to their vinery remaining empty for the considerable time that must necessarily elapse before the single Vine is large enough to fill the house. This, however, can be avoided by planting temporary Vines in the centre of the vinery, allowing each to produce two rods. Train these in opposite directions on the trellis, one towards the back and the other towards the front, and crop them as heavily as can be profitably done.

As the permanent Vine makes headway the temporary ones, of course, must be cut back, and must be finally cut out. Instead of having only one permanent Vine, three different varieties might be planted, each one being allowed to fill one-third of the house.

Watering.—Upon the proper application of water the health of the Vine in a large measure depends, for if the border is allowed to become dry the Vine has no means of obtaining its supply of food. On the other hand, if the condition of the soil be wet and cold, through an over-abundance of water, it becomes unsuitable as a rooting medium, and the roots die away. The importance, then, of careful watering cannot be over-estimated. Many think that after the foliage has fallen from the Vines no more water is needed until growth begins again in the spring. This is a great mistake, for the roots are active during autumn. Especially if a heavy crop of Grapes is still hanging must watering at this season be attended to. It is in the autumn that the newly-formed buds become fully developed and matured, so that it is reasonable to suppose that assistance to the Vine at this period is beneficial. Make a practice, therefore, of watering well the border with liquid manure every season after the Grapes have been cut. If the application of water be periodically continued until, say, December, probably no more will be necessary until the Vines have started again in the spring, although this can only be determined by examination, as the amount of water a Vine border requires depends upon the condition of the Vines and the formation of the border. If the former are healthy, and the latter contains plenty of brick rubble, more water will be absorbed than in the case of a border containing fewer roots and less drainage. Supposing the Vines to be capable of carrying a full crop of Grapes, water would be needed, broadly speaking, every three weeks after the first application (which, as a rule, is not necessary for some weeks after the Vines have been started) until the fruit is ripe. During the early and late months, some warm water should be added to the cold, in order to bring this to a suitable temperature—about 60deg. Fahr. After the berries are set, at every alternate watering use liquid manure until the Grapes are ripe.

Use of Fertilisers.—Before the vinery is closed in the spring remove about 2in. of the surface soil and top-dress the border with some well-rotted manure and fresh soil. After the flowering period, sprinkle Thompson's Vine Manure thinly over the border and fork it in before the latter is watered. This is also repeated when the Grapes are colouring.

It has been ascertained by analysis that one of the chief constituents of the Vine is potash; one therefore infers that this substance must be in some way necessary to its successful growth. Wood ashes, which contain a quantity of potash, are valuable as a manure for Vines; mix them with the soil when forming the border or with material for top-dressing. Nitrate of potash, in powdered form, is beneficial when applied directly to the soil, as, for instance, if sprinkled on the border before watering. It may not be out of place to now mention a few important details connected with the

Early Forcing of the Vine.—Some growers cut the first Grapes in April. To do this close the vinery the first week in November at a temperature of 55deg. This is gradually raised as advised for a later house, until by the New Year the night temperature has reached 60deg. Rising steadily, by the time the Grapes are ready for thinning it has reached 70deg., and a few weeks later the maximum, 73deg., is attained. The temperature gradually decreases as the Grapes approach maturity.

Some cultivators tie all the Vines in an early house along the front of the latter, contending that when in this position the buds break more evenly the whole length of the rod. The danger of twisting the stems and of rubbing off the buds is greater than the advantage gained would justify. It is better to tie the Vines at once to the trellis, simply allowing the ends to hang loosely, and check the rush of sap to the top buds alone.

In pruning early forced Vines, one cannot keep the spurs so neat and short as they usually are on later ones. To ensure a crop of fruit one must prune to the best bud, whether that be the last one or not. Pass a soft brush over the bunch when in flower to assist fertilisation, which does not then take place so readily as in the summer. When thinning, remember that the bunches and individual berries will not attain their full size when ripe, so it will be unnecessary to remove so many berries as advised when considering late Grapes.

Propagation.—The Vine is by no means difficult to propagate, for under suitable conditions roots are quickly and easily produced from the stem; if, for instance, the border is not congenial to the Vine roots, others are quickly formed amid the more appropriate surroundings of the vinery itself. These are by no means infrequent in forced vineries, when the border (especially the outside one) is somewhat cold, are known as "adventitious roots," and are produced usually on the spurs. The methods of propagation generally adopted are layering, by cuttings, grafting, inarching, or "eyes." The latter is by far the most extensively practised, and is also the most satisfactory. The technical term "eye" is applied to a bud cut from the ripened wood of the previous summer's growth, with ½in. of wood on either side of it. In preparing the eye for insertion, each cut should commence on the opposite side of the wood to the bud, and should also slant outwards. Eyes should be put in late in January. Place them singly in small 60 pots, and plunge in a mild hot-bed in a warm house about 70deg. Put a few crocks at the bottom of the pots for drainage, and fill fairly firmly with a compost of fibrous loam and sand. In the surface of this make a small hole and fill in with silver sand, into which the eye is gently pressed, until only the top of the bud is visible. If the soil is moist (as it should be) before being used it will scarcely need watering again until roots begin to form in a few weeks' time. Careful treatment is necessary until the plants are growing well; too high a temperature will produce weak and spindling plants, while the application of too much water would probably kill them. Grafting as a mode of propagation is not difficult if performed when the stock and scion are in suitable condition. In the winter, when Vines are resting, union between the two could not take place, and if the operation were attempted in the early spring, when the sap is rising, bleeding would ensue.

Apparently the best time for grafting is when the young shoots are a few inches in length. The scions, or grafts, must be taken from the ripened wood of the previous season, and kept cool and fresh by laying them on a north border and partially covering them with soil.

A few days before the grafts are required, if the buds are not already swelling, the former should be brought into a warm house to well prepare them for starting into growth. In selecting a suitable position on the stock for the graft, leave a shoot in advance of the point of union, otherwise the flow of sap would cease at the bud below and the graft consequently perish.

Of the various methods of grafting, whip or tongue grafting proves the most satisfactory. Having prepared the scion, as shown in the accompanying sketch, and a corresponding portion of the stock being removed, it should so be fitted to the latter that as much as possible of the inner bark of the one may fit over the inner bark of the other. After being tied well and tightly to the stock cover the graft with grafting wax, leaving the bud, of course, free. When the latter commences to burst the shoot on the end of the stock requires stopping, and when the graft is growing freely may be removed altogether. In from one to two months' time the graft ought to be established; the wax and matting can then be taken off, and the shoot given the same treatment as the others on the Vine.

Inarching.—The principles of this method, known also as grafting by approach, are the same as those of grafting, but whereas in the latter a part of one plant is cut off and made to grow upon another by inarching, two plants, each with their own roots, are united together. In vineries this system is usually employed for the purpose of joining the shoot of a pot Vine to one of the permanent Vines, which particular variety for various reasons may not be wanted. Having brought the pot Vine near to the stem of the older one, take off a portion of both at a point where the two can be conveniently joined together. The operation is then performed exactly as in grafting, with the difference that the scion is not severed from its own roots until the union is complete. Check the stock as the graft increases in vigour, and finally, if necessary, remove it altogether. The green shoots of the Vine may also be inarched in the same way; in this case, however, the two shoots must be as nearly as possible of equal thickness.

Propagation by Cuttings is not practised to any extent in this country, though it is a common way in countries where the climatic conditions allow Vine growing to be carried on as a rural industry. There the cuttings are taken from the last season's ripened wood, cut about 10in. long, and the lower buds are removed. They are planted in the vineyards at certain distances apart, and remain as permanent plants, being afterwards variously trained according to the particular system followed in the country.

Layering.—This is the most simple of all the methods of propagation, but it is not made use of largely so far as the Vine is concerned, for it is by no means a convenient one. It consists in bending down a portion of the recently ripened wood of the Vine into the border or a pot of soil, and where the bent shoot comes into contact with the soil, to there fasten it down firmly by means of a peg. Some recommend splitting the shoot slightly at this point to encourage the formation of roots, but if the soil is kept moist and the Vine well syringed roots will be emitted without this.

Pot Culture.—Vines in pots are, as a rule, the most generally cultivated where an early supply of Grapes is necessary, to avoid the hard forcing and consequent weakening of the permanent Vines, or where, perhaps, a vinery has been recently planted, and it is desired to maintain the supply of Grapes until the young Vines arrive at a bearing stage. After having been once hard forced pot Vines are usually thrown away, most growers preferring to again grow on young canes. These may either be developed into fruiting canes in one year or grown for two years before fruit is taken from them. In this case the canes are cut back after the first season's growth and grown on in the same way for another year. To have pot Vines strong enough to bear fruit when only one year old great care is necessary, for if not really well grown failure is certain. Their propagation is effected by means of eyes. This method of striking has been already explained, so one may suppose that they are rooted and growing. When well rooted, move them into well-drained 6in. pots, using for soil fibrous loam mixed with a quantity of coarse sand. Grow the Vines quickly. Keep them close to the glass, the house being closed early in the afternoon, and a moist atmosphere maintained. The thermometer at closing time may be allowed to reach 90deg. or 95deg. When roots are again visible round the sides of the pots remove them finally into 12in. pots. The best position in which to grow pot Vines is a lean-to house facing south; they are here trained up the trellis and have all the light possible, both when growing and ripening. When the pots are well filled with roots the Vines become dry quickly and require large quantities of water; they should never be allowed to suffer from dryness. So soon as the Vine has reached a length of about 8ft. stop it, also the lateral growths, which soon afterwards make their appearance. When growth has finished and the wood shows signs of ripening, more air should be gradually given, until the plants are sufficiently hardened to be moved out of doors. Although much less water is now needed, the soil in the pots must on no account be allowed to become dry, or injury to the Vines will result.

All the pruning necessary is to remove the laterals and shorten back the cane a little. Leave this about 6ft. long, sometimes more, sometimes less, according to its strength. The treatment the following year, when grown for fruiting, has been

given in detail in the notes on forcing. Before being started into growth the second season give a top-dressing of fresh soil, and when the Vines are in full growth liberal supplies of manure water are beneficial. Little water is needed at the roots until the Vines are growing freely.

Vines Out of Doors.—Vines were formerly more extensively cultivated out of doors in this country than at the present time. This is doubtless owing in a great measure to the fact that better fruit can be obtained in glasshouses, which can now be erected quickly and cheaply. The climate of our country is generally too cold and sunless to allow Grape culture out of doors as a dessert fruit to form a profitable pursuit. Certain varieties when planted against sunny walls facing south produce and ripen their fruit in a bright summer, and doubtless if more attention were paid to the cultural requirements of Vines on open walls better results would follow in many cases. It is no unfamiliar sight in Southern England to see a cottage covered with a Grape Vine carrying a crop of fruit, though these had received no attention as regards regulation of the growth and thinning the bunches and berries. To succeed with outdoor Vines a good well-drained border must be prepared, as advised for the inside border. Plant in the autumn before the leaves have fallen. If there is sufficient space for the horizontal training of the branches follow this practice rather than keep them in an upright position.

A VILLA VINERY AND GREENHOUSE.

In the winter, after planting, cut back the Vine to the three lowest good buds, so that three shoots may be produced the following season. These should afterwards be shortened, and the top one kept as a leader, the others being trained one to the right and one to the left. Other horizontal branches may be added annually from the new shoots produced until the wall is eventually covered; they must be quite 20in. apart. Each branch requires to be treated as a Vine rod and spurred in the same way, except that the spurs should be on the upper side only, and not less than 15in. apart. Attention to disbudding, stopping the laterals, and thinning the bunches and berries is also necessary here as in a vinery. Royal Muscadine, syn. Chasselas de Fontainebleau, is one of the best varieties for cultivation on an open wall. Though not large, the berries set well and are of good flavour. Chasselas Vibert, Black Cluster, and Esperione are other varieties for outdoor planting.

Early Forcing of Vines.—For planting a vinery intended for early forcing, Foster's Seedling and Black Hamburgh are the most satisfactory. Madresfield Court also forces well in a second early house. The variety upon which many mainly depend for late Grapes is Alicante; as a black Grape for general purposes it is difficult to surpass. Muscat of Alexandria is one of the most delicious of Grapes, but requires a higher temperature than most others to bring its fruit to perfection. It is not exactly that a higher temperature is necessary, but the heat is required over a longer period to properly ripen the fruit. If the Vines were forced early in the year, the temperature as maintained for other varieties would be high enough.

The Duke of Buccleuch, when well grown, is a remarkably fine and handsome Grape. The bunches are somewhat short and broad, with large, round, amber-coloured berries of rich flavour. This variety should be grown on the Long Rod System, as the wood is rather soft, and if annually spurred back the spurs often die away. Although this Grape in many gardens never bears a heavy crop, by retaining plenty of young wood it becomes fairly productive. Golden Champion has the same defects; it makes soft wood, which ripens badly, and is by no means certain to produce a satisfactory crop.

One of the best Grapes we have for late keeping is undoubtedly Lady Downe's Seedling. To have good fruit of this variety it should not be consumed before the end of January, for its flavour until then is not fully developed. Gros Colman, though only second-rate so far as quality is concerned, is now largely grown for market, chiefly for its fine appearance. Unless given liberal treatment the berries colour badly, remaining quite red.

Some varieties produce exceedingly large bunches, though these as a rule are not of good quality. Of these, Gros Guillaume, Trebbiano, and Raisin de Calabre are the best known. The first-named is a late Grape, with medium-sized black berries and enormous bunches. The last of the three is a white Grape, rather flavourless, though it improves in this respect and also in colour by hanging, and will keep well until early spring. The berries are round and the bunches large and loosely formed. Trebbiano is also a late variety, with white berries, more oval in shape than the former, and with more shapely and compact bunches; the flavour, though, is not first-rate.

Vine Pests.—There are several periods during the growing season when the Vine is easily injured, as, for instance, when the young shoots first make their appearance, again when the flowers begin to open, and later when the berries are swelling and stoning. A great pest is

mildew, a fungus that develops upon the berries and leaves, often ruining the parts affected. All that is visible to the naked eye is a white powdery substance, usually found on the under-sides of the leaves and bunches. If this be attacked at once it may be prevented from spreading, but if allowed to establish itself it is very difficult to eradicate The spores of this fungus can only germinate when a certain amount of moisture prevails; therefore the aim of the cultivator should be to avoid a damp, stagnant atmosphere, by maintaining a circulation of dry, warm air. On dull, mild days decrease the atmospheric moisture and keep the pipes of the house warm. Admit a little fresh air, so as to maintain a constant circulation. The best remedy is flowers of sulphur, applied by dusting the leaves and berries affected.

Some growers paint the hot-water pipes with a mixture of sulphur and water; this also answers well, but great care must be taken not to overheat the pipes when thus covered, or probably the whole of the fruit and foliage will be spoilt. In a day or two the spores of the mildew will have perished, when syringe off the sulphur with clear, soft water. Soft water, carefully applied, will not injure the bloom on the Grapes, though if hard water be used a sediment often remains on the berries after they become dry.

The shanking, *i.e.*, the withering, of portions of the bunches is a most annoying malady, if such it may be called. It is not usually a whole bunch that is affected, but generally one or more of the shoulders. Most growers agree that shanking is the result of ill-health; the Vine is evidently not in a condition to properly bring to maturity a crop of fruit. This may have been brought about through several causes; the roots have possibly entered a cold subsoil, the Vines may bear too heavy a crop, or perhaps are crippled from a severe attack of red spider or mildew. The border may have been overwatered or the Vines checked in some manner, by improper ventilation or the sudden removal of too much foliage. Once shanking has commenced it is too late to remedy the evil; all that can be done is during the following season to try to prevent a recurrence.

When the berries are very young, and their skins therefore tender and easily injured, some may occasionally be seen of a rusty colour. The berries thus affected have been injured in some way, and are suffering from what is known as "rust." Rubbing the berries with the head or hands when thinning will cause "rust," and keeping the house hot and dry when they are so young will also produce the same result. Of the injurious insects which affect Vines, red spider, scale, and mealy bug are the most prevalent and harmful. The first-mentioned is difficult to eradicate, and also does considerable injury to the foliage.

With this, as with all other pests, it is important to begin destructive measures as soon as the first signs of injury are seen; it is easier to check this insect than to remove it when once established. A hot and dry atmosphere suits this pest. Free and judicious ventilation is of benefit. Once it does obtain a hold in the vinery, the simplest method of checking it is to well syringe the affected parts with water regularly several times daily, and once a day for a few days apply a solution of soft soap and warm water.

If a vinery becomes thoroughly infested with mealy bug it is difficult to completely cleanse it. This insect is, perhaps, the most undesirable of all pests to have in the vinery, for as well as attacking the stems and leaves it greatly disfigures the fruit also, and can only be removed from the bunches by washing them. With Vines badly infested, remove all the loose bark in the autumn, and well wash the rods with some insecticide. The house also must be thoroughly cleansed with soap and warm water, and the surface soil of the border removed. Well syringe the Vines in the early autumn after the fruit has been cut, before the pest disappears into the many cracks and corners of the Vines and vinery. The Vine scale sometimes affects Vines under glass, though not to the same extent as those already mentioned. The simplest way to remove it is with a brush and warm soapy water.

THE STRAWBERRY.

By G. Wythes.

FEW fruits are more delicious than the Strawberry upon a warm early summer day. One desires Strawberries at all seasons, and those who have the means at their disposal can, though the fruits are not so nicely flavoured as those gathered from plants grown in the open ground, possess them for several months.

STRAWBERRY, FILI BASKET.

FORCING STRAWBERRIES. — To obtain good plants the best way is to layer the runners in small pots as soon as they can be secured. It is advisable to grow a few plants for runner production only, not allowing them to fruit, but to concentrate their strength upon the formation of early runner growth. This method cannot always be followed in private gardens, but suitable stock can be easily purchased from growers who have the plants in small 60-sized pots for forcing;

STRAWBERRY, ST. JOSEPH.

but, let me add, there should be no delay in the potting on. I like to get all my forcing stock into the pots in which they are to fruit as early in August as possible, as this only gives about two months in which the plants have to make their growth—none too long when good plump crowns are needed for early forcing. As I require several thousands of crowns, I commence layering at the end of June, the plants having been denuded in the early spring of their flower spikes to make an early runner growth, and in three weeks from the time of layering they are ready to pot up into the 6in. pots used for forcing, so that most of the work is completed by the end of July, and this gives a longer season's growth. There is no waste by planting a few rows for this purpose, as the next year such plants give a splendid crop of fruit. I plant rather closer than usual—viz., 18in. all ways—and in layering every other row is left open to allow of watering and attention to the plants. At the start there should be no want of water, as soil in the small pots dries quickly. Many growers plunge the pots in the beds. I do not, but stand them close together, as this saves time and answers well if plenty of water be given. At the end of three weeks the layers are rooted, cut from the parent plant, placed in the shade, and potted on, the plants when potted being placed in rows on a hard ash bottom in an open position. There are other ways of propagation. Some, and especially large growers, layer direct into the pots in which the plants are to fruit. This is not advisable in wet seasons, as the large mass of soil gets sour before the roots can fill the space, and worms are troublesome. The potting on system is preferable, though it adds to the labour. Another good plan is to cut square pieces of turf and plunge between the rows, the layers being pegged into the turf, and then lifted, with ample roots, into the fruiting pots. Good loamy soil is sometimes placed between the rows, and the layers pegged down, then lifted when rooted. This plan is good for planting out, but not for forcing, as at times the plants droop badly when potted, and take more time to recover. Whatever system is adopted, pot as firmly as possible, using the rammer freely. Use fairly heavy soil if it can be obtained, and not too much, if any, manure. As a sturdy growth is needed, a little bone meal or spent Mushroom manure will be found sufficient in the soil to enrich it.

VARIETIES TO FORCE.—These depend upon the grower's taste. If large fruits be desired, I do not know of a better variety than Laxton's Royal Sovereign, a large, bright scarlet fruit of good flavour, and one of the earliest. It may be forced more freely than many other kinds, and is now forced in immense quantities for the market on account of its good colour, size, and free growth. Few fruits give weightier crops. The next variety is different, as the fruits are smaller but of excellent quality. This is Vicomtesse H. de Thury, a medium-sized fruit, conical in shape, bright red flesh, sweet, and richly flavoured. It bears abundantly, and this makes up for lack of size. It will do well in smaller pots than larger growers, and is an excellent variety for layering direct into the pots in which the plants are to fruit. La Grosse Sucrée for early forcing is also a standard kind with a dark red fruit, glossy, and of excellent flavour; it is one of the most reliable kinds in cultivation.

President, a well-known variety, is difficult to beat for later supplies, and it is one of the best flavoured. Unfortunately, this variety is more subject to mildew than others, but by using sulphur at the start this pest is easily held in check. Many growers still use Sir C. Napier, and for May supplies it has few equals. It is a splendid fruit when well grown, though the flavour is not equal to that of the others already named. For the latest supplies, Gunton Park is excellent; it forces well when given ample time. There are others, such as Leader, Sensation, Veitch's Perfection, and British Queen, but these are at times less reliable; the two last-named are probably the best of all for their high flavour. Forcing is simple, but needs care at the start. Give a low temperature, not more than 45deg. to 50deg. at night, and very little more by day during the first few weeks, and the plants for very early supplies succeed with a little bottom heat, but it must be very mild. I use fresh leaves, and if hot-water pipes are employed it is well to have a regular heat, say 70deg. to 80deg., not more when starting the plants. The flower spikes push up much better with a little bottom heat, and in about six weeks from the time of starting

FORCED ROYAL SOVEREIGN STRAWBERRY.

they will be showing freely and need a place near the glass. Very little moisture has been required up to this period of growth, but with greater vigour in the plants it will be necessary. Tepid water should at all times be used, and the plants damped overhead daily with the syringe until the flowers open. Mildew at times is troublesome in a close house, and when the pest is seen fine sulphur should be dusted over the plants. More warmth may also be given at this stage—quite 10deg. higher temperature—and, if possible, a little ventilation daily whilst the plants are in bloom. After the bloom is set no delay should take place in thinning, leaving from six to nine of the strongest fruits on each plant. From this date syringe twice daily, early in the day and when the house is closed at midday, also give liquid manure or a good fertiliser at every other watering until the fruits cease to swell. During the swelling a more liberal temperature may be employed, say 65deg. at night, and 10deg. higher by day. This is not allowing for sun heat, as the thermometer may be allowed to run up freely. Another and excellent method of forcing, say with late fruits started at the beginning of the year, is to place them on shelves, and treat them just the same as one would Peaches, that is, slow forcing, say 45deg.

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THE HOUSE FROM THE LAWN, CHILHAM CASTLE, CANTERBURY.

"COUNTRY LIFE."

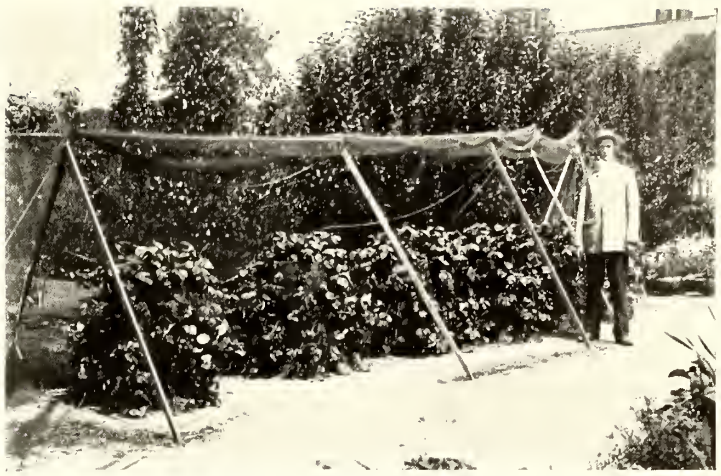
to 50deg. the first month, then 10deg. higher until in bloom. During the latter period keep the house drier, and then give more warmth. As growth increases, I invariably place 500 plants on shelves at a time, every three weeks from the end of December until May. At the end of April shelves are not so suitable, as the plants dry up rapidly. A cool bed is preferable; but in all cases it is well to grow the plants as near the glass as possible.

STRAWBERRIES IN THE OPEN GROUND.—Strawberries are more important to the majority of growers than forced plants, and of simple culture, but the treatment varies, as if the Strawberries were all grown one way the results would be less satisfactory. The old system was to plant a bed every half-dozen years, but this is not much practised now, and few who study quality allow the plants to remain longer than three years, as the best results are secured from young plants. I even go further, and only take one crop from such kinds as will fruit freely. The Pine section—British Queen, Empress of India, and a few others, Latest of All especially—do best the second year (as regards quantities of fruit). If the three years' system be adopted, everyone should know that Strawberries like a holding or rather heavy soil. Light soil will support the fruit, but the crop is not so good, and suffers badly in hot, dry seasons; on the other hand, deeply dug land, well enriched with decayed manure, will be beneficial. At planting it is well to plant firmly and not let drought check growth.

Planting may be done in the spring, or end of summer—preferably the latter period, as then the plants grow away freely in the spring. If planted early in the year the crop is *nil*, but the plants will be building up crowns for the next year. I find the same procedure advisable in the case of forcing plants as regards propagation. If the plants are layered into small pots they may be planted out well in August, and as regards distance, space must be governed by the time the Strawberries are to occupy the land. If three years, give 2½ft. between the rows and 18in. between the plants; if less, say two years,

STRAWBERRIES GROWN IN BARRELS (AMERICAN WAY).

give 6in. less between the rows; and if grown as annuals, a system of culture I will refer to, then space need not be so great, say 18in. between the rows and the same between the plants. Light soils may be improved by adding heavy materials, such as clay, marl, or cow manure used as a mulch in the summer after the fruit is over, or lightly forked in early in April.



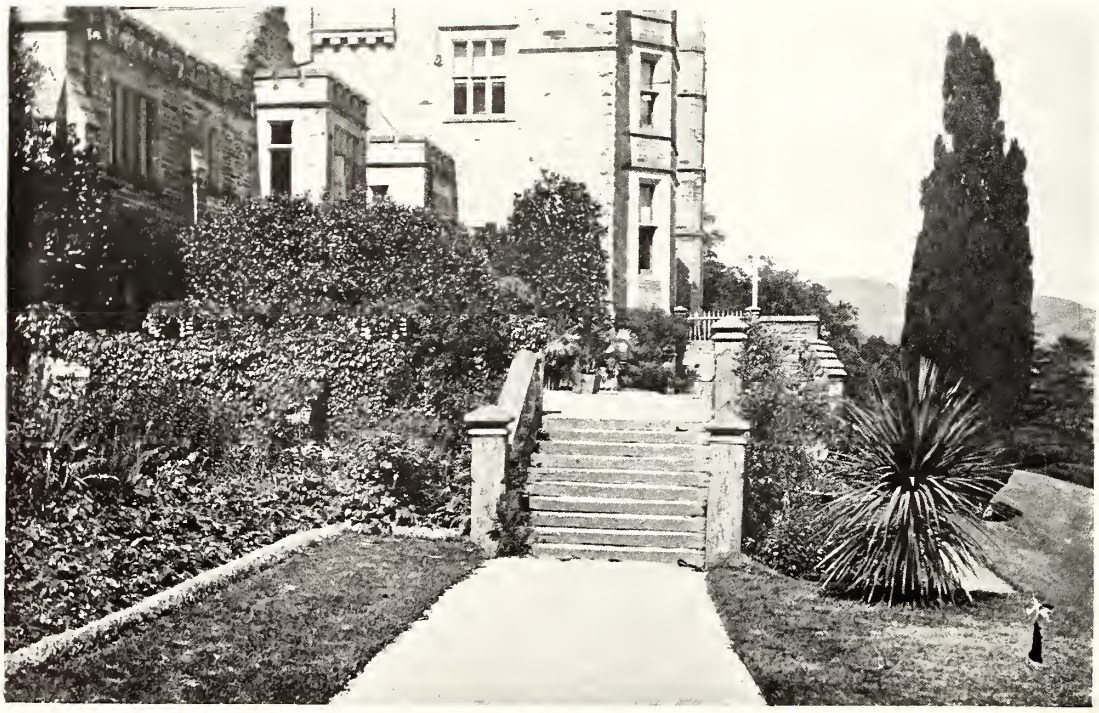
STRAWBERRIES IN BARRELS (ENGLISH WAY).

Growing Strawberries in tubs seems to have become popular, and one illustration was reproduced from a photograph kindly sent from America by Mr. J. P. Ohmer, of Dayton, Ohio, and the other by Mr. Worsley Taylor. Mr. Taylor writes in COUNTRY LIFE that the plants have yielded most gratifying results, "having produced an abundance of excellent fruit, which, being kept from the ground and freely exposed to the influence of sun and air, was all that could be wished in the matter of appearance and flavour. There are three tiers of holes in each barrel, six holes in a tier, and the plants are put in at the same time as the barrel is filled with loam, this being done about the month of February. The top is also planted, and the necessary watering of the plants is done from overhead."

VARIETIES.—An open position is best for the general crop, and a south or south-west border for the earliest, whilst a north border under a wall is excellent for the latest, such as Latest of All, a splendid variety, or Oxonian, a very late variety, but not a rich fruit. Waterloo also is good for a north border; it is a nearly black fruit of good quality. For a south border the variety Vicomtesse H. de Thury is one of the best; also Royal Sovereign, which is even earlier and remarkably productive, but Vicomtesse is best for preserving, and also such kinds as Grove End Scarlet and Lord Suffield. These may be placed a little closer when grown specially for preserves. For mid-season supplies, President, La Grosse Sucrée, British Queen, Sir C. Napier, and Veitch's Perfection are all good; and in addition to these, for latest supplies, I have named Latest of All. To this may be added Oxonian, Elton Pine, Frogmore Late Pine, Waterloo, Lord Suffield, and Loxford Hall Seedling. If mere variety is needed for July supplies, such kinds as Dr. Hogg, James Veitch, Princess of Wales, Countess, and Helene Gloede may be added.

STRAWBERRIES AS ANNUALS.—A good way is to grow the plants in the way I have described. Plants grown in poor or light soils answer thoroughly. In one way it adds to labour, but in another this is saved, as the land is in better condition for the next crop. My system is this: The runners are secured as early as possible—this is essential. Planting is done in July, and the plants must get ample supplies of moisture, as they have, like the forced plants, to make their growth in one season. Strawberries grown in this way need high cultivation, ample manures, and the land is trenched. It is surprising what growth these plants will make in one season and the quantities of splendid fruit they give, finer than that from plants grown on the old system of planting later and without a large crop the first year. Royal Sovereign, La Grosse Sucrée, and President succeed splendidly when treated as yearlings, but of course this way of culture is only advised for dessert fruits, not for cooking or preserving. Plants will thrive for the shorter season that fail under the three years' culture; and the ground after the Strawberry crop is cleared—I mean the one crop taken—is in good condition, without manuring or much preparation, for vegetable crops.

ALPINE STRAWBERRIES.—Of late years these small and delicious fruits have become better known, and may be classed as distinct autumn varieties, for by growing such kinds as the St. Joseph or any of the Quatre Saisons varieties fruits may be had well into October. As these kinds are so readily raised every year from seed or runners, they give little trouble. This class is quite distinct from the varieties named for the open ground, and few varieties can be relied upon for a longer supply. The best method of culture is to raise the plants from seed, which should be sown in March under glass. These will give excellent fruits the next June, and these small-leaved Alpine varieties produce runners at the same time that fruit is being produced. The earliest formed runners begin to form spikes, and another set of runners appears. These follow suit, and the plants ripen fruit until cut down by frost. Seed sown in May in light rich soil will produce seedlings to fruit the following year. Doubtless the best method of culture is to sow under glass in pans or boxes, then prick the seedlings off into rich soil, when large enough, in cold frames and plant out in beds 12in. to 15in. apart, with 12in. between the plants and 15in. to 18in. between the rows. If sown in the open, planting out is not done until August, and even less space will suffice. On the other hand, seed may be sown in the autumn in a cold frame, and the seedlings pricked out into boxes and wintered under glass. Being planted out in the spring, they will then give fruit the same autumn. Another plan is to get stock from runners. These Strawberries keep fruiting on the new growths made, and such kinds as the St. Joseph may be termed perpetual, as their fruits are produced over a long season; for instance, the old parent plant will fruit in June, and successions may be obtained from the new growths made right into the autumn. This class requires lighter soil than the ordinary kinds, but needs ample manure—beds should be made every year, destroying older ones, whether raised from seed or layers. The St. Antoine de Padoue is an excellent companion to the St. Joseph, and will, I think, be larger; it is a welcome addition to the perpetual fruiters. The fine Gunnersbury Alpine is one of the best for flavour and crops freely. Then, again, such kinds as the Alpine Red and White are very good, the latter being of rich flavour. Louis Gaultier is a good light-coloured fruit.



THE TERRACE, TAN-Y-BWYLCH, NORTH WALES.

IN THE SUNDIAL GARDEN (Compton Wynyates).

FRUIT TREES IN POTS.

MORE attention is now being given to the culture of fruit trees in pots, especially stone fruits and Grapes. In the case of stone fruits, as soon as the fruits are gathered the trees can be placed outside to ripen and rest, and the house used for some other purpose. An empty house is especially valuable in October now that so many Chrysanthemums are grown, and there are other purposes to which valuable space could be put in winter that will occur to anyone interested.

Apricots.—The Apricot is not always satisfactory as a pot tree, though when a house can be given up to it it does well, but in this case we should prefer to plant it out in soil that was freely dressed with old plaster and wood ashes, and the house should be constructed with movable lights, so that the trees can be fully exposed when the fruit has been gathered. We have seen very heavy crops in cool houses under these conditions. The ventilation is a most important matter. Success to a considerable extent hinges upon this being as perfect as possible without cold currents being created.

Cherries.—Cherries are not so much grown under glass as formerly; they do not succeed so well with other fruit, but when a light house can be given up to them Cherries are very prolific, and they are easily protected from birds, which is not so easy to do outside, for even when netted the birds somehow seem to find their way inside. For pot culture Cherries should be budded on the Mahaleb stock. In preparing the potting compost do not forget the old plaster, for lime is essential for allstone fruits, especially for Cherries. When failures occur it is usually through imperfect ventilation when the trees are in blossom or from a deficiency of lime in the soil. Fruit trees are easily kept free from green and black fly by vaporising with nicotine. And it is true economy in every sense to begin when the first fly is seen. Pinch the young shoots when five leaves have been made, and turn the trees outside as soon as the crop has been gathered. The compost used for Peaches and Plums will do for Cherries. Varieties: May Duke, Archduke, Late Duke (all the Duke Cherries succeed in pots), Early Rivers', Waterloo, Governor Wood, Elton, Bigarreau, Frogmore Early, Bigarreau Napoleon, and Black Heart (Werder's).

Figs.—These are dealt with separately.

Nectarines.—In all cultural details Nectarines require the same treatment as Peaches. Those who grow for sale often find Nectarines more satisfactory than Peaches. Early Rivers' is the best early variety; Lord Napier succeeds; Early Humboldt follows quickly after Lord Napier; Violette Hâtive, Rivers' Orange, Stanwick Elruge, and Victoria (late).

Peaches.—The value of light and free ventilation for Peaches, in fact for all fruits, has always been understood and appreciated by gardeners. A span-roofed structure is best, and it can scarcely be too wide or too lofty. There should be ample ventilation along the ridge, and also along each side, though side ventilation may not be much required when the trees are in blossom unless the weather is mild and sunny; but later on the side ventilation will be essential for perfect ripening of both fruit and wood.

The initial expense of potted trees may in some cases be rather more than when permanent trees are planted, but in the latter case border-making is expensive, especially when the maiden loam insisted on by gardeners has to be purchased. We have known more money spent on Peach borders than would have purchased trees and pots several times over, and then afterwards the training of these permanent trees takes up much more time than need be given to trees in pots, so that the latter system in the matter of labour appears to offer some compensation. It is true that bearing trees are rather expensive to buy, but a neighbour of ours bought bearing trees in pots at half-a-guinea each, and he said the first year's crop paid for the trees. This may

not always be so, and many would prefer to start with maiden trees, which when potted in the right kind of stuff soon develop into first-rate bearing trees. We have gathered fruit the second season from maidens, and there is some advantage in having the trees from the first under one's own management. Assuming it is decided to buy maiden trees, visit the nursery and select healthy, clean-stemmed trees, and as soon as the wood is ripe, without waiting for all the leaves to fall, have them home and pot immediately, so that the trees may commence at once to make new roots.

The compost should consist chiefly of two-thirds good loam, heavy rather than light, and if the loam of the district is inferior have a load or two from some district where good loam can be had; this will be money well spent. The loam should be enriched with some old manure and a sprinkling of bone meal, soot, and old plaster; it will be all the better if the remains of the hair usually mixed with the lime for making plaster are left in. Trim the damaged roots with a sharp knife, drain the pots well, and have the compost in a condition which may be described as neither wet nor dry; then pot very firmly, and set the pots outside either on a bed of ashes or on some impervious bottom which cannot be penetrated by worms. If the trees are potted early in October they may remain outside till the middle or end of January, especially the late varieties. If frost comes whilst the trees are outside, the pots must be sheltered with long, dry litter or Ferns.

The size of the pots must be suitable to the trees, ranging at first from 8in. to 9in. in diameter. Shift into larger pots when necessary, doing the work early in October, or even earlier in the case of the early-ripening kinds. When the trees have reached full size they may probably occupy No. 1 pots, and in these pots may be carried on for a number of years by annual top-dressings, removing as much of the old soil as possible, and filling up with good compost, ramming it in firmly.

One cannot fix a limit to the life of a potted fruit tree; it is mainly a question of good soil and careful management. We believe Messrs. Rivers have some of their old original trees in pots still doing good work now; therefore there is no reason why a tree in a good-sized pot, well cared for, should not live as long as when planted in the border.

The summer management of a Peach tree in a pot is more simple than with one trained on a trellis. The aim of the pruner must be constantly directed to keeping the trees in all their parts supplied with young bearing wood. This is not difficult when the wielder of the knife thinks before he acts. This is specially important when disbudding the young shoots in spring. Always leave a shoot or two as low down the branches as possible, and encourage them to grow and get strong. As regards stopping, all gross shoots, if any, should either be removed or stopped early in their career; if left they only rob the more moderate-growing shoots from which the next season's crop will be obtained. It is not necessary or desirable to stop all the young shoots at the same time. Peach trees should not be pinched so closely as the Plum, or the back buds may burst and the next shoots fail to ripen. Our custom is to pinch when about a dozen leaves have been made, stopping each shoot when that amount of growth has been made, without reference to any other shoot on the same tree. The back eyes that will bear the next season's crop will then be safe and remain dormant till the right season comes round.

In unheated houses it is advisable to retard the blooming of the trees as long as possible by giving free ventilation till the buds begin to swell. When that period arrives a regular system of management must begin. Ventilate freely in mild weather, but avoid cold draughts, keep the roots moist, and use the syringe freely to keep down insects. Early morning ventilation and early closing in the afternoon encourage growth and cause the fruit to swell rapidly, but a little air should be given along the ridge at night.

Peaches for Potting.—Waterloo ripens in July, resembles Alexander, but is more reliable; Hale's Early, early in August; Early York, rather later than Hale's Early, very free bearer; Royal George, August; Stirling Castle, similar to Royal George—both are good; Alexandra Noblesse, early in September; Dymond, a grand Peach; Crimson Galande, September; Barrington, September; Princess of Wales, Sea Eagle, and Goshawk.

Plums.—Plums may be grown in the same house as Peaches and Nectarines, and as regards soil and potting the treatment is the same, but the young shoots should be stopped when four or five leaves have been made. Splendid Plums are obtained in pots, but if the crop is heavy some of the fruit should be thinned off when young. It is important that the ventilation should be as perfect as possible, but this does not mean that cold air should rush through the trees at any time. Perfect ventilation consists in changing the air inside without causing cold currents. Varieties: Early Transparent Gage, Oullin's Golden Gage, Late Transparent Gage, Coe's Golden Drop, Jefferson's, Kirke's, Belgian Purple, Monarch, Pond's Seedling, Prince Englebert, Victoria, Washington, and The Czar. If possible, a division of the house should be given up to Plums. They are delicious when grown under glass.

COB AND FILBERT NUTS.

By G. Wythes.

IN many gardens these could be profitably grown. One often sees hedges of Privet or Thorn where Nut bushes might be planted instead that would give a crop, and at the same time answer the purpose of a screen. The Cob and Filbert give an excellent return under a regular system of culture.

As many growers are aware, the trees may be easily raised from seed and suckers. The last are not always satisfactory, as they reproduce growths too freely, but if the trees are grown on a single leg or stem from the start, it is easy to keep down suckers not required. Many trees have been planted in land that would not grow other crops, and left to chance—that is, to make what wood they liked. Of course, the results have been woefully poor, as even Nuts need some attention in the shape of suitable soil, food, and proper pruning. The best soil is that which will grow fruit well. A strong, heavy, wet soil induces too much leaf or wood growth and few fruits. The best Nuts I have ever seen were in a well-drained soil of fair depth, having a sandy or rock base, and the trees were manured freely every other year. Many may think manures out of the question for Nuts, but I do not see why, and if

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IN THE GARDEN, LEVENS HALL, WESTMORELAND.

"COUNTRY LIFE."

such aids as animal manure cannot be given, excellent stimulants may be found in the shape of sewage, liquid manure, guano mixed with soil in the autumn when the leaves are off the trees, and night soil. Fowls' dung and manure from piggeries should be mixed with water or soil in the winter months. In Kent a large trade is done with the well-known Kent Cob, and in some seasons the crops are much finer than in others. In 1894 the yield in Kent was enormous, as no less than two tons to the acre were obtained from well-cultivated trees. Of late years the yield, though not approaching the quantity referred to, has been fairly good, and this makes Nut culture more profitable than a year of abundance followed by a time of scarcity.

In the Kentish districts a regular system of culture is followed, and of course the soil is suitable, as from this county the best hardy fruits are obtained if good cultivation be given. Nuts will often flourish where fruits fail, and I have had excellent crops in stony ground, on banks, and in a dry soil. These trees appear to like dryness when once they have attained some size. On the other hand, the close-pruned trees, such as are seen in the Kentish fields, produce the heaviest Nuts and the best crop. Here they are grown on a single stem, the heads being formed somewhat like a vase—that is, the centres are kept open, and the side growths, when they have grown a few feet in length, are closely spurred in. The only difficulty with some kinds grown thus is the scarcity of catkins, and, of course, these are needed to set the blossoms. It is often advisable to plant a few trees of the common Hazel in Nut plantations for the purpose named.

I have briefly touched upon propagation, and, doubtless, the most common way is by suckers. These, taken from the parent plant in the autumn and cut back to, say, 15in. in length, may be planted in rows and at a distance of 2ft. apart, with half the distance between the plants. They will then be fit for planting out in their permanent quarters after three years. During the first year the lower buds, say 6in. to 9in. from the soil, should be rubbed off. This is to form the clear stem of the tree, and the next year a little pruning will decide its shape if the leader is removed and the side growths reduced to half-a-dozen from the side of the leading shoot. In the third year five shoots will develop, and the following season the young trees will be fit to plant in their permanent quarters, say, at a distance of 10ft. to 12ft. each way, according to the ground at command, or there may be double or even more that distance between the rows and the land filled with low-growing crops, leaving a space of 5ft. clear from the stem of the trees. After culture mainly consists in keeping the plants free from sucker growths, and regular feeding will also be advantageous, but this I have referred to. Another method of culture at the start is by layering, which should be done in the autumn. Many growers say that trees from layers are more profitable than from any other way of propagation. They certainly make less sucker growth, and, I think, are less inclined to run to rank wood than from suckers. After the layers are rooted (having been pegged down the previous autumn), plant them in rows for a couple of years, as advised for suckers, and treat similarly, but they will be ready to plant in their permanent positions in two years. The plants are also produced from seed, which should be sown in October or November in light soil in rows, say, 2ft. apart, but mice and rats devour the seed. It will be found a safe plan to sow thickly in boxes and plant out in rows in the spring. A few kinds, such as the Cosford, come fairly true from seed; others are less reliable, and in such cases I do not advise this mode of culture

Varieties are fairly numerous. The Kent Cob is one of the most popular on account of its free cropping and quality. It is a large Nut, and distinct, being broader, shorter, and with less husk than some of the Filberts. There can be no doubt but that this is one of the best for planting on a large scale or for the garden, on account of its free cropping. The Cosford is not termed a Cob Nut by some, but it is much like the true type, yet distinct, having a thinner shell than the Kent Cob, and is quite as good. I am not sure if it be quite as prolific; on the other hand, it will grow in almost any soil and is a splendid garden variety. The Atlas Cob is a very large Nut, and, though not

equal to either of the two first-named, is a novelty, and the largest Cob I have seen. The Berger is likewise less known, although it bears freely on the Continent; it is of excellent quality, and will doubtless become a favourite. The flowers are produced later than those of the others, and, like the Cosford, it bears male catkins freely. A very distinct variety is Pearson's Prolific, a short round Nut, but it crops very freely and is most useful among others, as a few trees of this variety are very valuable on account of their freedom in producing the male catkins for setting the bloom of other kinds.

The Filberts are well known. The true Kentish is an excellent Nut and of delicious flavour, but not so prolific as the Cob. The Prolific Filbert produces the fruit in bunches and has a pretty husk. The Red Filbert is well flavoured; it has a red skin, and is one of the most productive, being very sweet and a very good variety for garden culture. The White Filbert is like the red, but has a white skin, and is very productive. It is a good hardy variety, as it fruits when others fail. There is a purple-leaved Filbert, but it is of no commercial value, though the foliage is very pretty.

Nut culture is so seldom undertaken in the true spirit, that is, to make money out of the bushes, that thriving plantations are not often seen. But I strongly advise farmers and market gardeners to give some attention to this fruit tree, if one may so regard it, planting only the most productive and saleable kinds, and to grow them throughout on the principles laid down in the foregoing notes. Well-flavoured Cobs and Filberts are always appreciated, and may be easily preserved for use in the winter and even in the early spring months. Choose the finest varieties, prune and train in the proper ways, and then a good crop will await one, larger some years than others, of course, as much depends upon the weather at the time of flowering.

Nut culture, like fruit culture in general, must not be undertaken with hesitation. In all matters of fruit growing for profit practical knowledge is essential. It is as reasonable to expect a man to build a bridge without knowledge of his work as to expect a grower to produce profitable fruit without previous training.

A SHADY WALK.

A GROUP OF PYRETHRUMS.

LAYING OUT A GARDEN.

WHEN entering upon a new house, with the garden fresh from the builder's hand, one must consider the best way to lay it out, first ensuring that the soil is not a mixture of brick ends, tin pots, or débris of a similar undesirable nature—not a good foundation for the growth of flowers. It is of importance to commence well, and poor soil will not support masses of plants or fruits or vegetables.

In the laying out of gardens much of the detail must naturally be left to individual taste, but a few broad rules may be laid down for the guidance of the beginner. First and foremost, cart in plenty of good soil, unless, of course, the ground has not been disturbed by the builder for the purpose of securing gravel. In the construction of the garden beautiful the methods of Nature, and not those of the architect, should be our guide. Form the beds not primarily with the idea of exhibiting their geometrical or fantastic proportions, but so that they may fitly supply the wants of the flowers that they contain. It is not in the contour of the beds, but in the beauty of their occupants, that the charm of the garden should be sought. The soft green of an expanse of sward is restful to the eye, but this effect is marred where the lawn is cut up by the introduction of many trivial flower beds. Villa gardens with small lawns are often spoilt in this way, and therefore compare unfavourably with cottage plots through which a simple straight path leads from the wicket to the door, bordered on either side with hardy flowers we have known and loved from childhood's days. Where there is space on the lawn for beds, without unduly limiting its area, these should be of simple form—oblong, oval, or round—and not so restricted in size as to interfere with the full expression of beauty of the subjects they contain, for natural and artistic effect can never be attained where the plants are unable to assume characteristic growth.

Oftentimes, however, in small gardens the lawn will be too small to admit of flower beds, and in such cases space may usually be found for a wide border by the side of the

grass, and if backed by a wall so much the better. Here, in rich, deep soil, the beautiful hardy flowers will flourish abundantly, and provide a dainty picture from early spring until late autumn, while a host of lovely climbing plants, such as Roses, Honeysuckles, Clematis Jackmani, Wistaria, Passion-flowers, and many other perennial and annual creepers, will garland the wall with festoons of blossom and form a fitting background for the denizens of the border.

A path can generally be arranged for in front of such a border, and is advantageous in permitting a close inspection of the flowers at times when grass would be sodden under foot. In laying out a garden much depends upon the arrangement of the paths. The first reason of a path is to provide a means of proceeding from one spot to another with as little delay as possible; therefore meaningless twists and meanderings, such as are often seen in public gardens, designed under the mistaken impression that a departure from the straight line is necessarily artistic, should be avoided. Where, however, any obstacle furnishes cause for a deviation from the straight line, such deviation is not only allowable, but rational. Thus a lawn in front of the house at once suggests that the path should skirt instead of dividing its expanse, while groups of shrubs, necessity of access to flower beds, garden seats, summer-houses, or any objects of interest, afford ample motive for departing from the straight line. With pergolas, arches, and other garden structures the same rule that applies to paths holds good. They should appear to fill a want in the positions in which they stand, and should not give the idea of owing their existence merely to the whim of the designer of the garden plan. Let the work be of lasting materials. Oak is the best wood if procurable, as when well seasoned it will last a lifetime, while for the upper portions of pergolas bamboo answers the purpose well. All so-called "rustic work" should be avoided, for it is generally trivial, useless, and in bad taste. Simplicity and strength should be the objects aimed at in small gardens quite as much as in large domains, and in many of the former pergolas and arches draped with flowering growths are delightful.

A GROUP OF KNIPHOFIA (TRITOMA).

Running water is not usually seen except in large gardens; but where it does occur charming effects result, even if its volume be small. A runnel 1ft. or so in width, if treated with artistic feeling, adds much to the attractions of a garden; but here again the ways of Nature, the "predominant partner," must be followed if success is to result. There should be a reason for every curve of the little streamlet and for every little cascade, in the shape of some natural, or seemingly natural, obstruction, round which the water has to find its way, or in default of this to deepen until it can surmount the barrier and fall foaming into a miniature pool below. In some gardens, where a supply of water such as has been described exists, the opportunity occurs of utilising some of the moisture for a bed where plants delighting in boggy ground may have their quarters. Where, however, water is absent, there is generally a suitable spot for a rock garden, even in the smallest garden. A naturally-constructed rock garden in a sunny position will afford the means of cultivating some of the beautiful alpine flowers, a phase of gardening even more seductive than the culture of bog plants. If an old

A COLONY OF ASPHODELINE LUTEA (King's Spear).

wall be included within the confines of the garden, this may be soon clothed with flowers from seed sown in the chinks, or if mortarless retaining walls are built, and a slight layer of soil placed between the stones, a host of beautiful things will cover the surface with blossom, such as Tufted Pansies, Arenarias (Sandworts), Aubrietias, Arabis, Veronicas, and many others, while in any shady corner an outdoor fernery may be established.

Many will say, "How am I to keep the garden gay?" Bedding plants, such as Pelargoniums, or Geraniums as they are more familiarly called, it will generally be admitted, give the brightest and most lasting display during the summer and early autumn, but they require annual propagation and glass shelter for some months in the year, besides leaving the beds bare for considerably more than six months, unless their places are filled in the autumn with bulbs, which must be taken up in the early summer before their growth is ripened to make way again for the bedding plants.

This has led to a freer use of the hardy perennials, which have been dealt with

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THE NORTH AISLE, ROUS LENCH COURT, WORCESTERSHIRE.

"COUNTRY LIFE"

in detail in previous chapters. One can make a selection of noble kinds for permanent effect, for when once planted in deep, rich soil, and given an annual mulching, they will remain in health without further trouble for some years. They may be under-planted with spring bulbs, and thus the borders and beds will, with little labour, produce flowers for many months. In planting ever bear in mind that Nature groups her flowers, and does not produce them in lines. Hardy flowers should be massed rather than planted singly, and this applies to the shrubbery as well, where groups of the same kinds of flowering shrubs are far more effective than when dotted about in haphazard fashion.

THE COLUMBINE (Aquilegia cœrulea).

If the garden is of the usual rectangular form, and there is space for the growth of vegetables, keep these towards the lower end, and bush or other fruits can be planted near the walks. In small gardens it will be advisable to restrict fruit trees to those of the bush form chiefly upon the English Paradise stock. Merely a general outline is given of how to commence gardening, as details have been given in previous chapters, which deal with individual subjects.

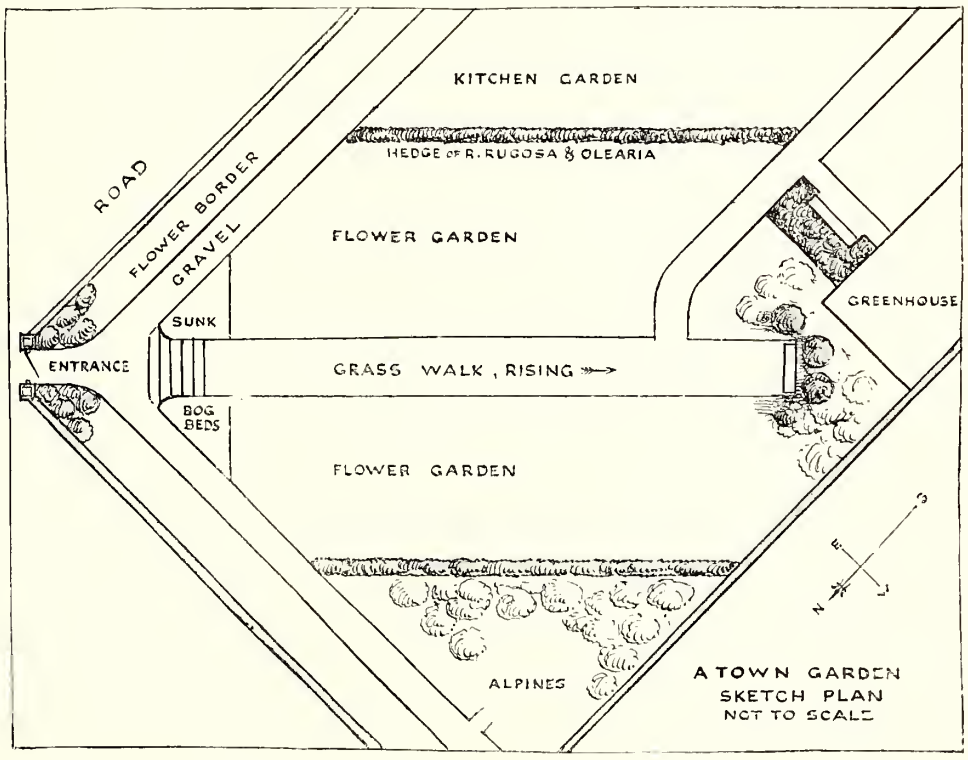
A TOWN GARDEN.

By E. H. Woodall.

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 management 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 glasshouses—

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, 7ft. broad, was sunk quite 3ft. 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 12ft. from the grass path, a hedge of Olearia Haasti 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 new and extra vigorous R. Wichuriana, which is not well known as yet, seems to promise great things. Its corymbs of sweet white little flowers in August and September are most delightful, and its glossy neat foliage an ornament to any garden. Conifers, too, are quite useless, and so is any evergreen that looks sooty and black, like some 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, Tritomas, 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 in which 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 Clematis 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 Sieboldii, Megaseas, and Funkias formed handsome masses of solid foliage, and in two years 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.

[This excellent article and plan are reprinted from the *Garden*, as we thought readers of the CENTURY BOOK OF GARDENING would value the practical information given by Mr. Woodall.]

IN laying out a new garden, thoroughness, at the start especially, should be the watchword. It is folly to merely scratch the soil, as without a depth of good ground plant life is never vigorous. In the garden one desires everything as far as possible to be vigorous, displaying rude health, which alone means an abundance of flowers or fruit. Money and labour spent upon the foundation bring their reward, and gardening under these conditions is pleasurable, and not hedged round with disappointments, the outcome of poor soil and careless or half-hearted culture. If the soil of the garden is poor, cart in other material to bring it into good tilth and acceptable to the crops. Never attempt too much. It is better to grow one plant well than a dozen badly; and study the plants purchased, one requiring more moisture than another, and some seeking shade rather than the light of day. Commence at first with plants of strong constitution, not the delicate alpine or fastidious border flower which requires much coaxing. These matters can be left until the garden is in working order, and one may try experiments with those flowers desired for their beauty or interesting associations.

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THE TERRACE GARDEN, EASHING PARK, GODALMING.

"COUNTRY LIFE"

THE COTTAGE GARDEN.

WINDOW AND ROOM GARDENING.

THOSE who possess no broad acres to cultivate and cover with flowers, or own neither greenhouse nor large garden, may find much pleasure in growing flowers in rooms. Many plants are happy in this position, but require even closer attention than in the greenhouse, where a more natural atmosphere surrounds them and they are less exposed to draught. It is a great advantage, of course, to have a greenhouse, even quite a small structure, to form a hospital for the plants from the rooms, which at times get sickly through dry air, gas, and dust, also to hasten into growth those that have been repotted. Gas, of course, is a great enemy. Even the most vigorous and hard-leaved plants suffer in this atmosphere, and therefore fortunate is the window gardener whose roomis lighted in some other way, say by electricity. The effect of this light is to leave uninjured the plant's growth, and even delicate Ferns will preserve their green healthy aspect through the winter when not exposed to the hot drying air produced by gas. It is a thousand times better to grow six things than to attempt to grow a collection, for this is never satisfactory. Much, naturally, depends upon the aspect of the room and attention given to its contents. When windows are opened in the morning for cold draughts to blow upon tender foliage, or the floor is swept without covering over the plants with paper, success will never attend window or room gardening. Light is important. Vegetation will not endure for long in half darkness, and in a light sunny window one sometimes sees plants even brighter than those in the well-appointed greenhouse.

As a rule, unless the house is in the country, where the air is sweeter and fresher than in the neighbourhood of large cities, chief reliance must be placed upon foliage plants, such as Aralia Sieboldii, Aspidistra lurida and its variegated variety, Araucaria excelsa, Cordyline australis, Dracænas of sorts, Ficus elastica (the India-rubber plant), some Ferns, Ophiopogon

Jaburan variegatum, Phalangium lineare variegatum, and some Palms; these are the most satisfactory. Succulent plants, it must not be forgotten, may be grown in a window, and of these there is a wide choice. The gorgeous Phyllocacti are a host in themselves; their flowers are of wonderful brilliancy, big petals opening wide in the sun, and though this wonderful beauty is fleeting, a succession of buds expands to carry on the procession. White, intense purple, crimson, scarlet, rose, pink, mauve, and a host of shades of all the leading colours, shot with satiny hues, are reflected in the petals. Nothing is more gorgeous or more interesting in the whole flower world than a blaze of Phyllocactus blossom, and these plants may be grown in a window. True, their foliage, if one may so describe the succulent leaves, is not ornamental; it is picturesque, but the beautiful flowers are worth waiting for.

Hard-leaved room plants, such as Aralia Sieboldii, the Ficus elastica, Cordyline australis, and the Aspidistra must always be sponged gently with warm water every week at least, as if this be not done they quickly fall into bad health. The reason is obvious. Dust chokes up the leaf surface, and interferes, so to speak, with the breathing of the plants. Treat each leaf tenderly, never brushing against the foliage, and in summer or on warm spring days, when a soft rain is falling, stand the plants out of doors to obtain a refreshing bath. Sponging is one of the principal items in the culture of room plants, and must be closely attended to, more so than is the rule. Watering is another important operation; it means either success or failure, and water should never remain in the saucers. Sometimes a plant is put into a large ornamental bowl, and in time an inch of water accumulates in the bottom. This is fatal; the roots are in a constant state of saturation, and quickly rot. Always water well. Driblets are harmful; but the beginner usually gives sufficient to moisten the surface, unmindful that the roots are in the centre and bottom of the ball of soil as well as at the top. One thorough watering will often suffice during the week in winter, unless the room is very warm, and in winter of course the plants are less active than in the spring, when new roots are made to exhaust moisture in the soil. These items, apparently trifling, are of great importance in successful room or window gardening. A successful grower of plants in a room writes as follows: "A great many plants will keep in good health for years in a dwelling-house, provided they are carefully attended to and placed in a fairly light position. The bane of plants kept in rooms is the dry atmosphere and the dust which settles on the leaves. To counteract this they should be thoroughly sponged once a week in tepid water, and the roots must not be allowed to get dry. An excess of moisture, too, is equally to be avoided, and this is very liable to happen if the pots are stood in vases or jardinieres, which do not allow of the escape of surplus water. In a light sunny window some flowering plants may be grown, but where shaded it is best to depend upon foliage subjects alone. The best time of year to repot any room plants that require it is in the month of April, as the roots are just

PINK-FLOWERED IVY LEAVED PELARGONIUM.

starting into activity. Where gas is burnt it is useless to expect plants to keep for long in a healthy condition."

Ill-health is frequently promoted by sour soil and worms, which disturb the drainage, that is, they mix up the soil with the crocks in the bottom of the pot and prevent the free egress of moisture. When the soil becomes sour or filled with worms repotting should take place, and the time for this is the spring, the great potting season, when vegetation generally is bursting into new leaf. Pot carefully, preserving as many of the roots as possible, and use thoroughly clean earthenware pots, not the fanciful glazed receptacles so frequently seen in drawing-rooms. A good general compost is loam mixed with some well-decayed leaf mould, and sufficient sharp silver sand to lighten it. Over the crocks in the bottom of the pots place some of the rougher soil to prevent the finer parts from running down and disturbing the drainage. Pot firmly, and water with extreme care until the plants are established. The reason of this is that the roots are not sufficiently active to absorb the moisture given, and hence they decay. When a greenhouse is available transfer them to this for a time, as a gentle warmth will promote quick growth. In dealing with the best kinds to grow in a window, culture necessary for the individual species and varieties is considered. Sometimes a little artificial manure is helpful in stimulating the growth of the plant, but such preparations must be carefully handled; it is a mistake to give an overdose, which means that the roots are quickly destroyed. Never give a dose in excess to that prescribed in the directions, and never repeat it at frequent intervals. When judiciously used, artificial manure has a remarkable effect upon the plant in growth and stimulates a further display of flowers.

THE COTTAGER AND HIS ROSES.

Insects, of course, trouble plants in rooms as well as those in the greenhouse and outdoor garden, but when in the room the pests are more under control. When first seen sponge them off, and thus stop progress. Neglect means that green fly and other insects will increase at such a rate as in time to render a course of fumigation in the greenhouse necessary. Soft-wooded plants, such as the Zonal Pelargonium, or "Geranium," are more liable to insect attacks than any of the hard-leaved class. But the way to prevent insects attacking plants is to promote vigorous growth. Healthy growth is seldom attacked, because the plants are, so to say, able to resist such attacks. It is weakly growth that suffers most severely.

FOLIAGE PLANTS.

Aralia Sieboldi.—The reason that this is an excellent room plant, though not so serviceable as the Aspidistra, is because the foliage is leathery. It must be an impure air to affect the tough shining coat, impervious to dust, and easily sponged to remove all sediment. One is able to realise how dusty a room is when such a plant as this is not sponged for a week. The drawing of the finger across the leaf leaves a distinct impression in the layer of dust, which of course chokes up the pores, so to speak, and the plant dies prematurely. Very often window and room plants fail through having been drawn up in heat, "made to sell," and this fresh glossy appearance, attractive to the eye at first, soon vanishes when the plants have been in the room for a week or so. Market growers, to obtain saleable stock quickly, force along the plants, even the hardiest kinds, in heat, and when fresh from the house they look vigorous and handsome. Of course this healthiness does not last, and plants grown thus require careful treatment afterwards, avoiding cold currents of air and giving no more water than is absolutely necessary. Foliage plants may be successfully managed, but flowers and the Winter Cherry (Solanum) are difficult to retain in health for any length of time.

Aspidistra (*the Parlour Palm*).—This is popularly called a Palm, but there is no relationship between the Aspidistra and the Palm of the greenhouse. The Aspidistra is the best room plant in the world; it is unexcelled, and will stand the roughest treatment with impunity, so much so that it is used in restaurants, in draughty halls, and it will brave even the changeable atmosphere in these places without injury. The green-leaved species, A. lurida, is not so popular as the variegated variety, which is readily distinguished from the other by broad longitudinal stripes of creamy white, more conspicuous in some forms than in others. The plants will increase in beauty with age, forming in time quite leafy masses, and even when divided up and placed into separate pots, without any kindly treatment in the greenhouse, they succeed remarkably well both in gas-lighted rooms and in large towns. But remember that careful sponging of the foliage to remove dust is imperative. The Aspidistra is, however, of slow growth, and for that reason is somewhat expensive; but the first outlay is the only one. Many things cost less, but require replenishing often, especially in towns. In dividing an Aspidistra when it has become too large for the pot, the proper way is in the early spring, before new growth begins, to turn the plant out of the pot, shake the soil from the roots, and divide the mass into as many pieces as are required; but too small pieces are a mistake. A considerable time must elapse before they are of respectable size, and, therefore, as the gardener says, "decorative." Loam, some well-decayed manure, and a little silver sand form the correct ingredients for the compost. The flowers are very strange brownish objects produced on the surface of the soil.

Ferns.—Happily, several Ferns are quite comfortable in a room, but to try to grow a collection is a mistake. The most successful generally in rooms are the following, all of great beauty, and they will continue, with careful treatment, many years in a healthy condition: Pteris tremula, grown so largely by market gardeners for room decoration, is as handsome as any, its tall graceful fronds of a rich green colour, and even in winter, unless the room be lighted with gas, they retain their freshness. Gas is a great enemy of Ferns. During the winter all Ferns are more or less shabby, because at that season they are at rest, starting into free growth again with spring, at which season repotting if necessary must take place. More peat will be required in the soil than in the case of the other plants already mentioned. An excellent Fern for rooms is Pteris cretica and its variegated variety albo-lineata, whilst mention may also be made of Onychium japonicum, Cyrtomium falcatum, and Asplenium bulbiferum. The Asplenium will remain in a room for years without requiring much attention. It is a somewhat heavy-looking plant, owing to its large drooping fronds, but it is interesting, and propagated by the little plants produced on the fronds. In this way it is increased, each of the tufts being taken off and potted up separately when more stock is desired.

Ficus elastica (*the India-rubber Plant*).—This is even better known than the Aspidistra, but is not so satisfactory in many ways. The India-rubber Plant is more

SINGLE WHITE PETUNIA.

difficult to maintain in health, some room gardeners failing utterly to prevent the leaves turning yellow and dropping off. The fault is not always, however, due to culture, but more often through purchasing plants highly fed and produced in a high temperature. It is far better to secure a rather scrubby-looking hardened plant than any fresh, green, exotic species which seldom retains the hue of health for many weeks. Ficus elastica, as the name suggests, is an Indian plant, and is much benefited, especially when in a room, by a little soot water occasionally or some good fertiliser. Soot promotes green colouring in the leaf, and no plant is more readily upset when its foliage is permitted to remain covered with dust. The Aspidistra and Aralia will stand a considerable layer for some time, but not the Ficus. A large pot is not necessary. Many of the healthiest specimens the writer has seen have been in quite small pots, but in such cases food must be given, especially during the spring months, in the form of stimulants. When repotted it is generally essential to place the plant in the greenhouse to recover from the check to the roots, as, unlike the Aspidistra, it does not recover quickly from such a disturbance

Of other good foliage plants, note should be made of the prettily variegated and thoroughly sturdy Ophiopogon Jaburan variegatum, a big name for a useful plant, with narrow, brightly-coloured leaves and, in its flowering time, bluish spikes. The room gardener who is really interested in the culture of plants will succeed with things not usually grown under such conditions, but only kinds that the novice may use have been mentioned. Of Palms, Phœnix dactylifera, Corypha australis, and the Kentias are the most serviceable; but Palms require more careful treatment than any of the foliage plants previously mentioned. The leaves require constant sponging, and this occupies considerable time, as the dust accumulates in the ribs, so to say.

FLOWERING PLANTS.

THERE is a greater choice of flowering plants for a room. Many of the most precious flowers of the garden may be grown in this position.

Begonia Weltoniensis is a charming window plant, making quite a bushy growth, and for its flowers, or for the sake merely of its foliage, it is worth careful culture. It dies down in winter, but springs up again in spring. The tuberous Begonias are not strictly room plants, but are useful, of course, when taken from the greenhouse for this purpose. When one, however, begins to consider the things that will stand room life for a certain time, then the subject is considerably extended, and one gets beyond the bounds of true room gardening. It is interesting and instructive, however, to try experiments with the object of coaxing into respectable growth plants not usually considered appropriate for certain forms of gardening.

Bulbous Flowers in Rooms.—Amateur gardeners are beginning to realise that there is a wealth of beauty in the bulbous flowers of the Daffodil, Hyacinth, Tulip, and so forth, but especially the Daffodil, which is one of the most suitable of all bulbs for windows. The bulbs flower satisfactorily if they are potted in the autumn, placed in a dimly-lighted cellar, or under a depth of 5in. of ashes in the open, then brought to the room when growth begins. The plan of the writer is to place the bulbs, selecting strong ones for the purpose, in the autumn in a cool dark cellar free from frost, and when the growth shows well above the soil the plants are taken to a sunny window where the atmosphere of the room is not very high. A high temperature means a forced spindly growth and few or no flowers. Daffodils are not made sufficient use of for this purpose; they are more successful treated in this way than any other bulb, and rarely do the plants refuse to flower. The trumpet kinds, the big handsome Horsfieldi, Empress, Emperor, and the much-neglected bunch or Polyanthus-flowered Narcissi, are generally a success, also the fragrant rich yellow Jonquils. Then one may also grow the pretty Snowdrops, blue Scillas, Crocuses, and similar cheap and pleasing bulbs. A new interest has been given to room gardening by the introduction of the Chinese Water-lily or Joss-flower, a variety of Narcissus Tazetta. This will flower well without soil; but perhaps it will be better to give the advice of Messrs. Barr and Sons, who, we believe, were amongst the first to import the plant from China: "The Water Fairy Flower, or Chinese Sacred Lily, is a species of Polyanthus Narcissus, annually imported by us from Northern China, where the climate and soil impart to the bulbs a marvellous precocity, together with a wonderful power of producing a great abundance of flowers; its growth is extraordinarily rapid—something like 20in. in forty days—in the temperature of a sitting-room or warm greenhouse. In nearly all houses in China and Japan the Sacred or Good Luck Lilies are grown in the living rooms in fancy bowls, filled simply with pebbles and water, and the natives compete with one another in growing the finest specimens for their New Year's Festival, successful culture being regarded as an emblem of 'good luck.' The largest and best developed flowers are called by the Chinese Grand Emperor. Each bulb produces several heads of bloom, the individual flowers being white with yellow cup if single, or white with yellow nectary if double, and delightfully fragrant. In this country the bulbs of the Sacred Lily can be flowered as successfully as in China, and to watch the rapidity of their growth is most interesting. Keep in a sunny window by day, and on a table near the centre of the room by night, as frost destroys the flower buds. The plants should not be kept in a room while gas is being burnt, as a too dry atmosphere shrivels up the flower buds; a draughty situation must also be avoided; the more natural conditions of a warm greenhouse will promote the greatest success, and the plants can be removed from thence to a sitting-room when in bloom."

Campanula isophylla and isophylla alba.—It is not possible to mention two more charming window plants for baskets than these, the type, C. isophylla, having blue flowers, and, as the name suggests, those of the variety are white. These Bellflowers, or Campanula, are grown with conspicuous success in many windows, and in some towns and villages there seems to be a "plague" of Campanulas, almost every cottage window displaying its wonderful basket of blue flowers. This, of course, is usually the result of one individual possessing a good plant and arousing envious feelings in the hearts of the neighbours, who forthwith go and do likewise. C. isophylla and its variety are not the only Bellflowers for this form of culture, as the pretty little C. Portenschlagiana, C. muralis, C. carpatica, and C. c. alba are also successful when grown in this form. The way to treat these Bellflowers is to allow them to increase without disturbance until it is seen by the growth that division and fresh soil are necessary. They are easily propagated by cuttings of the little shoots taken in spring, and when in growth give an abundance of water, varying the plain water with some gentle stimulant, say, some liquid manure or fertiliser. When in flower, a basketful of the blue kind in particular is very charming, and so freely are the flowers produced that scarcely a trace of foliage is seen; it is hidden beneath the foliage.

Fuchsias.—At one time the Fuchsia was a favourite window plant, but it seems to have gone out of fashion, though signs are not wanting that in the flower garden at least it will occupy its rightful position. Few plants are prettier or, when in flower, more graceful, the drooping flowers bending the slender shoots with their weight; and one may obtain a great variety of colours. The double varieties are less satisfactory and less pleasing than the single kinds, and should not be grown much in the window. The Fuchsia may be kept during the winter in a cool cellar, and when spring comes taken back to the window, when fresh shoots will quickly appear. It requires much the same treatment as the Geranium, and in a sunny window cuttings will root satisfactorily. It is impossible in the space at disposal to give a list of the most suitable varieties; any good catalogue will supply this information.

Mother of Thousands (*Saxifraga sarmentosa*) is such an old-fashioned window plant that one need scarcely describe it; the reason it is often a failure is because too much water is given, and through interfering with the delicate tendrils. S. Fortunei with its pinkish flowers is also useful for the same purpose, though neither is so attractive, as a basket plant, as the Campanulas previously mentioned.

Vallota purpurea (*the Scarborough Lily*).—This is a brilliant picture when in full flower; its colouring is wonderfully bright, but failure to flower the bulbs properly is usually the result of too kindly treatment, when the pots are allowed to get thoroughly crammed with roots, so that one wonders how the bulbs can find sustenance from the little soil remaining; its wealth of flowers appears late in summer. Any good fairly light soil is suitable, and the plant is increased by offsets. A sunny window is essential; it is impossible to hope for success in any other position. This handsome plant behaves very curiously—sometimes it flowers abundantly, whilst another plant, treated much in the same style, refuses to do so.

Zonal Pelargonium.—The popular name for this is "Geranium," but the true Geranium is a hardy British plant, and the brilliant flower of the greenhouse and summer garden is of hybrid origin. Still, all this does not alter the fact that the Geranium is one of the best of all window plants, which will remain unharmed during the

winter if not exposed to frost, and may even be hung up by its roots in a dry, frost-proof cellar until the spring, when new growth signifies that soil and light are required. In many an old stuffy cottage window the Geranium grows luxuriantly, partly because only an oil lamp or candle is burned at night. Henry Jacoby, that rich crimson flower, may be thus grown, and in fact all Geraniums, and their name is legion, may be placed in this position. In few classes of indoor flowers is there a greater range of colour, from snow white, through shades of crimson, salmon, pink, rose, and an infinite variety almost of subtle tints. Almost any kind of soil is suitable, and during the summer months especially give plenty of water. When the plants become leggy, cut back the shoots hard, and this must be carried out in spring when new growth begins. Cuttings of moderately ripened shoots may be struck in the window. Cut them just beneath a joint, and remove the two lower leaves to provide a clean stem for insertion in the soil. Roots will be emitted in less than a month, and then the cuttings may be potted off separately. A soil composed of loam, leaf mould, and silver sand is usually given, but, as previously mentioned, Geraniums are not particular in this respect. It is almost impossible to remove dust from the foliage. One cannot sponge a tender, soft leaf, but when the plant is exposed to a soft rain it becomes refreshed. Ivy-leaved Pelargoniums must not be grown in a room—they are only suitable for the window-boxes; but all the other Pelargoniums—French, Regal, Show, and so forth—are not suitable for this treatment.

ARALIA SIEBOLDI, VALLOTA, AND OTHER FLOWERS IN A ROOM.

WINDOW-BOX GARDENING.

WINDOW-BOX gardening differs greatly, sometimes taking the form of elaborate orders to some leading florist to maintain the boxes bright with colour during the season, or reflecting the mind of the owner, who rejoices in the use of as many interesting plants as possible for this purpose.

IN WINTER many shrubs can be brought into use. In many instances the shrubs are so handsome that they are allowed to remain throughout the summer as well, and sometimes are left undisturbed for several years. It is a matter of selection and position. For example, coniferous shrubs should certainly not be put in a window-box facing due south, except for winter furnishing. They would become too dry in the summer, and either die outright, or present a very shabby appearance. But where not fully exposed to sun all day, few plants are more useful. One need not have green foliage only. There are many forms of variegation. Nor are we at a loss for several very graceful trailers to droop over the box. If a box of shrubs is not crowded, it is easy to insert a few bulbs, such as Crocuses, Scillas, and Snowdrops, or even the Hyacinth and Tulip. One does not need much colour to enliven a box of various coloured evergreens. As soon as the bulbs are over, Lobelias, Nierembergias, Sedum gracilis, and one or two Ivy-leaved Pelargoniums can be utilised to advantage, and will give a summer change.

So few give sufficient water to window-boxes in the winter, and yet it is the

season when plants in the open are subjected to much wet. In winter, very drying winds occur, and quite as much injury from drought is caused at that time as during a very hot and dry summer. Then, again, few seem to think of liquid manure or top dressings for shrubs. But let them water well, summer and winter, and feed the plants a little; they will then produce glossy growth, pretty and clear variegations, and one will be loth to remove the shrubs entirely.

Even if it be decided to have the usual subjects for window adornment in summer, such as Begonias, Pelargoniums, Fuchsias, Lobelias, Heliotrope, etc., it is easy to move out the conifers and plant them in the garden until autumn. Among Euonymuses alone one can make up many variations in form of plants and colour, also find a very pretty green and silver variegated form to hang over the boxes. The Retinosporas and Cupressus will also furnish sufficient in each case, while, if one considers the list of those containing one or more suitable varieties only, it is difficult to make a selection. Euonymuses are the most satisfactory little shrubs for a window-box, especially if at all exposed to the salt spray, such as in our sea-coast towns. Remember that conifers are seldom healthy in smoky towns, and, therefore, should not be used in such positions. When soot effects a lodgment upon the feathery shoots, health flies away.

IN SPRING.—The window-box may be made as gay in the spring months as the flower-beds in the garden below, and the sheet anchor will be hardy bulbs—the Snowdrop to herald the spring, followed by Crocuses, Daffodils, Scillas, Chionodoxas, Tulips, and even Primroses and Auriculas; but one desires something or other tall in this position, not low-growing plants, unseen except when one is close at hand. Snowdrops and Scillas amongst small evergreen shrubs are very pretty, and a blaze of Tulips gives brightness to the house. Bulbs, too, are so cheap now that several boxes may be kept filled without much expense. It is important to have free drainage to the boxes, especially when they are filled with soil. Make four holes in the bottom, and raise the box slightly above the level, so as to provide a ready way for the water to escape. A few crocks may be placed in the bottom of the box, over these some rough leaf mould, then the principal compost, which may consist of loam, leaf mould, and sharp silver sand, made neither too heavy nor too light. Those who have no opportunities for growing very beautiful and choice bulbs may make use of the window-box for this purpose. Then, of course, it loses its brilliant colouring, such as is imparted to it by scarlet Tulips and yellow Daffodils. The writer knows of one enthusiastic gardener, not blessed with a place in which to grow alpine flowers, who makes use of his window-boxes. In these are grown the Violet-scented netted Iris (I. reticulata), its deep purple flowers filled with rich perfume, I. Bakeriana, I. Danfordiæ, Galanthus Elwesii, the tall garden Snowdrop, Crocus Imperati, in bloom before January has gone; Iris alata, easily recognised by the leek-like arrangement of its leaves; Sternbergia lutea, and the Winter Aconite (Eranthis hyemalis), besides any rare little bulb that may be sent to him. By these means the window-boxes become miniature gardens of beautiful flowers, under close observation, and it is surprising when the boxes are not in the full sun always, though in winter one is grateful for every ray of sunshine, how well these bulbs succeed. Snowdrops, especially in gardens near to large towns, seem lost when opening on a January or early February day. One desires the woodland whitened with the pearly nodding flower, so delicately poised on its slender stem. It is very interesting to be able to grow these delightful early-flowering bulbs, the Irises especially, which require such careful watching in the open ground. Iris reticulata is worth filling a whole box with for the sake of its delicious perfume and beautiful purple-violet colour. It is surprising to find this Iris regarded as almost a rarity by many good gardeners. This is a mistake. Such a flower should be treasured everywhere, and it is very easily grown, especially in pots in a frame or greenhouse.

IN SUMMER.—There is a wide choice of plants for the window-box in summer, and

it is advisable to vary the contents as much as possible. A continuous stream of scarlet Geraniums, or even Fuchsias, graceful and pretty as these plants are, becomes wearisome, and a surfeit of yellow Calceolarias is an abomination. Good self colours are delightful; they impart a restful aspect to the box, and the eye is not irritated by a medley of harsh hues. Always avoid flowers of a purplish crimson colour, or anything approaching magenta, which pales off to an ashy tone peculiarly objectionable at all times, though sometimes "ashy" flowers or a fanciful greyish colour are held up to our admiration. This is, of course, simply "fashion," just as the green Carnation is worn because of its novelty, though a more horrible travesty of a beautiful flower one can hardly imagine. At the sides of the window-box strings may be fastened leading to the nails placed at the top of the window, so that such creepers as the Canary Creeper (Tropæolum canariense), ordinary climbing Nasturtiums (Tropæolums), or even the small-leaved Virginian Creeper (Ampelopsis Veitchii) may run up and form a very graceful festoon around the frame, so to speak, of the window. One likes to see a break away from conventional types. The mossy Rockfoil (Saxifraga hypnoides), S. Wallaceii, the common Stonecrop, and similar evergreen mossy plants are very charming in windows, especially the mossy Saxifrage, which, even when the position is very hot and exposed, will make a free rich green growth, burdened in the spring months with white flowers. Over the edge of the box let the Creeping Jenny (Lysimachia Nummularia) trail, or even the yellow-leaved aurea, but this must be used with caution, as its yellow colour is too pronounced to use much. The Ivy-leaved Pelargonium is more often used for this purpose than the Lysimachia, and it is certainly a plant of very free growth, and flowers delightfully, with little attention, throughout the summer months. Petunias are excellent plants for window-boxes much exposed to the sun. They seem to revel in the heat and dry soil. The writer has seen in the very hottest summers beds of them full of flowers on railway stations with no shade near. Musk in rather shady places, Lobelias, and the things alluded to above when referring to window-boxes in summer, are a success under these conditions.

During the summer window plants require a considerable quantity of water, especially if the position is at all exposed to the sun.

WINDOW-BOXES AND TUB PLANTS AT KING'S WESTON.

When the plants are in pots, stir the surface soil a little occasionally, as then the water flows to the roots and the whole ball of soil becomes properly moistened. Remove decaying leaves and flowers, and the plants should remain in beauty until quite the autumn, when the season has again returned to make use of little shrubs.

MIMULUS.

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GREENHOUSE AND HARDY PLANTS USED IN WINDOWS.

WHEN one deals with this question, mere window or room gardening proper must not be thought of. It is a very simple matter to bring plants in from the greenhouse or cold frame to adorn the window; but certain things may remain in the window, without great harm, longer than others, such as the Persian Cyclamen and Chinese Primula, and the writer has attempted on many occasions to grow these plants, but without result. It is absolutely impossible to provide suitable conditions for tender greenhouse plants throughout the year. There is much to contend against in a room—changeable temperature, dust, dryness, and draughts. We have brought buxom specimens of the Lyre-flower, Dielytra (or Dicentra) spectabilis, from the cold frame in spring and used them for the room, and under such conditions they remain in beauty for a considerable season. A neat, well-flowered specimen, such as that shown in the illustration, is very pleasing, and we may write the same of the Petunia, Mimulus, Musk, and other homely subjects. Splendid results are often obtained by window gardeners, especially in cottages. The writer well remembers a number of cottages once upon the outskirts of a large town, and the kinds seen were noted down; these were all grown, from year to year, in the window, for the good reason that there was no greenhouse or frame. The names were Onion Plant, a large Onion-like bulb, with tall slender flower spike, the pretty Mother of Thousands (Saxifraga sarmentosa), the variegated Ophiopogon, the Fern named Asplenium bulbiferum, Phalangium lineare variegatum, Ivy grown in a pot, a very pretty decoration, always green and very vigorous; Geraniums, Fuchsias, Daffodils, Vallota purpurea, some Cactuses, and in one case an Himantiphyllum miniatum, which had been given to the cottager by the gardener at the "Hall." This is usually regarded as quite an indoor plant, but it was thriving well enough in this window, and the secret of success was keeping the plant away from searching winds or draughts and sponging the leaves. The most beautiful plants, however, were the Campanulas, of which mention has been already made; the plants were in baskets and masses of bloom, in one instance no less than six filling the window and standing upon the table with the old-fashioned Geranium. Campanula carpatica seemed to be the favourite species, this having somewhat larger flowers than C. isophylla, otherwise they are much alike, being as free in growth and flower also.

DIELYTRA.

In some cases a miniature fernery is

constructed in the window, and this is an interesting way of growing the smaller moisture-loving Ferns, as well as adding a feature of interest to the apartment. At one time Wardian cases were in great vogue, but it is wise not to attempt to grow things that need elaborate treatment or a warm temperature, otherwise failure will most certainly occur. Some of the smaller kinds can be accommodated, giving, of course, less water in winter than in summer. One hears far less now of these Fern cases, probably because little interest seems to be taken in this class, though why this should be so is not evident; the great world of Ferns contains many exquisite jewels.

NARCISSUS, MISS FLORA WILSON.

TUB GARDENING.

WINDOW-BOX gardening reminds us that the allied form of tub gardening deserves consideration. 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, when their handsome leaves and noble flowers are appreciated. Sometimes the foliage is very fragrant, and when brushed against gives off a warm 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 following kinds are suitable for this form of gardening:

Agapanthus, an excellent tub plant, is readily protected in winter by covering it over with mats, and placing in some outhouse when the plants cannot be housed elsewhere. The clear blue of the flowers is delightfully fresh, and when seen on some old terrace walk, or by the side of an oaken doorway, the flowers supply just that dash of bluish colour required amidst greys and the soft tints from Roses and the hardier summer plants. The great secret of abundant bloom is not to let the plants get, so to speak, "over-tubbed," as the foliage is produced at the expense of flower spikes. During the summer it is wise to give a little stimulant in the form of liquid manure. There are several varieties of A. umbellatus, but the type is more adapted for tubs than the forms of it, such as albus.

IRIS GERMANICA.

Aloysia citriodora (*Lemon Plant, or Sweet-scented Verbena*).—This will remain healthy for many years in a tub, and its foliage is pleasing in colour, and when rubbed gives off a delightful perfume as of ripe cut lemons. It is not thoroughly hardy, and when placed in the open, a warm, sheltered position must be selected.

Myrtles make excellent tub plants, and remain in health for many years with top dressings of soil, and their fragrant foliage is always welcome. They will also succeed in large pots; and of course the remarks here made as to tub plants apply to those that succeed in pots or large Italian oil jars cut in half. A delightful picture was once formed of the blue Iris in flower in one of these earthenware jars, and even when out of bloom the glaucous foliage is attractive. Myrtles should always be placed out of doors for the summer months, choosing a somewhat shady place. The effect of this open-air existence is to well ripen up

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THE MONKS' WALK, ASHRIDGE PARK, GREAT BERKHAMPSTEAD

"COUNTRY LIFE."

the wood and promote a wealth of flowers in the following spring.

Pelargoniums, Cape.—These make noble tub plants—Rollisson's Unique, Oak-leaved (quercifolium), and other varieties, but of course they must not have the shelter of a stable or outhouse during the winter months. Careful treatment will be as necessary then as in the summer months. The Cape Pelargonium specimens grown by Mr. Hudson at Gunnersbury House Gardens, Acton, are very fine, and remind us of a class of plants that seems to have passed almost out of cultivation. At one time the Pelargoniums, or "Scented-leaved Geraniums," as they were more familiarly known, were in considerable demand.

Other Good Tub Plants.—Besides the popular kinds already mentioned, the writer has seen the following made good use of in tubs: Abutilon Boule de Neige, the beautiful white variety so frequently seen in greenhouses and conservatories; Agaves of sorts; Brugmansia Knighti; Choisya ternata, popularly known as the Mexican Orange-flower; the Orange; the Coral tree (Erythrina Crista-galli); Hedychium Gardnerianum, or the Garland-flower, one of the hardiest of its race, with handsome Musa-like leaves and fragrant flowers; Heliotropes, smothered with their sweet-smelling flowers in summer; the pretty Plumbago capensis, and Yuccas.

SOILS AND THEIR TREATMENT.

IN gardening, soils have very much to be taken as found. To materially improve them is difficult. Change comes only after many years' cultivation, and by the addition of material both of soil of many kinds and of manure. Working, however, intelligently may do much to lighten trouble arising from soils of extreme character, such as those very light or very heavy. A medium soil that is naturally friable, porous, deep, and well drained is almost of an ideal nature and rarely exists, yet is sometimes found, especially in valleys where accumulations of alluvial deposit from rocks and hills have created depth.

Treatment of Heavy Soils.

These are usually termed clay, although sometimes found in bog formations. Clay soils are very common, and usually exist to a great depth. They are very difficult to work, yet usually where well managed are very reproductive under fairly favourable conditions. Clay soils usually need some sort of drainage, such as is furnished by cutting out drains from 2ft. to 4ft. in depth, and narrow, and in such directions as may ensure a fall for the water extracted from the soil. These drains may be laid in parallel, 20ft. to 40ft. apart as may be required, and consist of porous pipes, or, failing these, some 9in. of stone rubble or broken clinkers, on which is laid heath or furze to keep the soil from choking the rubble. Such drains do great good in carrying off surplus moisture. So also will in other cases surface drains where deep draining may be too costly. The object of drainage is, first, to relieve the soil of water that otherwise would become stagnant and sour and harmful to vegetation; and second, because soil choked with water excludes air, and air which follows water as it retreats downward is not only essential to plant life, but sweetens and purifies soil and renders it fertile.

It is imperative in working stiff soils that whilst broken up deeply the lower or subsoil be kept beneath and not brought to the surface. Wanting air, it is infertile, and several years' exposure to light and air is needed to render it fertile. But if in trenching the top soil be well broken and thrown out of the trench, the clay bottom well dug and broken up also, not only will the air penetrate to it later, but manure and plant food will also permeate it from the cultivated surface, and in course of time the subsoil may be gradually incorporated with the surface soil, great good resulting. As the process of trenching proceeds the top spit from the next trench is laid over the broken-up subsoil in the preceding one, and thus the best soil is always kept on the surface. These strong soils will benefit greatly by liberal exposure to the elements in winter when uncropped, provided the winter be fairly dry and there be hard, penetrating frosts. Frost congeals the water in the soil, and in so doing causes the particles to burst asunder, so that when a thaw comes and also drying winds, the previous hard-clung soil is found to be pulverised and in excellent working condition. Wet winters or cold wet springs not only react adversely on the soil after the frost has broken it up, but positively make its condition worse than before. These are matters that require foresight. Certainly stiff soils should never be

worked when rain falls, has just fallen, or is imminent. It is in such case far wiser to allow clay soils, if the winter time be wet, to remain just as left after the autumn crop was taken off, as the worms create in it abundant pores for rain to pass through and air to follow. It is a good plan also to allow a crop of annual weeds, Chickweed or Groundsel, to grow on the ground during the winter, as keeping it more porous; or better still to sow on it early in October Rye, Oats, Tares, etc., to furnish a green crop to dig in during the spring. If a dry spring follows a wet winter, such soils will work far better than will those turned up for exposure early in the winter.

Dressings for Stiff Soils.

These should largely be of a gritty nature when obtainable. Sweepings of town streets, including manure and grit, are good; so also are dressings from country roads and trimmings from roadsides and ditches, stacked to decay and dressed with lime. Decayed leaf soil is good dressing; so also is manure containing plenty of straw fibre, as that helps to keep the soil porous. Corn stubbles are good in this way. Cow and pig manures, being cold, should be largely avoided. All these dressings—and not least vegetable ashes from wood fires or of garden refuse—are valuable aids to the better pulverisation, aerating, and feeding of stiff soils.

Light Soils

are more easily dealt with. These are of a sandy nature, and in such cases often deep, or a sandy loam on gravel, perhaps not very deep and soon drying; or of brash on chalk, also often rather shallow. But they need little special exposure to the elements, being always porous and therefore well aerated. They never retain water, which percolates away rapidly, and artificial drainage is not required.

In all these cases great good is done by breaking up the subsoils deeply, though again not bringing them to the surface. The greater the pulverised depth of light or dry soils the more readily can plant roots find moisture in dry weather, whilst the sun's rays penetrating into the soil serve to attract water from lower strata to the surface, and thus furnish moisture to roots that is not found where subsoils remain hard, impervious, unbroken. Whether these lower soils be sandy, or gravelly, or chalky, in any case they do in time become aerated, manured, and fertile, and crops find at once greater moisture and food than can be found on soils shallow worked.

During dry summers crops on deep-worked soils always thrive doubly as well as those growing on shallow-worked soils. Light soils, whilst benefited by almost any manure, are most so by applications of half-decayed stable or cow-house manure, as these are both fertile and retentive of moisture. Where practicable, a dressing of clay laid on in the winter for the frost to disintegrate is very helpful. So, too, is the addition of retentive loam. In summer all soils, no matter of what nature, may be in a large measure kept moist by having the garden hoe run over the surface frequently, thus keeping on it a mulch of fine soil.

Too much importance cannot be attached to this matter of preparing soils. Unless the soil is in good condition healthy growth is made impossible, and if beginners in gardening would only lay this truth to heart, vegetable crops would be more abundant in years of prolonged drought. Insufficient stress has been laid in the past upon the advisability of providing a firm foundation or root run, to prepare the plants for times when all their strength is necessary not merely to fight against insect plagues, but in times of drought. The way to make a plant ready for insect attacks is to strengthen it. Weakly stock is always first seized upon, whether of the greenhouse or the kitchen garden. In the articles upon the vegetable garden much space is devoted to the consideration of soil preparation, and we are pleased to find that the matter is receiving more attention now than heretofore from young gardeners.

A YEAR'S WORK IN THE GARDEN.

A BRIEF calendar of the year's work may be useful to beginners in gardening, and the information given will be brief, as the various details of culture and selection of varieties have been considered at some length in the various chapters of the work.

JANUARY.

The Flower and Indoor Garden.—The work to be performed this month depends largely upon the weather. Sometimes the ground is frozen hard, which stops all planting of trees, shrubs, and hardy perennials. Sometimes, on the other hand, it is very mild, when planting of all kinds may be pushed forward without hindrance. When arrears have to be made up, every opportunity should be taken at this time, as planting of deciduous trees should not be performed, if possible, when the sap has become very active. Therefore, where alterations must be made in the pleasure grounds, in the shrubbery, or in the border, work away with a will, forming good groups of Roses, and never performing the work in a niggardly, half-hearted way. Bold groups are a thousand times preferable to paltry clumps, dotted about here and there without any good reason, the result being a spotty, unwholesome effect, utterly unlike the restful aspect of the garden artistically planned and planted. One group of some beautiful Rose is more charming than the same bed occupied with a dozen varieties of varying colours and diverse habits of growth. When planting Roses or hardy flowers, keep them away from overhanging trees or shrubs with hungry roots, which fill the neighbouring soil and rob it of fertility. Follow the advice given in previous chapters upon the way to plant. Such plants as Dielytra spectabilis, brought on in gentle warmth in the greenhouse, are very pretty in the window or house now, and other things may be introduced also, the Persian Cyclamen, Chinese Primrose, and so forth. Hardy plants may be planted now if the weather is favourable, and remember the advice, previously given, that a group is better than a single specimen hungry-looking and unsatisfactory. This applies to the border as well as to the rock garden. Phloxes, especially the Phlox stellaria group, are never seen in true beauty unless allowed to ramble much in their own way. It will be very important at this season to regulate the temperatures of the various houses, Orchid, stove, and greenhouse ; but full information is given upon these points in the chapters dealing with this important phase of plant culture. Give water with great care, never overdoing it, and remember that no fixed rule for watering or syringing can be laid down. More moisture will be required upon one day than on another, and so forth, everything depending upon the outside temperature. Heed must be paid to those plants that are at rest, or at least not in full growth ; these need less water than those very active. Plants approaching their flowering stage, such as Chinese Primulas and Persian Cyclamens, are benefited by weak liquid manure. Azaleas, Lilacs, Staphylea colchica, and other shrubs, gently forced, will be of much service towards the end of the month for decorations. A number of shrubs, Guelder Roses amongst them, respond readily to a little artificial heat, not hard forcing. Carnations and Auriculas, and, indeed, every plant that is quite hardy, but given frame protection during the winter months, must not be coddled. Give air on all favourable occasions and water carefully.

PHLOX STELLARIA.

The Vegetable Garden.—There should be a good supply of forced vegetables now—Seakale, Asparagus, Chicory, and so forth. Rhubarb is forced, as our previous notes indicate, very easily, even under the stages of a warm plant house. Asparagus may have a dressing of manure, and plant a few Early Ashleaf Potatoes under a warm wall where

the soil is light, also a few Peas in the Southern Counties. Mice are often very troublesome to early Peas, and the usual way to prevent their depredations is to damp the seeds and roll them in a bag of dry red lead. Sometimes a paste is made of lead and water and the seeds rolled in it, but the former plan is cleaner.

The Fruit Garden.—Finish off the pruning of fruit trees and Vines at once, and keep a close watch for insect pests, especially American blight. Remedies for insect pests will be found in the chapter upon insecticides. Fruit trees may be planted also. So much information has been given upon fruits in previous chapters, that one need hardly write more now.

MALOPE.

FEBRUARY.

The Flower and Indoor Garden. — Open weather still enables planting of trees, shrubs, and hardy plants to continue, but so far as practicable all such work should be completed during the month. Where work of this kind may not be in progress, it still may be desirable to prune or thin out many shrubs, and even the heads of flowering or other ornamental trees. Then the soil of the border can be forked over, and if in the process some decayed garden refuse or manure be worked in, so much the better. Where hardy plants and bulbs are in borders the pointing with a fork should be very shallow, and a dressing of fresh soil strewn amongst the plants will do great good. Lawns should be occasionally swept and well rolled; gravel paths also. Where the latter are weedy, an application of some weed-killer will be of great service in cleansing them. Dwarf Roses may be hard pruned at the end of the month, especially where the stems are protected from frost by moulding soil about them. Standard Roses are best left till next month. All descriptions of Chrysanthemums may still be propagated by putting the stout young root shoots as cuttings into pots filled with sandy soil, and standing them in a frame or cool house. Dahlia roots from which it is desired to obtain cuttings for rooting should be placed in shallow boxes filled with cocoa-nut fibre refuse or soil, be watered, then stood in full light and in quite gentle warmth to start them into growth. All foliage plants in houses should have an occasional cleansing, using a sponge or soft brush to wash the leaves. Bedding plants of the ordinary tender order may have tops taken off and put into warmth as cuttings. Fuchsias especially give nice young tops for such purpose. Sow both tuberous Begonia and Gloxinia seed in shallow pans on sandy soil and stand in warmth. Give greenhouses and plant frames liberal ventilation on fine days, keep all decayed leaves gathered, and dry off rapidly after watering. Bulbs yet buried in pots outdoors in ashes may be brought into a greenhouse by instalments to get them into bloom. It is yet a good time to pot up Liliums, using plenty of sand about them. Plant perennials such as perennial Phlox.

The Vegetable Garden.—On warm borders make at once a sowing of Chelsea Gem Pea, and at the end of the month one of May Queen or Senator for succession. The first-named is but 2ft. in height; the latter two 3ft. high. In open and strong, deep, well-manured ground make a further sowing of Long-pod Beans, such as Seville or Johnson's Wonderful. Sow in rows 2ft. apart and thinly in the drills. Where a large frame is at disposal, make, if possible, a hot-bed of manure, put the frame on to it, half fill with soil, and then plant 12in. apart some Ashleaf, Ringleader, or Sharp's Victor Potatoes. Failing a hot-bed, put the frame down on a warm border and throw some soil into it to raise it, then plant. Such frames should be well covered up at night. At the end of the month plant any early variety on a warm border, where later it will be possible to give the plants some protection from frost. If a frame can be spared, sow seed in it now, and a fortnight later, of any early Radish, especially the pretty French Breakfast. Outdoors throw out on a warm border the soil 3in. deep, then put in a floor of stable manure 2in. thick pressed down, on that strew 1in. of soil, and on that sow Radish seed fairly thick, covering up with long litter until all the seed has made good growth. A cold frame is of great value for raising in it plants of Cos and Cabbage Lettuces, Ellam's or Nonpareil Cabbages, and Snowball or other early Cauliflowers. Small sowings of these seeds may be made on a warm border, but they must be well covered with litter or mats till plants are formed. In a warm house or frame sow seeds of Comet, Eclipse, A1, or other good Tomatoes. This should be done thinly in pots. If a good heat can be furnished, some dwarf French Beans may be sown in pots also. A thin sowing of Celery seed may be made in a pan. Seakale roots with stout crowns should be put, a few twice a month, into any dark warm place in soil to produce blanched heads. Look over all stored Potatoes, Carrots, Beets, or other roots and rub off premature growths. A few strong roots of Rhubarb may be covered over with large pots or tubs, and further with long litter, to promote early growth.

The Fruit Garden.—There is, where fruit is grown under glass, more work to be done as a rule inside than outside in February. But much depends how far really necessary work has been brought up to time. All pruning, if not completed, should be so at once. Even where wall trees, especially Peaches and Nectarines, have been unnailed from the walls to check premature blooming, pruning should be completed, even though the renailing be left till the end of the month. With these trees the great object of the pruner should be to cut out bare shoots and preserve stout young, well-budded growths. All bush and pyramidal Apple and Pear trees should have pruning completed, as also any trained cordon or espalier trees. The refuse should be collected and burned, the trees in every direction, as well as Gooseberry and Currant bushes, being first sprayed with soft soap, then densely dusted with fresh slaked lime or soot. Have Raspberry canes pruned back and, if needful, thinned, then loosely tied to stakes or trellises. Liberal dressings of manure should be lightly forked in over all fruit trees and bushes, and also between old rows of Strawberries. Plants of the latter in pots for forcing should now be stood in a frame to help start root action, or be placed in a cool greenhouse temporarily for the same purpose preparatory to placing them in good warmth on high shelves. A few such plants should be thus treated now and again at the end of the month. All Vines should have been pruned long since, but where done late touch over the ends of the cut spurs with painter's knotting. See that inside borders for early Vines and Peaches are thoroughly moist and get on a gentle warmth, increasing it gradually as the month proceeds. It is a mistake to fire up too hotly at the first. Where trees or Vines are planted on outside borders, cover the stems where they are exposed, as a sharp frost on them often does great harm when the sap is active. All fruit houses, whether heated or not, will be all the better for a good fumigation with XL All Vaporiser, as just yet aphides are weak, and much good may be done by a good fumigation. It is wise to fumigate before the pests have established themselves upon the plants, and not wait until every shoot is smothered.

MARCH.

The Flower and Indoor Garden.—Outdoors the bulbs are now breaking through the soil, and scraping over the surface with one or two pointed sticks helps to loosen the soil and give it a neat, fresh appearance. Even where beds have carpet plants over them similar treatment is desirable. March is a good month to undertake the transplanting of evergreen shrubs, but it should be done early, so that the development of bulbs and other flowers be not hindered. Where Roses have been untouched, long shoots may be partially cut back prior to the final pruning early in April. Still, in warm gardens or in southerly districts the final hard pruning may be done at the end of March. All descriptions of outdoor climbers, and especially Clematises, Roses, Ivies, and Virginian Creepers, should now have a hard pruning and be neatly tied or nailed ready for the summer growth. Seeds of some hardy annuals, and not least of Marguerite Carnations, Malope, Iceland Poppies, and similar things, may be sown under glass to secure plants to bloom in the summer and autumn. Plant out neglected layered Carnations or Pinks; indeed, anything that is hardy may be got out in open weather. Put Dahlia roots and Begonia tubers into boxes filled with soil or cocoa-nut fibre refuse, and after damping them stand in warmth to promote early growth for the purpose of making cuttings or division to increase stock. Seed of both Begonia and Gloxinia may be sown in warmth; also Coleus and Celosia, as these require a long season. In a small heated house or bed cuttings of all descriptions of bedding plants may be propagated by being set thickly into pots filled with sandy soil. Plants in greenhouses now beginning to push growth, under the influence of more light and warmth, should have plenty of ventilation and more water; many also should now be repotted. The same may be said of plants kept in rooms, all of which will greatly benefit by repotting.

The Vegetable Garden.—March is naturally a busy month in this department, especially southwards or where the soil is fairly light and porous, or generally if the weather be open and mild. But, all the same, much work that is habitually advised to be done should be deferred for a week or two if the weather be cold, wet, or frosty. A further sowing of any good Long-pod or Green Windsor Broad Bean may be made, selecting for this crop deep retentive soil. Both early and late in the month further sowings of good Marrow Peas should also be made, taking special care, as these crops will have to produce their pods in the summer, that the soil is deep and liberally manured. Where root cuttings of Seakale have been saved for planting, get these put out at once in rows 20in. apart, and each set 12in. from the other in the rows. Towards the end of the month get planted out on a warm border any Cos or Cabbage Lettuce plants that have been wintered in a frame. Any similarly wintered Cabbage plants may be got out on more open ground. Plant some medium-sized tubers of Jerusalem Artichokes in any outlying ground that has been deeply dug; also some tubers of Stachys tuberifera on a border in rows 18in. apart, the sets being 10in. apart in the rows. Where spring Onions are needed for pulling as salad, sow a few drills on a warm border; also make in the same way a sowing of Early Nantes or Model Carrot for early pulling in rows 12in. apart, and, where desired, very small sowings early and late in the month of Extra Early Milan Turnip seed. Plant early Potatoes yet only on a warm border where shelter from spring frosts can be given. A free sowing in the open ground and on deep soil may be made of Tender and True or Hollow Crown Parsnip seed, and on a warm border a few drills may be sown of Red Globe Beet seed for summer pulling. Make sowings in small beds of Brussels Sprout, Autumn Giant Cauliflower, and Snow's Winter White Broccoli seed, covering up from birds. A sowing of Victoria Spinach may be made, as also of Parsley seed. Sow some Celery and Tomato seed under glass.

The Fruit Garden.—In warm houses Vines will now be breaking growth. Special care should be taken to keep up fire heat, especially at night, as frost would do the young shoots great harm. The very weakest shoots may be thinned out when but a few inches long. Peaches or other stone fruits in houses will be getting into bloom. To help set the flowers, tie two or three rabbits' tails to a stick or fine bamboo rod and touch the anthers of the flowers lightly once a day. Also tap the branches occasionally to help disperse the pollen. Give plenty of air on dry days, but do not expose to cold draughts. Get into warmth gradually other instalments of pot Strawberries for forcing. It is best to get these into a frame on leaves first for a couple of weeks, then to take them into heated houses, standing them on shelves near the glass. In all cases look keenly for aphis or red spider, and, if found, fumigate at once with XL All Vaporiser, the best of all fumigators. In a pit or low hot-house both Melons and Cucumbers may be planted out on raised mounds of soil, consisting chiefly of strong turfy loam. These must have a temperature ranging from 70deg. to 80deg. of heat, the house or pit being frequently damped or syringed to check the development of red spider or thrips. Outdoors great attention should be given to Gooseberry and Currant bushes and to Plum trees to keep birds from injuring the fruit buds. Either net them over or dust freely occasionally with lime or soot. Peaches, Nectarines, and Apricots on south walls will be opening bloom. Some form of shelter, by the aid of canvas coverings that do not touch the trees, should be furnished them at night and on till the bloom is set. Any belated planting should now be completed, the trees neatly staked, and a mulch of long manure placed about the roots to keep them moist. Raspberry canes should be pruned to the desired length according to their strength, and be loosely tied to stakes or wire trellises. Look carefully over Black Currants for any burst and non-growing buds, and gather them to destroy because infested with the white mite.

APRIL.

The Flower and Indoor Garden.—In all directions work will now need to be done. Where there is a small hot-bed or means to furnish bottom heat in a greenhouse, especially in a close-shutting frame, cuttings of all descriptions of bedding plants can now be inserted into pots filled with sandy soil, and thus quickly induced to root. Also in pots and pans seed may be sown of many tender flowers—Gloxinia, Celosia, Cockscomb, Lobelia, Petunia, Verbena, Balsam, Zinnia, Asters, Stocks, Portulaccas, and so many other beautiful flowers that it is needful should be thus raised for later planting out. All hard-wooded plants as a rule now need shifting into larger pots, and such things as Azaleas, Camellias, Heaths, etc., need the compost to be one-half of peat, whilst Pelargoniums, Calceolarias, Fuchsias, Abutilons, and all similar soft-wooded plants, do best with little peat, but more of turfy loam, leaf soil, and white sand. Give greenhouses and frames containing plants, plenty of air now, and more water generally will be required than has been the case through the winter. Outdoors make quite early sowings of Sweet Peas in clumps and rows, but thinly. Sowings also may be made where they are to flower of all sorts of hardy annuals—Mignonette, Clarkias, Godetias, Annual Chrysanthemums, Æthionema, and of all similar things. Some may be sown thinly in small pots, and raised in a frame for transplanting. Outdoors give Roses a final hard pruning early in the month, and as growth ensues watch for maggot in the leaves, and destroy them. Clear away any old foliage from about hardy Ferns, and give a top dressing of leaf soil. All spring bulbs will bloom this month, and some—especially Hyacinths—may need small stakes to support them. Lawns will now need frequent mowing, and gravel paths sweeping and rolling, for every part of the flower garden will be looking neat and gay.

The Vegetable Garden.—There is probably no busier month in the kitchen garden than April, for then much cropping has to be completed. All Potatoes should then be planted, and it is an excellent rule, where practicable, to put in the late main crop varieties early in the month, and the earlies, that so soon come up, about the third week. Other sowings may be made of good wrinkled Marrow Peas, varieties that reach to a height of from 3ft. to 4ft. being best. Specially good for sowing this month are Sharpe's Queen, Gladstone, and Autocrat. Quite at the

ÆTHIONEMA.

end of the month a sowing may be made of Ne Plus Ultra, or Long-podded Negro Dwarf Kidney Beans, on a warm border, and a row of Ne Plus Ultra Scarlet Runners also, ridges of soil being left on each side, across which Fir branches may be laid, to protect the plants for a week or two at night should frosts prevail. At the beginning of the month the customary sowing of Onion seed, in shallow drills 12in. apart, should be made on good rich soil, and at the end of the month Onion plants raised under glass may be put out where they are to grow for the summer. Sowings also in shallow drills may be made of both Nantes and Intermediate Carrot seed, and whilst Turnip-rooted Beet should be sown early in the month, tapering-rooted varieties should be sown at the end of the month. A further sowing of either Victoria or Long Standard Spinach should be made as before, also of Milan Turnip. Salsify and Scorzonera should also be sown thinly in drills. Where plants are needed, make in the middle of the month a sowing of Seakale seed in wide drills, and at the same time, where young plants are needed, sow Asparagus seeds in drills 12in. apart. Lettuce, Cabbage, Radish, and Mustard and Cress seed may be sown each month. In a warm house or frame sow Vegetable Marrow, Tomato, and Cucumber seed. Make outdoor sowings of Brussels Sprouts, White Broccoli, Giant Cauliflower, Savoy Cabbage, Red Cabbages, and various winter Kales.

The Fruit Garden.—Bloom on fruit trees, especially on walls, opens so freely in April that it is needful to furnish some description of protection to it from late white frosts. This is best done in the form of tiffany, frigi domo, a scrim canvas, which, fixed to rollers in long lengths, can be let down over the trees at night and be raised in the morning after the frosts have gone off. It is difficult to furnish similar protection to bushes or pyramid trees in the open garden, but these do not habitually flower so early. In all cases when the sun shines out warmly, expanded bloom on trees may be helped to set or become fertile by running a bunch of soft feathers tied to a stick over the bloom, also by topping the branches to dislodge the pollen grains. Where early Strawberry plants are showing bloom trusses, after giving the soil between the rows a good hoeing, a mulch of long litter or manure may be strewn down, as that will mulch, and then later keep the fruits clean. Keep an early look-out for evidences of caterpillars on Gooseberry bushes, and hand pick them. Also, again, look after mite-infested buds on Black Currants, and pick them off, burning them at once. In the vinery early-started shoots should now show the prospective bunches, and bear gradual but very gentle tieing down to the wires. Remove all but one good shoot to a stem that carries the best bunch. Later, houses may be shut closer and kept warm to start the vines. Go over later Peach, Nectarine, or other stone fruit trees in houses, and fertilise the flowers as previously advised. In the case of the earlier trees all foreright and back wood growths, with one-half the rest, may be rubbed out. The chief buds to save are those that spring from the bases of the present shoots. Get more Strawberry plants in pots under glass, and the latest batch should now be in cool frames, to bring them on gradually to bloom without heat.

MAY.

The Flower and Indoor Garden.—Almost all kinds of plants are now in full growth, and require a little stimulant in the way of liquid manure. Pelargoniums require assistance of this kind. An important work which must not be neglected is the thinning of seedlings. When too crowded the growth is spindly and unsatisfactory. Early in the month Calceolarias and the hardier bedders may be put out, and later on everything except the most tender kinds will bear planting—Zonal Pelargoniums, and so forth. In the earlier chapters of the book much information is given with regard to bedding. Lift spring-flowering bulbs when the foliage has died down, not before, unless, of course, their removal is necessary, whether the bulbs are in leaf or otherwise. Keep a sharp look-out for green fly, which increases tremendously at this season, inflicting Roses in particular. Before it has made much headway it is wise to syringe sharply and freely with clear water, but if the pest has obtained much hold then fumigate with tobacco, or in the case of plants in the open ground dip the shoots in tobacco water.

The Vegetable Garden.—This month the grower, in

a great measure, will see the results of labour expended early in the year. Keep the hoe going to check weed growth on all favourable occasions, and in some cases moisture will be necessary for newly-planted crops, such as Cauliflowers, Brussels Sprouts, and early Celery from plants raised under glass. Seed sowing is also important, as now is a good time to sow main crop Carrots, Beets, autumn and winter Cabbage, and Peas for the early autumn supply, such as Ne Plus Ultra, Late Queen, and the Michaelmas Pea. Sow Runner Beans early in the month, as there is no danger of frost, and with the soil in a warm condition the seeds germinate more quickly. The new type of Climbing French Bean has found much favour of late years. Such kinds as Tender and True, Excelsior, and Earliest of All are valuable varieties. Broad Beans may be sown in strong soil, and a cool quarter is best for this late sowing, choosing a Green or Broad Windsor variety. Turnips for August supplies should be sown in the middle of the month in well-worked soil. Sow thinly, and select a cool quarter, as at this season Turnip fly is troublesome. Some growers damp over at sunset and dust with wood ashes and soot two or three times a week. This promotes growth, and once the latter is active the fly is crippled. Such crops as Savoys for winter are best sown thinly this month in an open place to become sturdy. Sow Lettuce in variety. Planting out is important both in May and June, and in the case of all such things as Brussels Sprouts, the early autumn and winter Cauliflowers, and Broccoli the earlier the planting is done the less attention the plants need in the trying summer months as regards moisture, and there is greater freedom from caterpillar with strong plants. Lettuce should be transplanted carefully in rich land, but better results will follow if the seed is sown thinly in drills and the plants thinned during the next three months. Celery raised in frames or in boxes should be transplanted in rows 6in. apart all ways. Earlier plants may be placed in their permanent quarters, as it is better to plant small plants than allow seedlings to get drawn. Celery seed sown on a warm border for late supplies should be thinned, as the plants grown thus may be lifted direct into the trenches. Frame Cucumbers should be sown and planted out this month. Thinning seedlings is important, as much depends on the thinning as to their future success. Asparagus should be thinned severely, also such vegetables as Onions, Turnips, Beet, early Carrots, Parsnips, and Spinach.

The Fruit Garden.—There is less work in this department than in the vegetable garden. Hoeing and clearing are necessary, and newly-planted trees may need mulching should the weather be dry or east winds blow. Wall trees should receive attention. Remove strong shoots as they appear, as these if checked at this early stage of growth will give more strength to other parts of the tree. Apricots should be thinned early in the month, taking these fruits in hand before any other, then following on with Peaches and Nectarines. Disbudding of the latter should now be completed, and cut out any shoots overlooked earlier. In a few cases blister may be troublesome; remove affected leaves, giving such trees more shelter than others. Recently-planted Strawberries will need attention in the way of moisture in dry weather, and remove flower trusses. Give Strawberry quarters that are at all weakly supplies of liquid manure as soon as the fruit is set, but it is well not to touch the tender fruits with the liquid. Thin the trusses on young plants required to carry fine fruits. Mulch the surface to keep ripe fruit clean, also to prepare plants for summer production by removal of all flower spikes.

JUNE.

The Flower and Indoor Garden.—Bedding, subtropical and otherwise, must be completed this month. Choose, if possible, rather a showery time for the work, and water the plants well afterwards until they become well established. Finish planting out the ordinary bedders of the Zonal Pelargonium type, and be careful to remove fading flowers. This applies to practically all plants, especially of the pod-producing type. The plants cannot bear a double burden, and unless the seed-pods are kept rigorously picked off, the display of flowers will cease. Pay great attention at this time to Carnations. Tie up the slender flower stems to neat sticks, and give water freely when the weather is dry. It is as well to stir the soil occasionally about the roots. This is an excellent time to sow seed of perennial and biennial flowers, either out of doors or in a frame, selecting a well-made bed for the purpose, where there is not too much sun. Choice seed should be sown in a shallow pan in a frame. Syringe Roses

ROSE, DOUBLE PERSIAN YELLOW.

occasionally, and transfer Primroses, Auriculas, and Daisies to a shady part of the garden, but water them freely. Put a stake to Hollyhocks, Dahlias, and any tall plant likely to suffer in a strong wind. Dahlias have become popular garden flowers, and the newer Cactus varieties are fast ousting the other forms out of the garden. This is not desirable, but there is no question that the Cactus Dahlias are sumptuous garden flowers, of a great variety of rich colours and beautiful form. The true Cactus Dahlia flower has pointed petals, slightly twisted, not broad and flabby.

The Vegetable Garden.—Peas will be turning in freely from the first sowing; also French Beans, which should be gathered whilst young, as they age quickly. Asparagus should not be cut after midsummer, and no vegetable will better repay feeding with a good fertiliser, such as liquid manure, given every three or four weeks from July to September. Young beds recently planted or from seed should be mulched with some light material. Both spent Mushroom manure or burnt refuse and leaf soil are excellent. All Potatoes should now be earthed up before top growth has advanced much. Trenches should be dug for Celery, and manure placed in them in readiness for the plants. Prepare land cleared of early Potatoes or Peas for winter Spinach; this needs good cultivation, and when the soil is infested with wire-worms or other pests dress freely with soot and fresh lime before digging. Planting will be an important work this month, as most kinds of Brassicas will be ready. Give Brussels Sprouts ample room—2ft. to 3ft. apart is none too much; also allow liberal space to the large-growing Cauliflower and Broccoli. The latter will suffer less in severe weather when grown in an open position. Leeks for early winter supplies are best planted this month, and in shallow trenches 2ft. apart, with a liberal supply of manure for the roots. Lift carefully, as they suffer badly in dry seasons if the roots are broken. Beans and Peas for autumn sown this month will need good cultivation. Sow thinly and in deep drills, well manured some time previously. Dwarf Beans may be sown for late supplies. Such kinds as the Canadian Wonder and the Climbing French Beans give good returns. Cauliflowers sown now will turn in for October supplies, but these are best sown thinly in rows, dropping a few seeds at intervals of 18in. apart, and thinning to the strongest plant when large enough. Sow Turnips for succession crops. Endive is an important salad plant for the early winter supply. Both the Green Curled and Batavian should now be sown. Sow Cucumber for pickling on ridges. Mushroom beds made now at the foot of a north wall or ridge shaped in the open will be valuable for supplies in the early autumn. Thinning, transplanting, and planting out will need timely attention. Make up blanks by sowing at the earliest date, covering the seed with mats to conserve the moisture.

The Fruit Garden.—There is more work daily needing attention under glass. Wall Vines will need more moisture, and disbudding is a point often overlooked in the case of hardy Vines, and thin bunches before they flower. Train the best shoots of wall Figs in to take the place of old wood to be cut out another season, and stop other shoots not needed for extension. Shoots of Peaches, Nectarines, Apricots, and other stone fruits on walls should be nailed in as growth strengthens. Nail in others not needed for extension, and in a few cases last season's wood not bearing fruit may be cut out, thus allowing more room for the new wood. Summer pruning or stopping is now an important work. Shorten the foreright shoot of Pears. Cordon trees also should be pinched close back to form fruit spurs, of course omitting the leaders needed for extension. Syringe over late in the afternoon wall trees of all kinds, especially Peaches and Nectarines. Apricots require much moisture in light poor soils, and well repay feeding. Go over Peaches and Nectarines carrying too much fruit, removing badly placed fruits or those too thickly placed.

PYRETHRUM APHRODITE.

JULY.

The Flower and Indoor Garden.—One of the most important duties this month is to propagate Carnations by layering. This operation has been fully explained in the article upon the flower, and one therefore need not enter into details on this occasion. Strike Pinks from pipings, and remove plants in the greenhouse, such as Camellias, Ericas, some Palms, and similar things, to a fairly shady place out of doors, so as to give them the benefit of a change of air and gentle showers. Continue to pick off seed-pods, and give Dahlias plenty of water and a mulch of manure. Remember that earwigs are best trapped by putting a little moss in a small pot and inverting it upon a thin stake. Search the pots early every morning when earwigs are very troublesome. Chrysanthemums will require constant attention. Consult Mr. Beckett's article upon these for advice. Less fire heat will be required in plant houses now, but much water must be given if the weather is very warm.

The Vegetable Garden.—This month the weather varies, sometimes excessively hot and dry, or with thunderstorms and rain. During a time of heat and drought there will be much labour in keeping newly-planted green crops going; indeed, at this time will be seen the advantage of advice given early to plant in May and June, thus enabling the plant to obtain roothold to stand extremes of weather. This is an important month as regards seed sowing, as from the 10th to the 20th is the best time to sow spring Cabbage. No exact date can be given, as much depends upon soils and situation. Ellam's Dwarf Early Spring and Mein's No. 1 are excellent varieties; on the other hand, the Early Rainham is a great market favourite, and very reliable for April and May supplies if sown at the early date named. In sowing spring Cabbage give an open position, not a sloping dry border; sow thinly, and make the seed bed firm if the soil is light. The Coleworts belong to this family, and are as useful for autumn and early winter supplies as the spring Cabbage. The Rosette is the best for autumn use, and the Hardy Green for winter. Sow thinly in good soil,

protecting the seeds from birds. Spinach is an important winter vegetable. Sow seeds in cold or late gardens, and few kinds are superior to Carter's Long Standing and the Victoria Round-leaved in the South. August will be time enough to sow this vegetable; sow in good soil, as previously noted. Carrots may be sown for winter use; seed sown now of such kinds as Early Gem or the Short Horn varieties will provide roots that may be left in well-drained soil all the winter. Sow Parsley for winter use early in the month. When the weather is dry and hot, water at dusk, and dust over with soot to promote growth. Previous sowings should be thinned, and last year's plants not allowed to seed, but given food in the shape of liquid manure. Early Potatoes should be lifted and stored in a cool place. Seed of these for next season should be "greened" by exposure in the sun previous to storing on shelves or in boxes; if the latter, allow plenty of air to circulate round the seed. Plant all winter Greens, as the season is sufficiently advanced to secure a good growth before winter. Celery for first supplies will need copious watering; food, also, if large heads are needed. Liquid manure is excellent for growing crops. Make the last sowing of Dwarf Beans on a warm border, using a dwarf variety. Sow thinly, or thin early, as the seeds germinate freely. Late Peas may be sown, but very early kinds must be selected, such as May Queen, Daisy, Chelsea Gem, and Bountiful.

The Fruit Garden.—Budding of fruit trees is done this month, but it should be performed by specialists, as they have the best stocks at command. Early Strawberry beds will have ceased to bear, and hoe between the rows after the mulch is removed. Mid-season and late crops in parched weather may need moisture to swell up the fruit, and let this be carried out when the sun is declining. Runners will soon be procurable for new planting; indeed, if the flower growths were removed, as advised, they will be ready early in the month. These may be layered by pegging down into good soil or in small pots; the latter is the best way, as the plants do not suffer when detached from the parent stock. Peaches at this date are at times infested with green fly, but more frequently with red spider in light soils and with much heat. Syringe freely late in the day, and in the case of trees on which the fruit is not too far advanced add a little flowers of sulphur to the water. In showery weather mildew is troublesome. Dust the trees over with dry sulphur. Cherry trees are often infested with black fly, a troublesome pest. Dip the points of the shoots at once in a solution of quassia or tobacco water, and when dry dust with tobacco powder. Fruit borders in dry weather will need mulching with short manure to retain moisture and keep the surface roots from injury. Also water freely to assist the fruit to swell.

AUGUST.

The Flower and Indoor Garden.—During this month many shrubs may be layered, and cuttings taken of bedding plants to create stock for another year. Sow seed of Forget-me-nots, and tufted Pansies may be propagated by taking off the little rooted side pieces, not the hollow stems, but those tufted bits which soon become established in a cold frame. It is wise to have plenty of Pansies because the plants if not in a very hot position flower with wonderful freedom; the colours of the various flowers are delightfully varied from white through mauve, purple, to blue. It is important to get plants of quite tufted growth, as these flower over a longer season and more freely. Stir up the surface soil of the flower beds occasionally to let in sunshine and air. A hard-caked surface is of little value to plants in the flower beds.

The Vegetable Garden.—The summer crops, such as the early and midsummer Peas, will have finished bearing and may be cleared away. Broccoli may still be planted, but let the work be done immediately. Celery will need food and moisture, and more soil placed to the roots to blanch for early use, but defer blanching of the later lots for some time, as by so doing moisture and food can be given and there is less fear of bolting. Cut herbs for drying and dry them in the shade in a cool place. Spring-sown Onions in early gardens will have matured sufficiently to lift and dry on boards or shelves previous to storing. Should growth be late, bend over the tops of the thick-necked bulbs a week or two previous to lifting, and place the roots in dry weather on the soil to harden before housing; but they soon decay in damp weather, and keep badly if second growth begins. Spinach sown in July should be well thinned. Sow seed of winter Onions early in the month in soil made firm by treading in dry weather. Such kinds as Giant Rocca, White Naples, and the Leviathan Italian are excellent for this purpose. Lift Garlic, and dry for winter use; also Shallots. Globe Artichokes, as the crop is cleared, should be cut down, and the land between the plants well dressed with decayed manure. Cardoons may now be blanched, but if moisture is wanting they will run to seed badly. There should be no delay in planting out salads, such as Endive, for autumn supplies; and make another sowing of Lettuce to stand the winter at the end of the month, sowing the Hardy Hammersmith Cabbage or Hick's, and Bath or Brown Cos. So much depends upon the locality. If cold, Lettuces are best sown late this month to stand the winter, but in the South the middle of September is sufficiently early. Cabbage sown early in July will need attention in the way of moisture and thinning. Avoid a crowded seed bed, and make another sowing to give a succession to the earlier lot; the same varieties are still the best for the purpose. Plant out Coleworts as they are large enough. They like rich soil and not much space. Twelve inches apart all ways will suffice. Sow the Hardy Green Colewort for use early in the year; also Cauliflower for May and June supplies. The Early London and the Walcheren are reliable Sow thinly and in good soil. Pickling Cabbage may also be sown; and a large sowing of Turnips should be made for winter use, such as Red Globe, Golden Ball, or Perfection.

STANDARD ROSE.

The Fruit Garden.—August is a trying month in many fruit gardens, as so many trees need attention. Fruit of early Cherries will have been picked, but there must be no lack of moisture both at the roots and in the way of syringing of wall trees to keep the foliage clean.

Protect late Cherries, also Currants and Gooseberries, from birds. The early kinds of Apples, such as Duchess of Oldenburg, Irish Peach, and Mr. Gladstone, are of better quality if the fruits are gathered from the trees a few days in advance of eating. Culinary kinds, such as the Keswick Codlin, Mank's, and Lord Grosvenor, are best gathered and placed in a cool store, as if left too long many fall. The fruits of early Peaches, such as Hale's Early and Alexandra, should be gathered early in the day. Rivers' Early Nectarine is invaluable this month for first crop on open walls. Strawberry plants layered last month will now be ready to plant. The ground for these should be double dug or trenched and a liberal supply of food be given. Raspberries will crop longer if given a mulch and moisture in dry weather, and as soon as the crop is cleared cut out the old fruiting canes. The growth of autumn fruiters should be regulated, weakly shoots removed, and strong ones supported on wires or stakes. Alpine Strawberry plants should be fed freely in dry seasons, and the fruit thinned for latest supplies.

SEPTEMBER.

The Flower and Indoor Garden.—This is an important month, as evergreen shrubs may be planted now; indeed, no better time can be chosen for the work. Towards the end of the month take up tender plants that are to be preserved through the winter months. Make a sowing of annual flowers. A list is given of the kinds to sow at this time. Strike Roses from cuttings, plant Carnation layers and bulbs, and gather seeds. It is an important month for bulb planting; indeed, the writer puts in almost everything now—Scillas, Narcissi, Daffodils, and so forth, keeping back the Tulips until October. There is a wonderful selection of beautiful flowers to be obtained amongst the hardy bulbs. Daffodils and Tulips are hosts in themselves, and bold masses create rich effects. Towards the end of the month more fire heat will probably be necessary, and at any time sharp frosts may be expected.

The Vegetable Garden.—The hoe should have no rest in favourable weather. Digging of quarters needed for winter crops is essential in many gardens where double cropping is carried out; this work is often a laborious process if at all dry, and it is adviseable that it be done when rain has moistened the soil. Cabbage may with advantage follow Spring Onions, as the land will be in good condition, and in planting Cabbage, if the weather is dry, draw drills, as plants may then be watered more effectually. Sow Lettuce, as advised in August, for spring crops, as at times August-sown plants may be too large to winter well. On the other hand, if the weather is mild there is a great gain of time with August-sown plants. Corn salad sown now will be useful for late autumn and early spring. Endives will be large enough to plant out. A good breadth of the Batavian will be useful for winter supplies if the plants can be protected. Large plants of Lettuce may be lifted with their roots and placed in cold frames for autumn use, and some of the earlier-sown autumn seedlings may be transplanted at the foot of a south wall; they will winter here better than in open beds. The same advice is applicable to Endives, as often the large-leaved Batavian will pass through a winter safe if planted now, as advised. Parsley should be thinned, and some roots of the spring-sown seedlings lifted carefully into frames, or a bed may be covered over with frames and sashes. It is also a good plan to place a few roots in pots or boxes where frame room is limited. Late Potatoes should now be lifted. For late tubers the best mode of protection is doubtless potting, and, what is so important to the grower, treated thus they keep longer if well protected by soil. Tomatoes on walls should be gathered at the end of the month and placed on shelves to ripen. Frost will injure fruits not quite matured. Gather Capsicums grown in frames and dry them. Vegetable Marrows if cut and placed with the stalk end in water in a cool place will keep for weeks. The same advice is good for Beans fully grown. Encourage late Peas to grow freely, and should mildew be at all troublesome dust with sulphur, or syringe with a solution of the same. Roots that need ripening, such as Seakale for forcing, should have the old leafage removed and weed growth destroyed to admit air freely.

The Fruit Garden.—This is a busy month. The best kinds of Peaches, Plums, and early Pears will be in season. Peach trees should be gone over at least every other day, and ripe fruits placed in a cool fruit store, as if left till the stalk is loose the fruit will not keep long. Many of our best Pears, such as Louise Bonne of Jersey, Marie Louise, and many others, will be ready to place in the store this month, but there should be no undue haste, as the fruit keeps better when allowed to hang as long as possible. In the ease of late Peaches and Nectarines remove all leaves that cover the fruit, and with regard to Figs cut away wood not needed for next season; this will admit light to the trees, and mature the new wood. After the fruit has been gathered from Peaches, Nectarines, and Figs cut out the old fruiting shoots to save pruning next spring, and the wood will then ripen better. Any shoots of Pears or bush Apples not summer pruned may now be taken in hand. Cut secondary growths back to within a couple of buds from their base, and weak shoots may be cut away in the case of crowded trees.

OCTOBER.

The Flower and Indoor Garden.—Towards the middle of October all tender flowers must be removed from beds and borders, the soil well manured and deeply dug, then planted with bulbs of divers descriptions, somewhat deeply, the soil being then planted with various hardy spring flowers or foliage plants to make the beds green for the winter. Plants thus removed may be put into boxes thickly, or in any way preserved, and be placed in a greenhouse or frame out of the way of frost. All descriptions of deciduous trees or shrubs needing planting, and especially flowering ones, should be attended to now. Then may follow, where needed, lifting, dividing, and replanting, after well manuring and digging the ground, all descriptions of hardy perennials. Fresh ones from the nursery may also be planted now, so also Foxgloves, Sweet Williams, Canterbury Bells, Wallflowers, and other biennials. It is a capital month for the performance of work of this description, and the garden is, in consequence, very gay in the spring and summer following. Leaves that now fall thickly should be collected and stored in heaps, as the matter produced when in a decayed condition is valuable for potting or as manure. All climbers may have now a partial trimming to keep them fairly neat. Early in the month put a last batch of cuttings of Geraniums, Calceolarias, or similar plants into 5in. pots filled with sandy soil, and stand them on shelves near the glass for the winter. Plant window-boxes with small hardy conifers and shrubs, bulbs, and some hardy plants for carpets. Begonia tubers should be lifted from the open ground where they have grown during the summer, dried, then stored in boxes. Canna roots and Dahlia tubers, the stems cut hard down, should also be lifted and dried, then stored on shelves or in boxes, and be kept in a mild but not warm store for the winter.

The Vegetable Garden.—During this month, and as early as practicable, all late Potatoes should be lifted, sorted into eating, seed, and small sizes, then properly stored after being well dried. In ground that has carried summer crops plant Cabbages, Coleworts, and late-sown Savoys to turn in small in the ensuing spring. All Onions should have been cleared from the ground, well dried, then cleaned, and roped or stored in a cool dry place. Towards the end of the month lift for winter storing the stocks of spring-sown Carrots and Beets, just rubbing the soil and leaves off, then storing them in a very cool place in dry sand. Tomatoes outdoors should now be cleared off; partially ripe fruits will finish off in a warm room, and green ones may be converted into pickle or preserve. Any seed Marrows should be cut and placed under cover out of reach of frost. Seed Runner Beans should be gathered, lest frosts open them and dislodge the beans. The rows may be cleared away. At the end of the month any Herbs not stored should be cut, dried, and put into paper bags for use as needed. The latest sowing of White Turnips may be moderately thinned. Where White Broccolis are strong grown it is well to lay them on their sides, taking out a spit

of ground from behind each plant, then throwing the plant on to its side and laying the spit of soil from behind the next plant on to the stem to keep the plant down. Finish earthing up Celery, well patting down the sides of the ridges to exclude rain and air. Where spare portions of ground are to be trenched it is well to get on to them liberal dressings of manure, then, as the trenching proceeds, bury the manure between the upper and lower spits of soil, as that furnishes the crops with food and moisture during the summer season.

The Fruit Garden.—Generally October is the best month for planting fruit trees and bushes of all descriptions. The soil being yet warm root action is created and the trees soon get hold of the soil. Planting in all cases should be done only where the soil has been deeply worked and well cleaned. The addition of fresh manure is not needful if the ground has been previously manured and cropped. In any case such applications are best given to fruit trees on the surface. Do not plant deep, and always have the holes amply large to enable the roots to be laid out thinly. Late Apples and Pears should be gathered by the middle of the month. If the season be dry trees carrying late crops of fruit benefit much by liberal waterings. Store all Apples and Pears in a cool shed or house, where some ventilation can be given, but where the temperature at any time does not fall below freezing point. It is also a capital time to commence root pruning of trees that make excessive wood growth and produce little fruit. Cuttings should be taken from Currant and Gooseberry bushes so soon as the leaves have fallen, and should be properly made and planted, as early planting encourages early rooting. Raspberry suckers may be lifted and planted in clumps of three, in rows 4ft. apart, on good fresh soil, to make new plantations. Strawberry beds should be well cleaned, have the soil gently loosened and some manure laid over it. Plants in pots for winter forcing should have some of the earliest stood in a cold frame, and the rest stood on a dry ash floor and well packed with ashes for the winter. Cut bare back now all inside or outside Vines that have dropped their leaves. Also if new Vines are to be planted, do that speedily. Fruit trees under glass may be untied from the wires and pruned, and any planting required may be done now.

GLADIOLUS GANDAVENSIS.

NOVEMBER.

The Flower and Indoor Garden.—Bulb planting should be fully completed this month. Hyacinths, Tulips, Narcissi, and many smaller hardy bulbs can be liberally planted in all directions, both in beds and borders and on grass. Specially should many be put into pots, one large Hyacinth root into a 5in. pot and five Tulips into a 6in. pot. Narcissi or other bulbs should be proportioned to the size of the roots. When potted stand on a dry, hard floor outdoors, and cover up thickly with ashes or cocoa-nut fibre refuse for several weeks to cause roots to be formed ere the leaves develop. Take up Gladiolus bulbs that have ripened, dry them, save the small bulblets at the base of the bulbs, and keep them separate for sowing in drills the following spring. Store the large bulbs in dry sand in boxes for the winter, as these are generally tender. Plant small and especially evergreen variegated shrubs and conifers in otherwise empty beds, and add clumps of bulbs in plenty and in variety. Clear up all leaves that will cease falling by the end of the month, and thus leave the flower garden neat. Work in planting or renovating left undone from October should be completed now, as it is undesirable to have pleasure gardens in an untidy state all the winter. In greenhouses and frames ample preparation must be made to protect tender plants from frost and also from damp. In the greenhouse give fire heat when the temperature is low or the air is very damp, giving a little top air at the same time. In frames let the lights be thrown open on dry days, but be close shut on wet ones; cover these up well at night if frost prevails. Chinese Primroses, Cyclamen, Roman Hyacinths, Chrysanthemums, and various hard-wooded plants should be flowering freely in a warm house. Water at this time of the year somewhat sparingly and with care.

The Vegetable Garden.—Work this month is more restricted, but yet plentiful. There should be activity in manuring and trenching all vacant plots of ground to have them in good condition for spring cropping. Heaps of all descriptions of garden refuse, especially such as have been used to grow Vegetable Marrows, should be turned, have a good dusting of soot given in the process of turning, and then be utilised as manure. Go over Asparagus beds and remove all decayed growths, then, forking off 3in. or 4in. of the top soil, place on the surface a thick dressing of half-decayed manure, and recast over it some of the soil to leave the beds neat for the winter. It is desirable to place some long litter or Fern round the young sucker growths of Globe Artichokes, adding a little soil to keep it in its place. Draw ridges of soil over Celeriac to keep it secure from frost. Also do the same to White Turnips in drills, and over Parsnips left in the ground. Complete the moulding up of Celery, leaving the ridges very firm and neat. Trench out Seakale and Horse-radish, putting the strong roots into soil thickly for use as needed, and saving side roots to make cuttings for future increase. Some Seakale may be put into a warm dark place in soil to produce early blanched heads. Give Potatoes that are stored in pits or clamps additional covering in case severe frosts come. Go over late Giant Cauliflowers, and as they show small white heads break down the outside leaves over them to protect from frost. Have covering material ready to protect frames in which are Endives, Lettuces, Cauliflowers, etc., or to place about similar plants that may be growing in the open.

The Fruit Garden.—The month of November should be largely utilised for the purpose of getting fruit trees and

bushes planted, or transplanted, as this is work better done early than late. Also, where needed, continue to root prune coarse woody trees. It is a good month, especially on mild days, to go over wall trees and prune them, doing this generally rather hard than otherwise, and in the case of Pears that have become too thick-set with large spurs, cutting some clean away to compel the formation of new shoots to be pinched to form new spurs Figs especially should have old branches cut out to make room for young ones, and where the weather is very severe in the winter it is well to unnail the trees, bundle them up by tying, and wrap them in mats for a few months. Go on pruning all trees and bushes in the open, burning the trimmings. A solution of caustic soda, 2lb., and of commercial potash, 2lb., dissolved in hot water, with 20 gallons of water added, and 4lb. of soft soap, makes a capital liquid with which to gently spray all fruit trees and bushes to destroy insect life. Get more Strawberry plants in pots into frames, to bring them on gradually prior to putting them into warmth to force later on. Complete the pruning of Vines, Peaches, Nectarines, and similar trees under glass, and give these during the winter two sprayings or gentle syringings of the solution just described, as that is most efficacious in clearing the trees and houses also. Fruit tree borders under glass will be benefited now by removing a few inches of the surface soil, adding a dressing of half-decayed manure and strewing some fresh soil over that, and an occasional liberal watering given through the winter, as Nature does outside, will be productive of great good to Vines and trees.

DECEMBER.

The Flower and Indoor Garden.—This month little is in flower out of doors, chiefly Christmas Roses, which provide plenty of welcome cut flowers when a hand-glass is placed over a tuft in bud. This protection shields the flowers, which otherwise would become bespattered with soil. Clumps may be lifted also and brought under glass. Chinese Primulas and Persian Cyclamens will keep the greenhouse bright with colour. At this season watering is an operation that must be carried out with extreme care. There is no better plan of ascertaining whether a plant requires water or not than by rapping the pot. If it gives a clear ringing sound, then water is certainly needed; but if dull and heavy, sufficient has been given. When watering give a good dose at each application; never water in driblets. Never let the greenhouse go below 40deg., but a better temperature to maintain is one of 45deg. Plant out trees and shrubs, Roses, and so forth, when the weather is suitable. Forced Hyacinths are welcome now.

The Vegetable Garden.—The work in this department will chiefly consist in preparation of the soil for future crops, and one may do much in the way of digging, manuring, and trenching the soil. Every advantage should be taken when the ground is dry or frozen to wheel manure to the plots that require this assistance. Avoid puddling the soil, and all light or medium soils should be trenched sufficiently early to enable frosts and winds to sweeten the surface soil newly turned up. Forcing of vegetables will form an important work in this department. Seakale should be placed in the forcing or Mushroom house every fortnight in sufficient quantities to provide the supply. Those without conveniences for forcing may cover the plants in the open with pots, which should be smothered with litter, but avoid overheating. To prevent this a goodly portion of leaves mixed with the manure will make the heat more lasting and less violent. Asparagus should be forced under glass, and a gentle bottom heat, with a temperature of 60deg., will be sufficient. Permanent beds should now be prepared for forcing, to give a succession in February and up to the time the beds in the open ground provide material for cutting. Rhubarb will be in greater demand after the New Year, and place roots of an early variety in the forcing house every three weeks for the next two months. Radishes force easily; make a small sowing to give a supply in three months. A few early Potato sets may now be started for pot or frame work, to plant out early in the year. Endives should be protected in the open, and that under glass covered as needed for blanching. Choice vegetables, such as late Cauliflower and early winter Broccoli, will need protection; if the heads are formed it will be well to lift, with roots intact, and house in a cool place, as only a few degrees of frost injure the tender flower. Celery should be protected, and late plants receive their final earthing up. Free Lettuce on a warm border from all decaying matter, as damp is fatal at this season. Lift Jerusalem Artichokes, and sort and clamp like Potatoes. Prepare the land for other crops, and remove every trace of the Artichoke, as it soon spreads. Protect Globe Artichokes with bracken or litter, and in places where these plants winter badly a few shoots may be potted up and housed under glass for planting out in April. Cabbage plants in the open should be made firm by trenching, and then moulded up to protect the stem growth. Make up Mushroom beds monthly from now onwards until the month of April. After that better crops are secured from beds in the open if the Mushroom house is at all warm.

The Fruit Garden.—This month, though anything but a cheery one to the fruit grower, is most interesting. Planting, pruning, and cleansing are important, and the first-named should be proceeded with on all favourable occasions. It is useless to plant in frozen ground; and, though it is at times difficult to escape frost, it is well to defer the work till the soil is in suitable condition. Pruning of trees may proceed, and, in many cases, it is wise to remove useless old spur growths. Newly-planted trees should not be formed at planting, but merely shortened back early in the spring. Nail wall trees and give clean shreds or ties. Care is needed in tying young trees to allow sufficient space for the wood to swell. Trees covered with scale or moss may now be cleansed, and give old walls that harbour insects a good syringing of strong insecticide, detaching the trees from the walls before doing the work. Prune Currants and Gooseberries where birds are not troublesome. Newly-planted trees should be staked, and the surface soil mulched to prevent frost injuring the roots. Detach young growths of Peach and Nectarine trees from the wall to retard the buds, and protect Figs.

It is now my pleasing duty to heartily thank all who have assisted in achieving the object set forth when the Century Book of Gardening was commenced, that is, of making it a "comprehensive work for every lover of the garden." The task of illustrating the book has been no light one, and particularly is this the case with regard to the pictures of specimen flowers, vegetables, and fruits. For valuable assistance rendered in this connection my best thanks are especially due to Messrs. Carter and Co., the famous seedsmen, of High Holborn; to Messrs. Sutton and Sons, whose nurseries at Reading are world known; to Messrs. Kelway and Son of Langport; Messrs. Barr and Son of Surbiton; Messrs. William Paul and Son of Waltham Cross; and Messrs. George Bunyard and Co. of Maidstone.

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Editor of "The Garden."

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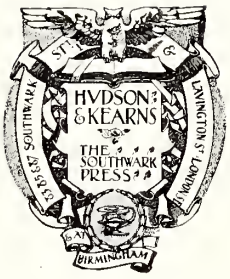
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