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AN ARTISTIC CORNER.

Tulips in a rough-hewn stone vase.

Photograph by Mrs. Grace Cumberland.
SATURDAY IN MY GARDEN

A PRACTICAL GUIDE TO THE CULTIVATION OF SMALL GARDENS, WITH HINTS ON THEIR CARE AND MANAGEMENT

BY

F. HADFIELD FARTHING, F.R.H.S.

WITH OVER ONE HUNDRED DIAGRAMS AND PLATES ILLUSTRATING ALL THE IMPORTANT GARDENING OPERATIONS OF THE YEAR

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The diagrams, which will be found to be not the least valuable feature of the volume, are the work of Mr F. Wood, whose practical knowledge of horticulture is exceeded only by the skill with which he has delineated the various operations that are essential to the daily practice of the science and art of gardening.

F. H. F.
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CHAPTER I

THE PLEASURES OF GARDENING

"It is a pleasant employment and profitable to one's pocket, and such an exercise of the body as fits a man for everyday duty which a free citizen may be called upon to perform."—Xenophon:

"God Almighty first planted a garden: and indeed, it is the purest of human pleasures."—Francis Bacon.

The love of flowers is instinct in mankind. It makes itself apparent in the earliest days of childhood, when the height of ambition is reached if one may become the sole possessor, the guardian and the tiller, of even the smallest plot of ground. It is, likely enough, a very modest piece of Mother Earth, chosen because it is situated in an out-of-the-way corner, and possibly because it is out of sight. But it is your undisputed property, and you are left to follow your own devices; to dig, to sow, to tend and to gather the produce—if there be any!—how and when you yourself shall determine. The youthful owner becomes, unconsciously, a philosopher. It is the sense of ownership which appeals most strongly to his untutored and undisciplined nature. The quest of the beautiful, the desire to excel in the art of gardening, the determination to induce the soil to yield its richest treasures at his behest are a later development of his maturer years. But the consciousness of ownership and the desire for possession are among the earliest characteristics of childhood, and so sure a foothold do they obtain that the onward march of after years neither obliterates nor eradicates them.

If, therefore, I place first among the pleasures of gardening the gratification of this instinct for ownership, I shall do no violence,
I trust, to any code of ethics. If any defence were required, it would merely be necessary to appeal to the derivation of the word "garden" for a complete and overwhelming justification. The dictionary gives "geard" (Anglo-Saxon): "a yard, or walled enclosure." Here we have the idea of ownership set forth in its simplest and most direct form. It suggests seclusion, quietude, freedom from prying eyes—a refuge in which, secure from unwelcome intrusion, its owner may at his will and pleasure commune direct with Nature, and transform his "walled enclosure," to quote the dictionary once again, into "a place, particularly fruitful, well cultivated or delightful: a very pleasant spot."

Adam Smith, the father of British political economy, in his "Wealth of Nations," says, cogently enough: "A gardener who cultivates his own garden with his own hands, unites in his own person the three different characters of landlord, farmer and labourer." He is, therefore, the possessor, or at least the tenant, of his plot of ground; he is his own master, and his time is at his own disposal. But if he be a true lover of gardening he will not be satisfied to coquet with his hobby. He will not regard it as though it provided him merely with an occupation for his spare moments during the bright days of spring and summer. He will come to realise, with a sense of conviction that will increase as season follows season with never-failing regularity, that gardening is essentially an all-the-year-round pursuit. If a man cultivate his own garden with his own hands he will find, as he makes a closer and more diligent study of the requirements of his trees, his vegetables and his flowering plants, that a new task awaits him every day of the calendar year.

Again, if we consider the influence of gardening upon the development of character, we shall find that it stands pre-eminent among all the occupations to which a man can set his hand. It inculcates the virtues of patience, so that he comes to wait with philosophic resignation for the fruit of his labour; of determination and strength of will, so that he does not fall into the fatal error of procrastination, but accomplishes the task that awaits him with
A Terraced Garden.

Note the rockery, the rustic steps and the well-designed trellis clothed with climbing roses.

Photograph by H. Gosney.
a promptitude which alone can ensure success; of constancy, for he speedily learns that if he neglect or be indifferent to the claims of his garden it will soon become an object of reproach, a mere wilderness in which the weeds will choke and exterminate his choicest flowers and plants.

Gardening, as every man who has practised it diligently and intelligently soon realises, is an unexampled developer of the faculties. Observation, ingenuity, foresight and alertness—all are brought into constant activity daily and hourly. One has known or has heard of so-called gardeners whose sole idea is to thrust a plant haphazard into the soil and be content to leave it to its own devices, indifferent to its welfare, not caring overmuch whether it produce its blossom or not. Not so the true devotee of the art and craft of horticulture. A little experience speedily convinces him of the need to study the requirements of his plants, to observe their habits, to seek to discover the situation in which they thrive best. He is attracted rather than repelled by the difficulties that confront him, and by the certain knowledge that if he master them, and do not permit them to vanquish him, Nature will work hand in hand with him as he works hand in hand with Nature, and that a rich and abundant reward will surely be his.

How indispensable, too, is the exercise of the faculty of foresight, of prevision, of looking ahead! It is an indisputable axiom that next year's garden is made out of this year's. In the height of summer, when beds and borders are aflame with colour, and are displaying their beauty with lavish prodigality, they are providing the cultivator with the wherewithal to increase his stock by the various methods of propagation that he has learned to practise, and by the provision of seed which when ripened will enable him to multiply his plants a hundred and a thousand fold if it be his royal pleasure. But neglect to propagate at the psychological moment, the omission to gather and store his seed when it is ripe and bounteous Nature offers it without stint and with no demand for payment, will be fatal to his hopes of future success.
If we contemplate gardening in its recreative and physical aspects we find it supreme. It is a hobby that appeals to and may be indulged in by men and women of all ages, and all conditions of life. It takes its votaries out of doors, into the open air, the sunshine, the frost, the cold and the warmth of our ever-changing climate, and makes them hardy, so that they are better able to withstand the onslaughts of insidious bacilli that lurk in stuffy rooms and improperly ventilated offices and workshops. It is unnecessary to dwell upon the advantages of a few hours' steady digging, upon the certitude with which it brings into play every muscle in the human frame, upon its invigorating effect upon the mind and the nerves, so that if afterwards one is obliged to engage in mental work, the brain is found to be clearer and the nerves steadier than could have been regarded as possible. And then how the perspiration streams from every pore of the body after the mowing machine has been brought into play on the lawn on a hot summer's morning! Such exercise is as effective in its health-giving properties as a Turkish bath, and quite as pleasant. But in whichever direction we may turn in contemplating the healthful exercises of gardening, whether it be trenching or pruning, planting or seed-sowing, wheeling a well-filled barrow or sweeping and tidying up, we find that each and all help to give tone to the whole system.

As an antidote to lassitude, the martyrdom of indigestion and the worries of everyday work, gardening cannot be excelled. It is a hobby that never palls, and never becomes monotonous. Its endless variety is its greatest charm. Some new task awaits you every day. You are your own master, you may dispose of your time as and when you please, and you may choose the work to which your changing mood may attract you. And there is this to be said for gardening: that once the afflatus is upon you, once you have surrendered yourself, whole-heartedly, to the goddess, your devotion will never slacken—you will remain a gardener so long as life shall last. You will desire above everything to be your own gardener—whether you be the single-handed worker in a modest patch or whether your means will allow you
to call in to your aid the extraneous assistance of a staff of skilled craftsmen. In the latter event you will at least be in a position to criticise and correct the operations of the professional gardener. But if you have health and strength, fortified by the knowledge that comes by experience, you will seek to cultivate your own garden with your own hand. Thus and only thus will you reap the full measure of enjoyment that can be wrested from it.
CHAPTER II

HOW TO PLAN A SMALL GARDEN

In these days of Town Planning and of garden cities, it is well that the subject of garden design should not be entirely neglected in a volume of this character. It is not every owner of a garden to whom the opportunity is afforded of taking a share in the planning and laying out of his plot of ground. If he live in a great city or in the suburbs of a large town the chances are that when he becomes the tenant of his house he finds the shape of the garden inexorably fixed for him; its paths constructed, its beds and borders made, and its grass plot, such as it is, already laid. It is either the work of the builder who has no soul above bricks and mortar, or of the previous tenant, who has had neither the time nor the inclination to make his garden a thing of beauty.

Happy the real lover of gardening who finds himself in a position so fortunate that, either as the owner or the tenant of a virgin strip of land, he is able to design his garden so that it become, as it should do, a true reflection of his own personality! Less happy, but still fortunate, the gardener who succeeds an owner or tenant with tastes akin to his own! The garden may not be all that he thinks it ought to be, but his keen and practised eye soon tells him that by a slight diversion of a pathway here, the widening of a border there, and the introduction of a bed or series of beds elsewhere, the appearance of the garden can be improved, so that it will be brought more nearly into conformity with his ideas. Least fortunate of all is the enthusiast whose means are somewhat limited, and who finds himself restricted to a tiny area of ground upon which the Philistine hand of the speculative builder has left its mark. The enterprising and obliging builder has “laid out” the garden. He has, it is true, very crude
notions upon the subject of garden planning, but he has, with
the best intentions, put it "in order" for you, and thus, as he
fondly imagines, saved you trouble and expense. You survey
the scene and the prospect is certainly not one that pleases. It
consists, not improbably, of a narrow strip of land—you are
lucky if it is more than fifty feet in length—enclosed by a slender
wooden fence; the border, if there be one, is not more than
eighteen inches or two feet wide, and the chances are that it is
placed on the side of the garden which is supplied with least
sunshine; the paths are all monotonously straight, and the
grass plot, if there be any, is a miserable little affair that has
been unevenly laid upon a foundation best calculated to kill right
away the turf that has been deposited upon it.

Your gorge rises, and in an excess of zeal to put things right
you begin to dig. A few thrusts are made with the spade, and at
the third or fourth effort to loosen the soil a severe jarring of the
arms acquaints you of the fact that there is an obstruction in the
way. It is perhaps half a brick or a massive lump of cement that
distresses you. And so it goes on until you are sorely tempted to
give up the effort in disgust.

It is only the obliging builder's little way! Your house has
no doubt been erected on what was formerly a meadow. The
builder has removed all the turf and sold it to the nearest nursery-
man; he has also taken off the top spit of precious loamy soil
and disposed of it to the mutual satisfaction of himself and the
said nurseryman, and then, in order to bring the ground back to
its proper level, he has filled it up with the clay and refuse that
have been taken out in making the foundations of the house. I
have no doubt many of my readers will agree that this is no fancy
picture or figment of the imagination, but fact as solid as the soil
they sometimes find in their suburban gardens. It ought to be
made a penal offence on the part of any builder to remove either
more turf than is absolutely necessary to find room for the founda-
tions of the house or the soil immediately beneath it, since this
is the loam of which the best borders are made.

If this has been your fate, however, there is nothing to be done
but at some considerable expense to have the rubbish carted away, to design anew your misshapen and disfigured garden plot, and to bring it by hard work and persevering effort into a condition in which your choicest plants will thrive, and your eyes not be shocked by the crude legacies of the speculative builder.

But before settling finally upon the design and plan of a garden—whether it be the miniature park of the country house, or the diminutive plot behind a suburban villa, does not greatly matter—it is well to have fixed clearly in the mind the purposes to which the garden is to be put. Is utility to be the guiding principle? Is the production of vegetables for culinary purposes, or the growing of flowering plants with the sole object of stripping them of their bloom at the earliest possible moment, to be the goal at which to aim? Then it were far better to adopt the methods of the market gardener, to pay little attention to the ultimate garden picture, and to grow flowers, as one grows vegetables, in conventional rows, so that as little space may be occupied by their serried ranks as is consistent with their good health and well-being.

But where the garden is to be transformed into a beautiful setting for the home it will be necessary to keep other considerations than the successful culture of perfect flowers in view. The ideal garden is that which at a first embracing glance satisfies the artistic sense of the beholder. If there be any feature of it out of proportion, which arrests the eye and detains it to the exclusion of everything else, then is the garden wrongly planned and ill-balanced. Details will afterwards claim attention, but these, if the plan be well considered, will not be exaggerated; they will be in keeping with the scale of the garden, and will contribute to and not detract from the harmonious character of the picture. In the designing of gardens too much attention is sometimes paid to the ground-plan, and not enough to elevation and perspective. And here the art of the landscape gardener must be brought into play. In the case of a large garden every effort should be made, in shaping its outline, to bring it into conformity with its environment. The value of trees in this
connection ought not to be overlooked, but these must be employed in the working out of the design in such a way that while they add to the artistic effect of the height, breadth, and length of the picture, they do not blot out any natural feature of the landscape which will add to the amenities of the scene.

Not the least important of the considerations that weigh in the planning of a garden is that of aspect. It is useless to expend an infinitude of time in working out the details of a plan, if at the end of it all the position of the garden be such that nothing will thrive in it. Sunshine is a prime necessity for the flower garden; if the house be in a situation in which the small plot is thrown into almost constant shade it will be a waste of effort to seek to grow flowers to perfection. Happily, however, there are very few garden spaces, even in these northern latitudes, which, owing to the obstruction of buildings or of trees, are in perpetual shade. Every effort must therefore be exerted to arrange the beds and borders in such a manner that the benefit of every available ray of sunshine is secured. The compass should be studied and its points be clearly marked on the plan. Thus it may be taken for granted that the north side of a house, a wall, or a fence, will receive no sunlight. All attempts to grow sun-loving subjects in such a situation will therefore be abandoned, and if it be found necessary in working out the garden scheme to include beds and borders with a north aspect, it will be advisable to waste as little space as possible upon them, and to grow in them only such plants as prefer plenty of shade. Among these may be mentioned evergreen shrubs, such as berberis; privet and bramble; box, for edging; lilac, ivy, periwinkle, Guelder rose, saxifrage, hardy ferns, calceolarias, cyclamen, dog’s tooth violets; and spring bulbs, including fritillarias, chionodoxa and Crown Imperials.

An error that is commonly committed in garden planning is to make the principal borders subservient to the paths. Their consideration should be in the reverse order. If the height of the owner’s ambition be to cultivate flowers, he will find himself the better able to achieve his purpose if he do not stint his beds and borders for space. The narrow strip of ground—generally
not more than a couple of feet wide—which does duty for the principal border in the vast majority of suburban gardens gives no scope for bold massing and tasteful arrangement. It encourages cramping and overcrowding, than which there is no more common mistake made by amateur gardeners. Let the main border then be at least five feet in width, and the beds be on such a generous scale as to allow of bold massing and a proper regard for the principles of colour blending. And above all let their situation be such that their occupants shall live in the sun.

These beds and border will be the preponderating features of the design; next in order of importance will come the arrangement of the paths, and the provision of grass, if space permits. It is not necessary here to enter into a prolonged discussion of the relative merits of the straight and the curved path. The owner of a small garden rarely has much voice in the shaping of its outline. It is fixed for him, and he must make the best of it. Whether it be rectangular, oblong, triangular or curved, he is compelled in the vast majority of cases to make his plan conform to the outlines decided for him by other people. But he may, if he choose, so construct his paths that they shall fit in with the design he has selected for his principal borders and beds. Let him fix firmly in his mind that his path is meant to serve a useful purpose; that it is intended to lead somewhere. His principal path should start as near as possible to the door of the house, and it should have an ending elsewhere than at a blank wall or fence—say either a summer-house or a greenhouse, if there be one or the other in the garden scheme. Subsidiary diagonal paths ought to be avoided; they are incongruous and ugly. The winding side path may be introduced to meet the requirements of the design, but there can be no two opinions about the superior advantages of a straight broad path which shall lead past the principal border, in gardens that are restricted for space. The winding path is difficult to plan tastefully, while it has the further serious disadvantage that it eats up ground that might much more satisfactorily be devoted to the cultivation of flowers, or to the provision of a generous expanse of lawn.
Diagram 1.—MAKING A PATH.

Fig. 1. The average garden path after a shower. Fig. 2. Excavate as shown. Fig. 3. Fill in as indicated. Fig. 4. Drain for a gutter. Fig. 5. A more expensive method. Fig. 6. A turf should cover the joints.
The proper construction of a garden path deserves some attention at this point. Of what material shall it be made? In a large garden in which wide herbaceous borders find a conspicuous place, the use of grass for the pathway has much to recommend it. But the foundation must be a good one, the soil must be well drained, and the path must be wide enough to permit of the frequent use of the mowing machine. For the small garden, however, other materials had better be chosen. They may be either gravel, cement, tar paving or cinders—to place them in their order of merit. Cinder paths are cheap, but they are suitable only for the kitchen garden. Tar paving is expensive, it is clean, and it never holds the water after heavy rain if it be properly laid. But it lacks beauty, though a layer of Derbyshire spar rolled in on the surface when the path is made will somewhat relieve the sombre effect. The same objections may be raised against cement, which, while durable enough, is distinctly not beautiful. Thus we are thrown back upon gravel. If it be of the right kind, so that it will solidify and bind well, there is no material that can compare with it either for utility or for attractiveness.

How then should the gravel path be made? Diagram 1 will afford some valuable hints as to the mode of procedure.

Figure 1 represents a garden path which has been allowed by neglect to become unsightly. It is not level, and in consequence after every heavy shower the water stands in pools at intervals of a few yards. Perhaps the path was the final effort of the enterprising builder in his desire to afford an air of superficial neatness to the garden before his first tenant entered into occupation. Many of my readers, I am confident, are familiar with the kind of path depicted in the drawing. It is presentable for a few months, but after a brief interval its imperfections are made manifest, and nothing remains for the conscientious gardener but to have it dug up and relaid with a view to its permanent utility.

The first essential is to dig out the path to a depth of nine inches or a foot. It will probably be found that such foundation as there is consists of hard lumps of clay. The clay must be removed
and the ground carefully formed until the surface is made convex—raised at the centre of the path and sunk at the sides.

Next, the all-important detail of drainage must be considered. If the subsoil is not too heavy this can be supplied if upon the foundation of the path a layer of rubble, composed of broken bricks and large clinkers, be placed. This had better be not less than six inches in depth, and it may be as much as nine. It will be necessary to roll this thoroughly until a hard surface has been obtained, and afterwards to put down a thinner layer of finer clinkers. The final layer should be one of good reliable gravel, and undoubtedly the best suited for the purpose in the London area is Croydon gravel. It is considerably more expensive than the ordinary builders’ gravel, but it is worth the extra cost. Its superiority rests on the fact that when it is well rolled it will “bind,” and in dry weather will become as hard as cement. If the drainage of the subsoil be inefficient, artificial measures must be taken. These consist of digging a gutter along each side of the path, as shown in Figure 4, and filling in the space to a depth of a foot or eighteen inches with rubble, so that it sinks below the foundation of the path. A more expensive method is shown in Figure 5. Here not only is the gully dug out, as in Figure 4, but narrow drain-pipes are laid along the bottom of the trench. The joints of the pipes must be covered with a turf, grass side downward. After the path has been constructed it will require to be attended to carefully for some time. It must be rolled frequently, especially after heavy rain.

Now we have the framework of the garden complete, and it only remains to fill in the details. These must depend principally upon the predilections of the owner. He will have to make up his mind whether he desires a garden mainly for the production of spring and summer flowers, for the growing of fruit and vegetables chiefly, or for a combination of all three. In the last case it is of course essential that the plot shall be one of considerable size—say not less than two hundred feet long. The owner of a small garden will be best advised by confining his activities to the growing either of flowers or vegetables; he cannot very well
combine the two with profit or pleasure to himself. But where there is room in which to make the attempt, it will be obvious that the part of the garden farthest from the house will be that which must be devoted to the vegetable plot. This should be rectangular in form, and the paths which serve it should be as few as possible, and invariably straight and not curved. A good arrangement is to divide the piece of land into four sections by means of a central path, with another bisecting it in the centre. This will permit of successional cropping—a subject which is dealt with in another part of this book—and it will enable the owner to reap the fullest possible benefit from the land he is endeavouring to cultivate. The question of including fruit trees in the vegetable section of the garden is one that is easily solved if the practice be adopted of growing only the smaller kinds of trees such as can be trained flat against a fence or wall or a trellis of stakes, dwarf pyramids, and bush fruits. These, while yielding a plentiful crop of fruit, are at the same time highly decorative adjuncts even to the smallest gardens, and may very well take the place of many of the evergreen shrubs which at present do duty at the back of the border. The error to be avoided is the planting of tall standard fruit trees in the centre of vegetable beds. These, besides impoverishing the soil, must ultimately and inevitably rob the growing vegetables of the light and air that are so essential to them, and thus render their satisfactory culture impossible.

To return to the flower garden, the owner will need to decide for himself the additional features he desires to introduce: whether, for instance, if he be a keen rosarian, he wishes to devote a section entirely to the cultivation of his favourite flower—and in passing it may be said that if the height of his ambition be to gain prizes at the rose show this will be essential; whether he will construct a rockery, or a little Alpine garden; whether he will introduce a pergola, and arches for the support of the innumerable climbing plants that help to add to the beauty of the garden; and whether, if he have room, he will erect a greenhouse, and frames, and a summer-house. The summer-house may well be placed at the extreme end of the garden, if possible, in a shady
STONE PATH AND PERGOLA.

Photograph by A. G. Cumberland.
place; the greenhouse and frames should be so situated that while they do not obtrude with an air of artificiality in the garden prospect they are nevertheless in such a position that they will reap the full benefit of all available light and sunshine, with a view to economy in heating if nothing else. If the whole art of gardening is to be practised within the little plot—that is to say, if you intend to raise your own plants from seed, or propagate them by cuttings—it will be necessary that at least a small portion of ground be reserved for a nursery bed. This must be in a shady spot. Adjacent to the nursery bed a combination potting-shed and toolhouse will be found to be a most useful adjunct to the garden, for in it may be preserved the little stores of sand, lime, leaf mould, loam, peat, and artificial manure, all of which will be brought into use in various ways as knowledge of the art of gardening is developed.

The furnishing of the garden with such accessories as seats and benches, terra-cotta vases or wooden tubs and boxes for palms, ferns, and other suitable plants, a sundial, an apiary or a dovecote, will depend, of course, upon the financial resources of its owner. All, if good taste be displayed, add to the amenities of a garden, and may be introduced as opportunity permits. But let him beware of the use of such abominations as multicoloured trelliswork, mechanical moving models, elaborately designed arches and other monstrosities that shock the artistic sense of the beholder. Such objects are incongruous in a garden picture, the elements of which should, above everything, be simple and natural.
CHAPTER III
THE LAWN: HOW TO MAKE AND PRESERVE IT

HITHERTO little more than passing references have been made to the inclusion of grass plots, or lawns—to give them their more dignified designation—in the scheme of the garden. But the provision of a broad smooth area of well-kept lawn is so indispensable an adjunct to the British garden that its care and treatment deserve a special chapter.

The lawn adds a finish to the appearance of the most efficiently tended beds and borders. Without it their beauty and charm are heavily discounted. How often does one see the plot of grass neglected and allowed to degenerate until it becomes the breeding ground of innumerable unsightly weeds, or perhaps be dotted here and there with ugly bare patches as the inevitable result of inattention and neglect. Yet how readily does the lawn respond to the expenditure upon it of a little labour and care! Nowhere else in the world can you find grass so rich in colour, so soft in texture, so smooth and velvet-like to the tread as on the emerald green carpet lawns of England. They are the envy of every Continental visitor. I was a guest a few years ago at a garden-party given by a Prussian diplomatist in Hamburg. The month was June, when here in England our lawns are at their best. Nothing impressed me more during my brief sojourn in my German host's garden than the distressing appearance of his lawn. The grass had sprouted in isolated blades; it was long and straggling, and it appeared as though the first touch of summer heat would wither and kill it irretrievably. One was afraid to walk on it, for the feet sank inches deep in the soft, sandy soil in which the seed had been sown. That garden-party, I am afraid, ruined the diplomatist's "lawn." Our fickle climate is often a subject
Fruit Trees on a Lawn.

Sunk garden in the foreground with sundial and brick-paved paths.

Photograph by Mrs. Cecil Farman
for malediction, but at least it renders the cultivation of our grass plots a comparatively simple matter.

A new lawn may be made either in spring or autumn, but the precise time must depend largely upon the meteorological conditions, and also upon whether it is intended to lay turf or sow seed. And here arises a puzzling problem for the amateur: Is it better to sow seed or to lay turf? Both have their advantages. To make a new lawn by sowing seed is a considerably cheaper process than that of laying new turf. But seed-sowing involves an immense amount of care in the preparation of the soil, and in order to secure any prospect of success, it is necessary to sow only towards the end of the summer—say in August and September—or to wait until spring has well arrived in April. The use of turf has one outstanding advantage in the fact that it produces a finished effect almost as soon as it is laid. But turf is expensive, and unless one is certain of the source of supply there is a danger that it may have been cut from a pasture abounding in noxious weeds that will exercise all the skill and patience, and a good deal of the time of the cultivator to eradicate. These are advantages and disadvantages that must be weighed carefully by the gardener who contemplates the making of a new lawn; but from the point of view of economy there can be no question that in these days, when seed specialists have brought the mixing and production of grass seed to a fine art, the grass-sown lawn will produce a better sward than can be obtained from a turf-laid area.

The methods of preparing the ground, whether for seed-sowing or for turf, are practically identical. The great essential in each case is thorough drainage. If the soil be naturally light, and the subsoil largely gravel, there need be no qualms about the efficiency of the drainage, but if the foundation be of heavy clay, which does not admit of the ready escape of surplus moisture, it is hopeless to expect the production of a perfect lawn. Either the clay must be dug out to a good depth and lighter soil substituted, or drain-pipes must be utilised to take off superfluous water. This may involve a little expense, but it will be repaid a hundred-
fold in years to come, by preventing the decay of turf, and the
cracking of surface soil in excessively dry weather. The pipes
should be laid about twelve feet apart if the lawn be compara-
tively small, and fifteen feet apart if the area be extensive. They
need not be placed more than eighteen inches below the surface,
but in order to clear off the water they should have a fall of six
inches in the direction of the main drain, which may either be a
large pipe or a fairly big hole deeply dug and filled with rubble
and stones.

Diagram 2 gives some valuable hints on the procedure
next to be adopted, if seed is to be sown. After deciding upon
the extent and shape of the proposed lawn, carefully mark it out
with a line. If the piece of ground is fairly level no preliminary
digging need be done. The first essential will be to provide a
considerable quantity of manure with which to enrich the soil.
This should be composed of fresh peat moss stable manure con-
taining old, well-rotted straw. It should be distributed evenly in
heaps over the surface of the ground, so as to be in readiness for in-
corporating with the soil when the ground is dug. The digging
need not be very deep, especially if there is a good natural drainage
to the soil. But the ground should be turned over to a depth of
at least a foot, otherwise in dry seasons the grass will become
brown owing to lack of an efficient root-run. During the
operation of digging the manure should be incorporated with
the soil in such a manner that the bulk of it remains within two
or three inches of the surface. In this way the roots of the
young grass will reach the manure quickly, and will thus receive
help and sustenance when they are most required.

The seed-bed must be prepared by thoroughly breaking up the
larger clods of soil, and by removing large stones and all weed
roots with an iron-toothed rake. The ground should then be
raked fine, and afterwards rolled until the surface becomes quite
true and firm, so that when it is walked on it hardly shows the
imprint of the foot.

Sow the seed thickly—at the rate of about one ounce to the
square yard, or two pounds to the square rod—and while carrying
out this delicate operation avoid the wearing of high-heeled boots, otherwise the surface may become dented with shallow holes, and the symmetry of the lawn be spoiled. It will be necessary to choose a calm day for the sowing, since the seed is so light that the least puff of wind will blow it away. The newly-sown area must now be covered with prepared fine soil to a depth of not more than a quarter of an inch, and the surface raked perfectly level. Afterwards the ground should be rolled and cross-rolled with a light roller.

Protection from sparrows and other birds will be necessary, otherwise the great bulk of the newly-sown seed will inevitably disappear. This can be obviated either by means of a large garden net spread a few inches above the new lawn or by stretching strands of black cotton, supported on twigs or pieces of firewood, diagonally across its surface.

When the grass is about an inch high it will be benefited greatly if it be top-dressed with a fine compost of fertilising fibre, malt culms, or rape dust, spread evenly over the ground. These will stimulate growth, preserve the young grass from extremes of temperature, and conserve the moisture in the soil. The grass should then be rolled at frequent intervals, and, if proper care be taken of it, it will be ready for hard use, supposing the seed was sown in September, by the early summer of the following year.

The laying of turves is a simple matter, provided the foundation has been properly made and the surface has been rendered perfectly level. Moist cloudy weather should be chosen for the operation, either in spring or autumn. Before the turf is laid an attempt may well be made to eradicate the worms in the soil. This can be partially accomplished by watering the surface with lime water. In this way unsightly worm casts can at least be reduced in number, and thus the soft, sticky, muddy condition which prevents the use of the lawn from September to May, be avoided. One or two of the leading firms of seedsmen have produced a worm-killer which is invincible in its effects, and at the same time contains manurial properties that improve the growth and texture of the turf. The preparation is spread over
the lawn on a mild day, and afterwards watered in. It drives the worms to the surface, where they die, and may then be swept away.

In laying turf—which, if it has been properly cut, will be in lengths of three feet by one foot—the great essential is to ensure that they are neatly fitted together, edge to edge. It is a good plan to examine each turf carefully before fixing it in position, and to remove weeds. If a temporary bench be erected on the side path the turf can be opened out on it, and the weeds be cut out with an old knife. The adoption of this suggestion will save a great deal of hard, back-aching work later on. Avoid, if possible, walking directly on the levelled soil while laying the turves. This can be prevented by using a plank on which to stand and moving it backwards as the work proceeds. So that neat edgings may be secured, allow the turves at the extremities of the rows to overlap slightly, and when the whole lawn has been laid go round the edges with an edging-iron and cut them carefully, so that they are straight and even. As each section of a yard or so in width is completed, the turves should be beaten level with a turf-beater—a heavy, flat piece of wood into which a stout handle has been obliquely fixed. Later on the roller may be brought into use, and thereafter it should be constantly employed, weather permitting. The grass should not be rolled in one direction only, but at right angles and transversely in turn. This will help to make it set firmly, will assist in keeping the lawn level, and will help materially in the production of close-growing and firmly-rooted grass.

The subsequent care of the lawn, whether it be seed-sown or turf-laid, will demand unremitting attention. Not a few people appear to imagine that to keep the grass mown close during the summer months is all the attention it needs to preserve it in condition. There could be no greater fallacy. Grass is a gross feeder, and soon exhausts the natural nutriment in the soil. Therefore it is necessary by artificial methods to supply the deficiency.

This is best accomplished by means of a top-dressing of some kind of fertiliser. In the autumn it is a good plan to spread a
Diagram 2.—MAKING A LAWN BY SEED-SOWING.

Fig. 1. The manure in heaps, evenly distributed. Fig. 2. The manure spread over the ground. Fig. 3. Digging and working in the manure. Fig. 4. Levelling and taking off stones, sticks and rubbish. Fig. 5. Sowing the seed. Fig. 6. In doing so avoid a windy day—result.
thin layer of well-decayed short stable manure over the surface of the lawn, afterwards using an old hard broom to induce an even distribution. The rains of winter wash the nutritive qualities of the manure into the soil, and supply the necessary food to the roots. An objection to this method is that for several months of the year the lawn looks unsightly; but the cost is slight, and the result is satisfactory when growth starts again. Failing the use of manure in autumn, it is advisable to stimulate growth in March or April by means of one of the many fertilising preparations that are on the market. First of all go carefully over the lawn and remove all weeds—such as plantains, dandelions, daisies, and knot-grass—with a pointed knife; then apply some lawn-sand, and after a time the weeds will, in most cases, have disappeared entirely. The lawn-sand can be purchased at a small cost from most seedsmen. Weeds, if left unchecked, spread with amazing rapidity. They speedily impoverish the ground and oust the true grasses. Where the trouble has not become excessive, hand-weeding may be resorted to. It is not sufficient to cut the weeds off at the top, for those I have mentioned are perennials, and some of them have long tap roots, which must be taken right out of the ground. Fill up the holes caused by the removal of the weeds with fine soil, and beat it in firmly. Sow on top of each patch a little fine grass-seed, and in a few weeks the bare places will be covered with growth. An excellent dressing may be made of powdered basic slag and bone meal mixed with many times their bulk of fine loamy soil. But whatever may be the fertiliser used, it should be brought into operation when the ground is in a moist condition.

Thin growth may be renovated in spring or early autumn by sowing grass-seed. The process is a simple one if a few simple rules be observed. It is obvious that it will be waste of effort to sow new seed on a hard surface. Therefore before starting operations it will be wise to wait until the ground has been thoroughly softened by a few heavy showers. The grass should be cut as short as possible, and all moss and weeds be torn out by the roots and burned. The bare patches must then be raked
as deeply as possible with a strong iron rake. It is useless merely to scratch the surface. It must be thoroughly scarified to a considerable depth. Unless this operation be efficiently performed, the roots of the new grass will be quite unable to penetrate deeply in the soil, and at the first touch of frost, intense heat, or drought the grass will perish. After the soil has been thoroughly broken up the surface should be made level by pressing it down with the back of a spade, and by adding a sprinkling of fine soil, composed of leaf mould, sandy loam, and well-rotted stable manure, which has previously been passed through a fine sieve. The seeds should then be distributed evenly over the soil, so thickly that they almost touch one another. A slight covering of fine soil beaten down gently with the back of a spade, and afterwards lightly rolled, will complete the operation. In ten days or a fortnight the new grass will make its appearance. If the weather is dry, watering may be necessary. This should be done from a fine-rosed can, care being taken not to wash the seed out. If the weather is warm in October it may or may not be necessary to cut the new grass. But in any case the mowing machine must not be used. If the tops of the shoots be clipped with a pair of shears a close growth will be promoted. The mowing machine must not be brought into use until the grass has made a thick growth and become thoroughly established.

No lawn that is dotted here and there with depressions or mounds can be considered satisfactory. If these defects are apparent, they should be attended to in spring and autumn, while the ground is soft. To fill up a hollow, cut round the depression and roll back the turf in the manner depicted above.

Loosen the soil underneath with a fork, and add sufficient fine loam to bring the grass up to the proper level. Then replace the turf, water and roll thoroughly. In the case of a mound or hump
the same process should be followed, save that in this instance sufficient soil should be taken from under the turf to reduce it to the desired level.

A question that is frequently asked by the anxious owner of a lawn is: "When shall I begin to mow it?" The answer must of necessity be complex. Much depends upon the weather. If the winter and spring have been mild the grass will have made good growth by the first or second week in April, and it will then be quite ready to take the mowing machine, provided the immediately preceding week has provided drying winds and plenty of sunshine. Indeed the growth may have been so abundant that it may be necessary to take off the top of the grass with a scythe, but in ordinary seasons, provided the blades are set high, the mowing machine will accomplish the work quite satisfactorily. Henceforward the machine should be kept regularly in use—once a week at least in the case of ordinary villa lawns, and even oftener where games of skill and precision are played. Nor should the roller be allowed to remain idle. It is useless, of course, to bring it into play when the ground is baked hard by the midsummer sun or when there is a trace of frost in the ground; but at all other seasons its frequent use has everything to recommend it. Untiring work with the mowing machine and the roller will tend to keep the lawn green and beautiful as nothing else can.
CHAPTER IV
SOILS, AND HOW TO CULTIVATE THEM

The merest tyro in gardening soon comes to realise that there is almost as great a variety in the quality and composition of the soil he endeavours to cultivate as there is in the flowers, fruits and vegetables that he seeks to grow in it. That its quality should vary with varying localities is not surprising, but that its composition within the confines of his own small plot of ground should differ so radically as is not infrequently the case may very well create astonishment, and certainly invite some explanation. Let us suppose that the tenant of a new garden is making a preliminary survey with a view to planning it out so as to realise his own ideas and to put it to the best economic advantage. The chances are that in nine cases out of ten he will look directly to the end and overlook the means. He will not trouble himself greatly about the quality of the soil, but will proceed to have the ground “dug over” (either by his own exertions or by the aid of a mercenary), and to have it “planted” forthwith. Whether the ultimate result will satisfy him may perhaps be problematical. But that some such rough-and-ready proceeding as this is the all too common practice of the new owners of small gardens I have not a shadow of doubt.

What, then, is the better alternative? Surely it is that the gardener should first of all make himself thoroughly acquainted with the characteristics of the soil he is about to till. His earliest task should therefore be to dig out holes to a considerable depth in various parts of the garden. The result will probably surprise, and in some cases dismay him. He may, as I hinted in a previous chapter, discover, not many inches below the smiling loamy surface, a number of relics bequeathed by the speculative builder.
in the shape of sundry pieces of cement, bricks, lumps of solid mortar, clinkers and what not. The remedy for this state of affairs must be drastic and immediate. But even supposing that the soil has not been unduly disturbed since it was converted, perhaps, from meadowland into a garden plot, the outcome of this preliminary exploration may nevertheless provide interesting and unwelcome results. The removal of the top spit will reveal the condition of the subsoil and the natural earth, and it is this stratum of his ground with which the gardener will have to wrestle in his struggle to induce the soil to produce its richest harvests. He may find that the subsoil consists either of solid impervious clay, or of flints and limestone, or thick layers of chalk, or possibly of sandy gravel. If he leave the holes open for a few days he will easily be able to test the drainage qualities of the ground. Should there have been no rain since the holes were dug, and water collect at the bottom, he will know that the subsoil is waterlogged, and that the drainage in this spot is imperfect. In the event of heavy rain he will be able to discover by the tardiness or the rapidity with which it disappears whether the drainage is good, bad, or indifferent. This will give him a clue to the future treatment of the soil which will be invaluable. By an intelligent application of correctives he will be able to supply the deficiencies that reveal themselves as he proceeds with the work of building up suitable soils for the reception of various classes of plants.

Without any resort to technical or scientific terms, it will perhaps be found advantageous to discuss the peculiarities of various subsoils in turn and to suggest the methods of treatment required in each instance. The only remedy possible in the case of the builder's relics is their instant removal. It may mean that in order to accomplish this satisfactorily it will be necessary to dig down to a considerable depth. The work will be hard and tiresome, but it will be labour well spent. If it involves the removal of a good deal of hard, useless clay, so much the better for the future welfare of the beds and borders that are being operated upon. And while the foundation is thus laid bare it will be well to see that proper provision is made for drainage.
If the soil has been dug out to a depth of two or three feet a layer of rubble—brick ends broken fairly small—may be placed at the bottom, and over this again a layer of old decaying turves—if such are available. Upon this foundation some of the best of the excavated soil may be deposited, and with this should be incorporated a generous quantity of well-seasoned farmyard manure. For the top layer to the depth of at least a foot good loam should be supplied. This, if possible, should be what is known as the “top spit” from an old meadow. It can be dug out a spade deep after the surface turf has been removed, and it will be found to be the finest growing material it is possible to obtain. A piece of ground prepared in this way, with a light surface dressing of old manure applied in early winter, and forked in during the spring months, will provide a medium for the cultivation of flowers and vegetables that will last for years without any radical disturbance.

For flinty, stony soils the most obvious remedy that suggests itself is the right one. This is their removal as time and opportunity permit. It will occur frequently enough to satisfy the most ardent desire for their disappearance, for with each disturbance of the soil they will in some mysterious manner work their way to the surface and invite instant removal. And unless they are removed, there need not be any assured hope that it will ever be possible to make a satisfactory seed-bed in such stony and flinty soil.

A sandy soil means a light and a dry soil. For general purposes it is less desirable in an ordinary small garden than any other variety. Its composition is such that the passage of water through it is too rapid and too free; it is not therefore sufficiently retentive of moisture, and it follows that such plant foods as the ground contains will speedily be washed away. An adequate supply of moisture is as great a necessity of plant life as sunshine itself, and if light, sandy soil is to be made a suitable medium for the cultivation of flowers and vegetables its capacity for retaining moisture must be improved. The quality of cohesion is lacking, and this can best be rectified by the incorporation in the soil of
such heavy elements as cow and pig manure, and clay that has previously been laid up, dried, and broken into as small pieces as it is possible to reduce it. It will be found a good plan also to dig into such soil, as opportunity permits in the autumn, decayed vegetable refuse, such as the leaves of cabbages, the haulm of peas, and the decaying stalks of brussels sprouts. These will help to enrich the ground and to give it that binding quality of which it stands in need. The task of improving hungry, sandy soil will be a slow one, but if the remedies recommended are persistently and frequently adopted they are certain to be successful.

Now we come to the opposite extreme—namely, the heavy clay soil which is so distressingly familiar to the suburban gardener in many parts of London. The most certain remedy for this condition of things lies in heavy and untiring manual labour. In a word, the ground needs digging and trenching again and again before it can be brought into a state of assured fertility. The object in this case is, of course, to open the soil so as to admit of a freer passage of air and water. Frequent digging is by far the most efficacious method of inducing this desirable result, but other and extraneous means may be brought into play. These are the incorporation with the soil, as it is trenched, of such disintegrating elements as coarse sand, gritty road sweepings, and, in moderation, sifted coal ashes. Light manure should also be used generously, but in this case well-decayed littery horse manure only should be employed. The sand, the road sweepings, and the littery manure should be spread evenly over the ground just before digging, and then be buried fairly deep.

A subsoil composed chiefly of chalk will, as a rule, be found to have deposited upon it merely the thinnest of surface coverings. In this case it is useless to attempt to grow ordinary garden produce which requires a deep root-run, and the only remedy to be adopted is one that may involve expense. This is to have the foundation thoroughly broken up and to bring in and lay upon it, to a considerable depth, soil suitable for the purpose it is desired to attain.
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From the foregoing pages it will be gathered that each individual gardener must judge for himself what are the soil conditions of his own garden, and what are the remedies which each requires to bring it into good cultivation. There remains, however, one important subject which deserves consideration in some detail—I mean that of digging and trenching. This is a part of the science and practice of gardening which does not always receive the careful study of the amateur gardener that its vast importance deserves. What, it may be asked, is the object of digging? To put the matter in its crudest and simplest form, it is the promotion of the aeration and good drainage of the soil. The free admission of air to the ground enables the atmosphere to perform its function in the preparation of plant food which shall make the soil more fertile. Good drainage protects plants from drought in summer and from stagnant moisture in winter. Digging also provides a deep root-run, and, if it be carried out at the proper seasons of the year, a fine seed-bed, when both are most needed.

But, as is the case with most gardening operations, there are right and wrong methods of digging. Provided one has sufficient physical strength, it looks an easy enough piece of work, but unless some amount of care and forethought be brought to bear upon it, it is certain to be done badly. Obviously, it is useless to endeavour to dig well with the maximum of effect, if an old, rusty, shallow spade be the implement employed. The spade should be bright and clean, as it will be if care has been taken of it when it has been put away in the tool-shed, and its blade must be of such a depth that it will be possible to penetrate at least a foot into the ground. Good digging consists in driving the spade into the ground well down to the haft, almost vertically; in turning the spit completely over, and in thoroughly breaking up the soil that is to remain below the surface. The reason for this last-named rule will be clear when it is remembered that only a prolonged and abnormal frost can be expected to pulverise the soil to a depth of a foot or eighteen inches. If therefore the lower layer of soil be not thoroughly well broken up during the process of digging,
it will remain in a cloddy state during the summer, and the crops will inevitably suffer when their roots are most in need of a free run in search of nourishment.

Too much emphasis cannot be laid upon the necessity for deep digging. Where there is a good depth of workable soil there need be no hesitation in turning the soil completely over, provided the subsoil be not brought to the surface. But it not infrequently occurs that immediately beneath the top twelve or eighteen inches of soil the gardener will find, as was indicated earlier in this chapter, a layer, more or less thick, of some hard, impervious substance. This it should be his object either to remove entirely, if it be of stone or rock, or to break up, so that it may become loose and porous, and thus add to the efficient drainage and consequent fertility of the upper layer of soil. In order to accomplish this efficiently it is necessary to resort to the operation known as trenching. This involves the disturbance of the soil to a depth of at least three feet. It means the expenditure of considerable time and a good deal of hard manual labour; but it will be found to be labour well spent, and the reward in greatly superior crops will be great.

There are two methods of trenching known to gardeners—namely, double trenching, which means the disturbance of the soil to the depth of either two or three "spits" or spades, one below the other; and bastard trenching, in which the position of the two spits of soil is not reversed, the lower spit being merely broken up and the top spit turned over on itself. Let me explain the two processes in a little more detail:—

Double Trenching.—First of all mark out the piece of ground to be trenched in convenient sized portions, either in squares or oblongs. At the extreme end of one of the sections dig out a hole to the desired depth—say three feet at least—and wheel the soil thus removed to the other extreme end of the section. Here it should be allowed to remain until the whole piece of ground has been operated upon, for it will be required to fill up the final hole or trench. If the soil is good throughout there need be no hesitation in turning the next subsection com-
SOILS, AND HOW TO CULTIVATE THEM

pletely over, beginning at the top, and throwing the soil into the bottom of the first trench or hole, bringing the lower layer to the top, so that what was formerly three feet below now becomes the surface soil. So the process of trenching goes on until the last subsection to be operated upon is reached, and if the work has been carried out systematically it will be found that the soil removed from the first hole made will be just sufficient to fill the final trench after it has been excavated to the proper depth.

BASTARD TRENCHING.—This is practised when the subsoil is of such inferior quality that it would be to court disaster to bring it immediately to the surface. In this case it is necessary to leave the lower spit of soil in its original position, and merely to break it up thoroughly before returning the top spit to its original position. In bastard trenching it is usual to work to a depth of two feet or two "spits." The necessity is to take out a trench to a depth of two feet, and wheel it back, as in the case of double trenching, to the other extremity of the section of ground to be operated upon. The next subsection should now be tackled, and in this case only the top spit should be removed. This also must be taken back to the extreme end of the section, and placed beside the original heap. At this stage the situation is that we have one hole two feet deep and another hole, immediately next to it, only a foot in depth. The next operation consists in moving the soil at the bottom of Hole 2 into the bottom of Hole 1, meantime thoroughly breaking it up if it be hard, and at the same time incorporating with it a forkful or two of well-decayed farmyard or stable manure. The top spit of the third subsection is now dug out, and becomes the surface soil of Subsection 1, and these operations are repeated until the whole piece of ground has been trenchled.

Digging and trenching are both best accomplished in autumn or early winter, but where circumstances prevent them from being completed before spring it will be advisable to allow the land thus treated to remain undisturbed for at least a month before seed-sowing or planting is attempted.
CHAPTER V

MANURES, AND HOW TO USE THEM

The amateur gardener who is also a diligent student of gardening literature is apt to become bewildered as he ponders the enormous volume of advice that is placed before him with regard to the important subject of manures and their use. If he were to attempt to follow all the instruction that is set before him he would require to be chemist as well as horticulturist; scientist as well as humble raiser of vegetable and fruit crops. It would be essential for him to have a complete knowledge of the ingredients and special qualities of phosphates, nitrate of soda, sulphate of ammonia, kainit, and other chemical productions—all extremely valuable plant foods if prepared and used carefully by a skilled chemist, but dangerous and deadly indeed if they be improperly employed by one who does not thoroughly understand the strength and nature of each. That the gardener who has made a study of the constituents of soils and manures gains a considerable advantage over his competitor who does not possess his scientific equipment, cannot be gainsaid; but the amateur who is merely a beginner in the art of gardening need not on that account despair of achieving results in his own little plot of ground that will amply repay him for the time and trouble that he expends upon its cultivation. Let him pin his faith to natural and animal manures, and, until he understands them thoroughly, eschew artificial or chemical compounds, and all will be well.

The key to the solution of problems associated with the successful cropping of a piece of land will be found much more readily in following the advice as to deep digging and trenching given in the preceding chapter than in any profoundly scientific
dissertation upon chemical manures. But the subject of manures and how to use them is nevertheless of such great importance that no efficient gardener can afford to neglect it.

Let us reduce the science of manuring to simple terms, and we shall then see why it is necessary to obtain a firm grip on its first principles. Manuring means nothing more nor less than the feeding of the soil. It stands to reason that if you crop a piece of ground from year to year with potatoes, or beans, or roses, you will gradually rob it of essential plant foods, until at last your crops will fail and your rose-trees refuse to put forth any but the most mediocre type of blooms. Therefore if you exhaust the ground of those elements in it which supply the needs of your plants, it follows that you must from time to time repair the deficiency—and, for want of a better word, we call it manuring. Plants obtain a fair proportion of their sustenance from the atmosphere, by means of the breathing apparatus in their foliage, but most of the feeding is accomplished in the foraging expeditions carried on incessantly by their roots. If the roots on almost any plant be examined it will be found that they are supplied with smaller fibrous roots or minute hairs. These are similar to the capillaries that unite and feed the blood-vessels of the human body. They are tubes with bores as fine as a hair, and it is through these that the food is absorbed from the soil and passed on through the instrumentality of the larger roots to the stem, leaves and blossoms of the plants themselves. Incidentally it may be remarked that when one remembers the delicate construction of these myriads of tiny hairlike roots the supreme necessity for thoroughly breaking up the soil in the process of digging and trenching is brought vividly home. The sheer impossibility of efficient root-action in hard unyielding soil is at once apparent.

At the same time another important fact in the root-feeding of plant life suggests itself. This is that the capillaceous roots cannot absorb the food they require in the form of solids. Therefore it follows that all the many varieties of manure that are employed in enriching the ground must of necessity be such as
will easily dissolve when brought into contact with the moisture in the atmosphere and in the soil. This will be found to be the case with all the commoner animal manures generally used as plant foods, and experiment will show that mineral manures, such as guano, nitrate of soda, kainit, and salt are easily soluble also. What then are the essential plant foods which it should be the aim of the gardener constantly to supply? The three primary elements that contribute to the building up of plant life are:

1. Phosphate, which helps to maintain the framework or hard, woody material of plants;
2. Potash, or salt, which forms tissue, fruits, and seeds; and
3. Nitrogen, or nitrate of soda, which helps to make leaves or soft stems.

The use of these scientific terms, which one finds so frequently employed in connection with artificial chemical manures, might tempt the beginner in gardening to hasten to use them. He would probably employ them indiscriminately, and therefore harmfully. Most of the artificial fertilisers are what are known as incomplete manures, for the very good reason that they do not contain something of every food element which plants require for their nourishment. Animal manures, on the other hand—especially those obtained from the farmyard—are complete manures, because they embody in varying degree, but with a properly balanced share of each in their composition, all the foods which any plant is likely to require. It follows, therefore, that for ordinary gardening purposes a judicious and frequent use of good, well-decayed farmyard or stable manure will supply all that is necessary in the building up and sustenance of plant life.

But there are other natural fertilisers that may be used with excellent supplementary effect in the small garden. Their elements are both vegetable and mineral, and they include decomposing green crops, such as the haulm of potatoes, peas, beans, and the stumps and leaves of cabbages, brussels sprouts, cauliflower and so on; the decayed leaves of trees, especially and preferably those of the oak; pond mud, if it can be secured;
burnt wood ashes, or the refuse of the bonfire heap, soot and lime—these all supply useful plant food and may be used with perfect confidence in any part of the garden.

Farmyard manure may be applied to the ground at any convenient season of the year, but it should never be used in a raw, "green" condition. If it is in this state when it is purchased it had better be placed in a heap and be allowed to mature for a week or two, turning it over once or twice before using it. If it contains a large quantity of long fresh straw, this should be allowed to rot somewhat, and then be used upon clayey, heavy soil. It should be dug in a foot deep in the autumn and early winter, and it will then help both to fertilise and to break up the ground. Opportunity should be taken of hard frost to wheel the manure on the ground, so that it shall be ready for use when the conditions become suitable for digging.

For enriching light, sandy soils nothing can exceed the value and efficacy of cow manure. Besides being an admirable plant food it will help to supply the binding qualities that such light soils require. But it is impossible to use it in its fresh state, and it is necessary therefore to stack it in an out-of-the-way corner—for twelve months, if possible. It will then become easily manageable and can be employed freely. Similar use may be made of the refuse of the pigsty, after it has been treated in the manner suggested for cow manure.

Leaves form an excellent plant food if in the late autumn they are collected, buried in a hole in the ground to decompose, and disinterred and dug into the soil after the lapse of a year. If manure be mixed with the leaves during the filling up of the hole decomposition will be assisted. Such a collection of leaves and manure can be turned to excellent account in the following late spring if it be used as a bed for marrows, or, if a frame be placed over it, as a suitable compost in which to grow cucumbers or melons. After the crop has been gathered the leaves and manure can be used with splendid results, either in the flower border or on the vegetable plot.

Do amateur gardeners thoroughly appreciate the value of soot
as a fertiliser? I am afraid they do not. They know that it has
its uses as a deterrent to the ravages of slugs, but one too rarely
sees them using it as a manure. It should be applied to the roots
of plants of all kinds in a liquid form, and the method of preparing
it is as follows:—Obtain a small bag—a discarded flour-bag or
a dog-biscuit bag will serve the purpose—fill it with soot that has
been kept for three or four months, and allow it to hang suspended
in a pail of water, from a stick fixed across the top of the bucket.
Let it hang for a few days, and when it is required for use squeeze
the bag until the water assumes a light brownish hue. The
liquid may then be applied to the plants with beneficial results.
Fill the pail again, and suspend the bag of soot in the water, so
as to be ready for use on another occasion. The process may
be repeated several times before it will be necessary to refill the
soot-bag.

In its dry state soot may be scattered freely on a windless day
with beneficial effects on the onion plot. Not only will it act as a
fertiliser but it will prove most effectual in warding off that
dreaded pest—the onion fly. If after sowing such root-crops as
carrots, parsnips and beetroot the surface of the soil be dusted
with soot, the crops will benefit considerably. But a word of
warning is necessary. New soot contains a great amount of heat,
and if applied too soon after it has been collected from chimneys
and flues its caustic properties are likely to prove more harmful
than beneficial. The only safe plan, therefore, is to place it in
a box or a sack and keep it in a dry place for a fortnight before
attempting to use it. This precaution applies whether the soot
be used in a dry state or in its liquid form.

As with soot, so with lime: its properties as a protection against
insect pests are generally recognised; but too little regard is paid
to its manurial qualities. In reality lime is absolutely essential
to the life, health, and vigour of the vast majority of plants. Its
function is to correct the acidity in soils that are too rich in
humus, and in addition it assists materially in reducing clay and
heavy soils to a friable condition, so that they are more easily
worked. Lime is especially valuable in the case of soils that
Diagram 3.—LIQUID MANURE.

Fig. 1. The ingredients in a tub of water: a, farmyard manure; b, water; c, soot (one peck) to be renewed every few weeks. Fig. 2. Stir occasionally. Fig. 3. Adding water as may be required. Fig. 4. Use about one-eighth of the mixture (d); the remainder to be water (e).
have been heavily manured, for its effect is to liberate the nitrogen from the manures in the shape of ammonia, which promotes an immediate and robust growth. The methods of applying lime vary with the quality of the soil. Indeed, it must be borne in mind that it would be just as injurious to apply lime to hungry soil in too generous quantities as it would be to omit to use it in the case of crop-sick soils, for while a sufficient supply of lime will promote the solution of otherwise inactive plant foods, any undue excess may possibly arrest this beneficial process altogether. On light sandy soils, therefore, lumpy chalk should be spread over the surface at the rate of two pounds to the square yard. This will supply all the lime that is required. The chalk, if applied in the early winter, will disintegrate under the influence of the weather, and in the spring it may be lightly forked into the ground. For moderately heavy soil slaked lime, to the extent of two pounds to every six square yards, should be used, while for very heavy clayey ground quicklime should be substituted: in this case half the quantity will be sufficient to meet the requirements of the same area. In fruit culture lime is a most valuable, indeed an indispensable ingredient in the soil, and should be supplied as a top-dressing round the base of the trees at least once a year. It is necessary to state, however, that lime should only be used when the ground is clear of crops. If applied to soil under a growing crop it may burn the roots and cause disaster. Gas lime is a splendid insecticide, but it is also highly poisonous to plant-life in its fresh state. It should only be used, therefore, on cleared ground in November, be left undisturbed throughout the winter, and be dug in during early spring. If applied at the rate of half-a-pound to eight square yards its effects can be none other than good. Where a heavier dressing is considered to be necessary the ground will require to remain uncropped for a whole season.

As has already been indicated, potash is a most valuable plant food. Wood ashes contain this essential element to quite an appreciable degree, and it is for this reason that I should like to lay stress upon the importance of the autumn bonfire. For there
are virtues in the gardener's bonfire that are not always appreciated either by himself or by his next-door neighbours. Its primary object is, of course, the destruction of rubbish, and if its foundations be well and truly laid its effectiveness in this respect cannot be excelled. But its value is increased a thousand-fold if one realises, even though one's eyes are almost blinded by thick, pungent smoke, that the cheerful blaze is putting paid to the account of myriads of insect pests that are the bane of the gardener's life at midsummer. A November bonfire means a healthy garden nine months thence.

The greatest asset of the autumn bonfire, however, is to be found in the ashes that are its residue when the last scrap of refuse has been consumed. These have a manurial and fertilising value that is often forgotten. They should be carefully preserved, and, as opportunity permits, be strewn over the asparagus or onion bed in the early spring, be incorporated with potting mould, or indeed be used anywhere where the soil needs enriching.

The value of liquid manures, particularly when plants and trees are nearing their highest point of maturity in the course of the year, can hardly be exaggerated. The advantages of liquid over solid manures are that their effect upon growing plants is immediate, and for this reason, if for no other, care should be exercised in their use. It will be advisable therefore to consider briefly how they should be made and when and where they should be applied.

Liquid manure is water holding in solution all the chemical constituents of the fertilisers that supply to plants their natural food. Many materials can be used in its composition. Those most generally employed are horse, cow, sheep, pig and poultry droppings; house slops and soot. These may be utilised either separately or all together. In the latter case the best plan is to procure a large tub or barrel which has been rendered thoroughly water-tight and fitted with a beer barrel-tap; next obtain a small sack or bag, fill it with the manures, and suspend it inside the cask by means of a stout stake placed over the top. Afterwards fill the barrel with water, stir it well with a stick once or twice.
a day for about a week, after which the bag and its contents can be removed and the liquid will be ready for use. In making liquid manure whose ingredients are varied it is necessary to consider the relative values of the different manures employed. It may be stated as a good working rule that sheep and pig manures are richest; those from the horse coming next; and, last of all, cow manure. Poultry droppings are far stronger than any of these, and should be used sparingly and with considerable caution. If used separately, one peck of poultry manure will make thirty-six gallons of liquid.

The great danger to be faced in the use of liquid manures is that of applying them in too strong a condition. A good general test is to dilute them until they attain the colour and consistency of weak tea or light lager beer. It is far better to err on the side of weakness than to run the risk of ruining a plant irretrievably by supplying it with liquid manure that is too powerful. Again, it should only be used when plants are either ripening their fruits or putting forth their flowers—that is to say, when the greatest strain is being thrown upon them and they are searching right and left for the plant foods that are to carry them to maturity. It would be suicidal and worse than useless to apply it to tender young seedlings and newly-potted plants in which root action has made little or no progress. Another indispensable rule to be observed is that liquid manures should never be used when the soil is dry or parched. If, for example, it is desired to stimulate the growth of a batch of sweet peas in dry, sunny weather at midsummer, the ground should be well soaked a day previous to that on which liquid manure is supplied to the roots. This rule applies equally to pot plants in a greenhouse as to stronger-growing subjects out of doors. Again the maxim, "little and often," is a sound one to observe in this connection. Study the requirements of the plants it is desired to stimulate; give stronger doses to gross-feeding subjects like arum lilies and cinerarias than to weaker-growing plants such as palms and cacti, and, above all, stop the use of stimulants altogether as soon as the highest stage of maturity has been reached.
BOOK II

THE GARDEN BEAUTIFUL
CHAPTER VI

A BORDER OF HARDY PERENNIALS

The man of moderate means who desires to see his small garden plot a mass of bloom during the summer months, and indeed well on into the autumn, is often at a loss to know how best to achieve his purpose, and at the same time to keep his expenditure within reasonable bounds. His quest for information leads him from time to time to the classic treatises on gardening, and he is told to raise this in heat, to prick that off and harden in a cold frame, to pot on the other, and to pinch out a fourth species of plant, until he recoils in despair from the effort to master the technicalities of the science of horticulture, and either calls in the jobbing gardener to "tidy up" the borders, or abandons the attempt to achieve order out of chaos.

He is not, perhaps, the owner of a greenhouse and a frame, and even if he were he has not the leisure to devote the many hours that are essential to the successful raising of seedlings or the propagation of cuttings. All these operations are fascinating in the extreme to the amateur who boasts proudly, and not without cause, to his neighbours that he raised that batch of asters from seed, and layered that bed of carnations himself, or that his calceolarias and pentstemons are all from his own cuttings. It is the aim of most amateur gardeners to be able to say, "Alone I did it. This is my own work from start to finish. Not once during the past year have I had to call in professional assistance—even for the prosaic but none the less important operation of trenching or digging my borders."

This is all very laudable and worthy; but, as I have said, it is not everybody who has the means, the time, or the inclination to attempt such horticultural flights. What, then, is the alternative?
It lies in the cultivation of that class of plants known as hardy perennials. No finer sight can be imagined than a well-stocked herbaceous border when the flowers are at their best in July, August, and September—such a one as you can see every year at Hampton Court Palace or in Kew Gardens. The formal beds of scarlet geraniums, yellow calceolarias, and blue lobelia, beloved of the jobbing gardener, pale into insignificance beside the stately grandeur of well-grown perennials. The initial cost of such plants hardly exceeds that of more formal bedding subjects, and once it has been overcome the owner of a group of hardy perennials has the satisfaction of knowing that his purchases possess the merit of permanence.

The great attraction which the perennial border has for the average amateur gardener is surely that when once it has been well and truly planted—that is to say, when a suitable soil medium has been provided, and due attention has been paid to the requirements of the plants in regard to disposition and situation—it demands comparatively little attention, save for an occasional loosening of the surface soil with fork or hoe, and an annual top-dressing of littery manure. The plants take care of themselves. They thrust their fresh green spikes through the soil with the advent of sunny days in February, they attain the zenith of their beauty in summer and early autumn, and then die down to be stirred into activity again and again as season follows season.

First of all, in planting a perennial border—and, indeed, in every other branch of gardening—comes the preparation of the soil. In the well-ordered garden this should have been accomplished before Christmas; but where the opportunity for this has not been forthcoming the work of digging and planting may be carried on in suitable weather with perfectly satisfactory results until the middle of April. To delay until the autumn would be to waste precious months of bloom; indeed, I am not sure that it is not better in the long run to plant the perennial border after the sun has had time to warm the ground in March and April and to dispel the chill damp of winter rains and snows. The small pieces of root and the young plants that are purchased from the
Mixed Border in a Front Garden.
The chief features of this border are lupins, irises, pinks and pansies.

Photograph by W. E. Ward.
florist will at least have a chance, in consequence of the delay, to get hold immediately and grow away without any serious check.

The chief point to remember in preparing the soil for perennials is that the border is to be the home of your plants for three or four years at least. The less you disturb them the better they will grow. Therefore dig deep and dig thoroughly. If you find that the good soil is two feet deep you may rest satisfied that you have it at sufficient depth.

It is possible, however, that you will have to contend with a mass of heavy clay or a layer of light sandy soil, and that the drainage of the subsoil may be imperfect. In that case the hints given in the chapter on "Soils and How to Cultivate Them" will be found useful. The great object to be aimed at is to give your perennial plants a sufficiently deep root-run. Where the top layers of soil are defective they should be treated so that, if they are too light, moisture-retaining substances are incorporated, and if too heavy, the lighter qualities of sand and road grit may be introduced so as to bring about a better condition of porosity.

The building up of a border with entirely new material will be found to be a somewhat expensive undertaking, but where it is possible the results can be nothing but satisfactory if the following method be adopted:—The old soil should be taken out to a depth of two or three feet, the subsoil loosened for purposes of drainage, and the vacant space filled in with layers of well-rotted manure towards the bottom, old pieces of turf, road grit, and loamy soil. The surface should be raised and rounded to allow for the inevitable shrinkage which will follow as the soil settles down.

And here let me emphasise the desirability of generosity in regard to the width of the border. If the plants are not to be cramped for room; if they are to be allowed to flourish, and to attain the breadth and height that are natural to them, then be assured that they will only reach the standard of perfection of which they are capable if they be accorded spacious treatment. By this I mean a border not less than four feet wide, and if possible six. Its length will, of course, depend upon the dimensions of the garden—the larger it is the better chance will it give of effec-
tive grouping and the adoption of suitable colour schemes. But whatever its length it must have breadth if it is to be an artistic success.

What to plant is a question that may next be considered. I have drawn up a list of hardy perennials and biennials which may prove useful to the beginner, and I have arranged them in three sections, so that he may have some guide by which to judge the natural height of the plants when he sets out his border. The biennials will need renewing after two years, either from seed or young plants:

### Tall Subjects

- **Delphinium** (white and various shades of blue and red; one to four feet).
- **Digitalis grandiflora** and **D. purpurea** (foxglove). (Yellow, purple spotted or white; three to five feet.)
- **Hollyhocks** (double and single, varied colours; ten to twelve feet).
- **Rudbeckia** (stately subjects, rather like sunflowers, but with slender stalks. Profusion of bloom; three to six feet).
- **Sunflowers** (giant or medium, such as Miss Mellish or Soleil d'Or; four to eight feet).

### Medium Height

- **Anemone Japonica** (white and pink flowers; late; one and a half to two feet).
- **Aquilegia** (Columbine) (various colours; two to three feet).
- **Campanula persicifolia** (blue and white; thrives in partial shade; one to three feet).
- **Campanula lactiflora** (white tinged with blue; two to six feet).
- **Campanula pyramidalis** (chimney bellflower, blue; four to six feet).
- **Canterbury bells** (various colours; three feet).
- **Coreopsis grandiflora** (beautiful yellow flowers on long stems, invaluable for cutting; three feet).
- **Doronicum** (light yellow flowers; bloom early; one to three feet).
- **Gaillardia** (should be massed in groups; two to two and a half feet).
- **German iris or flag** (fine spike leaves; evergreen; flowers in variety of colours; two to three feet).
- **Geum** (colours various; vigorous growth; one to two feet).
- **Hepatica** (suitable for windy places; two to three and a half feet).
- **Iceland poppies** (various colours; valuable for cutting; one foot).
Lupin (many beautiful hybrids; flowers May and June; four to six feet).
Lychnis (flowers in spikes or panicles, June and July; one to three feet).
Michaelmas daisy (secure newer sorts; there are many fine varieties; two to three feet).
Montbretia (midsummer to autumn flowering bulbs; deserve good treatment and require frequent division; two to two and a half feet).
Oriental poppies (scarlet; one to five feet).
Œnothera (evening primrose), Œ. Youngii, one and a half to two feet, is a fine bushy perennial variety.
Pæonies (various colours, handsome plants. They take a year or two to become established; three to five feet).
Phloxes (various colours; fine heads of bloom; flowers July and August; one to three feet).
Polemonium (Jacob's ladder; late spring and summer flowering; one to two feet).
Polygonatum (Solomon's seal; elegant pendulous flowers; two to two and a half feet).
Pyrethrum (various colours; innumerable varieties; two to five feet).
Scabiosa caucasica (thrives well in sheltered position beside a south wall; two to two and a half feet).
Shasta daisy (white with yellow centre; prolific bloomers; three feet).
Solidago (golden rod: yellow flowers, August and September; three to six feet).
Spiræa (goat's beard) S. aruncus is a good variety which thrives in a moist position; three to four feet).
Tritoma (Flame flower; flowers in early autumn; two to six feet)

Dwarf

Auricula (will thrive in any dry position; six to nine inches).
Iberis (evergreen candytuft; six inches to one foot).
London pride (spreads rapidly; needs keeping in check; nine inches to one foot).
Pansies (many varieties; six to nine inches).
Phlox Carpatica. (Carpathian Harebell; white and various shades of blue; six inches to one foot).
Pink (Mrs Sinkins or Her Majesty; white; six to nine inches).
Violas (various choice colours; six to nine inches).

The list can be extended indefinitely. I have chosen only a few of the better-known kinds; but there are thousands of others. It is an education in gardening to study the catalogues of some
of the leading growers of perennials. The classes are all carefully
tabulated, and contain cultural notes of the utmost value to the
amateur.

A selection of the plants that are intended to furnish the
border having been made, the next essentials are firm planting
and discrimination in the choice of positions, so that the effective
groupings and colour schemes can be arranged. Even the be-
ginner in gardening will be familiar with the good old rule that
tall-growing subjects should be placed at the back of the border
and low-growing plants in the front. But he will be wise not to
observe it too closely. Its adoption will inevitably result in a
dreary and monotonous uniformity, which it should be his object,
in this as in all gardening operations, to avoid. By all means
let him place his hollyhocks and his rudbeckias towards the back,
but do not let him hide his early flowering chrysanthemums, his
tritomas, his irises, his coreopsis, or his choicest Michaelmas
daisies in such a manner that their full beauty is obscured. Let
him break up his border by judicious planting. A well-arranged
border is like a shifting kaleidoscope, but to realise this constant
variety the colour, height, and habit of each individual plant
need to be studied.

As time goes on the clumps of phlox, rudbeckia, campanula,
Michaelmas daisy and many other occupants of the perennial
border will expand and swell until they swallow up every available
inch of soil, and, indeed, overlap each other in their eager hunt for
refreshment and sustenance. This may be expected to occur in a
well-stocked border in the course of three or four years, and then
the necessity presents itself for a vigorous thinning out and a
judicious rearrangement of the plants. Neglect to meet the re-
quirements of the occupants of the border by attention to these
operations will inevitably result in a serious impoverishment of
the soil, and a distressing deterioration of the plants.

While one is about it, it is well to do the thing thoroughly. In
the case of a comparatively new border it may, of course, be found
sufficient to thin out only a few of the more vigorous occupants,
but where the border has been allowed to remain undisturbed
for several years complete renewal and redistribution are essential; and in order to accomplish the operation satisfactorily it is advisable to divide the border into sections, say, six yards in length, so that the varied tasks of lifting, dividing, digging, manuring, and replanting can be accomplished, so far as one section at least is concerned, in one day. The adoption of this plan obviates the possibility of damage to the plants by frost, if, as might be necessary where a longer stretch of border came under review, they had to be left out of the ground for several days at a stretch.

Let us suppose that it has been decided to take such a section in hand: What should be the method of procedure? First the old clumps must be lifted, and this, in the case of well-seasoned old roots of perennial aster, phlox, or sunflower, will not be too easy a task, especially if by neglect, the soil has been allowed to become solidified. In such a case it is best to thrust a sharp spade round the extremities of the clump, and then to lift it bodily, if possible, out of the ground with the aid of a strong fork. The roots thus removed may be placed on one side to await division.

Here it is necessary to offer a word of warning. Some discrimination must be observed in arriving at a decision in regard to the subjects which will bear disturbance and those which will not. Exceptions to the general rule of wholesale lifting must be made in the cases of pæonies and alstroemerias. These resent all interference. To disturb them once they have become established means another long interval before they will reward the cultivator with gorgeous displays of blooms.

In digging the border it is necessary to penetrate deeply enough to ensure a thorough breaking up of the subsoil. The advantages to be derived from this will be apparent both in the manner in which the occupants of the soil will thrive and in the comparatively little need there will be for the use of the watering-can, save in periods of excessive heat in summer.

The efficient manuring of the border while the digging is in progress requires some care. The kind of manure to be used depends largely upon the nature of the ground. If it is light and inclined to be sandy, and therefore unable to retain moisture in
times of drought, it will be found advisable to place a good layer of cow manure two, and, if possible, three feet below the surface. Where clayey soil predominates, every effort should be made to lighten it by the use of decayed vegetable matter and turves, littery manure, and gritty road sweepings.

When the soil has been thus treated, deeply dug, well manured, and thoroughly pulverised on the surface, and sloped gently from the back to the front of the border, it will be ready for replanting. The clumps previously lifted should then be divided. The old roots may be sundered by the use of a sharp spade. In selecting the pieces suitable for replanting, it is well to take them not from the centre of the o’d clump but from the extremities. These are the newer parts of the plant, and therefore the more vigorous.

Firm planting is a cardinal principle to be observed. It is not enough to make a hole with spade or trowel, thrust in the roots, and fill in with soil. The new plant must rest securely on the bottom of the hole, be packed round tightly with soil, and then, to make assurance doubly sure, it is a good plan to tread carefully all round its crown so as to keep it in position.

In replanting, as in the making of a new border, it will be advisable to keep an eye on colour schemes, on the necessity for grouping, and on the danger of overcrowding. As the work proceeds retain clearly in the mind the deficiencies presented by the border in previous years, and remedy them by attention to the rules here set forth. In a large border single specimens are lost; effective grouping alone can provide a satisfactory result.
CHAPTER VII
SUMMER FLOWER BEDS

THE formal summer flower bed, beloved by our mid-Victorian grandfathers, is now no longer in favour among the high priests of gardening who seek to set the horticultural fashions of the moment. It is anathema, is despised and rejected, and in their eyes is altogether abhorrent and antiquated. Did not William Morris, the Socialist poet, write of "that aberration of the human mind, carpet bedding"? He had before him, doubtless, a mental vision of an elaborately shaped bed of brick-red geraniums, yellow calceolarias, and blue lobelia, and it would go hard indeed with the man who, in these æsthetic days, expressed dissent from this contemptuous outburst.

But violent as has been the revolt against the formal carpet bedding system which prevailed half a century ago, we still have with us, happily enough, the red geranium, the yellow calceolaria, the blue lobelia, and the white marguerite, and though we do not press them into the service with such monotonous iteration as did our forefathers, they still find an honoured place among the wealth of decorative material which is at our disposal as we plan our summer flower beds and borders. Simultaneously with the revival in popularity of old-fashioned, homely hardy perennials, there has grown up the system which for want of a better term is called "mixed bedding." This is a comprehensive enough classification which permits of the employment of a large variety of half-hardy or tender plants for filling beds in the flower garden during the summer months. It allows a fair amount of latitude to the gardener in the direction of satisfying individual taste in harmonious grouping and in the arrangement of colour schemes, and it is an altogether admirable system, since it can be adapted
with the most satisfactory results either to the park-like gardens of country mansions or to the modest little plot that adds to the amenities of the suburban villa or the country cottage.

The size of the garden will of course determine the number and the dimensions of the beds which it is intended to devote to summer bedding plants. It will not however necessarily affect their shape. This will depend largely upon personal idiosyncrasies. But a moment’s consideration will demonstrate the utter undesirability of the adoption of elaborate and fantastic designs. Five-pointed stars, crosses, and crescents, worked out with geometrical precision, are sometimes recommended to the amateur gardener, but if he be wise he will reject them unhesitatingly. Such elaborately designed beds are not easy to construct, and even after they are made they involve an expenditure of time and labour in preserving their outline, and in keeping the rampant growth of their occupants in check, which might be utilised with far better rewards in other directions. Simple circles, ovals, squares, diamonds, and oblongs are infinitely more serviceable than fantastic designs. Let “Use before ornament” be the guiding principle in the shaping of flower beds.

For the sake of appearances, and also because it has a utility of its own in that it promotes good drainage for the many bedding plants that do not thrive well in over-moist situations, it is a good plan in constructing flower beds to have the soil raised above the level of surrounding paths and stretches of lawn. If the existing soil is of a heavy, retentive nature it had better be removed to a depth of eighteen inches; the base of the bed be covered with six inches of pebbles, stones, or brick rubbish for drainage, and the surface soil be composed principally of sound turfy loam. The excessive use of manure should be avoided, since in the case of such plants as zonal pelargoniums its influence would be merely to produce an undue amount of foliage and few flowers. As in nearly all the rules that are laid down for the guidance of amateur gardeners, there are exceptions which call for the exercise of judgment and discrimination. Plants that are grown chiefly for their fine foliage require rich feeding, and in constructing a bed in which
Fig. 1. The top portion of the diagram represents a section of a border of mixed bedding plants which will give a homely and effective display of bloom at slight cost. The key to the plants in the border is as follows:—1, chrysanthemum; 2, dahlia; 3, sweet peas; 4, nicotiana affinis; 5, antirrhinum; 6, marguerite; 7, zinnia; 8, pink (Mrs Sinkins); 9, pansies; 10, daisies; 11, verbenas (to be pegged down); 12, Virginian stock; or 13, mignonette; 14, in dry weather plants from pots may be planted thus, thereby getting the benefit of the watering; 15, trim the ball thus—correctly planted; 16, incorrect method.
such objects are to secure a home it will be found worth while to incorporate with the soil a generous supply of organic manure and to bury it deeply, so that the roots may be induced to thrust themselves downwards in their search for sustenance and thus help to keep at bay the ravages of drought in hot, dry weather.

Let the beds be nicely and evenly shaped, so that they present the appearance of a smooth mound, and then be allowed to settle down comfortably before any attempt at planting out is made. This will contribute to firm planting and robust root production.

Next comes the all-important consideration: What shall the amateur plant in his summer flower beds, so that he may achieve his ambition, and realise the ideal of the garden beautiful? The choice at his disposal is unlimited, and the quantity of plants which he may grow satisfactorily is bounded only by the extent of his garden and by the dimensions of his purse. But let him not be deluded into the belief that the mere possession of the wherewithal to stock his flower beds and borders will enable him, without taking further thought, to make his garden even passably beautiful. "I am strongly of opinion," writes Miss Gertrude Jekyll, the most distinguished of British lady amateur gardeners, "that the possession of a quantity of plants, however good the plants may be themselves and however ample their number, does not make a garden; it only makes a collection. Having got the plants, the great thing is to use them with careful selection and definite intention. Merely having them, or having them planted unassorted in garden spaces, is only like having a box of paints from the best colourman, or to go one step further, it is like having portions of these paints set out upon a palette. This does not constitute a picture. ... It is just in the way it is done that lies the whole difference between commonplace gardening and gardening that may rightly claim to rank as a fine art."

The truth of this must surely carry conviction to the mind of the veriest tyro in the science and practice of horticulture. He sees here set before him the goal at which he seeks to aim. The
SUMMER BEDDING.

The edging is French lavender; the 2nd row Blue Lobelia, and the 3rd row Centaurea (silver foliaged half-hardy perennial). In the centre of the beds are yellow calceolarias, ten week stocks, pelargoniums and standard roses.

Photograph by W. Scholling.
problem that confronts him lies in the means that shall be employed to attain it. If I may offer a humble word of advice, it is that he should begin at the beginning. He will not achieve perfection easily or immediately; before the goal is reached he will have expended hours—nay, years—of careful watching, noting and doing; he will have had meanwhile to put himself into closest acquaintance and sympathy with growing things; will have marked their diversities of habit, and their peculiarities of colouring and growth, so that, working in harmony with Nature, he may assist her in producing the perfect garden picture.

And the beginning of the art of summer bedding is to be found, I believe, in striking at the outset the note of simplicity. Let the inexperienced amateur confine his activities to a few of the plants with which he is most familiar, such as the geranium, the calceolaria, the viola, the pansy, the verbena, and the fuchsia; half-hardy annuals like African marigolds, petunias, phlox Drummondii, nicotiana (the new hybrid and coloured varieties), stocks, asters, and the like, and for edgings such simple plants as lobelia, blue or white, alyssum, arabis, and Virginian stock.

Here there is ample choice for the display of a nice discrimination in the selection of colours and in the disposition of the plants. What, for example, is calculated to produce a simpler or finer effect than a bed or two devoted exclusively to the cultivation of violas? The range of colours is wide, and the beds may be confined to flowers of a single hue or to mixed varieties at discretion. The supreme advantage of the viola over other bedding plants lies in its extended period of flowering. If care be taken regularly to remove faded blossoms the viola will flower with astonishing persistency, even in a shady situation, from late in April until the end of September. Here is a list of a few of the many varieties that lend themselves to simple bedding arrangement, with their distinctive colours:

| Snowflake | Royal Sovereign |
| Sylvia | Kingcup |
| Seagull | Mrs E. A. Cade |
| White Empress | Walter Welsh |
Primrose Dame | Duchesses of Fife
Sulphurea Ardwell Gem | primrose | John Quarton
Blue Gown Royal Scott Blue Rock Blue Diamond Blue Duchess | dark blue | purple
| light blue | lavender

Still keeping simplicity as the keynote of our summer bedding, let us consider the advantages of another long blooming plant, the petunia. If the more gaudy colours are avoided, and our attention be confined to the pure purple and white shades, a most charming effect can be produced, especially where the plants are set on a raised sunny bed or bank. Phlox Drummondi again is among the most brilliant of half-hardy annuals. Planted in long narrow beds cut out of the lawn as a groundwork either to standard or bush roses, it is hard to excel for gorgeous colouring. But avoid mixed seed. Purchase it, as may easily be done cheaply, in packets containing only one variety and colour, use discretion in planting out, and the effect will be all that can be desired.

Similarly, verbenas appear at their best when not associated too closely in combination with other plants. They are best treated in separate beds or in sections of narrow borders. They require to be planted in bold masses.

The verbena some years ago lost a good deal of its popularity as a bedding plant. This was due to the fact that it was almost annihilated by fungoid disease, the result of weakened growth, which in turn was due to over-propagation or propagation in a forcing temperature to ensure rapid rooting of the cuttings. It is true that the verbena is not a hardy plant, but it is too choice and delightful a flower to be allowed to disappear from our English gardens, and all gardeners will rejoice at its recent return to favour. I have vividly pictured in my mind a magnificent group of a comparatively new type of verbena known as Miss Willmott, which I saw while making an inspection of the glorious mixed border at Hampton Court Palace recently. The plants
were splendidly massed in front of the border, and their lovely rose-pink flowers made a picture that arrested attention immediately, and left an indelible impression on the memory. It was the introduction of Miss Willmott which brought about the revival of verbena growing. It is a distinct type, and is by common consent the best verbena ever grown. Other good varieties are Princess of Wales, a deep purple-blue, and Snowflake and Purple King, which were the pride of our grandfathers' gardens.

The simple form of summer bedding which is confined to the employment of a single variety of plant for each bed is one that the beginner in gardening can easily work out for himself. When, however, we come to consider the intricacies and the difficulties of mixed bedding, new problems present themselves. In order to achieve success, the amateur will require to make himself acquainted with the capabilities, the habit, the colour and the height of each species of plant that he proposes to employ in the embellishment of his garden. The following table contains a few of the plants most commonly in use. It indicates in addition to their names the period of flowering, the height and the colour of each variety:

<table>
<thead>
<tr>
<th>Species</th>
<th>Variety</th>
<th>Colour</th>
<th>Height</th>
<th>Flowering period</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;</td>
<td>Golden Fleece</td>
<td>Yellow</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>Anna Crozy</td>
<td>Pink</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>Emperor</td>
<td>Purple</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>Royal Scarlet</td>
<td>Red</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>Thompsonianum</td>
<td>Variegated foliage</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>Ageratum</td>
<td>Blue Star</td>
<td>Light blue</td>
<td>6 ins.</td>
<td>June-Sept.</td>
</tr>
<tr>
<td>&quot;</td>
<td>Little Dorrit</td>
<td>Lavender</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>Victoria Louise</td>
<td>Light blue, white centre</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>Imperial Dwarf</td>
<td>White</td>
<td>9 ins.</td>
<td>&quot;</td>
</tr>
<tr>
<td>Alonsoa</td>
<td>Warzewiczi</td>
<td>Bright scarlet</td>
<td>2 ft.</td>
<td>July-Sept.</td>
</tr>
<tr>
<td>Amaranthus</td>
<td>Melancholicus</td>
<td>Maroon</td>
<td>1 ft.</td>
<td>&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>Ruber</td>
<td>Blue</td>
<td>4 ft.</td>
<td>&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>Umbellatus</td>
<td>White</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>Albus</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>Species</td>
<td>Variety</td>
<td>Colour</td>
<td>Height</td>
<td>Flowering period</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------</td>
<td>-------------------------</td>
<td>---------</td>
<td>------------------</td>
</tr>
<tr>
<td>Aralia</td>
<td>Sieboldi</td>
<td>Foliage</td>
<td>4-5 ft.</td>
<td></td>
</tr>
<tr>
<td>&quot;</td>
<td>Comet</td>
<td>&quot;</td>
<td>1 ft.</td>
<td>&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>Plume</td>
<td>&quot;</td>
<td>1½ ft.</td>
<td>&quot;</td>
</tr>
<tr>
<td>Beet</td>
<td>Ornamental</td>
<td>Rich maroon</td>
<td>1 ft.</td>
<td></td>
</tr>
<tr>
<td>Impatiens</td>
<td>Balsam</td>
<td>&quot;</td>
<td>1-1½ ft.</td>
<td>July-Sept.</td>
</tr>
<tr>
<td>Canna</td>
<td>Indian Shot</td>
<td>Various</td>
<td>2 ft.</td>
<td>July-Sept.</td>
</tr>
<tr>
<td>&quot;</td>
<td>Orchid-flowered</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>Plumosa</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>Pyramidalis</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>Celsia</td>
<td>Cretica</td>
<td>Yellow</td>
<td>4-5 ft.</td>
<td>June</td>
</tr>
<tr>
<td>Cobæa</td>
<td>Scandens</td>
<td>Purple</td>
<td>Climbing</td>
<td>Aug.-Sept.</td>
</tr>
<tr>
<td>&quot;</td>
<td>Cactus</td>
<td>&quot;</td>
<td>5 ft.</td>
<td>&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>Pompon</td>
<td>&quot;</td>
<td>4 ft.</td>
<td>&quot;</td>
</tr>
<tr>
<td>Eucalyptus</td>
<td>Globulus</td>
<td>Foliage</td>
<td>4-6 ft.</td>
<td></td>
</tr>
<tr>
<td>Fuchsia</td>
<td>Fulgens</td>
<td>Red</td>
<td>Standard</td>
<td>June-Sept.</td>
</tr>
<tr>
<td>&quot;</td>
<td>Splendens</td>
<td>Scarlet and green</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>Triphylla</td>
<td>Crimson</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>Geranium</td>
<td>Zonal Pelargonium</td>
<td>Various</td>
<td>1-2 ft.</td>
<td></td>
</tr>
<tr>
<td>Grevillea</td>
<td>Robusta</td>
<td>Fern-like foliage</td>
<td>2 ft.</td>
<td></td>
</tr>
<tr>
<td>Heliotrope</td>
<td>Peruvianum</td>
<td>Heliotrope</td>
<td>Standard</td>
<td>or bush</td>
</tr>
<tr>
<td>&quot;</td>
<td>(Cherry Pie)</td>
<td>&quot;</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>Hydrangea</td>
<td>Hortensia</td>
<td>White, pink, and blue</td>
<td>2-4 ft.</td>
<td></td>
</tr>
<tr>
<td>&quot;</td>
<td>Paniculata</td>
<td>White</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>Lobelia</td>
<td>Emperor William</td>
<td>Dark blue</td>
<td>9 ins.</td>
<td>&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>White Gem</td>
<td>White</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>Auratum</td>
<td>Ivory white, purple blotches</td>
<td>2-6 ft.</td>
<td>August</td>
</tr>
<tr>
<td>&quot;</td>
<td>Bulbiferum</td>
<td>Orange red</td>
<td>2-4 ft.</td>
<td>May-June</td>
</tr>
<tr>
<td>&quot;</td>
<td>Candidum</td>
<td>White</td>
<td>5 ft.</td>
<td>June</td>
</tr>
<tr>
<td>&quot;</td>
<td>Croceum</td>
<td>Orange</td>
<td>3-6 ft.</td>
<td>June-July</td>
</tr>
<tr>
<td>&quot;</td>
<td>Giganteum</td>
<td>Ivory white</td>
<td>10 ft.</td>
<td>July</td>
</tr>
<tr>
<td>&quot;</td>
<td>Henryi</td>
<td>Orange yellow</td>
<td>3-6 ft.</td>
<td>July-Sept.</td>
</tr>
</tbody>
</table>
HOW TO TURN OUT A PLANT FROM A POT.

Tap the rim of the pot gently on the edge of a box or the potting bench as shown in the top photograph. The picture below shows the plant released from the pot.
The satisfactory arrangement of plants selected from the above list will tax the ingenuity and skill of the gardener. Experiment and practice, and a study of the charming bedding out effects produced in public parks and gardens will be found of the utmost service in enabling him to achieve success. The following hints, however, may prove useful if it be remembered that they are intended to be merely guiding principles and suggestions, not unalterable rules, like the laws of the Medes and Persians.

(1) Do not attempt to grow too many kinds of plants in one bed; let simplicity and grace strike the keynote both of
the design of the bed and the arrangement of its occupants.

(2) For formal bedding place the taller plants, such as standard fuchsias, campanula pyramidalis, or foliage plants, like eucalyptus, yuccas or aralias in the centre, and allow the other occupants of the bed to slope gradually downwards towards the edge, keeping dwarf plants such as alyssum, lobelia, or echeverias for the edging.

(3) Avoid overcrowding. Remember that the plants when they are "bedded out" in early June are only a fraction of their ultimate size. Give room for expansion. For example, godetias should be planted at least one foot apart, and violas not nearer to each other than nine inches.

(4) Watch the arrangements of colours carefully so that garish and inharmonious effects may be avoided. Keep in mind that scarlet and blue (say a bed of salvias, splendens and patens) harmonise well together; that a blending of mauves and purples is always attractive; and that white is an exceptionally forceful "colour," and should be carefully employed, either in conjunction with scarlet, blue, or purple. The following combinations are good:—shades of pink, rose, salmon and scarlet; purple, lilac and yellow; crimson, blue and white, and yellow and orange; whereas combinations such as the following are bad, and should be strictly avoided:—red and yellow, blue and yellow, violet and red, scarlet and yellow, orange and magenta, and crimson and orange.

(5) Make it a rule to place small plants in small beds and large plants in large beds.

The treatment of bedding-out plants immediately before their committal to the open ground requires a little care. It is assumed, of course, that if they have been protected in frames during early spring they have, when planting-out time arrives at the end of May or the beginning of June, been thoroughly hardened off against a south wall or fence. On the evening before the day on which it is intended to plant them out the pots should be well
soaked with water. This stimulates the roots, and in addition facilitates their removal from the pots.

The two illustrations facing Page 72 indicate the method in which this removal may be effected with least injury to the plants. The pot should be taken in the right hand, the plant placed through the fingers of the left hand and turned upside down. Then the rim of the pot should be tapped lightly against the edge of a box or a block of wood. The plant by this means will be released, and will rest firmly on the palm of the left hand. With the fingers of the right hand the crocks, or small pieces of pot which have served as drainage, should be removed carefully and a few of the outside roots loosened.

The plant is then ready for insertion in the hole prepared for it, which on no account should err on the side of smallness. It should be wide enough and deep enough to hide the whole of the pot soil. Fill in any intervening space that may be left with soil, and press it hard round the plant. Firm planting is essential. It keeps the plant steady in the wind, and gives the roots a chance to start off into new growth without a check. A good watering is as necessary after planting as it was previous to the operation.
CHAPTER VIII

THE ROCKERY

By many people it is erroneously supposed that the chief purpose served by a rockery is that of filling up any odd corner, no matter what its position so long as it be dark and damp—such a spot indeed as will not grow the ordinary garden flowers that thrive only in the sunshine.

Before choosing the situation for a rockery, it is well to realise clearly what its object is. It is intended to be the home of the flowers that clothe the Alpine slopes, and to display them to the best advantage in a position, artificially provided, which shall approximate as nearly as possible to their natural surroundings. In any collection of Alpine plants that may be secured there will inevitably be both sun and shade loving subjects, and in selecting a position for the rock garden it will be necessary to study the requirements of both classes of plants.

Avoid above all things, therefore, the dark, damp corner. Choose, rather, a position in which there can be a free circulation of air, and in which both sunshine and shade can be provided. If possible let the aspect be one running from north-east to south-west.

Another common error, examples of which may be seen frequently, arises from want of care in constructing a rockery. One sees sometimes a "rock garden" which is nothing better than a heap of clinkers, bricks, and rough stones shot haphazard upon an ill-formed mound of earth. No plant worth cultivating can be expected to thrive under such conditions; even if it lived for a few months it would inevitably die when the full heat of summer arrived, for the sufficient reason that for want of room in which to expand, the roots would wither.
Diagram 5.—MAKING A ROCKERY.

Fig. 1. Frontage of rockery too formal. Fig. 2. Frontage to be preferred.
Fig. 3. Foundation of rubble and other rough material. Fig. 4. Front row of stones should be embedded. Fig. 5. Pockets may be made where convenient. Fig. 6. Ramming in the soil. Fig. 7. The result. Fig. 8. Pocket to be avoided.
On the other hand, there are "rockeries" on the construction of which neither time nor expense has been spared, which are masterpieces of rocky art, but which are not and never can be the home of thriving flowers.

Diagram No. 5 will enable the amateur to see at a glance how a rock garden should be constructed. By its aid and a careful study of some of the charming rock gardens to be found in many of the public parks he should have little difficulty in achieving a fair measure of success, even at the very outset of his endeavours.

The autumn provides a favourable opportunity to start the construction of a rockery. The first essential is to lay in a good stock of fair-sized stones. If possible it is advisable to procure pieces of sandstone, but where this cannot be done it will be necessary to fall back on the cheapest stone obtainable in the neighbourhood. The purpose of the rocks or stones is to afford congenial crannies which the roots can explore for nutriment, and to provide flat or round surfaces upon which the plants can spread their trailing beauty as though they were growing on their native Alps.

In preparing the ground upon which the rockery is to rest, it will be necessary to ensure good drainage. This can be provided if the ground be dug out to a depth of three feet and the bottom covered with a layer of old rubble and stones. On this base clods of new turf turned upside down and the roughest of the soil should be placed.

It will naturally be desired that the rock garden should be elevated, and for the purpose of ensuring that it shall be of sufficient height—say, two, or at most three feet above the ground-level—any mould available can be used, but the top should consist of at least one foot of good soil—chiefly sandy loam mixed with some peat, to which a good portion of sandstone chips and grit has been added.

The stones should next be placed in position. Their disposition may be left to individual taste and idiosyncrasy. The chief point to bear in mind, however, is that they must be so fixed in
their places as to provide crevices in which the plants can be set.

The filling in of the crevices with soil needs careful attention. It will not be enough to put soil in loosely, so that when the first heavy rains come it will be washed away into the drainage. The mould must be pressed down firmly and rammed hard if the crevices are fairly deep, as they should be.

Next the questions what to plant and when to plant need consideration. At the outset the amateur should confine his attention to a few of the commoner kinds of Alpines, and avoid overcrowding, so that the stronger plants do not smother the weaker. As the cultivator becomes better versed in the habits and requirements of his plants he can add gradually to his collection.

Here are a few suggestions for the first purchases, divided into convenient sections:—

*For Sunny Positions*

Saxifraga (in variety).
Silene (in variety).
Androsace carnea (pink).
Dianthus (Alpine pinks, in variety).
Campanula (Alpine "hare-bells").
Primula (in variety, early flowering).

*For Shady Positions*

Ramondia (Pyrenean violet, moisture-loving).
Gentiana (Alpine gentians, shrubby).
Gaultheria (trailing plants).
Sedum (stonecrops).
Pulmonaria (virginia cowslips).
Viola pedata (Alpine varieties).
Cyclamen (spring and early summer flowering).

*For Dry Positions*

Sempervivum (two to six inches high, indispensable rock plants).
Helianthemum (rock roses).
Draba (early flowering).
Armeria (Alpine thrift).
Aubrietia (early flowering).
Arabis (useful for dry crevices).
Alyssum (masses of colour).
Arenaria (sand wort).
Coronilla iberica (pea-flowering rock plant).

In addition there are many trailing and creeping plants such as
vinca (periwinkle), veronica and gypsophila, and dwarf shrubs
like erica (heaths), menziesia (Irish heather), genista (small-
growing brooms), cotoneaster and spiræa, which can be added to
the collection as desired.

If the construction of the rockery be taken in hand during the
autumn and winter all will be in readiness for planting by March.
The plants can be obtained from the florist in small pots, and
the work of transferring them to their new home will thus be
facilitated. Care must be taken to plant firmly.

The established rockery can be induced to provide a pretty
display of bloom almost all the year round if recourse be had to
some of the rarer species of bulbous plants which help to make
the garden gay in spring and summer.

Most amateur gardeners cultivate a few at any rate of the
commoner kinds of bulbs. The hyacinth, the tulip, the daffodil,
the crocus, and the snowdrop find a place in almost every small
garden. These are all easily grown. They are cheap, and they
lend themselves readily to the production of fine broad masses
of colour in the open garden when April and May come round.

But there are dozens of other varieties of bulbs and hardy
tuberous-rooted plants not less cheap, and certainly not less
beautiful, that the amateur neglects year after year. Possibly
he has never heard of many of them, or perhaps if he has seen their
names in the growers' bulb catalogues he has imagined that the
difficulties associated with their cultivation are in proportion to
the length of the names conferred upon them by botanists, and
to the extraordinary vocal contortions that are necessary in order
to pronounce the words aright.
A well-filled Rock Garden.
Photograph by Miss Eleanor Sciffner.

A Wall Plant: Crucianella Stylosa. (Crosswort.)
Photograph by J. A. Ellis
Thus he finds:

<table>
<thead>
<tr>
<th>Alliums</th>
<th>Erythroniums</th>
<th>Leucojums</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bloomerias</td>
<td>Fritillarias</td>
<td>Muscaris</td>
</tr>
<tr>
<td>Brodiaeas</td>
<td>Galanthuses</td>
<td>Polygonatum</td>
</tr>
<tr>
<td>Calochorti</td>
<td>Hymenocallis</td>
<td>Puschkinias</td>
</tr>
<tr>
<td>Colchicums</td>
<td>Iris</td>
<td>Scillas</td>
</tr>
<tr>
<td>Chionodoxas</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I have chosen this list because most of the varieties included are dwarf-growing bulbous flowers, which lend themselves admirably to special treatment as subjects for cultivation in the rockery. Most bulbs revel in a well-drained site, and the elevated soil of a properly made rockery gives them precisely those conditions in which they are most likely to thrive.

Moreover the majority of the varieties I have enumerated find ideal resting-places in the nooks and crannies of a rockery, protected as they will be by the spreading evergreen foliage of such attractive rockery plants as saxifragas, aubrietias, and sedums. Here they will find a natural and cosy home, whereas if we attempted to grow them in isolated patches in the ordinary flower border they would seem lost in the large expanses of bare earth surrounding them.

But lest the reader who is unfamiliar with the names of many of these delightful bulbs should still be alarmed at the prospect of unseen difficulties ahead, let us examine them a little more closely. We shall find that the Latinised names are merely a cloak which hides the identity of not a few familiar and quite well-known flowers.

Thus we find erythronium to be none other than the dog's tooth violet, that galanthuses are our old friends the snowdrops, that scillas are bluebells in infinite variety, and that polygonatum is merely Solomon's seal—an old-fashioned denizen of many a cottage garden.

The varieties of allium that are most suitable for rockery culture are allium moly, which produces bright yellow flowers in May and grows to a height of one foot; A. narcissiflorum, which has rosy purple flowers and blooms in June; and A.
acuminatum (rose), which flowers in July. All should be planted from three to four inches deep in sandy loam. They will thrive best in a sunny position.

The bloomerías produce yellow flowers on stems about a foot high. B. aurea is an especially good variety, which blooms in June. The flowers are borne in the shape of umbels.

Brodiæas, known as the “vegetable fire crackers of Australia,” should be planted in an elevated position on the rockery, and they grow best in fibrous peaty soil. There are fifteen or sixteen varieties, ranging in colour from white, blue and violet to yellow, lilac and heliotrope. Their height varies from six inches to two feet, the best dwarfs being B. grandiflora (blue), B. ixioides splendens (yellow), and B. Murrayana (violet). Brodiæas, again, revel in the sunlight.

Calochorti may be planted in the rockery as late as the end of November. Once more there is a wide range of colour to choose from. The best dwarf rockery varieties are C. lilacinus, which, as its name indicates, is lilac in colour. Its height is nine inches. Rather taller calochorti are C. luteus (yellow), C. venustus (white), and C. venustus oculatus (various). The soil they like best is a mixture of peat, loam and sand, and the flowering period extends from June to August.

Among the early spring blooming bulbs are the chionodoxas. These are quite dwarf, ranging only from six to nine inches in height. The best pure white is C. lucilœ alba; C. sardensis is blue, C. Tmolussi is purple, and C. lucilœ roseus is lilac. Again sandy loam is the best compost in which to plant them, and this should be done to a depth of three inches.

The two varieties of snowdrop (galanthus) best suited for rockery culture are G. Elwesii (the giant single snowdrop), which is eight inches high and flowers in January, and G. Fosterii, which grows six inches high and flowers in February.

Hymenocallis is somewhat tender, and is suitable for culture only in the south of England and in Ireland. Its flowers are white, and there is one variety, H. calathina, whose colours are green and white. Sandy leaf mould should be provided for the
bulbs, which should be planted to a depth of three inches. The flowering period is March.

Fritillarias offer an extended choice for cultivation in the rockery, and they can be had in flower from April to July. The early flowering varieties are F. plurifolia (purple), F. pudica (yellow), and F. Whitallii (brown). The latest to bloom is F. armena, a fine golden yellow which is only six inches tall and blooms in July. September is the best month to plant, but the bulbs may still be got in and planted to a depth of four inches.

Muscaris are mostly blue and white, and their height ranges from six to nine inches. They thrive in a sunny position, and in sandy loam. In addition to the blues there are M. botryoides candidum (white and rose), M. moschatum flavum (yellow), and M. plumosum (mauve).

Scillas flower from February to May, and vary in colour. Thus we have S. bifolia praecox (blue), S. bifolia rosea (rose), S. bifolia alba (white), S. rubra (red), and S. hyacinthoides (lilac). Most scillas will thrive in ordinary garden soil, but it should be made as light as possible by incorporating with it a quantity of road grit or sand.

The leucojum greatly resembles the snowdrop, though its petals bear green spots at their bases, and are somewhat different in shape from those of the galanthus. L. vernum is an excellent variety, which revels in moisture. Therefore it should have a good depth of soil and be kept well watered. It should be planted three inches deep.

Puschkinias are pretty little white and blue flowers six inches high. They bloom in April.

If the rockery faces south, the bulbous iris should on no account fail to find a place in the collection. The best varieties for the purpose are I. reticulata Krelager (purple), I. Sindjarensis (lilac), I. histrioides (blue), and I. dangardiae (yellow). These all succeed best in light sandy soil, with which a small quantity of mortar rubble has been mixed. They resent stagnant moisture, and therefore it is advisable, when planting, to surround each bulb with a little sharp sand.
The dog's tooth violet (erythronium) is partial to shade, and grows from six to eight inches in height. Its variegated foliage forms a valuable feature of the rockery. The bulbs should be arranged in a group of a dozen or more, and once they are established they will give very little further trouble. The best varieties are E. Hartwegi and E. revolutum.
CHAPTER IX

FLOWERING TREES AND SHRUBS

In the search for the limitless number of flowering trees and ornamental shrubs that in these days lend the charm of their beauty to our British landscapes and gardens the world has been scoured, and not in vain. We find the gorse and the broom, the wild cherry and the hawthorn, the lilac and the laburnum, the laurel, the tree box and the holly everywhere, and one would not dream of banishing them from our purview in our endeavour to attain the ideal of the garden beautiful. Some of these, of course, are indigenous to the British Isles; others came originally from Southern Europe and Persia; but the vast majority of the delightful flowering shrubs and trees a few specimens of which ought to find a space in even the most modest garden, have come to us from India, China, Japan, the American continent and from the overseas dominions of Great Britain. Of this great multitude there are one or two, such as the rhododendron and the azalea, that stand out pre-eminent in popularity.

The object of this chapter is to introduce to the reader who is unaware of their existence a few of the choicer varieties of shrubs and flowering trees of comparatively recent introduction which, if they be employed with discrimination and taste, will add a new delight to the garden picture at all seasons of the year.

The common conception of shrubs and shrubberies is that they shall consist of masses of evergreen, close clipped subjects that may be planted so as to fill up any odd corner, cover a bare expanse of soil, or perform the functions of a hedge or screen. The effect of such unimaginative and purely utilitarian methods of planting cannot fail to be uninteresting; in all too many instances,
indeed, they produce an impression that is at once unsightly and repellent. If the garden be large enough, and it be thought necessary to include a shrubbery within its scope, its arrangement may be carried out in such a manner that, so far from being uninteresting, it will prove to be one of its most attractive features. So great is the variety of shrubbery plants from which a choice can now be made that, instead of the dull monotony of laurels and privet, it is possible to secure subjects of a more gay appearance in which will be blended all the requisites of hardiness, free growth, and dense and vivid foliage, together with a seasonal display of delightful bloom. By these means it will be possible to make the shrubbery a thing of beauty and of joy—an ornament instead of an eyesore.

There is another aspect of the use of shrubs in the garden that demands attention. This is their employment for decorative purposes in beds and borders, apart altogether from their inclusion in orthodox shrubberies. In a previous chapter on "How to Plan a Small Garden" I suggested the need for the study of perspective—the necessity just as much to build the garden skywards as to be certain that its ground-plan be well and truly laid. Here the judicious introduction of flowering shrubs and trees can be made to play an all-important part. They will, besides forming beautiful objects in themselves, and as isolated or grouped specimens, help to break up the picture; they will give it a balance and an attractiveness that are all too frequently absent from the average small garden. How often, as one obtains glimpses of suburban garden plots from a passing train, does the entire absence of trees impress itself upon the mind! They wear an unfinished, undressed appearance that is positively distressing. No matter that the flower beds are neat and trim, that the flowers themselves are well cultivated and admirable specimens of their kind, the aspect is unpleasing and flat. There is just as great a need for shade as for sunlight in the perfect garden—as much for the sake of its natural denizens as for that of its human frequenters. And surely no better method of providing this necessary shade, as well as of adding to the beauty of the garden, can be found than by
FLOWERING TREES AND SHRUBS

planting in it, in suitable positions, trees that blossom and trees that bear luscious fruit.

The planting of trees in a small garden requires discrimination, first in avoiding the mistake of choosing positions for them in which they will obstruct the light of windows facing the garden, and ultimately perhaps blot out the garden picture altogether from the view of the occupants of the house; and next of so planting them on the lawn that they eat up the space that ought to be available for the playing of summer games. Where there is no intention to use the grass plot for lawn tennis or croquet, trees should be chosen for positions on the lawn that are essentially graceful in their habit of growth—such trees, for example, as the silver birch, the mountain ash, the laburnum or the willow. If fruit-bearing trees are desired for the furnishing of the lawn they may be either standard apples, or the quince, the medlar and the mulberry.

The following list of flowering trees suitable for cultivation in town and suburban gardens may be found useful:

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Botanical Name</th>
<th>Colour of Flowers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horse chestnut</td>
<td>Æsculus hippocastanum</td>
<td>White</td>
</tr>
<tr>
<td>Red chestnut</td>
<td>&quot; carnea</td>
<td>Red</td>
</tr>
<tr>
<td>Elder</td>
<td>Sambucus racemosa</td>
<td>Scarlet</td>
</tr>
<tr>
<td>Indian bean</td>
<td>Catalpa bignonioides</td>
<td>White</td>
</tr>
<tr>
<td>Almond</td>
<td>Prunus amygdalus</td>
<td>Rose</td>
</tr>
<tr>
<td>Laburnum</td>
<td>Cytisus alpinus</td>
<td>Yellow</td>
</tr>
<tr>
<td>&quot; Ardoini</td>
<td>L. vulgare</td>
<td>Purple and yellow</td>
</tr>
<tr>
<td>Service berry</td>
<td>Amelanchier canadensis</td>
<td>Yellow</td>
</tr>
<tr>
<td>Abelia</td>
<td>A. rupestris chinensis</td>
<td>White</td>
</tr>
<tr>
<td>Aralia</td>
<td>&quot;</td>
<td>Pink</td>
</tr>
<tr>
<td>Judas tree</td>
<td>Cercis siliquastrum</td>
<td>Cream</td>
</tr>
<tr>
<td>Magnolia</td>
<td>M. conspicua</td>
<td>Rosy purple</td>
</tr>
<tr>
<td>&quot; M. macrophylla</td>
<td></td>
<td>Snow-white</td>
</tr>
<tr>
<td>&quot; M. conspicua Soulangeana</td>
<td></td>
<td>White and purple</td>
</tr>
<tr>
<td>&quot; M. Lennci</td>
<td></td>
<td>Purple and pink</td>
</tr>
<tr>
<td>&quot; M. Stellata</td>
<td></td>
<td>Reddish purple</td>
</tr>
<tr>
<td></td>
<td></td>
<td>White</td>
</tr>
</tbody>
</table>

If evergreen but not necessarily flowering trees are desired, a choice may be made from the arbutus, the box, the holly and the
SATURDAY IN MY GARDEN

oak, while trees that provide beautiful foliage include the golden maple, the golden elm, the golden willow and the cut-leaved birch.

The owner of a small garden will not have room either for an extensive shrubbery or for many isolated specimens, and therefore his choice of shrubs should be all the more carefully made. By way of offering suggestions, the following are lists of hardy shrubs —some evergreen, others deciduous—from which such a small collection could be built up:

**FLOWERING SHRUBS**

<table>
<thead>
<tr>
<th>Name</th>
<th>Colour of Flower</th>
<th>Flowering Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amorpha</td>
<td>Blue</td>
<td>Autumn</td>
</tr>
<tr>
<td>Andromeda polifolia</td>
<td>Pale pink</td>
<td>Summer</td>
</tr>
<tr>
<td>Azalea</td>
<td>Various</td>
<td>Early summer</td>
</tr>
<tr>
<td>Berberis</td>
<td>Yellow and gold</td>
<td>Spring</td>
</tr>
<tr>
<td>&quot; (Mahonia)</td>
<td>Orange</td>
<td>Autumn to spring</td>
</tr>
<tr>
<td>Buddleia globosa</td>
<td>Purple-red</td>
<td>Late summer</td>
</tr>
<tr>
<td>&quot; Lindleyana</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>Ceanothus Americanus</td>
<td>Blue</td>
<td>Summer</td>
</tr>
<tr>
<td>&quot; Veitchianus</td>
<td>Yellow</td>
<td>Winter</td>
</tr>
<tr>
<td>Cistus (various)</td>
<td>Yellow and white</td>
<td>Late spring</td>
</tr>
<tr>
<td>Choisya ternata (mock orange)</td>
<td>White</td>
<td>Spring</td>
</tr>
<tr>
<td>Cytisus (various)</td>
<td>Yellow</td>
<td>Early summer</td>
</tr>
<tr>
<td>Deutzia gracilis</td>
<td>White</td>
<td>Spring and summer</td>
</tr>
<tr>
<td>Ericas (heaths)</td>
<td>Various</td>
<td>Spring</td>
</tr>
<tr>
<td>Forsythia suspensa</td>
<td>Yellow</td>
<td>Early summer</td>
</tr>
<tr>
<td>Fremontea californica</td>
<td>Yellow</td>
<td></td>
</tr>
<tr>
<td>Genista (various)</td>
<td>Yellow</td>
<td>Late summer</td>
</tr>
<tr>
<td>Hibiscus syriacus</td>
<td>Purple</td>
<td></td>
</tr>
<tr>
<td>&quot; totus albus</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>&quot; cælestis</td>
<td>Blue</td>
<td></td>
</tr>
<tr>
<td>Hydrangea hortensia</td>
<td>Pink</td>
<td></td>
</tr>
<tr>
<td>&quot; paniculata</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>&quot; grandiflora</td>
<td>Yellow</td>
<td></td>
</tr>
<tr>
<td>Hypericum (St John’s wort)</td>
<td>Yellow</td>
<td></td>
</tr>
<tr>
<td>Ledum (various)</td>
<td>Pale pink</td>
<td>Early summer</td>
</tr>
<tr>
<td>Lespedeza bicolor</td>
<td>Reddish purple</td>
<td></td>
</tr>
<tr>
<td>Liriodendron tulipifera</td>
<td>Yellow</td>
<td>Late summer</td>
</tr>
<tr>
<td>Olearia stellulata</td>
<td>White</td>
<td>Summer</td>
</tr>
</tbody>
</table>
FLOWERING TREES AND SHRUBS

FLOWERING SHRUBS—Continued

<table>
<thead>
<tr>
<th>Name</th>
<th>Colour of Flower</th>
<th>Flowering Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paeonia moutan</td>
<td>Various</td>
<td>Early summer</td>
</tr>
<tr>
<td>Prunus nana</td>
<td>Rosy pink</td>
<td>Spring</td>
</tr>
<tr>
<td>&quot;   triloba</td>
<td>Pink</td>
<td>&quot;</td>
</tr>
<tr>
<td>&quot;   Simoni</td>
<td>White</td>
<td>Early spring</td>
</tr>
<tr>
<td>Pyrus japonica</td>
<td>Rosy crimson</td>
<td>Late spring</td>
</tr>
<tr>
<td>Rhododendrons</td>
<td>Various</td>
<td>Early summer</td>
</tr>
<tr>
<td>Ribes (currants)</td>
<td>Various</td>
<td>Spring</td>
</tr>
<tr>
<td>Spiraea arguta</td>
<td>Cream-white</td>
<td>Early summer</td>
</tr>
<tr>
<td>&quot;   discolor</td>
<td>Red</td>
<td>Midsummer</td>
</tr>
<tr>
<td>&quot;   bella</td>
<td>Rosy red</td>
<td>Late summer</td>
</tr>
<tr>
<td>&quot;   Douglasi</td>
<td>Crimson</td>
<td>&quot;</td>
</tr>
<tr>
<td>&quot;   japonica</td>
<td>White or mauve</td>
<td>Early summer</td>
</tr>
<tr>
<td>Syringa (lilacs, various)</td>
<td>Yellow</td>
<td>Autumn</td>
</tr>
<tr>
<td>Ulex (gorse) nanus</td>
<td>Various</td>
<td>Early summer</td>
</tr>
<tr>
<td>Viburnum opulus (Guelder rose)</td>
<td>Purple and mauve</td>
<td>Late summer</td>
</tr>
<tr>
<td>Veronica</td>
<td>White</td>
<td>&quot;</td>
</tr>
</tbody>
</table>

SHRUBS WITH COLOURED LEAVES

<table>
<thead>
<tr>
<th>Name</th>
<th>Colour of Leaves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acer palmatum aureum</td>
<td>Yellow to orange and gold</td>
</tr>
<tr>
<td>&quot;   roseo-marginatum</td>
<td>Bright green fringed with rose</td>
</tr>
<tr>
<td>&quot;   sanguineum</td>
<td>Deep crimson</td>
</tr>
<tr>
<td>Aucuba japonica variegata</td>
<td>Yellow, glossy leaves</td>
</tr>
<tr>
<td>Buxus (box) sempervirens</td>
<td>Silver, gold and variegated</td>
</tr>
<tr>
<td>Cerasus—lauro (laurel)</td>
<td>Large glossy green leaves</td>
</tr>
<tr>
<td>Euonymus—atropurpureus</td>
<td>Purple shaded with orange</td>
</tr>
<tr>
<td>&quot;   aucubifolius</td>
<td>Bright green spotted with yellow</td>
</tr>
<tr>
<td>&quot;   aureus</td>
<td>Yellow and pale green</td>
</tr>
<tr>
<td>&quot;   Duc d'Anjou</td>
<td>Green and gold</td>
</tr>
<tr>
<td>&quot;   japonicus latifolius</td>
<td>Silver</td>
</tr>
<tr>
<td>&quot;   radicans (Silver Gem)</td>
<td>Silvery white and pale green</td>
</tr>
<tr>
<td>Ilex (Holly)</td>
<td>Various</td>
</tr>
<tr>
<td>Ligustrum aureum (privet)</td>
<td>Golden</td>
</tr>
<tr>
<td>Osmanthus ilicifolius purpureus</td>
<td>Rich plum</td>
</tr>
<tr>
<td>Ozothamnus rosmarinifolius</td>
<td>Silvery leaves</td>
</tr>
<tr>
<td>Phillyrea decora</td>
<td>Leathery bright green</td>
</tr>
<tr>
<td>Retinospora ericoïdes</td>
<td>Delicate green stained with violet-brown</td>
</tr>
<tr>
<td>Thuja gigantea</td>
<td>Dark green</td>
</tr>
</tbody>
</table>
With the aid of the classified lists given above the beginner in gardening will be able to decide for himself the kind of shrubs or flowering trees that are likely to aid in beautifying his garden. But among them all the rhododendron reigns supreme as the queen of evergreen shrubs, and there is therefore little necessity to apologise for singling it out for a more extended treatment than it is possible to give to other occupants of the shrubbery. The rich colouring of its gorgeous flowers in May and June is a sufficient reward for any time and expense that may be devoted to its cultivation.

It used to be supposed that the rhododendron could only be induced to grow to perfection in peat, but this is a fallacy. It will thrive in any good garden loam, but it detests and utterly refuses to accommodate itself to any soil in which there is a trace of lime or chalk. Mix a little peat with the soil by all means if it can be secured easily, and add as much leaf mould to the composition as you conveniently can, but while providing the best medium that you can secure, do not be deterred from endeavouring to grow a few specimens of rhododendron in your garden if you have room. The initial expense is perhaps a drawback in the case of amateur gardeners with slender purses, but their value as decorative subjects is so great that for the sake of securing one or two plants it is advisable to consider whether some other
intended purchase shall not be abandoned. The rhododendron likes plenty of moisture and a little shade, and in early spring the early flowering varieties will require some protection from north and east winds and from May frosts. The shrub will also benefit enormously if it be regularly fed during the summer months with liquid manure. Unless this be done, and especially in certain soils, the leaves will turn pale or yellowish. This is a sure indication that the plants lack sufficient nourishment.

The choice before the prospective purchaser of rhododendrons is a very wide one. There are more than a hundred species, and of these there are any number of varieties. But the beginner should confine his attention to the hardy evergreen species which experience has proved to be suitable for outdoor cultivation in Britain. These come principally from the mountainous regions of the Southern United States of America, from the Caucasus, and from Asia Minor. The best hardy rhododendron is Pink Pearl, and other excellent varieties are R. Kewensis, White Pearl, Doncaster, Mrs Anthony Waterer, Bacchus, Ascot Brilliant, and Marquis of Waterford.

These are, of course, only a few of the better-known varieties. There are hundreds of others which can be found enumerated in the catalogues of the great florists and growers.

The amateur will doubtless be somewhat puzzled, as he realises the enormous number and variety of the shrubs and flowering trees at his disposal, in arriving at a decision as to what is the best time of the year for planting and transplanting them. A little consideration will help us to arrive at a good working plan. It may be taken as a general rule that the most suitable time for planting all kinds of shrubs is in early autumn. Certainly this is true of deciduous plants—that is to say, shrubs and trees that shed their leaves as winter approaches. An exception may however be made in the case of evergreens, which may be planted with as much success in April as in October.

But whenever the transference is made from the nursery bed of the grower to the garden the operation needs to be performed with care and foresight. Some three weeks or so before the
actual moving it is advisable to cut round each plant with a very sharp spade, severing the long-growing roots, and forcing the shrub to form new ones in a compact ball, which can be readily lifted with a good mass of soil when the due time arrives. The florist, if he does his duty properly, will attend to this. In the meantime, as soon as the order for the plants has been given the ground should be made ready for their reception. This will involve a thorough digging and manuring of the soil, care being taken to bury the manure deeply so that it will not come in direct contact with the young roots of the plant. The stations for the plants should be marked out and be left well exposed to the weather so that the soil shall have time to sweeten before the shrubs are planted. The need for a careful spreading out of the roots and for firm planting must be insisted upon. After the operation is completed water must be applied freely so that it sink deep down to the roots. It will also be found of great benefit if the foliage be sprinkled several times after planting. It may also be added that plants of trees and shrubs that have been grown in pots may be planted out at any season of the year, save in frosty weather, without any great risk, providing the roots are carefully untwined and spread out to their fullest limits, and that the plants are well supplied with water until they become thoroughly established.

The pruning of shrubs is not a difficult operation, provided it be done with discretion. The clipping of evergreens, so as to dispense with ragged and straggling growths, is best undertaken in autumn when rampant growth is suspended, but in the case of shrubs which throw out long growths in summer it is necessary to keep them in check so as to preserve the shape and beauty of the shrub, and here a judicious use of the shears is necessary. With regard to flowering trees and shrubs their pruning should be neither wholesale nor drastic. To clip vigorously forsythias, ribes, mock oranges and such like plants is, indeed, as unwise as it is unnecessary, since it not only robs them of their natural beauty but also restricts their ability to produce so great a wealth of blossom as is expected of them. The object in pruning flower-
ing shrubs should be merely the removal of dead wood or too rampant growth. Foliage shrubs require nothing more than an occasional lopping off of weak shoots, or of strong ones where they seem too crowded. If one side of a shrub is much thinner and weaker than the other, severe pruning on the weak side will have the effect of inducing vigorous growth, and the plant will soon assume a natural and normal shape. Evergreen hedges should be pruned well back in the autumn and then be left to their own devices until the following summer, when frequent and regular pruning will be necessary.
CHAPTER X

CLIMBING PLANTS AND CREEPERS

No words need be wasted in an endeavour to emphasise the important part played by climbing plants and creepers in the building up and development of the garden beautiful. Their variety is infinite, they may be employed in a hundred ways, and with equally satisfactory results in the ornamentation not less of the walls of the country cottage and its boundary fences than of the walls and terraces of the stately mansion. Their aid may be called in, with the confident assurance that they will not fail to achieve their purpose, in the decoration of the verandah, the doorway, the French window, the wooden fence of the suburban villa, the humble arch before the artisan's doorway, and the elaborate pergola that now finds a place in nearly every garden with any pretensions to spaciousness. Garden taste—and it is gratifying to find that it is so—tends more and more to reliance on natural effects and less on architectural design. It seeks to allow Nature to exercise her beneficent sway, so that she be not confined too rigidly within geometrically designed limits. And in contributing to this end, in softening the outlines of bare walls and fences, there is nothing that can be placed in competition with, or take the place of, the climbing plants and creepers that bring transforming clouds of beauty in their train.

Nor need the economical gardener hesitate to cultivate them in plenty on the score of expense. Many of those which grow most quickly, and on that account are all the more valuable in hiding ugly expanses of bricks and mortar and bare wooden fencing, are annuals, the seed of which can be purchased for a few pence. Tropæolum majus (the climbing nasturtium) and tropæolum canariense (the canary creeper) are familiar plants
that may be cited as examples. Then, if permanent plants are in requisition, the expenditure of a few shillings will supply quite a good little collection of pretty ivies, clematis, jasmines and Virginia creeper.

These are all so familiar, even to the most inexperienced gardener, that it is unnecessary to dilate at length upon their decorative value. The aim of this chapter is to introduce the reader to as wide a choice of desirable creeping and climbing plants as it is possible to discuss within the limits of space, to suggest the appropriate purposes to which each should be put, and to supply a few simple hints upon the proper methods of planting them and their subsequent treatment.

Let us consider the case of a lover of gardening who becomes the tenant of a suburban villa or a new country cottage towards the end of March—say, Lady Day. He is naturally anxious to cover his bare walls and fences with beautiful foliage at the earliest possible moment, and he may perhaps be at some loss to decide how most effectively to achieve his purpose. He knows that if he wait long enough he can clothe his fences and his arches by planting climbing roses and a selection of young plants from the great legion of perennial climbers that are at his disposal; but in the meantime he will have to be content with very few flowers until these permanent climbers become thoroughly established. The remedy lies in a free use of annual climbers. The seed of the hardy varieties which I shall enumerate later can be sown at once in the open ground; that of the half-hardy and tender kinds towards the end of April and during the opening week of May. If he be the happy possessor of a warm greenhouse, or even a cold frame, the seed of half-hardy climbers can be sown even earlier and the flowering period be expedited. They will require to be grown under the protection of glass until all danger of frost is over, and then be planted out in their assigned positions.

I have already referred to the climbing nasturtium as being perhaps the commonest of annual climbers; but even the showy and rampant nasturtium deserves good treatment and judicious
care in the selection of varieties for cultivation. The kind which most often finds a place in the gardens of amateurs is tropæolum majus, but there is another variety, tropæolum lobbianum, which has smaller and more delicate foliage and which yields a greater wealth of bloom. The seed of T. lobbianum costs slightly more than that of T. majus, but since a better general effect is produced the additional expenditure is well repaid. The tropæolums may be obtained in separate colours. For example, the variety of T. lobbianum known as Fire King bears immense quantities of deep scarlet flowers on stems that grow to a height of twelve feet or more during the season. Then there are cardinalis (scarlet), fulgens (dark foliage and scarlet flowers), Golden Queen (yellow), and Princess Victoria Louise (creamy white blotched with orange scarlet). Tropæolums will thrive in almost any garden soil, but they will grow more luxuriantly and produce a finer display of bloom if the ground has been deeply dug and well manured a month or two before the seed is sown. They may be used with splendid effect in the decoration of walls, fences and trellis-work. At the outset of their growth, however, they require to be supported by strands of string, or wire netting, and they need a little training to keep them within bounds. Similar treatment should be accorded to the canary creeper, whose pale yellow flowers and delicate light green foliage may be used with charming effect for covering a low hedge or a wattled fence.

The sweet pea, the most popular garden annual of the moment, should, strictly speaking, be classified as a climbing plant; but its position is one of such great importance that it deserves to be discussed at length in a separate chapter.

Another great and delightful family of climbing annuals is that known as ipomæas or convolvuli. The members of this family are nearly all half hardy, and the seed should therefore not be sown out of doors until towards the end of spring. The variety most frequently seen in small gardens is ipomæa purpurea, more familiar, perhaps, as convolvulus major. The flowers vary in colour, ranging through many delicate shades of white, pink and rose into deep blues and violets. It should be supplied with
string or twiggy branches to twine about, and if it be allowed free play will speedily clamber over a bush in the shrubbery and mantle an arbour or summer-house. A slightly less hardy variety, which needs to be raised in heat in May, is ipomoea rubro-caerulea, introduced from Mexico. The flowers, which are large—in some instances as much as four inches across—are of a pretty pale blue colour. They open early in the morning, and fade about noon, but are produced in such abundance that from the middle of July onwards until autumn approaches they provide a rich display of colour. Another species, tropæolum hederæfolium, the ivy-leaved morning glory, produces much smaller flowers, but is none the less desirable or welcome on that account. It may be sown in the open at the end of April. All convolvuli thrive best in rather rich open soil.

Eccremocarpus scaber, a native of Chili, bears delicate orange-coloured flowers against dark green foliage, and though one does not often find it in the amateur's garden it deserves to be extensively cultivated. It should be treated as a half-hardy annual, though in the warmer regions of Devon and Cornwall it has established itself as a perennial and grows luxuriantly. The most suitable position for it is one with a south or south-west aspect, and it may be trained either on a wall or against trellis or rustic work.

Cobæa scandens, sometimes called cups and saucers from the shape of the flowers, is often treated as a greenhouse annual; but if its planting out be delayed until June it makes a splendid display as decoration for a rustic arch, an arbour or over trellis-work. Another delightful climber for a south wall or other fairly warm situation is passiflora cærulea—the passion flower. It has light delicate foliage and large elegant flowers which appear to be blue, but are really white with a mass of blue filaments lying on the petals. P. gracilis and P. Constance Elliott both bear white flowers, while those of P. lutea are yellow. In very favourable positions passion flower plants produce fruit—mostly large yellow berries—but this does not often occur out of doors unless in an unusually hot summer.
SATURDAY IN MY GARDEN

If a quick-growing foliage plant, with inconspicuous flowers, be desired, there is no climbing annual that can beat the common hop, *humulus lupulus*, but a more satisfactory variety for garden decoration—for clothing an arch or a trellis—is the Japanese hop, *humulus japonica*. Its foliage is of a deep rich green colour, and its leaves are more shapely and more deeply cut than those of our native hop.

Ornamental gourds are very easily grown, and are worth cultivating for the curious variety in shape of their fruit. They require the culture afforded the vegetable marrow, which means that if they are to be seen to perfection they must be planted out in rich soil and be generously treated in regard to stimulating manures. The following is a list of the most ornamental gourds:

<table>
<thead>
<tr>
<th>Abobra viridiflora (wax)</th>
<th>Lagenaria clavata (club)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coccinea indica (scarlet fruit)</td>
<td>Siphon</td>
</tr>
<tr>
<td>Cucumis anguinus (serpent)</td>
<td>Cucurbita melanosperma (variegated fruits)</td>
</tr>
<tr>
<td>&quot; Dipsaceus (teasel)</td>
<td>Cucurbita pepo (profusion of small apple- and pear-shaped fruits)</td>
</tr>
<tr>
<td>&quot; Dudaim (balloon)</td>
<td></td>
</tr>
<tr>
<td>&quot; Erinaceus (hedgehog)</td>
<td></td>
</tr>
<tr>
<td>Cyclanthera explosens (bombshell)</td>
<td>Momordica (warted fruit—orange)</td>
</tr>
</tbody>
</table>

By the aid of a few of the annuals mentioned a newly-made garden may speedily be clothed with beautiful climbing plants. They will at least cover bare and ugly places until the first frosts of autumn come to cut them down. In the meantime plans can be laid for substituting permanent subjects for those that are of an ephemeral nature, though I hope I have indicated clearly enough the desirability of using at least a few annual climbers in the decoration of the garden every year.

Of all the evergreen climbing plants that help to clothe British gardens with foliage even in the depth of winter, there is none that is better known or more extensively grown than ivy. Nor is its popularity unmerited, for the ivy, or *heder* *a*, to give it its botanical name, is an accommodating plant, and it is easy to cultivate. Almost every garden in the land displays one or more specimens of ivy, but for the most part—and one notes it with regret—the attention of amateurs is confined chiefly to the coarser and
larger-leaved varieties, such as *Hedera helix canariensis*, or *H. H. dentata*, to the exclusion of the many smaller, daintier, and more variegated kinds which, if once they were introduced into the garden, would never again be excluded.

For the sake of those of my readers who are unfamiliar with these choicer varieties I will give a brief description of them. To begin with the silver-leaved kinds, there is first and foremost *H. marginata elegantissima*, which, while being perfectly hardy, is very free in growth. Its light green leaves flushed with white have a margin of cream-white. *Crippsii* is a most attractive variety. Its silvery grey leaves have prominent veins. The leaves of *marginata rubra* turn to lovely shades of crimson in winter. Yellow-leaved varieties are few in number, but among the best of these is *Chrysomela*, whose foliage alternates in colour between a greenish and a rich yellow. Other satisfactory yellow kinds are *spectabilis aurea* and *angularis aurea*. The very small variety, *H. H. minima*, makes an ideal decoration for the rockery. It rapidly covers large stones or small rocks and affords a most effective carpet against which to display the myriad flowers of a well-stocked rockery.

Some ivies derive their names from the shape of their leaves—as, for instance, *H. pedata*, so designated because its leaves resemble the feet of a bird. The best varieties in this class are *taurica* and *himalaica*. Their leaves are light green, and they carry conspicuous silvery veins. A distinct variety with deeply lobed digitate leaves is *H. H. digitata*, while *lobata major* is another with deeply cut lobes.

I have mentioned only a tithe of the innumerable varieties of ivy which are worthy of the attention of the amateur gardener. Most are perfectly hardy, and will grow anywhere in any moderately good garden soil. There are one or two of the tenderer kinds, however, such as the yellow *Chrysomela*, which should not be planted in too much shade. It is a good plan when ordering from the nurseryman to inform him of the situations in which it is intended to plant the various kinds, and to be guided by his experience and advice.
SATURDAY IN MY GARDEN

It is possible that not a few enthusiastic admirers of ivy as a decorative subject for the garden may have been deterred from planting it because of the familiar legend that it makes the walls of houses damp, and that its roots enter the crevices and destroy the walls. The theory that ivy harbours moisture is quite fallacious. Indeed, it exercises just the opposite effect, for it not only throws off the rain but draws the moisture out of a naturally damp wall by means of its aerial rootlets which cling to the wall. And the mention of aerial rootlets suggests an important point in the culture of ivy that should not be lost sight of. These rootlets, if they be given the slightest encouragement, will project themselves at intervals along the whole length of a shoot in the search for fresh sources of nutriment. For this reason it is advisable and usual when planting not to support all the shoots against the wall or fence. One or two may be so trained for the sake of immediate effect, but the remainder should be stretched out horizontally along the base of the wall and be pegged down firmly into the soil. The formation of new roots will by this means be encouraged, and vigorous new growth will speedily make its appearance.

The hardier varieties of ivy may all be planted at any time between the months of October and February, but the planting of the tenderer sorts should be confined to September and March. I have said already that ivy will thrive in any moderately good garden soil, but this requires a little qualification if rapid and vigorous growth is desired. For instance, a light, gravelly soil will need enrichment with well-decayed manure and leaf mould, and, on the other hand, heavy, clayey, stagnant ground will require to have some lighter material, such as sand or road grit, incorporated with it.

One of the most important operations associated with the cultivation of ivy is the annual clipping, which should never be neglected where a neat and tidy appearance is desired. The most suitable season for this operation is during the months of March and April, immediately before the young leaves begin to make their growth. Do not be afraid of using the shears in the case of
old and well-established plants. The clipping ought to be thoroughly and vigorously carried out, and the ivy cut back close to the wall or fence. All old and worn-out wood should be ruthlessly removed, and all dead leaves cut off. The immediate effect may be to produce a very bare appearance, but the wonderful growth which will soon follow this vigorous pruning will in a few weeks give ample evidence of the beneficial effect of the operation. Ivy is often grown with delightful decorative effect on the trunks of living trees. Where this is done the ivy ought not to be allowed to grow far up the trunk, but kept to within six or eight feet of the base.

Ivy is propagated by means of cuttings. These should be taken from firm and well-developed, and not from young and fleshy shoots. They may be planted in a shallow trench, along the bottom of which a layer of sand has been placed. After the lower leaves of the shoots have been removed the cuttings should be inserted in the trench so that their bases rest firmly on the sand. Some fresh fine soil must then be filled in the trench, and the whole trodden down hard round the base of the cuttings. The best time for planting cuttings out of doors is October, but where this has not been possible they may still be propagated in pots, if the latter be placed in a warm frame or greenhouse.

Among perennial climbers jasmine possesses the additional merit that it bears a profusion of flowers. There are a number of varieties that flourish in British gardens. Most of them are deciduous, but there is one, *jasminum humile revolutum*, which is evergreen, and forms an excellent decoration for walls. Its flowers are bright yellow, and they are borne without stint in summer and early autumn. The most commonly grown variety is *jasminum officinale*, which perfumes the air from June to September with its wealth of pretty white blossoms. An indispensable adjunct to the garden is *jasminum nudiflorum*, which bears sweetly scented yellow flowers along its leafless shoots in the depth of winter. The best positions for it are a wall, a trellis or a pergola, or it may be planted with very pretty effect in conjunction with ivy, the dark evergreen leaves of the ivy forming a
most effective background to the starry array of yellow jasmine flowers. The jasmine can be easily propagated by layers or cuttings. The layers, if they be pegged down in the soil, will be rooted in a few months, when they may be detached from the parent plant.

The clematis ranks deservedly among the most popular of climbers. It is of easy culture, is not fastidious either in regard to soil or position (except one facing due north), and it will readily accommodate itself either against a trellis, by a verandah, at the foot of rustic or wire arches, against pergolas or at the base of an ivy-covered wall.

Much progress has been made in recent years in the cultivation and improvement of the clematis, and its varieties are now legion; but among them all none holds its position in the front rank with greater tenacity than the old-fashioned C. Jackmani, with its large rich purple flowers, in conjunction with its progeny, C. Jackmani alba (white), C. Jackmani rubra (crimson), and C. Jackmani superba (violet purple). Other newer varieties in the same class are Alexandra (reddish violet), King Edward VII. (pure violet with a crimson bar in each petal), and Star of India (reddish plum, tinged purple and red bars).

In other sections there is a wide range to select from, among the best being the following:

<table>
<thead>
<tr>
<th>Name</th>
<th>Colour of Flowers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marcel Moser</td>
<td>Pale violet, red bar</td>
</tr>
<tr>
<td>Coccinea</td>
<td>Scarlet</td>
</tr>
<tr>
<td>Beauty of Worcester</td>
<td>Violet blue</td>
</tr>
<tr>
<td>Lady Caroline Neville</td>
<td>Lavender with mauve bars</td>
</tr>
<tr>
<td>La France</td>
<td>Violet purple</td>
</tr>
<tr>
<td>Duchess of Teck</td>
<td>White, mauve bar</td>
</tr>
<tr>
<td>Countess of Onslow</td>
<td>Purple, scarlet bar</td>
</tr>
<tr>
<td>Miss Bateman</td>
<td>White with red anthers</td>
</tr>
<tr>
<td>Lady Londesborough</td>
<td>Silvery grey</td>
</tr>
<tr>
<td>Madame Edouard André</td>
<td>Velvety red</td>
</tr>
<tr>
<td>Mrs G. Jackman</td>
<td>White</td>
</tr>
<tr>
<td>Madame Baron Veillard</td>
<td>Rosy lilac</td>
</tr>
<tr>
<td>Montana</td>
<td>White</td>
</tr>
</tbody>
</table>
The successful culture of the clematis consists in careful attention to three important operations:—planting in good strong loamy soil; feeding, for the clematis will absorb a great deal of nourishment; and pruning at the right time. It should be remembered that clematis plants are grafted on the roots of the wild variety, and this fact affords a hint as to the method of planting of which it is well to take note. In most cases the plants will arrive from the nurseryman in pots. The clematis should be carefully removed from the pots, and the roots be uncoiled and spread out to their fullest limits. An examination of the base of the stem will indicate the point of union between stock and scion. The roots should be buried deeply enough to admit of the joint being buried at least three inches below the surface, so that the scion may be able to form new roots of its own. The feeding should consist in the frequent application of weak doses of liquid manure in early summer. With regard to pruning it may be said that as a general rule clematises of the Jackmani section may be treated with almost ruthless severity. Indeed they may be cut right down to the ground in early spring, and yet will start again and bloom profusely the same year, or, if this drastic treatment cause misgivings, may be allowed to grow on with a little thinning out of dead and superfluous wood. The other sections thrive best if the pruning knife be used sparingly. It will be sufficient to cut out straggling growths after flowering so as to keep the plants within bounds.

Not less on account of its delightful fragrance than because of its pretty slender foliage and graceful flowers do honeysuckles (loniceras) take high rank among popular climbers. L. periclymenum is the common familiar variety of the hedgerows; L. caprifolium bears yellow flowers; L. tormentella, small pink blossoms; L. etrusca, yellow and purple; and L. japonica, red.
SATURDAY IN MY GARDEN

Two valuable winter flowering varieties are L. fragrantissima and L. Standishi. The honeysuckle likes warm quarters and plenty of sunshine, but it is apt at times to become infested with aphides or green-fly. These, however, can be kept in check by a few applications of a wash made of soft soap and nicotine or quassia extract.

Among all the many garden treasures that have come to us from China and Japan the wistaria takes a foremost place. Its beauty is undeniable, and it is rapidly becoming a favourite even in the small garden plot. But the would-be cultivator of the wistaria will need to exercise patience; he will have to wait before it will attain its full development, since it does not establish itself quickly. The most suitable use to which it can be devoted is as a covering for arbours, arches, verandahs and house fronts, where its magnificent racemes of blossom can hang in pendulous beauty in full view of the beholder. The most common variety is the Chinese, W. chinensis; but the finest wistaria yet introduced into this country is W. multijuga of Japanese fame. It bears clusters which sometimes attain a length of four feet, while a simple cluster will carry almost a hundred and fifty blossoms. The best soil for the wistaria is a rich, fairly light loam, to which may be added a moderate quantity of decayed farmyard manure. Pruning is necessary to produce a good effect. The largest flowers grow on short spurs coming from the base of the shoots. These should be cut well back after flowering towards the end of summer.

The Virginia creeper is deservedly popular among the deciduous climbers which depend upon the beauty of their foliage for the high regard in which they are held. Ampelopsis Veitchi, or, to give it its newer designation, vitis inconstans, since it belongs properly to the great family of the vines, is the self-clinging small-leaved variety which when once it is planted and obtains a good start requires little further attention. It soon covers a wide expanse of wall or fence with a beautiful mantle of green, which in the autumn turns to a gorgeous crimson. Ampelopsis or vitis quinquefolia is the older and commoner variety, which though distinctly useful is prone to become untidy unless it be
carefully trained and pruned. Other ornamental vines that are valuable for their rich autumn tints are V. californica, V. Labrusca, V. Romaneti and V. vinifera purpurea.

The climbing plants mentioned in the foregoing pages form but a tithe of the many kinds that are at the service of the gardener, but it may at least be said that if the beginner experiments with but a few of those I have enumerated he will have no cause to regret either the expenditure of time or of money which their introduction into his small domain will involve.

It only remains to add a few general cultural directions to bring this already long chapter to a close. Climbing plants will grow well in any ordinary garden soil of which good sound loam and well-decayed manure form the basis. They may be planted at any season of the year (save in periods of severe frost) provided they are obtained in pots. The roots should be carefully extracted from the pots, and be spread out, so far as this operation can be carried out without removing all the soil from the ball. Roots that are in any way injured should be cut off with a sharp knife. After planting, make the roots firm by treading the soil down fairly hard, and afterwards give water copiously until the plants are well established. Care must also be taken, in the case of those climbers that require help in their earliest stages, to see that they are fixed securely to their supports, and that training and tying are subsequently attended to as the plants spread upwards and outwards.
BOOK III

FLOWERS FROM SEED
THE ECONOMY OF SEED-SOWING

The very natural desire of the amateur gardener to grow his own flowers from seed is easily understood. First, he is influenced by the ambition to achieve success by his own unaided efforts—to watch over his flowers from the earliest days of infancy until they attain the highest stage of their development and reward him with a rich harvest of bloom. A second and not unimportant consideration is borne in upon him as he gains experience. This is the necessity to practise economy. He finds, as he becomes better acquainted with the mysteries of horticulture, that it is considerably cheaper to grow a batch of plants from seed than it is to purchase a couple of dozen of the same plants from the florist when they are nearing the period at which they will bring forth their flowers.

There is yet another consideration which will weigh heavily with the cultivator whose supreme aim it is to produce flowers in perfection. If he has given any study to the history of a few of the most popular of our garden flowers he will know that while it has been possible to propagate them from year to year by means of cuttings, this process has, in some instances, entailed severe penalties. Take the case of only two of them—the hollyhock and the verbena. Continuous propagation for many generations so debilitated the constitution of these plants that they became the victims of diseases which threatened their very existence. The battle with these diseases lasted for years, and indeed, in many cases it was given up in despair. That these flowers were ultimately rehabilitated in popular favour was due to the fact that great seed experts deserted the old paths of propagation and resorted to Nature's own method by raising plants possessing
the initial vigour and vitality of seedlings. The resulting plants proved, in point of stamina, to be eminently satisfactory, though in other respects, and especially in regard to their failure to come true to the parent stock, they were disappointing. But as scientific methods of seed-saving were introduced these difficulties were overcome. It is now possible to obtain the seed of hollyhock, verbena, and many other subjects which can be depended on not only to come true to name, but to produce larger and more perfect flowers than could be obtained under the old system of propagation.

Thus has been brought about a revolution in the economy and complexion of the British flower-garden. Thanks to the efforts of expert hybridisers, the number and beauty of innumerable flowers have been augmented, the labour of the gardener has been simplified and, owing to the resulting economy of time and money, their cultivation has been brought within the means of hundreds of thousands of amateur gardeners who would either have had to forgo some of the choicest pleasures of gardening or, where their purses allowed, must still have been compelled to depend upon the skilled florist if it were desired to increase their stock of plants.

All this is now changed. Seed is so cheap and abundant that for the expenditure of a trifling sum the amateur can stock a well-sized garden with many of the most delightful flowers, and secure a mass of bloom that will delight the eye of himself and his neighbours during a large portion of the year. Indeed, the ease with which the seed of the most common British garden flowers can be secured leads to an amount of waste that, however profitable it may be to the seedsman, is positively appalling from the economical gardener's point of view. This waste is due chiefly, perhaps, to want of skill on the part of the inexperienced cultivator who has not sufficiently studied the How, the When, and the Where of seed-sowing; but it is also due to the incurable practice of buying more seed than can be usefully employed in a small garden. The alternative is that of purchasing the seed of the vast majority of common annuals and half-hardy annuals, as
AN EFFECTIVE CORNER.

The picture shows how by the use of tubs and drain-pipes a shady corner can be decorated with ferns and climbers.

Photograph by Miss I. Phipps.

A COTTAGE GARDEN.

The centre bed is filled with pansies and edged with auriculas and box. The side beds contain wallflowers in four different colours.

Photograph by R. P. Thomas (by permission of "Amateur Gardening").
THE ECONOMY OF SEED-SOWING

well as that of the more familiar biennials and perennials, in penny packets. There are many firms who issue catalogues containing five thousand or six thousand varieties of seeds, every one of which can be obtained in this way. The number of seeds in each packet, of course, varies with the rarity of the variety in demand, but, if a reputable firm be chosen, never with the quality of the seed. The advantages of this plan are obvious. It enables the amateur to obtain just sufficient seed for his immediate requirements, and while it allows him to practise a very necessary economy in this direction, it gives him the opportunity to spend more liberally in the purchase of choice plants that might otherwise not be within the range of his, possibly, limited means.

As has already been indicated, it is quite possible, if a little judicious forethought be employed, to stock a garden with annuals that will provide a display of bloom for several months of the year. An objection sometimes raised against annuals is that they are weedy and short-lived. The objection has some point if they be chosen indiscriminately, and if no regard be paid either to the period of the summer in which they flower or to the length of time that is necessary to bring them to maturity. They are not, however, all so short-lived but that by the practice of the principle of "succession" the beds and borders of a small garden need ever be without its annuals in bloom from April to October. If a bed of candytuft be sown towards the end of March it will provide a rich display of colouring—either crimson, carmine, deep purple or snowy white—for several weeks, and then, if when the candytuft begins to wane its place is taken by young aster plants that have been raised under glass, there will speedily be another display beside which not even the most tenderly nurtured of orthodox bedding plants can bear comparison. Again, if long-lasting annuals be in question, it is surely only necessary to place in the scale sweet peas, tropæolums, Tom Thumb nasturtiums, and German scabious, to mention only one or two that readily occur to mind. For early spring we have the wallflower, the forget-me-not and the lupin, and from midsummer onwards the poppy, Virginian stock, eschscholtzia, godetia, larkspur,
and Clarkia, and for climbers the canary creeper and the convolvulus.

The seeds of hardy annuals germinate so readily, provided they are inserted in suitable soil, that they may be used in a dozen ways in the embellishment of the garden. How valuable they are if their aid be called in to cover a bare brown patch in the herbaceous border! What charming edgings they make to beds that are filled with more formal bedding plants! How expeditiously and accommodatingly do the climbing varieties cover fences, newly-made trelliswork and rustic arches that would otherwise have to wait gaunt and dismal for months before they could be transformed into objects of colour and of beauty! For these and other purposes they are indispensable. And yet there is a use to which it might be wished that they were more often devoted—even in gardens that are limited for space. This is, that a border or plot should be set apart each season for their exclusive cultivation. Such a border, if one portion of it be sunny and another be partially shaded, would be found a source of immense and unexpected delight, especially if some attempt were made to grow in it a few of the lesser known but not on that account less refined or less elegant annuals. A few that may be recommended for this purpose are: white, yellow, and purple sweet sultan, phacelia campanularia, silene, viscaria oculata, gypsophila elegans, saponaria calabrica and double sanvitalia. There are hundreds of others equally beautiful to be found in the catalogues of seedsmen. Let the cultivator choose where he will, follow his own good taste in the disposition of the various colours, and he will secure a display that cannot but be held in the highest esteem by the genuine lover of floral beauty.

If it be desired to cultivate what are known as self-beds of annuals, in which separate plots are devoted to one kind and one colour of a hardy annual, nothing could be simpler or more effective in its results. Where this method is practised there is little necessity to worry overmuch about the danger of clashing colours or about the height of the plants. If the seedlings be thinned out adequately the annuals thus treated will grow
naturally, and will yield a rich harvest of bloom. Treated in this manner the godetia holds high rank among the easily-grown annuals. Gloriosa is a blood-red variety which grows to a height of about eighteen inches, and has probably the richest colouring of any annual yet introduced into our British gardens. It provides a display of colour which arrests the eye wherever it may wander. A softer tone is afforded by the pinks—either G. Lady Satin Rose or G. Albanus. G. Bridesmaid has an apple-blossom tint, while G. The Bride is an excellent white variety.

Other suitable annuals for treating in the same manner are: Clarkias, cornflowers, lupins, phacelia campanularia, gillas, linarias, convolvulus minor, eschscholtzias, mignonette, jacobea, candytuft, sweet sultan, and evening primrose, especially the dwarf variety known as Cenothera bistorta Veitchii.
CHAPTER XII

HARDY ANNUALS

If hardy annuals are to be grown to perfection, as they may well be by the most modest of amateur gardeners if he will practise the virtues of care and patience, it is essential that three cardinal principles be kept ever in mind. These are:

1. Proper choice of aspect;
2. Thorough preparation of the soil;
3. Thin sowing and efficient thinning out of the seedlings.

Hardy annuals, with few exceptions, thrive best in a sunny, open situation. They are quick-growing plants which, as their name implies, germinate their seed, flower, and produce seed again all within the limits of one season. It is therefore useless to attempt to grow them on a sunless border facing north, where their growth must inevitably be retarded and their full development checked. Neither must they be sown in positions that are overhung or too heavily shaded by trees.

The vast majority of hardy annuals may be sown with perfect safety from the end of March onwards, and most of them will at least germinate, even if they do not make much further progress, no matter what the kind of soil in which they are placed. But to ensure success the soil needs proper treatment, and it is advisable to begin its preparation as early in the year as possible. This should consist in the deep digging of the ground, thoroughly turning it over and leaving it rough on the surface, and at the same time incorporating with it plenty of well-decayed farmyard or stable manure. The object to be attained in leaving the soil rough on the surface is an important one. It will enable the frost and the wind and the rain thoroughly to pulverise and refresh the soil, so that when the time for seed-sowing arrives the
ground will be in an easily workable and friable condition. If the soil is inclined to be clayey, and therefore heavy, it will be found a good remedial measure to work in some road sweepings or grit, and, where they are available, a quantity of wood ashes saved from the autumn bonfire.

With the advent of March it will be necessary to fork over the ground, breaking up the large lumps that have not already fallen apart under the influence of frost. In order to produce a fine tilth in which to sow the seed the rake must be brought into play. This should be made of iron, and should be plied vigorously. In a normal season the winds of March will complete the process of drying and pulverising the soil. The closing days of the month and the opening days of April will provide an ideal opportunity for sowing.

The methods of sowing the seed will vary with the purposes it is intended to achieve. If it be desired to fill up odd vacant spaces in the herbaceous border the seed will of course be sown in small round patches, about two feet in diameter; if for edgings, in long, shallow drills; and if for beds, in more or less broadcast fashion. The proper depth at which to sow must of course be regulated by the size of the seed. For such fine seed as that of gilia it will be necessary merely to cover it over as lightly as possible by shaking a little fine soil over it through a narrow-meshed sieve. The seeds of cornflowers, linum, godetia, etc., which are larger, may be covered to a depth of half-an-inch, while the larger seeds, such as those of giant-flowered sunflowers and lupins, will require to be sunk a couple of inches below the surface.

It is necessary to avoid sowing too thickly, especially in the case of very fine seed, but however sparing one may be in this respect it is absolutely certain that more plants will fight their way through the soil than can be allowed to attain maturity. Therefore the practice of thinning out must be followed rigorously at an early stage of the seedling’s growth, and it must be continued at intervals until the proper distance between plant and plant has been secured. Overcrowding is fatal; it is the cause of more
failures in the cultivation of annuals than anything else. It is necessary, of course, to discriminate. The sunflower and the lupin will need more space in which to develop than the linum or the poppy, but even the latter will yield more flowers and finer plants if they be allowed plenty of breathing-space. Therefore thin out remorselessly and stifle the pang that will rise unbidden at the sight of so many apparently promising seedlings cast on the rubbish heap. But the thinning-out process, essential as it is, may be attended by evil results unless care be taken. This operation is best performed in the evening, and should be undertaken when the soil has been softened by rain. Many of the young plants that it is intended to leave undisturbed are loosened in pulling out those that are to be sacrificed. It is advisable, therefore, to make those that are to remain quite firm by pressing them down in the soil with the thumb and fingers.

The subsequent treatment of hardy annuals consists in keeping the soil free from weeds by frequent surface-hoeing with the Dutch hoe, copious watering in periods of drought, and efficient staking and tying in the case of plants that require it for their support. Flowers should be cut regularly, for it is hopeless to expect quick-growing annuals to bear the double burden of blossom and seed at the same time. Once seed be allowed to form and to ripen the days of the hardy annual's flower productivity are numbered.

The practice of sowing certain hardy annuals in autumn has much to recommend it. Coupled with the advantage which results in an early display of bloom is the additional merit that plants thus raised are distinguished by greater vigour and longevity than those sown in spring. Autumn-sown annuals gain in virility by the fact that they have time in which to develop a vigorous root service before the heat engendered in the soil during summer has evaporated. Very little top growth is apparent until spring, but when the seedlings are transplanted, as they may be in April, the fact that they are well supplied with roots will give them a splendid start. Among the annuals that lend themselves readily to autumn sowing are godetias, nigella, annual chrysanthemums,
**HARDY ANNUALS**

**Alyssum maritimum, Shirley poppies, candytuft, Clarkia, eschscholtzia, saponaria and sweet pea.**

The following is a list of hardy annuals of easy culture, showing their average heights and their varieties of colour:

<table>
<thead>
<tr>
<th>Name</th>
<th>Height</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agrostemma</td>
<td>1 ft.</td>
<td>Rose, pink and white</td>
</tr>
<tr>
<td>Alysum</td>
<td>3 to 9 ins.</td>
<td>White and golden yellow</td>
</tr>
<tr>
<td>Atriplex</td>
<td>5 ft.</td>
<td>Crimson foliage</td>
</tr>
<tr>
<td>Calandrinia</td>
<td>1 ft.</td>
<td>Rose, golden anthers</td>
</tr>
<tr>
<td>Calendula grandiflora</td>
<td>1 ft.</td>
<td>Deep orange</td>
</tr>
<tr>
<td>Calliopsis (or coreopsis)</td>
<td>9 ins. to 3 ft.</td>
<td>Crimson and yellow</td>
</tr>
<tr>
<td>Candytuft</td>
<td>6 ins. to 1 ft.</td>
<td>Crimson, lilac, carmine and white</td>
</tr>
<tr>
<td>Centaurea Marguerita (sweet sultan)</td>
<td>6 ins. to 3 ft.</td>
<td>White, blue and carmine</td>
</tr>
<tr>
<td>Chrysanthemum (cyans minor) (cornflower)</td>
<td>1 to 2 ft.</td>
<td>Blue, white, purple and rose</td>
</tr>
<tr>
<td>Clarkia</td>
<td>1 1/2 ft.</td>
<td>Various</td>
</tr>
<tr>
<td>Clary</td>
<td>1 1/2 ft.</td>
<td>Leaves tipped with white, purple and red</td>
</tr>
<tr>
<td>Collomia</td>
<td>1 1/2 ft.</td>
<td>Scarlet, flowers like bontardias</td>
</tr>
<tr>
<td>Convolvulus minor</td>
<td>1 ft.</td>
<td>White, rose, blue and violet</td>
</tr>
<tr>
<td>Eschscholtzia</td>
<td>6 ins. to 1 ft.</td>
<td>Various</td>
</tr>
<tr>
<td>Gilia</td>
<td>6 ins. to 1 1/2 ft.</td>
<td>Blue, white and tricolour</td>
</tr>
<tr>
<td>Godetia</td>
<td>6 ins. to 1 1/2 ft.</td>
<td>Various</td>
</tr>
<tr>
<td>Helichrysum (everlasting)</td>
<td>1 1/2 to 2 ft.</td>
<td>Various</td>
</tr>
<tr>
<td>Jacobea</td>
<td>1 1/2 ft.</td>
<td>Crimson, purple, rose and white</td>
</tr>
<tr>
<td>Larkspur</td>
<td>1 to 2 ft.</td>
<td>Various</td>
</tr>
<tr>
<td>Lavatera arborea (tree mallow)</td>
<td>4 ft.</td>
<td>Red marbled leaves</td>
</tr>
<tr>
<td>Linum</td>
<td>9 ins. to 1 1/2 ft.</td>
<td>Scarlet, rose, blue, white and yellow</td>
</tr>
<tr>
<td>Love-likes-bleeding</td>
<td>2 ft.</td>
<td>Red and white</td>
</tr>
<tr>
<td>Lupins</td>
<td>2 1/2 ft.</td>
<td>Blue, white, rose and yellow</td>
</tr>
<tr>
<td>Malope (mallow)</td>
<td>2 ft.</td>
<td>White, rose and red</td>
</tr>
<tr>
<td>Mignonette</td>
<td>9 ins. to 1 1/2 ft.</td>
<td>Various</td>
</tr>
<tr>
<td>Nasturtium (tall and Tom Thumb)</td>
<td>1 ft. to 9 ft.</td>
<td>Various</td>
</tr>
<tr>
<td>Nemophila</td>
<td>6 ins.</td>
<td>White and blue</td>
</tr>
<tr>
<td>Nigella (Love-in-a-mist)</td>
<td>1 1/2 ft.</td>
<td>Blue, white and purple</td>
</tr>
<tr>
<td><em>G</em>anothera Drummondi</td>
<td>1 ft.</td>
<td>Yellow and white</td>
</tr>
<tr>
<td>Name</td>
<td>Height</td>
<td>Colour</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>-------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Polygonum</td>
<td>2(\frac{1}{2}) ft.</td>
<td>White and crimson</td>
</tr>
<tr>
<td>Poppy</td>
<td>1 to 2(\frac{1}{2}) ft.</td>
<td>Various</td>
</tr>
<tr>
<td>Rudbeckia (bicolor)</td>
<td>2 ft.</td>
<td>Yellow</td>
</tr>
<tr>
<td>Saponaria</td>
<td>6 ins. to 2 ft.</td>
<td>Rose, pink, scarlet and white</td>
</tr>
<tr>
<td>Silene (pendula compacta)</td>
<td>3 ins.</td>
<td>Pink, rose, crimson and white</td>
</tr>
<tr>
<td>Statice Suworowii (everlasting)</td>
<td>1(\frac{1}{2}) ft.</td>
<td>Bright rose</td>
</tr>
<tr>
<td>Sunflower</td>
<td>3 to 12 ft.</td>
<td>Yellow</td>
</tr>
<tr>
<td>Sweet peas</td>
<td>4 to 10 ft.</td>
<td>Various</td>
</tr>
<tr>
<td>Viscaria</td>
<td>1 ft.</td>
<td>Crimson, pink and blue</td>
</tr>
</tbody>
</table>
As their name implies, half-hardy annuals must not be sown out of doors until all danger of frost is over—say towards the beginning of May. But it is possible to get to work two months sooner, and thus ensure earlier flowering by sowing them in a frame set over a hotbed or in a warm greenhouse. Even the lack of these almost indispensable adjuncts to the enthusiastic amateur’s garden need not deter him from attempting to grow from seed a few of those half-hardy annuals which add so much delight to beds and borders in the height of summer. It is quite possible to raise them in a sunny room indoors—say, an attic whose windows face south. But in case this method be adopted, sowing should be deferred until April.

The seed may be sown in pots or boxes; either will serve the purpose equally well, the choice depending upon the quantity of plants it is desired to raise. If these be very numerous boxes will be found most convenient. In the raising of half-hardy annuals there are one or two guiding principles that need to be kept in mind. These are: to use fine moist, sandy soil; to sow thinly; to water carefully; to supply ventilation as soon as the seedlings peep through the soil, and to prick off early so as to prevent overcrowding in the seed pan or box.

In preparing the pan or box for the reception of the seed it will be necessary to pay careful attention first of all to the drainage. If boxes be used, it is a good plan to drill a few holes in the bottom with a red-hot poker, and to cover these with a layer or two of broken crocks. The latter should also be used generously if either pots or pans be utilised. Fill the box or pan to within an inch of the top with finely sifted soil, and press it down firmly.
with the bottom of a flower-pot or a flat piece of wood. The soil should now be watered lightly through a fine-rose can and be left to stand for half-an-hour. Upon this moistened surface the seed may be sown. This should be done carefully, so that the seed may be distributed evenly over the surface of the soil. In the case of very fine seed, such as that of nicotiana, no covering of soil is necessary. All that need be done is to press the seed into the soil with a flat instrument, either the bottom of a small, clean flower-pot, or a square, flat piece of wood. Larger seeds may be lightly sprinkled over with soil and be gently watered in. A sheet of glass should next be placed over the pan or box, this again be covered with brown paper, and, after careful attention to labelling, the seeds are ready to be placed either on a hotbed or on the warm greenhouse shelf.

In a few days the seedlings will peep through the soil, and it is then that ventilation becomes important. To begin with, place two wooden labels across the edges on each side of the pot or box, underneath the glass, and substitute white paper for brown. A few days later the glass may be removed altogether, and all that is needed until the time for pricking off arrives is to see that the tiny plants are shaded from the direct rays of hot sunshine, and also that they are not allowed to become dry and drawn. When the seedlings have become well established, and have produced four leaves, they should be pricked off into other boxes in which the soil has been made a little richer by the introduction of leaf mould. The seedling should be set deep in its new quarters, about two inches from its neighbour, so that the leaves rest lightly on the soil. The plants will require to be kept well shaded for a few days, and to remain in the warmth of the greenhouse for several weeks longer. Then towards the end of April they may be transferred to a cold frame to harden off, and by the end of May they will be ready for planting out in the open border.

The number of half-hardy annuals is legion, but there are a few which ought not to be absent from any well-ordered garden. Here is a list of them, with their descriptions:
Diagram 6.—SOWING HALF-HARDY ANNUALS IN BOXES.

Fig. 1. Light shallow boxes may be made from egg-boxes, weet-boxes, etc.
Fig. 2. Give plenty of drainage and cover with rough material. Fig. 3. Section of seed-box ready for sowing. Fig. 4. Sow thinly. Fig. 5. Useful wooden tool for making the soil firm. Fig. 6. After sowing rub a little fine soil through a sieve. Fig. 7. Water with a fine rose. Fig. 8. Not with an ordinary rose. Fig. 9. If fine rose not available use a cone of paper filled with water.
Ageratum.—Colours white and blue.

Aster (China).—Victoria, Comet, Ostrich Plume, Quilled and Crown; colours various.

Balsam.—Colours various.

Cobæa scandens.—Colours purple and white.

Lobelia.—Colours blue and white.

Love-lies-bleeding (Amaranthus).—Colour red.

Marigold (African and French).—Colours yellow, orange and striped.

Mesembryanthemum tricolor.—Colours various.

Nemesia.—Colours various.

Nicotiana affinis.—Colours various.

Phlox Drummondi.—Colours various.

Salpiglossis.—Colours various.

Salvia (Bluebeard).—Colour blue.

Stock (ten-week and Giant Perfection).—Colours various.

Zinnia (single and double).—Colours various.

Half-hardy annuals in the main revel in sunshine, but there are a few which prefer shady or partly shaded positions. Among these are French marigolds, phlox Drummondi and nicotiana.
CHAPTER XIV

BIENNIALS AND PERENNIALS

A biennial in garden language is a plant that is sown one summer, flowers the next, and then dies. As a matter of fact, many so-called biennials are really perennials. They struggle on and flower for several years until they have exhausted themselves. But they are at their finest period of development in the second year after seed-sowing, and it is the best practice, therefore, to renew the stock every year.

To the gardener in a hurry—who, by the way, is not and never can be really successful—the necessity for waiting a full year from the time of seed-sowing to the time of flowering is abhorrent. Thus it is perhaps that so few amateur gardeners try the experiment of growing biennials from seed. But it is one that is well worth making, and some hints on their proper treatment follow.

The month of May is the time to secure the seed. A penny packet of each of a few varieties will provide you with enough plants to stock a large garden, even if allowance be made for some failures.

Here is a list to select from:

<table>
<thead>
<tr>
<th>Variety</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canterbury bells</td>
<td>Blue, rose and white</td>
</tr>
<tr>
<td>Daisies</td>
<td>Red and white</td>
</tr>
<tr>
<td>Evening primrose</td>
<td>Yellow (large flowers)</td>
</tr>
<tr>
<td>Forget-me-not</td>
<td>Blue, white and rose</td>
</tr>
<tr>
<td>Foxglove</td>
<td>White, purple and spotted</td>
</tr>
<tr>
<td>Hollyhocks</td>
<td>Many colours (double and single)</td>
</tr>
<tr>
<td>Honesty</td>
<td>Purple, crimson and white</td>
</tr>
<tr>
<td>Pansy</td>
<td>Immense variety</td>
</tr>
<tr>
<td>Scabious</td>
<td>Yellow, purple, white and carmine</td>
</tr>
<tr>
<td>Sweet-william</td>
<td>Crimson, yellow and white</td>
</tr>
<tr>
<td>Wallflower</td>
<td>Yellow, purple and blood-red</td>
</tr>
</tbody>
</table>
The number of seeds in a small packet ranges from two hundred wallflowers and three hundred and fifty sweet-williams to one thousand evening primroses.

All these plants are hardy and they therefore require no coddling. The seed should be sown in May or June in carefully prepared seed-beds in the open. Since the resulting plants are not required for decorative effect during the ensuing summer, they are usually allotted a small corner in the kitchen garden. Choose a day for sowing when the soil is in a friable condition, after a few days without rain. The seed should be sown in drills drawn from one end of the bed to the other. It is a better method than broadcast sowing, for it enables one to keep the varieties distinct and also facilitates thinning out. This is a most important matter, and should on no account be neglected.

By the end of the summer strong, vigorous plants will have been formed, and they should then be transplanted to another bed prepared for their reception. Here they may be left till early spring, when they should be transferred to their flowering quarters. In the case of wallflowers, however, autumn planting is more satisfactory, since it enables the young plants to become thoroughly established before the severe frosts of winter arrive.

If there be no room in the kitchen garden or in the flower borders for a seed-bed for biennials, the seeds may be sown in boxes or pans, and the seedlings afterwards transferred to a suitable position in the open. The boxes should be placed in a sunny position, and shaded on hot days until the seedlings are well above the ground.

Perennials may be treated in the same way as biennials. By sowing seed in June or July it will be possible to secure in the succeeding spring a fine collection of such subjects as:

- **Arabis**
- **Campanula**
- **Columbine**
- **Delphinium**
- **Lupin**
- **Primrose**
- **Viola**
- **Polyanthus**
A Border in Late Summer.
The dominating features of this border are perennial phloxes and asters.
Photograph by E. W. Tilley.

Dorothy Perkins.
The most popular of climbing roses is seen trained over an arch and along a wall.
Photograph by Mrs. Mary Owen.
CHAPTER XV

EARLY SEED-SOWING UNDER GLASS

The raising of tender plants from seed can only, of course, be attempted where there is glass and where the heating arrangements are capable of maintaining a moderately high temperature during severe frost. For in order to achieve satisfactory results it is necessary to sow the seeds of many such tender subjects in January, when the danger of inclement weather is greatest. By giving the young seedlings a long and steady period of growth their future success will be ensured. Moreover, delay is dangerous. As the season advances the rush of work out of doors increases so rapidly that once the opportunity of sowing some of the choicest seeds is lost it cannot be recovered.

Here is a list of the seeds that may be sown under glass during the opening weeks of the year:

| Begonia | Petunia |
| Gloxinia | Lobelia |
| Streptocarpus | Calceolaria (herbaceous) |
| Cyclamen | Canna |

In the case of most of these the seed is very small, and great care must be taken in handling it lest it be wasted. Therefore it is advisable not even to open the seed-packet until the moment arrives for sowing its contents.

Diagram 7, printed on Page 127, gives some useful hints as to the proper method of procedure. First of all it is essential that all pans, pots or boxes which are to receive the seed shall be thoroughly clean. This applies equally to the crocks, or broken pieces of flower-pot, which are to form the drainage. The pans will have holes for drainage in the bottom, and over these it is well to place three or four layers of crocks, as shown in Figure 8.
Over the crocks some rough soil may be placed, next a layer of sifted soil, and finally a sprinkling of fine sandy soil—the final layer not to be higher than an inch and a half from the rim of the pan. If the soil is at all dry it is a good plan next to dip the pan in tepid water. It is better both now and during the early stages of the seedlings' career to water by immersion than by applying moisture from the top by the aid of a water-can, no matter how fine the rose may be. The use of the water-can must inevitably disturb the soil and swamp the tiny seedlings, and this spells certain disaster.

All is now in readiness for sowing the seed. Care must be taken to distribute it over the surface of the sandy soil as evenly as possible. This can best be done by placing a small quantity of fine sand in a saucer and mixing the seed with it. It should then be turned out on a piece of paper as shown in Figure 4, and gently tapped at the bottom with a stick so that the contents may fall evenly on the soil. Or, to make assurance doubly sure, the mixture can be placed in an old sugar-castor and the contents shaken out over the pan. The finest seeds will need no covering of soil. All that is necessary is to conserve the moisture and exclude the light until germination is well on the way. This can best be done by means of a sheet of glass placed over the pan. Air need not be rigidly excluded, but light must be at first, and this can be done by the use of a piece of brown paper placed over the glass.

It will be seen that attention to small details is essential to success, and this is equally important through all stages of the seedlings' career. The after-treatment consists chiefly in supplying the necessary moisture and ventilation.

Here comes the tussle, and it is at this point that disaster dogs the steps of not a few amateurs who essay the task of bringing tiny seedlings to maturity. First and foremost among their difficulties is that associated with the supply of moisture to the young plants. They either allow the soil to become too dry, and thus cause the roots of the tiny seedlings to shrivel at their birth, or they pour water over them from a watering-pot and wash them out of the soil. After the seedlings have made their appearance
Diagram 7.—SOWING FINE SEEDS.

Fig. 1. The seed-pan. Fig. 2. Use plenty broken crocks for drainage. Fig. 3. Section of pan filled and ready for seed-sowing. Fig. 4. Small seeds should be mixed with fine dry sand and distributed as shown in the drawing. Fig. 5. The pans should be watered from the bottom by immersing them in water in a tray or similar receptacle.
there is no safer method of supplying moisture than that of plunging the pots to their rims in a pail of tepid water, and holding them securely in position until the soil has been well saturated. If the glass be kept on the pots the operation need not be repeated for several days, but it will be necessary to wipe dry the under side of the glass each morning, so that an excess of moisture shall not cause the seedlings to "damp off" and rot.

The next operation is that known as "pricking off," and it is a delicate one. The seedlings of begonias, gloxinias, lobelias and calceolarias are so tiny that it is almost impossible to single them out without damaging them. The best plan, therefore, is to lift a small cluster in a bunch and transplant it whole into a box or pan filled with fresh soil. The little clusters of seedlings should be placed an inch apart so as to allow room for development, and then a few weeks later it will be found possible to transplant again, and this time singly, into thumb pots. The operation must be repeated again and again as the pots become full of roots, until by the beginning of June the plants are ready either for bedding out or for placing into their flowering-pots, care of course having been taken in the case of bedding-out plants that they have previously been thoroughly hardened off in a cold frame.

The seed of canna or Indian shot is large and hard. So hard is it, indeed, that it needs special treatment to ensure its germination. This consists in soaking the seed in warm water for thirty-six hours. Even after this long immersion germination may not be certain, and the plan is frequently adopted of filing away a piece of the shell of the seed. Care must be taken, however, that the germ is not injured. In order to ensure successful growth the pots containing the seed must be kept in a temperature of 75° at first. As fast as the seedlings are ready for moving they must be transferred singly to small pots.
CHAPTER XVI

HOW AND WHERE TO GROW ROSES

The rose is pre-eminently the "sweetest flower that blows," and the first favourite in British gardens. The mere mention of its name conjures up a flood of historical memories that would fill a volume; it sets the senses all aglow with pleasurable excitement as one contemplates the rose's beauty of form, its delicious scent, and its rich and varied colouring. But one must resist the temptation to dwell on these delightful diversions if this book is to be confined within reasonable limits and to be kept closely to its original purpose, which is to set the beginner in gardening on the right track, and to help him to keep to it. Therefore, without any further preliminaries, let us plunge straightway into the thorny but ever pleasant path that leads to successful rose-culture.

If it can be said that any particular month marks the beginning of the rose-grower's year, then surely November must be accorded the place of honour. For it is at this period of the year that his new plants arrive from the nurseries, and the time is at hand when the task of planting must be pressed forward vigorously. Let us suppose that there are some of my readers who intend for the first time to secure a small representative collection of roses, and to give them the special treatment and attention which the cultivation of the finest of flowers deserves. What should be their choice among the hundreds of varieties which find a place in every large rose-grower's catalogue? No two experienced cultivators would make the same selection, but for general practical purposes I submit the following list of a hundred:—
### SATURDAY IN MY GARDEN

#### Hybrid Perpetuals
1. Baroness Rothschild (light pink).
2. Captain Hayward (scarlet crimson).
3. Hugh Dickson (crimson).
4. Frau Karl Druschki (white).
5. Général Jacqueminot (scarlet crimson).
6. Margaret Dickson (pale flesh).
7. Mrs John Laing (soft pink).
10. Fisher Holmes (shaded crimson scarlet).
11. Jean Soupert (deep purple).
13. A. K. Williams (carmine).
15. Beauty of Waltham (crimson).
16. Ben Cant (crimson).
23. Marchioness of Londonderry (Ivory).
24. Mavourneen (silvery pink).
25. Mrs R. G. Sharman Crawford (rose).
26. Reynolds Hole (maroon).
27. Souvenir du President Carnot (rose pink).
28. Sultan of Zanzibar (maroon).
29. Star of Waltham (crimson).
30. Victor Hugo (carmine).

#### Hybrid Teas
32. Dean Hole (pale silvery rose).
33. Lyon Rose (salmon pink).
34. Caroline Testout (salmon pink).
35. J. B. Clark (deep scarlet).
36. Augustine Guinoisseau (blush).
37. Avoca (crimson).
38. Betty (coppery rose).
39. Captain Christy (pale pink).
40. Countess of Derby (peach).
41. Dorothy Page Roberts (coppery pink).
42. Edward Mawley (carmine).
43. Florence Pemberton (cream, edged blush).
44. G. C. Waud (orange rose).
45. Gloire Lyonnaise (white).
46. Griss an Tephtiz (carmine).
47. Kaiserin Augusta Victoria (lemon).
48. Lady Ashtown (deep pink).
49. La France (shell pink).
50. Madame Ravary (orange yellow).

### Teas
51. Mme. Mélanie Soupert (yellow).
52. Mrs W. J. Grant (rose).
53. Papa Lambert (rose).
54. Pharisaeer (blush, shaded salmon).
55. Richmond (carmine).
56. Sunbeam (copper, flushed rose).
57. Viscountess Folkestone (cream).
58. White Killarney (white).
59. White Lady (cream).
60. William Shean (cream).

### Climbers
61. Anna Ollivier (rosy flesh and buff).
63. Maman Cochet (salmon shaded with yellow).
64. Marie van Houtte (canary yellow).
65. Anna Charton (cream, rose edge).
66. Betty Berkeley (carmine).
67. Bridesmaid (pink).
68. Catherine Mermet (salmon pink).
69. Etouille de Lyon (lemon).
70. G. Nabonnand (flesh).
71. Harry Kirk (sulphur).
72. Madame Constant Soupert (yellow).
73. Madame Pierre Cochet (salmon yellow).
74. Molly Sharman Crawford (white).
75. Mrs B. R. Cant (rose).
76. Mrs Edward Mawley (salmon).
77. Niphetos (white).
78. Souvenir de Pierre Notting (apricot).
79. Sunrise (fawn).
80. Sunset (apricot).

This list is suggested with no pretensions either to completeness or finality. The inexperienced grower will, however, find it a use-
GLOIRE DE DIJON AS CLIMBER.
The specimen shown in the picture covers a space 27 ft. high and 20 ft. broad.
Photograph by S. Jeans.
And here it is perhaps necessary to explain what is meant by Hybrid Perpetual, Hybrid Tea and Tea roses. They are the designations chosen by professional growers, and, at least in the case of the Hybrid Perpetuals, the term is misapplied. Indeed, save for a few isolated varieties, the flowering period of the “H.P.’s” is all too brief. Many of them bloom profusely towards the end of June and early in July, and then go out of flower. But they produce a second crop in August and September, which, if not so fine as the first, is nevertheless welcomed as the summer wanes. There is a tendency to decry the Hybrid Perpetual because it does not always live up to its name; but it is nevertheless an indispensable adjunct to the rose garden, and as a class is so large and so varied that no true lover of the rose can dare to neglect it. Indeed, some of the greatest triumphs achieved in the show tent have been obtained by such famous Hybrid Perpetuals as Frau Karl Druschki (the best pure white rose ever produced), by Mrs John Laing, and by Captain Hayward, to name only three of the best in their section.

Hybrid Teas have been produced by crossing the ordinary Tea with the Hybrid Perpetual. They are a most beautiful race, almost as delicate in form and colour as and slightly more hardy than the Tea itself. Their value as decorative plants for the garden is only excelled by the Tea, which, because of its delightful foliage, its scent, and its varied colouring, ranging from pale yellow to glowing crimson, stands supreme among roses. Its flowering period often extends from June until December—and this in spite of the fact that the Tea is regarded as delicate and prone to suffer in severe frost. With ordinary care, however, in the choice of situation, and in the provision of suitable protection during extreme cold, the Tea rose will be found as robust as most of its allies.

Most of the roses mentioned in the list, if bushes be ordered, can be purchased even from growers of the highest standing at
ninepence each. A few varieties will run to a shilling or one and sixpence, while the climbers will vary from a shilling to half-a-crown. Orders should not be delayed beyond the end of October, since the rule, "First come first served," applies to the sale of rose-trees as to most other things.

It is a good plan, if possible, to buy rose-trees that have been propagated in your own neighbourhood, or to procure them from a district in which the soil approximates most nearly to that in your own garden. If, however, you have any doubt on this point, tell the rose-grower from whom you are ordering your trees what is the nature of your soil, and leave the selection of suitable varieties to him.

The next point to decide is the kind of roses that are to be planted. Shall they be standards or bushes, or both? This is entirely a question of taste. Standard roses will cost more than bushes. No satisfactory specimen of the best established varieties can be obtained for less than half-a-crown, and many of the newest kinds cost a good deal more. The tall standard has in recent years gone somewhat out of favour, owing to an inherent tendency to succumb before the rigours of a severe winter. Experience has shown that dwarf bushes are much harder, and on the whole produce finer blooms. Bearing these facts in mind, therefore, the prospective purchaser of new rose-trees can make his own decision. If he feels that his rose-bed will not be complete unless a standard rose-tree stands guard at each corner, let him by all means try the experiment, and at any rate include a few half standards in his collection. But I am certain he will derive most pleasure and reap a richer harvest of flowers from a small collection of Hybrid Perpetual and Hybrid Tea bushes.

Meanwhile the amateur who has not hitherto attempted the cultivation of roses on any well-considered plan will have a short interval in which to determine his course of action. If his garden be a very small one he will have no option but to make the best attempt he can to grow his roses in beds and borders already devoted to other plants. But where it is at all possible an effort should be made to provide a special bed or beds in which it will
not be necessary to plant any other subject whose root action is either deep or "hungry." For roses themselves are gross feeders, and they resent the intrusion in their domain of any other plant which at the same time makes a great drain on the nutritious elements in the soil. This is the all-important consideration which should influence the planting of roses in beds by themselves, but there are others hardly less cogent. If the beds be not more than four feet wide the bushes and standards can be planted two feet apart in a double row, and the narrowness of the bed will enable the grower to reach his trees with ease without treading on the soil when the operations of pruning, feeding and disbudding have to be performed during the spring and summer.

In selecting a situation for the rose-bed the sunniest position in the garden should, if possible, be chosen. But it may not always be possible to give large bushes and climbers such a favoured spot, and in that case it is well to know the varieties that will thrive in shade or partial shade. Among these may be mentioned that most accommodating of all climbing roses, Gloire de Dijon, while others are Madame Alfred Carrière, Reine Olga de Wurtembourg, Lord Penzance's hybrid Sweet Briers, Hybrid China, Pink China, and the Ayrshire rose.
HAVING despatched his order, the prospective cultivator should set about the preparation of his beds and soil, so that everything shall be in readiness for planting operations as soon as the roses arrive from the grower. Roses require a good soil. A famous grower gives the following definition of the most suitable medium for roses, and it so accurately describes what is necessary that I pass it on. He says the soil should be “a rich, unctuous loam—a loam which, when it is pressed between the thumb and finger, does not crumble, but kneads like a piece of putty; it must not be clay, although approaching it closely.” It must not be too light and sandy, so that it cannot retain moisture, and it must not, on the other hand, be so heavy as to be in danger of becoming waterlogged. A rich loam, with a suggestion of clay in its composition, is the ideal soil, and every effort should be made to secure it either by adding fine soil, road grit, and ashes where the ground is too heavy, or by adding rich loam and clay where it is deficient in these properties, and is therefore too light.

Two or three weeks before planting the beds should be deeply dug and left rough upon the surface. Deep trenching is essential, and during this process a good quantity of well-decayed manure should be incorporated with the soil. Diagram 8 will give the reader a clear idea of the proper method of planting. The cardinal principle to keep in mind is that the roots must have plenty of space, as shown in Figure 1, and not be crushed and cramped as indicated in Figure 2. In the case of standards, a stout stake should be placed in the centre of the hole before the tree is planted, and not afterwards. Figure 5 shows the dire effects which follow the latter practice. The holes for the reception of the trees should
Diagram 8.—PLANTING ROSE-TREES.

Fig. 1. Allow plenty of room and spread out the roots. For standards insert a stake at the same time. Fig. 2. A lazy practice—hole too deep and roots cramped. Fig. 3. If manure is used it must not touch the roots. Fig. 4. Dwarf rose planted. Fig. 5. Effects of staking after planting—the roots are cut off or displaced.
not be made too deep. The plant must be placed in the ground at a sufficient depth to cover, when filled in, the junction where it has been budded, the object being to make the rose itself throw out roots and become self-supporting. The neglect of this precaution is often responsible for the throwing up of suckers from the Manetti or briar stock, which rob the tree of its strength.

Another rule to bear in mind is that manure should never be placed in contact with the roots. It must be remembered that for some time after planting the roots will be practically dormant, and if manure be placed near them it may induce fungus and cause the young tendrils of the roots to rot.

Firm planting is necessary. When the roots have been carefully spread out on the base of the hole they should be covered with two or three inches of fine soil and trodden firmly down. It is a good plan where it can be obtained, and especially if the season be damp, to fill in immediately round the roots some fibrous material, such as small pieces of old turves and the refuse from the potting-bench. This prevents the wet soil from forming a cake round the roots and choking them. When all the trees have been securely planted a layer of well-rotted littery manure may be placed over the bed, and as a precaution against hard weather it will be advisable to draw the soil up round the collar of the plants. This especially is wise in the case of Tea roses, which are prone to suffer severely in periods of sharp frost.

If the trees should arrive when the ground is not in a suitable condition to receive them—that is to say when it is too wet, or is frost-bound—it is a mistake to allow oneself to be flurried into committing them to the soil, in the belief that immediate planting is necessary. As soon as the plants arrive unpack them carefully, and "heel" them in. This means that a small trench is dug in a spare piece of ground, the roots laid in carefully and covered over with soil. The adoption of this precaution will prevent the roots from becoming dry, and will preserve them until such time as the ground in your rose-bed is in a fit condition to receive its future occupants.
CHAPTER XVIII
WHEN AND HOW TO PRUNE

The art of pruning rose-trees is not one that can be acquired in a day, and the amateur gardener may be forgiven if, as he contemplates the volume of conflicting advice that is showered upon him each year during the lengthening days of March, he pauses bewildered before the task that confronts him. He will be told, for example, by one expert to prune early, and by another to wait until all danger of severe frost is over; by a third to prune hard, and by a fourth to prune lightly; by others that it does not matter very greatly whether he use the secateurs or the pruning knife, and by still another rosarian that it is disaster to use the first and salvation to stick firmly to the knife.

Now the wonderful thing about this medley of advice is that all these experts may be perfectly right, though they speak with many voices and with varying emphasis. But to the inexperienced amateur it brings nothing but distraction as he turns inquiringly from guide-book to guide-book in his search for enlightenment. And yet he knows only too well that the pruning of his rose-trees is by far the most important operation that needs to be performed during the course of the rosarian year; that upon its proper accomplishment depends not only the future welfare of his favourite bushes, standards, and climbers, but that even the immediate results in the shape of the coming summer's bloom may fall short of his desires and expectations if he fail to use the pruning-knife at the right time and in the right way.

May I suggest that the beginner in the science of rose-growing should, as a preliminary, get firmly fixed in his mind the first principles of pruning; why it is necessary, and what are its effects. And as an aid in this direction let us first of all consider
what will happen to a rose-tree that is left unpruned. It is the habit of the rose to throw out new shoots from the base of the plant every season. These, being stronger and more vigorous than those produced in previous years, naturally absorb nearly all the sap upon which the tree depends for its existence, with the inevitable result that, as time goes on, the older shoots become weakened owing to the restriction of the flow of sap, and in consequence cease to put forth any blooms. It is because of this natural habit of the rose that the annual pruning of the tree is necessary. The object to be aimed at is to keep the flow of sap coursing steadily through the new channels which are formed every year, and this can only be accomplished if the worn-out shoots are kept under control by means of the pruning knife.

Such is the main purpose of pruning; its subsidiary object is to keep the plant to the shape wished for by its grower. Further, if it be desired to produce exhibition blooms, which shall be large and shapely, it will be necessary to cut the plant back severely almost to the level of the ground; if the decoration of the garden be the purpose in view, the shoots will be left longer; if the production of large bushes be desired, the shoots will be still less reduced in length; while in the case of climbers which are intended to clothe pillars, arches, fences, and pergolas, some of the shoots will require little more than the removal of their dead extremities during spring, provided the older and worn-out shoots have been removed bodily in the early autumn.

It will thus be realised that the requirements of each individual rose need to be carefully studied by the grower who in pruning them desires to achieve the best results. For the purposes of the amateur with a small collection his trees may be classified as follows:

1. Hybrid Perpetuals
2. Hybrid Teas
3. Teas
4. Climbers

I will deal with each section in turn:

**Hybrid Perpetuals.**—This class is most suitable for outdoor culture, especially in bush form. The end of March is the most
Diagram 9.—PRUNING ROSE-TREES.

Fig. 1. Tea rose, prune as indicated. Fig. 2. Hybrid perpetual may be pruned more drastically. Fig. 3. The effects of careless pruning; the cuts should be made above buds that point outwards. Fig. 4. Drastic treatment of an old bush rose-tree. Fig. 5. Pruning an ordinary bush. Fig. 6. (a) Right way to make the cut; (b and c) the wrong way.
suitable time for pruning. First cut out any dead or weakly wood from the centre of the plant down to the base, so as to allow plenty of air-space for the remaining shoots. These should next be dealt with. If the tree was newly planted in the autumn do not hesitate to prune it hard—that is, cut it down to within six or nine inches of the base. In carrying out this operation a study must be made of the condition of the buds. Towards the higher end of the stem buds will be found in active growth; at the lower end nearer the ground buds will be dormant. A good rule is to cut just above the third or fourth dormant bud. After selecting the bud, cut off the stem so as to sever it at an angle of 45°. An invariable rule to be followed is to choose a bud that is pointing outwards, and to hold the knife so that the cut may also be made in an outward and upward direction. Cut about a quarter of an inch above the bud, and be careful not to damage it.

With older trees the treatment should be the same, save that in this case the plant should be cut back to within three or four dormant eyes of the previous year’s pruning. Each year, however, one shoot should be cut back to the base to promote young growth. This will prevent the plant from becoming too straggling.

**Hybrid Teas.**—For garden decoration prune sparingly at the same time that the Hybrid Perpetuals are cut back. Cut out dead and weak wood, and shorten the longest shoots a little. If, however, you are growing for exhibition, or large specimen blooms are desired, cut back hard—much in the way you have treated your Hybrid Perpetuals.

**Teas.**—The pruning of Teas should be delayed until the first or second week in April—at any rate until it is possible to be certain which part has been killed by frost and which buds bear most promise. It is essential to cut back hard to good sound wood. In some instances, if the winter has been severe, it will be necessary to go beneath the surface of the ground itself to reach a bud that promises growth. Do not be alarmed at the prospect. If the roots be sound the tree will speedily reassert itself. Some rosarians are so enamoured of the knife that they will tell you that
Diagram io.—PRUNING ROSES.

Fig. 1. Standard pruned for the garden. Fig. 2. The same tree pruned hard for exhibition blooms. Fig. 3. Take care that the eye \((a)\) points outward. Fig. 4. A speedy but unsatisfactory method of pruning — with secateurs. Fig. 5. Make a clean cut with a pruning knife.
a properly pruned bed of tea roses should be practically invisible after the operation. I do not recommend such drastic methods, but merely mention this fact to reassure the amateur who is afraid of pruning hard.

It may be taken as a general rule that all newly-planted rose-bushes should be pruned severely the first year—that is to say, they should be cut down to within three or four inches of the ground. In this way the plant will be properly built up and a good framework formed. Roses planted in the spring should be pruned at the time of planting; those planted in the autumn should be pruned in the following spring.

Another safe rule to follow is that weak-growing varieties should be pruned hard; medium not quite so much, and vigorous sorts a little less. For example, to take vigorous growers among the Hybrid Teas, like J. B. Clark, La France, Florence Pemberton and Caroline Testout—these require only light pruning in the case of established plants. The longer and stronger shoots coming from the base should be reduced in length to about eight inches, while from two to three eyes may be left on the laterals on the remaining shoots. Among the Hybrid Perpetuals which thrive best under the same treatment are Clio, Duke of Edinburgh, Mavourneen, Frau Karl Druschki, Hugh Dickson, Margaret Dickson and John Hopper. The Teas that prefer light pruning are varieties such as G. Nabonnand, Maman Cochet and Marie van Houtte.

In the medium class which require moderate pruning are Admiral Dewey (H.T.), Alfred Colomb (H.P.), Alfred K. Williams (H.P.), Anna Olivier (T.), Baroness Rothschild (H.P.), Betty (H.T.), Captain Christy (H.T.), Countess of Gosford (H.T.), Crown Prince (H.P.), Dean Hole (H.T.), Général Jacqueminot (H.P.), Killarney (H.T.), Kaisorin Augusta Victoria (H.T.), Marchioness of Londonderry (H.P.), Mrs John Laing (H.P.), and Viscountess Folkestone (H.T.).

The varieties that require hard pruning include Cleopatra (T.), Comtesse de Paris (H.P.), Countess Annesley (H.T.), Countess of Derby (H.T.), Duke of Albany (H.P.), Duke of Fife (H.P.),
Helen Keller (H.P.), Le Havre (H.P.), Madame Constant Soupert (T.), Mildred Grant (H.T.), Mrs W. J. Grant (H.T.), Reynolds Hole (H.P.), and Victor Hugo (H.P).

CLIMBERS.—One of the most embarrassing problems that confront the amateur rose-grower is that of the pruning of climbers. The questions that present themselves for solution generally take the following form:—“How and when shall I prune climbing roses? Shall I cut a newly-planted climber down to the base, or shall I allow it to grow in its own way for a year, and then prune it?” My answers must be general. If the tree were planted—as it should be—in the autumn, it is a good plan to cut it down to within a foot or eighteen inches of the base. This will tend to strengthen the roots, and will promote the production of vigorous shoots in the succeeding summer. Comparatively few, if any, blooms need be expected in the summer after planting, since most climbers produce their flowers on wood that is a year old. In the following early autumn the old wood should be cut down to the base, and the new shoots produced during the summer be allowed to remain, save for a slight pruning at the extremities.

With regard to the pruning of climbers in spring, much depends on their treatment in the previous autumn. If the old wood was cut out all that remains to be done is the removal of any dead wood at the extremities of the branches, and the clipping off of useless small branches which if allowed to remain would prevent

Diagram 11.
PRUNING A CLIMBING ROSE.
Shorten the tops of last year's wood as at A A A, and cut down to the base old wood as at B B.
a free circulation of light and air. Where pruning was not done in the autumn it may be advisable in March to cut out a few old shoots from the centre of the tree, as shown in the small diagram (No. 11). This represents a climber that has been planted two years. The removal of the old wood will promote a more vigorous growth in the stems that are retained.

Simultaneously with the operation of pruning, especially if it be done in the autumn, it will be found advisable to train the new shoots in the desired direction. In my own garden most of the climbing roses are growing by the side of high wooden fences, and I find that the best method of tying is obtained by drawing long strands of stout wire from one end of the fences to the other. The shoots are trained horizontally, and are tied securely to the wire with thick twine. By this simple method a great deal of work with hammer and nails is avoided; the climbers always present a tidy appearance, and the blank spaces of wooden fence are covered with greater rapidity.

It should always be remembered in regard to the pruning of all classes of roses that the weakest growths must be pruned more severely than the strong ones. The reason is obvious, for the effect of pruning is to produce more vigorous growth from the base of the shoot thus treated. Thus and thus only can satisfactory blooms be ensured.

After pruning is over, the manure which was spread over the beds in the autumn should be lightly forked in below the surface. This will have the double effect of fertilising the soil and of allowing air to penetrate it.

There can be no two opinions about the beneficent effect of a judicious summer pruning of rose-trees. While the bushes and the standards are full of glorious bloom one may be tempted to rest satisfied with the visible reward of many months of care and labour, but the true rosarian is he who is ever studying the future welfare of his trees. He has, by past experience, proved the value of keeping rampant summer growth in check, and he speedily learned the need for a thinning out of the shoots as soon as the first flush of bloom had gone.
A patient study of a favourite rose-tree will soon fix firmly in the mind of the inexperienced amateur the cardinal fact that the finest blooms are produced on the new wood. His aim should therefore be to cherish this new wood to the best of his ability. This can be done by giving light and air to the centre of the tree, and to do this it is necessary to cut out all old wood absolutely, if there is plenty of new wood available, and thus, by admitting air, sunshine, and light, to strengthen the new growth and assist in hardening and preparing the stems for another season’s work.

Many of the so-called Hybrid Perpetuals, as I have said, give only one satisfactory crop of bloom. Simultaneously with its production new growths start up from the base of the bush. A little consideration will show that if the old shoots that have already produced their flowers are cut right away the whole strength of the tree will be concentrated in the new shoots, to the great advantage of the plant in the following season.

The Teas and Hybrid Teas, most of which bloom well into the autumn, require different treatment. When a rose is cut from a Hybrid Tea or Tea a shoot springs at once from the next bud on the stem. It is a good plan when the rose is being cut, to prune the shoot back somewhat. In this way a better new shoot and a finer crop of second blooms can be obtained.
EFFICIENT and skilful pruning is half the battle in the successful culture of the rose, and in the production of satisfactory blooms. But this is not all. Even though such pests and diseases as aphid, grub, and mildew have been kept at bay, constant attention must be paid to the rose-beds during the few critical weeks which immediately precede the full development of the flowers.

The important operation of disbudding, for instance, should not be neglected by the amateur who proposes to exhibit, nor indeed should he fail to practise it to some extent if his object be merely the production of fine blooms for decorative purposes in his own garden. If a healthy, vigorous rose-tree be examined it will be found that there is a superabundance of both flower-buds and leaf-stems. This is bountiful Nature's way, but from the expert rosarian's point of view she is too generous. If all shoots and buds were left to develop naturally the result would be disastrous to the fulfilment of our hopes. The bushes and standards would develop into masses of weak wood, little better than a thicket, from which light and air are excluded. The true policy, therefore, is to disbud. This operation, which consists in the removal of superfluous shoots and buds, should be carried out by degrees. Where two or three shoots are growing nearly close together, and are pointing inwards towards the centre of the bush, two out of the three should be dispensed with either by pinching them out with the thumb and finger or by cutting them out with a knife.

If prize-winning blooms are sought for, not more than one bud should be left at the end of a shoot. Some varieties, such as
Baroness Rothschild, come with single buds, but the majority will be found to have three or four crowded together. The amateur whose object is to grow roses solely for their decorative effect in the garden will not require, of course, to be so drastic in his methods. But, even in his case, disbudding on a moderate scale will result in the production of larger and better blooms, and it will also be for the ultimate welfare of the plant.

The rose, as I have already indicated, is a gross feeder, and it requires some amount of artificial stimulus if it is to be grown to perfection. If the surface of the soil were top-dressed during the autumn, or immediately after planting in November in the case of newly-purchased trees, little further in this direction will have been necessary up to the end of May.

Where there are plenty of buds the roots will by that time be making great demands on the soil, and these can best be met by the application of liquid manure once a week or even a little oftener. In the case of strong and established plants the solution may be fairly strong, but liquid manure supplied in weak and frequent doses should be the rule for weakly and newly-planted roses. For its efficiency in affording the necessary stimulus nothing can exceed cow or pig manure. (The rose-grower cannot afford to be too fastidious.) If a bucketful or two of manure be steeped in a few gallons of water for a week or so, and then be diluted in clear water until it is of the colour of weak tea, it will form an admirable liquid manure. The solution should, however, never be applied when the soil is dry, and it should be spread over as large a surface as possible, and not be poured directly round the stem of the plant. The reason for this is that a well-planted and vigorous rose-tree will spread its roots out for a considerable distance in search of food, and if the liquid be poured in a widish circle round the plant the extremities of the roots will benefit as they should by the application of the manure. If there has been no rain for some time the ground should be well soaked with clear water the day before the liquid manure is applied. If dry fertilisers are preferred, suitable compositions can be
obtained from the florist's. One of the best is guano, either native, Canary or fish. About a dessertspoonful may be spread round each plant when the soil is damp, and be well hoed in afterwards.
CHAPTER XX

PROPAGATION

Of the two principal methods of propagating the rose—namely, budding and by means of cuttings—the last-named is by far the easier, and it is the method with which the amateur may experiment with confidence. Whether, taking all things into consideration, it is completely worth his while to undertake the task is an open question. Not a few of the leading rosarians are inclined to scoff at the practice. They point out—to use the words of one of them—that "the chief drawback to the process is that the greater number of the Hybrid Perpetuals, though they will root and make a certain amount of growth, decline to go beyond a certain point, and ultimately dwindle away. The fact is that budding on briar stocks is not done merely for the fun of the thing; the vigour of the wild stock is absolutely necessary to most of the garden perpetuals and teas. As an amusement own-root roses are a nice amateur's hobby; for stocking a garden they are a mere delusion." Now this may be very true, and it may also be true that young rose-trees propagated by florists are so cheap and so thoroughly reliable nowadays that for the expenditure of a few shillings each year the amateur may add to his collection a couple of specimens of the choicest and newest kinds of roses. But the true gardener loves to experiment, and if any of my readers have never yet tried the plan of striking rose-cuttings I should strongly advise them to adopt it. If, as doubtless will be the case, some of the cuttings fail to strike, a few will certainly do so, and among these they may be lucky enough to secure several choice rose-trees that will bloom and give delight for years.

Cuttings may be taken any time from the beginning of
September until the end of November, and Diagram 12 gives some practical hints on the procedure to be followed.

The cuttings should be made of wood of the current year's growth. It should be well ripened and be medium in strength. Figure 1 in the diagram shows a cutting taken from a bush of Madame Lambard. It is eight or nine inches long and should be detached from the old wood with a heel, as indicated at the base of the cutting. AAA represent the lower leaves, which should all be removed. With the point of a knife pick out all the lower buds except the uppermost four or five. Figure 3 shows how the heel should be trimmed, by cutting off the ragged end.

The cuttings may be inserted in the open ground, which should be composed of good friable soil, sandy rather than clayey. The situation may be some half-shady corner of the garden under a north wall. Drive a spade well into the soil and work it backwards and forwards, towards and away from the body, so as to leave a V-shaped trench in the ground along the bottom of which a layer of sand may be placed. The cuttings should be inserted six inches apart to a depth of six inches, taking care that the heel of the cutting rests firmly on the base of the trench. Tread the cuttings firmly into the ground and they may then be left alone for a year, after which they will, if they have survived the rigours of the preceding winter, be ready for planting out in their permanent quarters.

Another plan—that of striking cuttings in pots—is shown in Figures 4 and 5. The cuttings for this purpose should be no longer than four or five inches. They should be trimmed as shown in Figure 4 and inserted round the edge of the pots as indicated in Figure 5. The pots may be placed in a cold frame or greenhouse and planted out—as they obtain new roots—in the early spring in ground that has been deeply dug and well manured. So that a good foundation may be laid for strong, bushy and symmetrical specimens, the young plants must be severely pruned the second season, and all attempts to flower should be frustrated by pinching off all the buds during the year succeeding that in which they have been "struck."
Diagram 12.—ROSE CUTTING.

Fig. 1 represents a growth showing cut with heel; a a a, lower growths removed; b, old wood. Fig. 2. Cuttings planted out and growths shortened at c. Fig. 3. Place to make cut in ragged end of heel. Fig. 4. Cutting suitable for pot work. Fig. 5. The same potted. Place cuttings round the pot with growth pointed inwards as indicated.
The plan of increasing one's stock of rose-trees by the process known as budding is one that is not often practised by the inexperienced amateur, but it is a method that has many advantages, the chief of which is that it enables the grower to perpetuate the varieties of which he is particularly fond by budding them on easily secured stocks of strong wild varieties. The proper time for undertaking the work is late July, when the first flush of bloom is over.

The first essential is to see that a proper supply of stocks has been secured. The grower who looks ahead obtains his stocks in the autumn, either by cutting them himself from the briars in the hedgerows of country lanes or by securing them in good time from the nurseryman. A stock very largely used nowadays is the manetti, which was introduced from Italy about fifty years ago. The stocks should be planted in the autumn, in ground that has been well dug, and, if possible, on ridges of earth. The reason for this will be seen later. By the time the season for budding comes round the stocks will have formed good roots about four inches beneath the surface of the ground, and will be ready to receive the buds. The implements necessary for the operation of budding are a sharp knife and some bast, worsted or soft cotton, similar to that used by tallow chandlers for wicks.

The diagram (No. 18) will help the reader to understand the process to be followed. It is not so difficult as it looks, and the joy of propagating one's own rose-trees is ample reward for the few failures which must inevitably fall to the lot of the beginner. Perhaps the first doubt that will arise in the mind of the amateur who has never before undertaken the task of budding will be: "What sort of shoot or bud am I to take from the parent plant?" The answer is simple. For the novice an excellent plan is to select a plump shoot with a good blossom at the end of it. The shoot from which a bud is taken must not be quite ripe. Lower buds on a long-growing shoot, and those below a full-blown flower, are the best. Now begins the preparation of the bud for insertion in the stock. Cut off the leaves at the spot indicated in the diagram, about an inch and a half above the eye, and then proceed to cut
Diagram 13.—HOW TO BUD ROSES.

Fig. 1. The budding knife. Fig. 2. The shoot from which the bud is to be taken. Fig. 3. Cutting out the bud. Fig. 4. The bud. Fig. 5. The bud with inside removed. Fig. 6. The receiving cut on the briar stock. Fig. 7. Opening the incision. Fig. 8. Inserting the bud. Fig. 9. The bud inserted. Fig. 10. How to tie the bud.
out the bud. Insert the budding knife about an inch above the eye, and make a circular slicing cut to remove the bud from the stem. The piece thus removed should be about an inch long. Next prise up with the point of the knife or thumbnail the bit of wood in the slice of shoot and peel it out of the shell of bark, care being taken not to pull the eye of the bud away. If this by any mischance is done the bud is spoiled, and may as well be thrown away.

The bud will now be ready for insertion in the stock. But before this is done it is necessary to make an incision in the bark of the briar or manetti to be operated on. This is made as near to the base of the plant as possible, especially in the case of the manetti stock. Make an incision in the bark of the stock in the shape of a letter T, as shown in the diagram. The cut need not be deep, only sufficiently so to allow the bark to be raised easily. This should be done with the flat handle of the budding knife, and when a sufficiently large opening has been made the bud should be carefully inserted. It should be pushed in at the transverse cut—the top of the letter T—as far down to the end of the longitudinal cut as it will go. The bud should be allowed to lie quite flat in the slit made for it. Next tie the bud round firmly with the bast or wool, leaving the bud exposed, and the operation is complete. If standards are wanted, the stocks should be cut from briars about a yard or four feet long, and the bud inserted in a shoot at the top of the briar stock as shown in the illustration.

It will be possible to ascertain whether union has been achieved in about three weeks, for then, if such be the case, the joint will begin to swell. The tying material should then be somewhat loosened, to allow for natural swelling as the stock grows. Meanwhile the upper shoots of the stock must not be severed. They should be left intact until the spring, when, if all has gone well, the bud will be found to be making growth. The top of the stock can then be severed about two inches above the point of union, and at the same time it will be found advisable to remove from the stock all suckers or underground growths. The bud must be
allowed to make a little further growth before it is pruned. This
should be done lightly at first. In the following autumn the
newly-budded tree can be transplanted into permanent quarters,
and its subsequent treatment will be that recommended for
established roses.
Chapter Xxi

Pests of the Rose

The pests of the rose are so numerous as to alarm the beginner who is confronted with a list of them for the first time. Here is a list extracted from a handbook published by the National Rose Society, and I am bound to admit that it is a gruesome catalogue:

Beetles (Coleoptera)

Rose beetle
Cockchafer
Summer chafer
Garden chafer
Weevils

Bees and Sawflies (Hymenoptera)

Rose leaf-cutting bee
Leaf-rolling sawfly
Rose slugworm
Rose emphytus
Rose shoot-borer sawfly

Moths (Lepidoptera)

Vapourer moth
Pale tussock moth
Gold-tail moth
Brown-tail moth
Buff-lip moth
Dagger moth
Winter moth
Mottled umber moth
Tortrix moth or rose maggot
Red rose maggot
Brown rose grub
Green rose maggot
Yellow rose grub
Rose-leaf miner

Aphides, Scale Insects, etc. (Hemiptera)

Greenfly, or rose aphis
Scale insects
Scurvy rose scale
Frog-hopper or cuckoo-spit
Rose-leaf hopper

Thrips (Thysanoptera)

Red Spider (Tetranychus telarius)

In addition to this formidable array of insect pests the diseases
Diagram 14.—THE GREENFLY.

Fig. 1. The insect makes its appearance. Fig. 2. And before the day is out increases. Fig. 3. Result the following day. Fig. 4. Later the young buds will be attacked. Fig. 5. Spraying. Fig. 6. Applying the solution by sponge.
caused by fungi have to be fought successfully if perfect roses are to be obtained. Here is a list:

<table>
<thead>
<tr>
<th>Rose mildew</th>
<th>Rose-leaf scorch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rose black mildew</td>
<td>Sooty mould</td>
</tr>
<tr>
<td>Rose rust</td>
<td>Rose-tree canker</td>
</tr>
<tr>
<td>Black spot</td>
<td>Parasitic canker</td>
</tr>
</tbody>
</table>

But, after all, when one has kept closely in mind and put into use the adage that "Prevention is better than cure," the average amateur will find that in practice he will need only to be constant in his warfare against grubs and caterpillars, greenfly and mildew to save his finest blossoms from serious harm and his trees from devastating disease.

For grubs and caterpillars the remedy is simple. They will inevitably make their appearance with the advent of new foliage, and will find their way to the flower-bud as soon as it is formed, unless in the meantime they are destroyed. And there is only one really effective method of accomplishing this end—that is to search diligently for the crumpled rose-leaf. Wherever a leaf is found to be curled up and sapless, there assuredly will you find the marauding grub. The leaf must be picked off and the caterpillar concealed within its folds crushed between the thumb and finger until all danger of resuscitation is over. It is not a pleasant job, especially for the dainty fingers of lady gardeners; but it is drastic and it is effectual.

The remedies for greenfly, or rose aphis, are summed up by Mr F. V. Theobald in the Rose Society's handbook as: "Just a little gentle washing with non-caustic substances and a lot of finger-and-thumb work." This is excellent advice, and save that the inexperienced beginner may like to know what are the non-caustic substances recommended for use, there is little more to be said. Here is the remedy suggested by Mr Theobald:

"Aphis may easily be kept in check on roses by spraying, but this must be done with care. The writer has seen roses as badly damaged by the washes used as by the greenfly. The reason is, the rose will not stand any strong corrosive spray. A particular rose may do so at one time, but at another it will have its foliage
ruined. Moreover, a strong corrosive wash is not necessary to kill aphides. All that we have to do is to block up the breathing pores, and so asphyxiate them. This may be done with simple soft soap and water. For the spraying of roses you must get the best soap, and not use more than one pound to twenty-five gallons of water. To this may be added two and a half pounds of quassia chips. The effect of the latter is undoubtedly most beneficial, for it acts as a stimulant and cleanser to the leaves, and by many growers is said to have a direct effect on the aphides. The soft soap has some corrosive power, for it contains caustic soda (about 4 per cent.). This soft soap and quassia wash is made as follows:

Dissolve the soap in boiling soft water; boil the quassia chips, and let them simmer for about twelve hours, adding water enough to keep them covered. Every now and then strain off the liquid extract and pour into the dissolved soft soap, and well stir, and lastly, add the full quantity of water of dilution. This is all that is required to kill aphids. To clear the roses, we must spray twice in succession on two consecutive days. Nicotine is an excellent insecticide, and may be safely used with soft soap."

Mildew is perhaps the most difficult of the enemies of the rose to overcome. The fungus first appears as a white mould on the foliage of the trees, and unless it be promptly checked it will spread, until the whole collection has become affected. The best way to check the disease in its early stages is to dust sulphur powder lightly over the affected leaves. The sulphur should be put in a fine muslin bag and be shaken over the leaves on the first calm evening after the disease is detected, this operation to be repeated at intervals until the mildew has been eradicated. In cases where the disease has not become rampant spraying may be recommended as a preventive. The preparation recommended in the Rose Society's booklet is a solution of potassium sulphide, popularly known as "liver of sulphur." One ounce should be dissolved in five gallons of rain water, and if a tablespoonful of liquid glue is added the fungicide will adhere much longer to the foliage.

The frog-hopper, or cuckoo-spit insect, generally makes its
appearance towards the end of May. The spittle with which the insects surround themselves is nothing less than the sap of the plant, which has been secreted by them to form a protective covering. Such robbery of the tree’s vital ingredients must be checked at once, and this can be done either by “thumb-and-finger work,” as previously recommended, or by spraying with an insecticide which contains nicotine. In order, however, to get rid of the froth, or spittle, and thus reach the insect itself, it is necessary to spray first with clear water and then to apply the tobacco wash. The ingredients of the insecticide recommended are: Tobacco refuse or dust, \( \frac{1}{2} \)-lb.; soft soap, 1 lb.; soft water, 12 gallons. The tobacco should be steeped in water for some days, and then be allowed to simmer over a fire for an hour. Pour off the liquid, and repeat the steeping operation, and add the second extract to the first. The product may then be mixed with the dissolved soft soap and applied through a syringe to the affected trees, above and below.
Diagram 15.—PESTS OF THE ROSE.

Fig. 1. A bud attacked by the rose maggot. Fig. 2. A leaf curled up by a grub—the leaf should be opened and the grub removed. Fig. 3. Foliage attacked by the leaf-cutting bee. Fig. 4. A bud partly eaten by the rose caterpillar or grub. Fig. 5. A bud and stem infested with aphis. Fig. 6. The frog-hopper or cuckoo-spit.
CHAPTER XXII

PREPARING ROSES FOR EXHIBITION

The hints already given, if they be diligently followed, will enable the amateur gardener to achieve a full measure of success, especially if his object be chiefly to produce satisfactory decorative blooms. But the height of ambition is not attained by a large number of growers until they have exhibited at local rose shows and have gained a prize. The problem: "How to prepare the blooms for exhibition?" is one that confronts them, however, and it needs a little careful study and the exercise of much pains and patience if it is to be solved to their own satisfaction, and—more important still—to the satisfaction of the judges under whose severe scrutiny their choicest roses will come.

I paid a visit, towards the end of June, during a recent summer, to the garden of a friend who is a very successful grower of roses and a prize-winner at some of the leading shows. Needless to say, he was extremely busy with his final preparations for getting his exhibition blooms into perfect condition, and it occurred to me that not a few of my readers whose ambitions lie in a similar direction would be glad to know what those preparations were.

On Page 166 is reproduced a picture of a rose-bed in my friend's garden, containing nearly three hundred trees. The picture was taken on the day after more than three hundred blooms had been cut, yet in spite of this wholesale thinning out there were still many choice flowers. It was from these that the blooms for exhibition were selected. It will be noticed that the majority of them are protected by linen hoods. The object of this is to preserve the expanding buds from being battered by heavy rain.
Diagram 16.—HOW TO MAKE SHADES FOR ROSES.

Fig. 1. A circular piece of zinc. Fig. 2. The shade. Fig. 3. Screw and nut for apex. Fig. 4. Section of apex. Fig. 5. The shade fixed. Fig. 6. A good substitute may be made of grease-proof paper pinned together as in the diagram. Fig. 7. The linen shade supplied by florists. Fig. 8. Another simple device for shading. Fig. 9. Effects of not shading; the flower is prematurely "blown."
and dew, and to shade others from the fierce heat of the sun's rays, which, if allowed to beat down on some varieties of roses, would bleach them and spoil their colour irrevocably. The shades are placed well above the buds, so that, while they provide ample protection, the flowers may not be deprived altogether of light and air.

Another practice is to tie the bud round its centre with white double Berlin wool. The purpose here is to keep the heart of the bud sound and compact, and to prevent it from premature expansion. It also serves to preserve the colour of the inside petals—an important point when the judges come to inspect the blooms. A further picture indicates the method adopted by the expert grower to produce an elongated bud. For this purpose he ties a piece of white paper round the bud in the shape of a cylinder—not too tightly, but sufficiently firmly to ensure that the apex of the bud shall extend outwards.

The intending exhibitor must get up very early in the morning of the day on which he intends to show. This applies especially in cases where the blooms have to be taken not too long a journey. His early rising will be necessary so that he may cut his flowers before the sun has begun to affect them. Whatever he does, let him not cut a fully-developed rose, however beautiful it may be. Roses that are three-quarter or even half opened are the best. If they have been tied up with wool, as suggested, they will expand during the few hours that elapse between the cutting and the moment of judging. Another essential point to keep in mind is that the newly-cut blooms should be placed in water the moment they are removed from the tree. If this be neglected the pores of the stem close up, and even if the blooms be placed in water later they cannot benefit to the full extent. If, however, the rule has been observed, and a rose be seen to be flagging, the base of the stem may be cut again with a sharp knife and the water changed. Where a long journey is necessary, and roses have to be cut the night before the show, this should be done in the late evening. The blooms should be placed in water to which a little ice has been added, and then consigned to a cool cellar or dark
TO PRODUCE AN ELONGATED FLOWER.
The grower ties a piece of white paper in the shape of a cylinder round the rose.

ROSES WITH NIGHTCAPS.
This picture shows the method adopted to shade roses from the sun and to protect them from rain and heavy dew.
room. The blooms will need careful packing with moss in a box for removal to the show, and on arrival there they should be displayed on a specially constructed stand, there to await the judges' verdict.
BOOK V

SOME FAVOURITE FLOWERS
CHAPTER XXIII

THE SWEET PEA

It would be an effort at once superfluous and presumptuous to attempt to say anything in praise of the sweet pea as a desirable subject for culture by the amateur gardener. Everybody knows the flower, and everybody loves it for its fragrance and its beauty. The gardener who cultivates a small plot of ground at the back of his house especially cherishes it because of the simplicity of its culture and because the reward which follows upon a very little effort on his own part is so rich and so satisfying.

To the genuine enthusiast the height of his ambition has been attained when he finds his choicest specimens displayed on the exhibition bench, and if he be the winner of a first prize his delight knows no bounds. Truly he has his reward. For my part, however, I prefer to think of the sweet pea as a flower which provides a gorgeous display of bloom in the summer garden, and as a decorative subject in the house. For absolute beauty there are few things in this world more delightful than a vase of freshly plucked sweet peas—unless, indeed, it be a bowl of well-grown, shapely roses.

After all, the growers of sweet peas whose be-all and end-all is the winning of trophies at an exhibition are in a minority. The vast majority of us are content if we can grow a batch or two of sweet peas that shall not put us to shame. But we shall not be wholly satisfied unless we have included in our selection one or two of the latest and choicest varieties, and it is here that the exhibitor and the expert come to our aid.

A notable advantage which the amateur reaps from the severe competition of the professional sweet-pea raiser is the cheapness
of the seed. No sooner is a new variety placed on the market than it is snapped up on every hand, and its multiplication is so rapid that in a year or two at most it is accessible even to the slenderest purse. Therefore it behoves the cultivator who desires to keep abreast of the advances made in sweet-pea culture to watch carefully for the appearance of the latest kinds, and to keep track of them until he is able himself to become the proud possessor of the choicest varieties.

Here the National Sweet Pea Society comes to his aid. The floral committee of the society is constantly holding trials and classifying varieties. The following is the latest list issued under its authority. The varieties are placed in order of merit, under their own colours:

<table>
<thead>
<tr>
<th>Bicolour</th>
<th>Cream-Pink (Deep)</th>
<th>Maroon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arthur Unwin.</td>
<td>Constance Oliver.</td>
<td>Black Knight Spencer.</td>
</tr>
<tr>
<td>Mrs Andrew Ireland.</td>
<td>Mrs R. Hallam.</td>
<td>Tom Bolton.</td>
</tr>
<tr>
<td>Mrs Cuthbertson.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Blue</strong></td>
<td>Crimson</td>
<td></td>
</tr>
<tr>
<td>Mrs G. Charles.</td>
<td>Sunproof Crimson.</td>
<td></td>
</tr>
<tr>
<td><strong>Blush</strong></td>
<td>Fancy</td>
<td></td>
</tr>
<tr>
<td>Mrs Hardcastle Sykes.</td>
<td>Afterglow.</td>
<td></td>
</tr>
<tr>
<td>Princess Victoria.</td>
<td>Charles Foster.</td>
<td></td>
</tr>
<tr>
<td><strong>Carmine</strong></td>
<td>Prince George.</td>
<td></td>
</tr>
<tr>
<td>John Ingman.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cerise</strong></td>
<td>Lavender</td>
<td></td>
</tr>
<tr>
<td>Cherry Ripe.</td>
<td>Florence Nightingale.</td>
<td></td>
</tr>
<tr>
<td>Decorator.</td>
<td>Lavender George Herbert (Dobbie’s).</td>
<td></td>
</tr>
<tr>
<td><strong>Cream, Buff and Ivory</strong></td>
<td>Masterpiece.</td>
<td></td>
</tr>
<tr>
<td>Clara Curtis.</td>
<td>R. F. Felton.</td>
<td></td>
</tr>
<tr>
<td>Isobel Malcolm.</td>
<td>True Lavender.</td>
<td></td>
</tr>
<tr>
<td>Paradise Ivory.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cream-Pink (Pale)</strong></td>
<td>Lilac</td>
<td></td>
</tr>
<tr>
<td>Gladys Burt.</td>
<td>Agricola.</td>
<td></td>
</tr>
<tr>
<td>Lady Miller.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrs H. Dickson.</td>
<td>Magenta</td>
<td></td>
</tr>
<tr>
<td>Mrs Routzahn.</td>
<td>Menie Christie.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marbled and Watered</td>
<td></td>
</tr>
<tr>
<td>*Helen Pierce.</td>
<td>*Helen Pierce.</td>
<td></td>
</tr>
<tr>
<td>May Campbell.</td>
<td></td>
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</tr>
</tbody>
</table>

* Indicates a grandiflora variety, all others are waved.
In order to grow sweet peas to perfection a few essential rules must be observed. They are:

1. Deep tilling of the soil.
2. Thin sowing.
3. Good feeding.
4. Efficient staking.

Let me take these in the order in which I have set them out. The aim of the successful raiser of sweet peas is to produce large blooms on long, firm stalks. Deep cultivation alone can help to achieve this result.

The ground on which the flowers are to be produced ought to be dug to a depth of at least two feet in the autumn, and some rich farmyard manure incorporated with the soil. In no case should manure be mixed with the surface soil. If it be buried deeply it will enrich the lower layers, and when the heat of summer comes, and the long sweet-pea roots are thrusting themselves deep down in the soil in search of nutriment, they will find it in the manure applied in the previous autumn. The advantages of

<table>
<thead>
<tr>
<th>Orange-Scarlet</th>
<th>Pink (Pale)</th>
<th>Striped and Flaked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Picotee Edged (Cream Ground)</td>
<td>Marie Corelli, Marjorie Willis, Rosabelle.</td>
<td>Striped and Flaked (Purple and Blue) Loyalty, Suffragette.</td>
</tr>
<tr>
<td>Evelyn Hemus, Mrs C. W. Breadmore.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Picotee Edged (White Ground)</td>
<td>Barbara, Earl Spencer, Melba, Stirling Stent.</td>
<td>Striped and Flaked (Red and Rose) America Spencer, Aurora Spencer, Mrs W. J. Unwin.</td>
</tr>
<tr>
<td>Elsie Herbert, Marchioness of Tweeddale, Mrs Townsend.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pink (Deep)</td>
<td>Scarlet</td>
<td>White</td>
</tr>
</tbody>
</table>
good feeding will surely make themselves manifest in the size of the flowers and the height to which the plants will grow.

On this point Mr Henry Eckford, of Wem, Shropshire, who has done more perhaps than any man living in improving the sweet pea, gives the following advice:—"Any time between November and February, give the ground a good dressing of manure, cow manure for preference, but failing this, use well-rotted stable manure or such manure as may often be obtained in towns, from the butcher's slaughterhouse. This must be dug in as deeply as possible. Allow the ground to lay up rough. I recommend this in preference to the ordinary method of placing the manure in the bottom of a trench and covering with an inch or two of soil, because I have known so many instances where this has been done by amateurs, and as soon as the young seedlings get their roots down into the manure they sicken and die. If the manure is spread and dug in as recommended, the plants will be perfectly safe. Do not use the sweepings of a fowl-run for sweet peas, as they frequently fill the ground with minute eel worms and nothing will more surely destroy the plants. Much loss is traceable to this pest."

The problem when to sow out of doors is easily solved if the grower intends merely to provide a summer display in the garden. In a moderately dry February, the seed may be sown during the second week, but I do not think that there is much to be gained by sowing out of doors at so early a period of the year. No time will be lost by postponing the operation until March, and even then it will be an advantage to wait until the ground is dry and is in an easily workable and friable condition.

If sweet peas are to be cultivated in rows it is a good plan to draw a broad, flat-bottomed drill, about a foot or eighteen inches wide. On no account should it be concave. The inevitable result of this would be to crush the seed into the centre of the shallow drill, and to cause overcrowding. Thin sowing, however, can be carried out with perfect ease if the drill be flat. If clumps are to be grown, the same rule should be observed—the bottom of the circular trench should be perfectly flat.
Birds and mice are great enemies of the sweet-pea grower in the earliest stages of cultivation. Here is the method recommended by Mr Eckford for circumventing their depredations:—

"It is always wise to red lead the seeds prior to sowing, to prevent birds or mice taking them away. An easy way to coat the seeds is to place them in a pail or other vessel, and sprinkle with water sufficient to damp thoroughly every seed (not to soak them). Pour off superfluous water and then sprinkle the seed with red lead, a little at a time, stirring them the while with a stick, until each seed is dry coated and free. Paraffin may be used instead of red lead, but it is not so certain. The soil is such a purifier that the odour of paraffin goes off quickly, and when we remember that the seed is attached to the plant for quite a considerable time, it will be seen that the substance that adheres longest must be the most effectual. When paraffin is used, place the seed into a vessel and pour paraffin over it, only allowing the seed to remain a short time, then sow directly it is removed."

These preliminary preparations complete, all is now in readiness for committing the seed to the ground, and the question that next arises is "How far apart should each seed be sown?" The answer depends upon the purpose for which the flowers are being cultivated. If for exhibition, then nine or even twelve inches would not be too great a distance to allow between the plants; but if for simple garden decoration and for cutting, six inches will be amply sufficient. The old method of sowing in zigzag lines, thus:

.. . . . . . . . . . . . . . .

is now seldom practised by the expert. Instead, the seed should be placed in single rows, thus:

.. . . . . . . . . . . . . . .

I do not believe in deep sowing in early spring. The ground for some time to come is certain to be cold and clammy, even at the surface, and if the seed be sown too deeply it will be slow to germinate. The drills should be drawn three inches deep, the surface be made fairly firm, and the seed covered with not more than an inch or an inch and a half of soil. If this be done a shallow
trench will be left, and the raised sides will afford some protection against cutting east winds during the very earliest stages of the young plants' existence.

A very effective plan, if it is not convenient to sow sweet peas in long rows, is to arrange them in round clumps—half-a-dozen seeds in each. The clumps may be dotted here and there at the back of the mixed border, and the effect will be very pleasing.

You may perhaps wish to fill up an odd corner on a gravel path near a window so that the fragrance of the flowers may be wafted into the house. This may be accomplished by sowing the seeds in a large pot or in an old butter bucket painted green on the outside. Sow three or four seeds in a pot, or half-a-dozen in the tub, make the soil rich, and you will not be disappointed.

As soon as the tiny plants begin to peep through the soil pea guards should be used, or black thread may be stretched over them zigzag fashion, to prevent the birds taking the tender tops. Slugs and snails, too, should be watched for, especially on moist evenings. An occasional dusting with soot or lime, or both, will prevent these pests doing much damage.

Sweet peas cannot be afforded support too early. Directly the seedlings are two or three inches above the soil their slender tendrils should be assisted in their natural efforts to cling to a support. This is best provided by the short twiggy tops of hazel sticks. A little later the final staking must be attended to. This should be provided by longer hazel sticks, five or six feet high. These are put into the ground in unbroken straight lines on either side of the trench, at an inclined angle, slanting in one direction on one side and in the opposite direction on the other.

If the weather in May and early June be genial the plants will climb over these rapidly, but it would be a mistake to leave them altogether to their own devices. It is not enough to place the stakes in position and to expect the plants to take care of themselves. If the rows or clumps of sweet peas be examined it will be found that many of the leading growths are being throttled by the tenacious grip of the tendrils. These should be carefully untwined and trained in another direction. The leading growths
Sweet Peas in Tubs.

A pretty effect is produced by planting sweet peas in tubs and placing them at intervals along the garden path.

Photograph by Mrs. Watts, Lymington, Hants.

Leafy Shade.

A shady path in a well designed garden.

Photograph by Henry Ridge.
must be brought towards the outside of the sticks, so that they can derive the fullest benefit from sunlight and air. In some instances where there is any difficulty in inducing the shoot to keep in position, it can be tied to a stick.

As the buds form it will be necessary to apply frequent doses of weak liquid manure. Soot water is an excellent fertiliser. It is easily prepared, and if care has been taken to store the soot in a dry place for several weeks there need be no hesitation about using it. Weak solutions of nitrate of soda may be also used as a fertiliser, while a surface mulching of short manure will be found of the utmost value for keeping the plants in a vigorous condition. While supplying necessary food, the mulching also keeps the soil moist and dispenses with the too frequent use of the watering-pot.

In hot, dry weather it will be necessary to give water to the plants. When this is done, see that it is done thoroughly. No mere dribble will accomplish any good. It is better to give a heavy soaking twice a week than a sprinkling twice a day. A good plan so as to ensure that the water may reach the roots is to drill holes about nine inches from the base of the plants, and into these pour water again and again until you are satisfied that the moisture has gone down to a good depth below the roots of the peas. Soft rain water is always safe, whereas service water may contain something which the plants do not like, and, as is frequently the case, do more harm than good. If service water only is available it should be exposed to the sun and air for twenty-four hours before being used. After watering, there is often a tendency for the surface of the soil to become hard and caked. This should not be allowed. Stir frequently with a Dutch hoe to keep the surface soil open.

In a normal season sweet peas sown out of doors in March will bloom towards the middle of June. Everybody knows that if the sweet pea be allowed to run to seed the flowering period will be brought to an untimely end, but the lesson needs to be emphasised. It is a good rule to attend to picking every day, either in the early morning or in the evening. If this operation be faithfully performed the flowers will reward you both by their
abundance and their size, and it will be possible to pluck them in plenty throughout the remaining days of summer.

The aim of not a few sweet-pea experts nowadays is to have their favourite flower in bloom from January to October. This can only be achieved, of course, by the aid of glass and artificial heat. Sweet peas can be induced to bloom in the middle of winter if they be sown in pots in September, and be grown on steadily, without undue forcing, in a gentle heat. But the task is not an easy one, for the simple reason that the sweet pea is a hardy plant, and unless very carefully handled it resents forcing.

The average amateur gardener, however, is always anxious to have his sweet peas in bloom at the earliest possible moment. With this object in view he can sow in pots in the autumn.

The pots are placed in a cold frame, and if they survive the winter, seeds thus sown will produce an early and probably a more abundant crop of bloom than seeds sown at the normal time. The great essential in connection with autumn sowing is to keep the plants cool and dry, and not to put them out of doors into their flowering places until all danger of severe frosts is over—say, about the middle of April.

A further sowing can be made under glass in February. The seeds should be sown five or six round the edge of a five-inch pot, and one in the middle, or singly, in thumb pots, as shown in Figures 1 and 2 of Diagram 17. An excellent plan is to call in the aid of a disused egg box, as depicted in Figure 3, sowing one seed only in each division. When planting-out time comes the sides of the box can be broken away, and the plants can be easily removed without disturbing the roots in any way. While the soil should be fairly light, it is a good plan to have mixed with it a fair quantity of leaf mould. The roots bind well round such a compost, and this assists the separation of the plants when the time comes for planting out.

The pots should be placed on a bed of cinders in a cold frame, giving plenty of air in mild weather, and protection from severe frosts by means of mats placed over the glass.
Diagram 17.—SWEET PEAS IN POTS.

Fig. 1. Sow seed half-inch deep in thumb pots. Fig. 2. Five seeds in five-inch pot. Fig. 3. An old egg or market fern-box may be used, one seed to be sown in each compartment. Fig. 4. Place in cold frame or, Fig. 5, near the light in a cool greenhouse.
By the end of April, sweet peas raised in pots will be ready for planting out in the open ground. They will be five or six inches high, putting forth their prehensile tendrils and seeking in vain for the support of twigs and sticks. Unless this be given to them without delay they will inevitably become lanky and misshapen. But they will also be searching for a new and richer element in which to thrust down their roots, and this can only be afforded by planting them in the places in which they are to yield their precious blossoms.

As a rule, the amateur sows four or five seeds in a five-inch pot, and where this is the case he will have to make up his mind whether he shall plant his young sweet peas singly, giving them a generous amount of space for development, or whether he shall just turn them out from the pots and plant them in little clumps, without disturbing the roots. If he has ambitions in the direction of prize-winning in the show-tent, he will adopt the former plan, allowing nine inches between each plant; if his desire be merely to obtain cut blooms for decorative purposes he will follow the second alternative, and deploy his plants in tiny groups after the method depicted in Figure 3 of Diagram 18.

The ground will of course have been made ready previously for the reception of the seedlings. It should have been well trenched in the autumn, and well manured also. All that ought to be necessary, when planting-out time arrives, is a light forking over of the surface and a breaking up of the lumps of soil which have not already been pulverised by the frost, the rain and the wind.

If the soil has been thus prepared, deep planting will be easy. This is an important point to remember. It is not enough simply to bury the roots; the lower part of each stem ought also to be well covered. Care must also be taken to plant firmly. The soil should be pressed round the collar of each plant in such a way that the stem may emerge from the centre of a saucer-shaped cavity in the ground. This will be of assistance in the watering of the plants, since it will direct the refreshing stream of moisture direct to the very heart of the roots.
Diagram 18.—SWEET PEA PLANTING.

Fig. 1. Sturdy plants ready for transplanting. Fig. 2. Planted out and protected from wind and rain. Fig. 3. The wrong method. Fig. 4. Planting the contents of a pot without disturbing the roots.
The staking of the plants must proceed simultaneously with the operation of planting out. As each row or clump of sweet peas is deposited in the ground the provision of suitable supports should be attended to. Small hazel sticks should be fixed in the ground round the sweet pea plant in the manner shown in Figure 2 of the diagram, and not in the way depicted in Figure 4. In a few weeks' time longer and stronger supports will be necessary, but the important thing at the moment is to give the tiny tendrils something to which they can attach themselves with least trouble. Even in the case of clumps round which stakes and string or galvanised wire are to be used for support, the use of small twigs at the outset will be found an advantage.

Cupid or dwarf sweet peas are easy to grow and are extremely useful when grown in pots for the decoration of window-boxes, the conservatory, or the greenhouse. The Cupid variety may be used in the open garden with excellent decorative effect if it be provided with a suitable situation. The plants are very small, they do not attain a height of more than a few inches, and though they produce tendrils they do not climb.

The Cupid sweet pea thrives best on a light and comparatively dry soil; therefore it is useless to sow the seed in ordinary heavy soil which holds moisture. If this be done the plants will shed their buds after the first heavy rainfall, and will produce very little bloom. The better plan, therefore, is to sow them on a raised bank or bed, or in a fair-sized niche in the rockery where there is ample drainage and partial shade, or they may be utilised to form an edging if they be sown one inch apart and be allowed to grow away and follow their own devices. In this way delightful ribbons of bloom in varying colours can be arranged.

If the peas be sown in pots the latter should be large enough to provide ample root space. Eight-inch pots answer the purpose admirably, and in these a dozen seeds may be sown an inch or an inch and a half deep. The plants may be grown either in a frame or in a cold greenhouse, but, as has already been indicated, they must not be exposed to heavy showers of rain.
Diagram 19.—CUPID SWEET PEAS.

Fig. 1. For pot work in the greenhouse sow four or five seeds in a five-inch pot. Fig. 2. The pots on the greenhouse shelf or, Fig. 3, in the cold frame. Fig. 4. The result.
CHAPTER XXIV

THE DAHLIA

THE dahlia will always make a successful appeal to the affections of the amateur gardener, first because of the comparative simplicity of its culture, but chiefly because, at a period of the year when the summer denizens of the flower garden are beginning to bear traces of wear and tear, and are preparing either for their winter rest or their demise, the dahlia is just coming into bloom. If the weather be at all propitious, there is a certainty that it will produce a wealth of gorgeous flowers over a period of many weeks, and that it will help to make the early autumn garden gay until the first severe frost pronounces its doom.

For the purposes of classification the dahlia family may be divided into six sections. These are: (1) cactus, (2) show and decorative, (3) paeony-flowered, (4) pompon, (5) single, (6) Tom Thumb. A moderate-sized volume could be filled in enumerating the thousands of varieties that are included in growers’ catalogues, but for the guidance of the amateur gardener it will be sufficient to indicate in the following tables a few of the newest varieties worthy of his attention, as well as those that are suitable for exhibition, if he entertains ambitions in that direction.

CACTUS

<table>
<thead>
<tr>
<th>Name</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austin Cannell</td>
<td>Mauve touched with crimson at the base of the petals</td>
</tr>
<tr>
<td>Britannia</td>
<td>Salmon pink flushed with apricot</td>
</tr>
<tr>
<td>Crimson King</td>
<td>Crimson, scarlet tips</td>
</tr>
<tr>
<td>General French</td>
<td>Bright terra-cotta</td>
</tr>
<tr>
<td>Keyne’s White</td>
<td>White</td>
</tr>
<tr>
<td>Gladiator</td>
<td>Yellow and pink</td>
</tr>
</tbody>
</table>
THE DAHLIA

CACTUS—Continued

<table>
<thead>
<tr>
<th>Name</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Dreadnought</td>
<td>Crimson deepening to maroon</td>
</tr>
<tr>
<td>*Florence M. Stredwick</td>
<td>Pure white</td>
</tr>
<tr>
<td>*H. Shoesmith</td>
<td>Rich crimson, narrow petals</td>
</tr>
<tr>
<td>Iris</td>
<td>Rose pink</td>
</tr>
<tr>
<td>Mauve Queen</td>
<td>Two shades of mauve</td>
</tr>
<tr>
<td>*Mrs Carter Page</td>
<td>Maroon tinged with yellow</td>
</tr>
<tr>
<td>Hilda Shoebridge</td>
<td>Salmon</td>
</tr>
<tr>
<td>*George Gordon</td>
<td>Yellow and orange</td>
</tr>
<tr>
<td>Primrose</td>
<td>Yellow shading to cream</td>
</tr>
<tr>
<td>Ruby</td>
<td>Ruby-red tipped with carmine</td>
</tr>
<tr>
<td>Starfish</td>
<td>Orange-scarlet</td>
</tr>
<tr>
<td>*Ruby Grinsted</td>
<td>Yellow tipped with fawn</td>
</tr>
<tr>
<td>Mary Service</td>
<td>Heliotrope, yellow at the base of the petals</td>
</tr>
<tr>
<td>Mrs B. Barker</td>
<td>Purple, lighter shade at the tips</td>
</tr>
</tbody>
</table>

* Suitable for exhibition.

SHOW AND DECORATIVE

<table>
<thead>
<tr>
<th>Name</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>George Hobbs</td>
<td>Magnificent orange</td>
</tr>
<tr>
<td>Henry Walton</td>
<td>Yellow, edged scarlet</td>
</tr>
<tr>
<td>John Walker</td>
<td>White</td>
</tr>
<tr>
<td>Warrior</td>
<td>Scarlet</td>
</tr>
<tr>
<td>David Johnson</td>
<td>Salmon shaded to rose</td>
</tr>
<tr>
<td>Claret cup</td>
<td>Purple-crimson</td>
</tr>
<tr>
<td>Cherub</td>
<td>Deep amber</td>
</tr>
<tr>
<td>Florence Tranter</td>
<td>White, blush shaded, edged with red-purple</td>
</tr>
<tr>
<td>Sea Shell</td>
<td>Pale pink, camellia-shaped</td>
</tr>
<tr>
<td>Yellow Colosse</td>
<td>Extra large, clear yellow</td>
</tr>
<tr>
<td>Baron Shroeder</td>
<td>Purple</td>
</tr>
<tr>
<td>Rayon d'Or</td>
<td>Bright orange</td>
</tr>
<tr>
<td>Spotless Queen</td>
<td>White</td>
</tr>
</tbody>
</table>

PÆONY-FLOWERED

<table>
<thead>
<tr>
<th>Name</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pius X.</td>
<td>Bright yellow</td>
</tr>
<tr>
<td>Bertha von Suttner</td>
<td>Salmon and yellow</td>
</tr>
<tr>
<td>Corallina</td>
<td>Deep coral rose</td>
</tr>
<tr>
<td>Andrew Carnegie</td>
<td>Salmon pink, bronze shading</td>
</tr>
<tr>
<td>Duke Henry</td>
<td>Crimson, shaded carmine</td>
</tr>
<tr>
<td>Geisha</td>
<td>Yellow suffused with scarlet, yellow centre</td>
</tr>
<tr>
<td>H. Hornsveld</td>
<td>Soft yellow flushed with salmon</td>
</tr>
<tr>
<td>High Sheriff</td>
<td>Terra-cotta, shaded rose</td>
</tr>
<tr>
<td>Kaiserin A. Victoria</td>
<td>Yellow shading to white</td>
</tr>
</tbody>
</table>
### SATURDAY IN MY GARDEN

**PAEONY-FLOWERED—Continued**

<table>
<thead>
<tr>
<th>Name</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queen Wilhelmina</td>
<td>Pure white</td>
</tr>
<tr>
<td>South Pole</td>
<td>Pure white</td>
</tr>
<tr>
<td>Sunrise</td>
<td>Blending of pink, yellow and carmine diffi-</td>
</tr>
<tr>
<td></td>
<td>cult to describe</td>
</tr>
</tbody>
</table>

**POMPON**

<table>
<thead>
<tr>
<th>Name</th>
<th>Colour</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adelaide</td>
<td>Blush edged with lavender</td>
<td>3 ft.</td>
</tr>
<tr>
<td>Annie Holton</td>
<td>Rich crimson tipped with silver</td>
<td>3 ft.</td>
</tr>
<tr>
<td>Crusoe</td>
<td>White, edged bright rosy pink</td>
<td>4 ft.</td>
</tr>
<tr>
<td>Daisy</td>
<td>Amber and salmon</td>
<td>3 ft.</td>
</tr>
<tr>
<td>Edith Bryant</td>
<td>Creamy yellow edged with crimson</td>
<td>3 ft.</td>
</tr>
<tr>
<td>Florence</td>
<td>Lilac</td>
<td>3½ ft.</td>
</tr>
<tr>
<td>Galatea</td>
<td>Bright crimson shaded purple</td>
<td>3 ft.</td>
</tr>
<tr>
<td>Ideal</td>
<td>Pure yellow</td>
<td>3 ft.</td>
</tr>
<tr>
<td>Jessica</td>
<td>Yellow or amber edged with red</td>
<td>3½ ft.</td>
</tr>
<tr>
<td>Mary</td>
<td>Primrose</td>
<td>3 ft.</td>
</tr>
<tr>
<td>Mephisto</td>
<td>Crimson maroon</td>
<td>3 ft.</td>
</tr>
<tr>
<td>Midget</td>
<td>Terra-cotta red</td>
<td>3 ft.</td>
</tr>
<tr>
<td>Virginia</td>
<td>Pure white</td>
<td>3 ft.</td>
</tr>
<tr>
<td>Whisper</td>
<td>Yellow edged bronze</td>
<td>2½ ft.</td>
</tr>
</tbody>
</table>

**SINGLE**

<table>
<thead>
<tr>
<th>Name</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alice Castle</td>
<td>Rich coppery-orange shading to rose</td>
</tr>
<tr>
<td>Aurora</td>
<td>Yellow suffused with orange</td>
</tr>
<tr>
<td>Queen Mary</td>
<td>White with yellow ring</td>
</tr>
<tr>
<td>Ivanhoe</td>
<td>Rose with carmine ring</td>
</tr>
<tr>
<td>Meg Merrilees</td>
<td>Clear yellow</td>
</tr>
<tr>
<td>Tressilian</td>
<td>Orange-red</td>
</tr>
<tr>
<td>Pirate</td>
<td>Deep crimson and purple</td>
</tr>
<tr>
<td>Sir Walter</td>
<td>Rose with orange in centre</td>
</tr>
<tr>
<td>Jeanie Deans</td>
<td>Orange-scarlet</td>
</tr>
<tr>
<td>Craigie</td>
<td>Crushed strawberry</td>
</tr>
<tr>
<td>Snowdrop</td>
<td>Pure white</td>
</tr>
<tr>
<td>Betty</td>
<td>Rosy lilac</td>
</tr>
<tr>
<td>Brilliant</td>
<td>Crimson scarlet</td>
</tr>
<tr>
<td>Owen Thomas</td>
<td>Crimson-scarlet tipped with yellow</td>
</tr>
<tr>
<td>Victoria</td>
<td>White with side margins of crimson</td>
</tr>
<tr>
<td>William Parrot</td>
<td>Orange-scarlet</td>
</tr>
<tr>
<td>Winona</td>
<td>Deep maroon</td>
</tr>
<tr>
<td>Yellow Satin</td>
<td>Yellow</td>
</tr>
</tbody>
</table>
There are three principal methods of propagating the dahlia, as follows:—

(1) By seed sowing.
(2) By cuttings.
(3) By division.

If the gardener has artificial heat at his command in February and March, the raising of a small batch of dahlia seedlings is a fairly easy matter. Seed of the various classes of dahlias—either decorative, cactus, pompon or single—can be obtained cheaply, and if it be sown in sandy soil in pots or boxes placed in genial warmth it will germinate with astonishing rapidity.

As soon as the seedlings are an inch or so high and have formed a pair of leaves, they should be pricked off singly into a thumb pot which has previously been filled with soil composed of loam, leaf mould and sand. The pots should be placed in an airy position on the greenhouse shelf, and be kept moderately moist. When the roots have permeated the soil and are touching the sides of the pots, the young plants must be potted on into five-inch pots and be inserted in soil that has been enriched by the incorporation of some old and well-decayed manure. Towards the middle of April, when the atmospheric conditions ought to be becoming more genial, the plants can be placed in a cold frame, and gradually hardened off preparatory to planting out during the opening days of June.
A commoner method of propagation is that illustrated in Diagram 20. This depicts the proper way to take cuttings. When the old stools are taken from their winter quarters they will probably present a shrivelled-up appearance, as though all the life had been dried out of them. Their owner must not, however, be deceived by this. If he places them in a box, or on the greenhouse bench above the hot-water pipes, scatters some fine soil loosely round them, and sprinkles them at intervals with water through a fine-rose can, the roots will speedily be restored to their wonted condition of plumpness. In a few days strong young shoots will be sent up from the crown of the tubers, and it is these which, with proper treatment, will produce vigorous flowering plants during the autumn. The cuttings should be detached from the tuber when they are about three inches long, and be prepared as shown in Figure 2. The stem must be cut through horizontally immediately beneath a joint, from which in time the new roots will be thrown out. Thus properly trimmed, the cutting should be inserted in a thumb pot filled with sandy soil.

For a day or two after the cuttings have been potted they will probably present a very sorry appearance. They will be limp, and will hang helplessly over the side of the pot. But this is only a temporary relapse. If the warmth of the house or hot-bed frame be well maintained for a time, the cuttings will soon recover their erect and sprightly appearance, and will rapidly establish themselves. Potting on will be necessary, as in the case of seedlings, so soon as the small pots are filled with roots, and their transference to a cold frame to harden off should follow a month or so later. The principal point to bear in mind is the need for avoiding forcing methods. These will result in leggy growth, a debilitated constitution, and poor flowers, whereas the aim should be to produce sturdy plants by giving them all the fresh air that is possible during the earlier stages of their growth.

But it may be asked: “How can dahlias be propagated without the aid of glass or artificial heat?” The answer is, “By division of the old tubers.” If this plan be adopted, however, it should not be put into operation until towards the end of April.
Diagram 20.—DAHLIA PROPAGATION.

Fig. 1. Last year's root removed from its winter quarters. Fig. 2. Cutting removed from parent and trimmed. Fig. 3. The rooted cutting progressing in the thumb pot. Fig. 4. Another way of propagating. Fig. 5. If too large for the pot cut as indicated.
The old tubers can then be divided, as shown in Figures 4 and 5 of Diagram 20, and the piece of root potted up, and grown on in the window of a room facing south.

It has long been a common practice to divide the old stools, and plant them direct in the open ground late in the spring. The division must be done carefully. It is a mistake to suppose that each tuber if detached from the stem will produce a new plant. All the eyes from which growth can start are clustered at the crown of the old stem. To the practised eye they are plainly visible, but if there is any doubt about it, it is a good plan to make a vertical cut through the stem and divide the tubers in two or more sections. The resulting divisions may then be planted in well-manured and deeply-dug ground, with the crown of the tubers four inches below the surface. This fairly deep planting will ensure that no precocious growth is made until all danger of late frosts is over. Probably the divided dahlia will throw up many shoots at the outset. In that case the weakest of them should be thinned out, otherwise the flowers will be few in number and poor in quality.

About the middle of May—it will all depend upon the state of the weather—young dahlias that have been struck from cuttings or raised from seed will require to be placed in a cold frame. Here they should be hardened off by keeping the lights raised at every available opportunity until they are ready for planting out in the first or second week in June.

The dahlia requires plenty of room, and therefore, while not discarding it altogether for the purposes of the mixed border, I find that it pays to devote a bed of considerable size exclusively to its cultivation. The soil is well prepared beforehand. Very soon after the last clump of tubers has been lifted in the autumn the ground is deeply dug, and the surface left rough during the winter, so that the atmosphere may do its part in fertilising and sweetening the soil. In March the ground is again dug over and broken up, and at the same time a good quantity of rich stable manure is incorporated with the soil. A week or so before planting-out time circular holes two feet in diameter and eighteen
Fig. 1. Cut down foliage, dig round roots with a spade, and lift. Fig. 2. The root. Fig. 3. Place tubers on a mat to dry. Fig. 4. Clean roots and store in sand in deep boxes; label tubers carefully. Fig. 5. The common but slovenly practice of heaping up the tubers under a greenhouse staging, where they may damp off, should be avoided.
inches deep are dug out, a few forkfuls of manure are placed in the bottom of the hole, and covered with fine soil.

When the time comes for planting, a smaller hole, but one of sufficient size to take the base of roots comfortably, should be made with a trowel, and the dahlia carefully removed from the pot so as not to injure the roots. The plant, with the ball of earth attached, should then be inserted in the ground, adequate care being taken that the base of the roots rests firmly on the bottom of the hole prepared for it. Next the soil should be pressed round the roots, and a nice even surface be made.

Staking is an important operation, and this should be done at the same time as the planting. Use good stout stakes. The dahlia is a heavy plant, and needs to be safeguarded adequately against the buffeting of high winds. Thrust the stake a foot or so into the ground, as near as possible to the roots of the plant without damaging them, and then securely tie the main stem to the stake with bass or raffia tape.

If the best results are to be obtained dahlias will require a little careful attention throughout the summer. Towards the end of July the plants will be growing rapidly, and this is the time to thin out the shoots. If large, handsome flowers are desired, and especially if the grower has any intention of exhibiting, it will be sufficient to confine the plant to one main stem. Nearly all the side shoots should be removed. Moreover, as soon as the early flower buds appear they should be rigorously thinned, and at this stage liquid manure may be given to the plants at each alternate watering. A further aid in increasing the productivity of flowers may be found in liberal mulchings of short, decomposed manure.

It will be necessary also to keep a sharp look-out for the earwig—one of the most persistent enemies of the dahlia. The commonest and not the least effectual method of trapping them is to fill small flower-pots with hay, and place them, inverted, on the top of the stakes to which the plants are tied. The pots should be examined every morning and the earwigs shaken out on the garden path and destroyed.

With the arrival of the first sharp frost in autumn the glory of
the dahlia will depart. You will wake up one fine crisp morning in late October, to find your dahlia flowers hanging limp, and the stems a seared and blackened mass. Then the question arises, What shall be done with the tubers that have been formed at the base of the plants? The grower is naturally anxious to save them for purposes of propagation in the following spring, and if he have had no previous experience in the cultivation of dahlias he very naturally desires to know whether it is safe to leave them in the ground throughout the winter months. As a general rule for most parts of the country I should strongly advise against running the risk of disaster, which the leaving of the tubers in the ground involves. The dahlia is not a hardy plant, though it is a perennial. The newly-formed tubers at the base of the plant are succulent and sappy, and if they be left undisturbed in the ground a prolonged spell of frost will ruin them. They will become blackened masses, and will rot away. In warm and unexposed places it may be possible to preserve dahlia roots in the ground during a mild winter by covering their resting-place with a good thick layer of littery manure or ashes; but if it is desired to maintain the stock the risk is too great to be run even when these precautions are adopted.

What, then, is the best plan to follow? Diagram 21 will help the beginner to solve his difficulties. As soon as the first severe frost has blackened the stems they should be cut down to within six inches of their bases. Next with a spade cut niches six or eight inches deep round the extremity of the tubers. This will facilitate the process of lifting, which should be done with the utmost care, so as to avoid either cutting or bruising the tubers.

As each plant is lifted tie to one of the stem stumps a stout label bearing a legible record of the name and colour of the variety. It is essential that this be done, otherwise there will be endless confusion when the time comes in the next year to begin the operation of propagation.

When all the plants have been lifted and labelled carefully spread them out on a mat or a piece of sacking on the floor of a dry, frost-proof shed or greenhouse. Here they should be allowed
to remain for a few weeks until they are thoroughly dry. Afterwards they may be further cleaned by the removal of any superfluous soil that still remains attached to the roots, and they should then be placed in deep boxes as shown in Figure 4, and covered lightly with sand or dry moss.

The chief essential now is to keep the tubers away from all possibility of damp and frost reaching them. Therefore the practice depicted in Figure 5, should be avoided at all costs. This is to place the tubers under a greenhouse bench, where they will inevitably be "damped off" if the drip due to watering plants above them be allowed to fall continually upon them. If there be no greenhouse accommodation for the storage of the tubers they may be placed with perfect safety in a dry cellar or loft. Here they should be allowed to remain until February, when the time for propagation by means of cuttings will have arrived.
CHAPTER XXV

THE CHRYSANTHEMUM

The chrysanthemum has been very properly designated the queen of autumn flowers. Thanks to the untiring and assiduous efforts of the great growers and hybridisers it has been brought to a pitch of perfection undreamt of a generation ago. So multifarious are the varieties now at the disposal of the amateur gardener that it is possible to have it in bloom in the outdoor garden from August to November, and thence by the aid of glass to maintain the late flowering kinds in the height of their gorgeous beauty until February.

I have suggested that the chrysanthemum takes many forms, and it may be desirable for the guidance of the beginner to set out concisely the distinguishing features of the various types. They are:

**The Japanese.**—This variety predominates in the show and exhibition classes. The flowers are of great size, many are quaint and curious in shape, and they are notable for their rich colouring. The petals are broad and flat, but they turn and twist in all directions—so much so, indeed, that it is difficult at times to distinguish them from the true incurved variety.

**The Incurved.**—The flowers are more formal in their outline and build than the Japanese. The petals turn inwards and form a cone-shaped flower.

**The Reflexed.**—In contradistinction to those of the incurved class, the petals turn outwards from the centre. This variety is not now so popular as it once was, but it still produces many splendid flowers.

**The Anemone-flowered.**—These have a cushion-like disc.
of quilled petals in the centre, and a fringe of long tasselled florets. They form a very pretty section for decorative purposes.

**THE POMPON.**—Here the flowers are small and globular in shape. There are both single and double varieties, and they are among the earliest chrysanthemums to bloom. The pompons make a dainty section which should be represented in every amateur's collection.

**THE SINGLE.**—Generally early flowering, and suitable for placing in the border. They possess one or two circles of broad petals and carry a hard button or eye in the centre.

The whole art of successful chrysanthemum culture consists in affording the plants a long season of growth. For eleven of the twelve months of the year the Autumn Queen demands the assiduous attention of the cultivator. No sooner do one season's flowers go out of bloom than he begins to busy himself in making preparations for the propagation of the plants which a year hence are to fill his greenhouse or conservatory with a gorgeous array of massive flowers of brilliant colour.

The month of December is the real beginning of the chrysanthemum grower's year, and it is then that he sets about the task of propagation. This applies solely to those growers who are able to afford both their old plants and their young cuttings some protection, either in a greenhouse or in a frost-proof frame, from the rigours of severe weather. The propagation of outdoor chrysanthemums may be deferred until spring is at hand.

What then should be the procedure to be followed in order to ensure a good supply of cuttings? The process is simplicity itself. So soon as the last blooms have been removed from the old plants the stems should be cut down to within four inches of the base. The pots may then be placed either in a slightly heated frame or in the coolest quarter of the glasshouse. Here, if they be given a moderate supply of moisture, they will speedily begin to throw up sturdy young shoots from the base of the plant. These are the
shoots from which cuttings are to be taken, and it will be essential to keep them from becoming thin, drawn and weakly. This is the reason for removing them from the influence of excessive heat.

The process of shoot formation may be slow or rapid, according to the nature of each particular variety; but, if it be slow, there is no necessity for impatience. In due time the shoots will begin to thrust themselves through the surface of the soil, without resort to forcing. If the old stool be examined at this period it will probably be found that while much of the new growth comes from the base of the plant other shoots thrust themselves out from the old stem. These in many cases bear flower-buds at the extremity, and for all practical purposes they may be regarded as utterly useless. They can be "struck," but they will never produce satisfactory flowers. Therefore in taking cuttings the cultivator must devote his attention to encouraging the production of basal shoots which thrust themselves through the soil at some distance from the old stem, as shown in Figure 1 of Diagram 22. If the old pots can be kept in a temperature of not less than 40° to 45° they will soon provide plenty of cuttings, and this process will be assisted if the surface soil in the pots be kept free from weeds and if some light sandy soil be spread over it.

How is it possible, it may be asked, to tell a good from a bad cutting? Figures 2 and 3 in the diagram may help the reader in his quest. Figure 2 represents an unsatisfactory cutting. It was taken from the stem of an old plant, and though it seems from all outward appearance to bear promise of future satisfactory growth, the promise is illusory. For even though no flower-bud appear at the apex of the shoot, it is probably there in embryo, and will very soon make its presence apparent. This is the kind of shoot to be discarded without remorse. The genuine cutting is that shown in Figure 3. It was taken from a shoot that emerged through the soil at some distance from the stem. In taking a cutting of this kind it is a good plan carefully to remove the surface soil to a depth of a few inches and to detach the cutting beneath the soil. This can easily be done if a sharp knife be used.

The next process is to trim the cutting by the removal of three
or four of the leaves towards its base. This should not be done by pulling the leaves from the stem with the thumb and finger and employing such force that part of the fleshy portion of the stem is torn away. The safer plan is to cut off the lower leaves as near the stem as possible, either with a pair of sharp scissors or with a knife. The ideal cutting should be three inches in length, and it may be reduced to this size by cutting horizontally (not slantwise) immediately beneath a joint formed by the union of the leaf stalks to the stem of the cutting.

The preparation of the soil for the reception of the cuttings is an important item at this stage of the proceedings. The most satisfactory compost will be obtained if fibrous loam and thoroughly decomposed leaf mould be well mixed together in equal proportions. To this it will be necessary to add a good quantity of coarse silver sand. When this has been incorporated the whole compost should be passed through a half-inch sieve. The soil ought to be nicely moist—but not so wet as to be sticky and difficult to manipulate.

Next it must be decided where the cuttings are to be "struck," whether in pots or boxes. In the case of the choicer Japanese varieties I have no hesitation in recommending the use of small pots. The chrysanthemum, above all things, requires uninterrupted growth, and there is danger if the cuttings are struck in boxes that when the time comes for "potting on" the roots may be damaged, and growth be thereby checked. "Thumb" pots are quite large enough to receive the cuttings in the earliest stage of their development. They should be thoroughly washed before being brought into use, and in the case of new pots it is advisable to soak them for a few hours before use, otherwise they will withdraw a good deal of the moisture from the soil, and probably leave the stem of the cutting dry. This would considerably retard the process of root formation.

For drainage purposes one broken crock should be placed in the bottom of the pot. Over this it will be well to put in a small quantity of rougher soil from the sittings. Fill the pot nearly to the brim with the prepared compost, and make fairly firm.
Diagram 22.—CHRYSANTHEMUM CUTTINGS.

Fig. 1. Old plant cut down and throwing up young growths suitable for cuttings. Fig. 2. A poor cutting. Fig. 3. A good cutting. Fig. 4. Cutting inserted in a thumb pot. Fig. 5. Cuttings may be planted—a number in a large pot or in boxes (see Fig. 6).
Next dust a small quantity of fine silver sand over the surface, and make a hole exactly in the centre to a depth of two inches or so. This can be done with a sharpened piece of wood about the thickness of a black lead pencil. As the hole is made a little shower of sand will descend to the base of the hole. This will be found beneficial to the cutting in keeping its base free from stagnant moisture, thus preventing the disastrous process known as "damping off." The cutting can now be inserted so as to cover the second joint. The soil should be pressed firmly round the base of the cutting, and a final sharp rap on the potting bench will complete the operation of settling the cutting securely in the soil. Each cutting must be named, and it is also a good plan to inscribe the date on the label for future reference and guidance. The cuttings should be carefully watered in with a fine-rosed can.

When the batch has been completed, if they are to be kept in a greenhouse or frame it is an excellent plan to place the small pots in a deep box which has been filled either with ashes or clean cocoa-nut fibre refuse. The pots should be plunged to their rims in the fibre. This will help to keep them both warm and moist. A thick sheet of glass can then be placed over the box, and for a few days, until the process of root formation begins, the cuttings may be kept air-tight. So soon, however, as they begin to stand upright and present a bright green appearance at the extremities, air must be supplied in moderate or generous quantities according to the state of the weather. The glass should either be wiped or turned at least once a day, so that the condensed moisture may be removed and a sturdy growth be encouraged.

In a month or six weeks the young cuttings will be well rooted, and they may then be allowed free access of air by removing them to a shelf in the greenhouse, taking care, however, to keep them near enough to the glass to prevent them from becoming drawn and spindly. Here they will rapidly become established, and will need little attention, save for an occasional watering, until the time arrives for the first repotting.

By the middle of March chrysanthemum cuttings which were taken in December or January should have received their second
potting and be pinched back for the first time. These operations should, however, never be performed simultaneously. It is better to pinch off the top of the main shoot first, and this ought to be done when the soil in the pot is fairly dry. The object of pinching is to induce the young plant to throw out two new shoots from the apex of the stem.

Soon after the new shoots have made their appearance the plants may be transferred to five-inch or six-inch pots. The compost or mixture of soils should be made up of fine loam, coarse sand, sweet leaf mould and a sprinkling of soot and fine bone meal. The incorporation of some old lime or mortar rubbish will be found beneficial in keeping the soil sweet and also in providing food for the plants.

A point to bear in mind is that the chrysanthemum must not be "overpotted"—that is, must not be transferred to too large a pot. The stronger and sturdier plants can be placed in six-inch pots, and weaker in five-inch. Special attention must be paid to drainage. The crocks should be placed carefully in the bottom of the pot, and over this some of the larger pieces of mortar rubbish. Upon this basis place a layer of fibrous loam and ram it down fairly hard—but not so hard as to interfere with the proper drainage of the pot. Next turn the young chrysanthemum out of its pot, and place it exactly in the centre of the larger pot, so that the top of the old ball of soil is at least three-quarters of an inch below the rim of its new receptacle. Fill in all round the plant with the new soil, and ram it down firmly with the potting stick, taking care during this operation not to damage the roots.

The plants should be returned to their old places in a cold frame for a brief period, allowing plenty of air on all suitable days. When growth has been thoroughly re-established, the pots can be brought into the open. They should be placed in a sunny position if possible, in rows running from north to south, and the pots should rest either on a bed of ashes or upon pieces of wood placed in parallel rows. The latter is perhaps the more satisfactory method, since by keeping the pots well raised above the ground
worms are unable to enter the pots, and a free circulation of air all round and underneath the plant is possible.

Towards the end of June the plants will need to be finally repotted. This is a task that cannot be accomplished all at once, for the simple reason that all the plants are not ready for the operation. Chrysanthemums in all their stages prior to and at the final potting should be "shifted on," as the professional gardener says, just when they are ready—no sooner and no later. The discovery of this psychological moment requires that the grower shall pay careful attention to the progress of his plants. He will make frequent examinations of the roots by turning the ball of earth out of the pot, and if he finds that the soil is full of roots and that more earth space is required, he will see that it is promptly provided.

By this time the plants will be in five-inch or six-inch pots, and the stems from a foot to eighteen inches high. In the case of strong, vigorous growers, pots nine inches in diameter across the top will be used for the final "shift." For the weaker varieties seven-inch or eight-inch pots will be large enough.

The preparation of the soil requires careful consideration. A good average compost can be made up of loam in which there is a fair admixture of matted root fibre, and one part each of leaf mould, wood ashes, old lime rubbish, or broken oyster shells, and charcoal or coarse sand. A five-inch potful of bone meal should be added to each bushel of the compost.

Be sure that the pots are thoroughly clean, and that they are well crocked for drainage. Place a shallow layer of the fibrous loam over the crocks, and fill to the necessary height with the prepared soil. Knock the plant out of the old pot, and shake off as much of the old soil as it is possible to remove without injuring the roots. Then place the ball in the centre of the new pot, and fill in layer after layer of soil, making each fairly firm. A potting stick should be used for the final layers, so that the soil can be rammed in tightly, for firm potting in the case of chrysanthemums means a healthy, sturdy growth, well-ripened wood, and the consequent production of satisfactory blooms.
CHRYSANTHEMUMS.
The plants placed out on boards, after the second potting.

TOMATOES.
The picture shows how to grow tomatoes in boxes in a greenhouse. Three or, at most, four plants are grown in each box.
A strong bamboo stake should be supplied to each plant, which should be securely tied. As the potting is completed the plants should be placed out of doors on slates or planks of wood in such a position that they can obtain all the sunshine available, so that the wood may be thoroughly ripened. Give the plants plenty of room—eighteen inches apart will not be too much—and take care to ensure that they are secure against high winds which may blow the top-heavy plants over and cause irretrievable damage. Where a large number of chrysanthemums are grown it is a good plan to insert a stout wooden stake at the extremity of each row and to fix to them two strands of galvanised wire, one at the top of the stake and the other three feet down. The canes already fixed in the pots can then be tied to the wires and the plants will be safe from harm.

The subsequent treatment of the plants will depend largely on the purpose for which the flowers are intended. If it be desired merely to secure a brilliant display in the greenhouse, the process depicted in Diagram 23 may be followed with an assured prospect of success. This consists in pinching out the top of the stem when the young plant is six or eight inches high. Lateral shoots will speedily develop below from the axils of the leaves. These shoots when they attain a length of six or eight inches should be pinched out, and each succeeding six or eight inches of growth be in turn similarly treated. This repeated "pinching out," as it is called, will induce a bushy habit of growth and will ensure the production of a large number of blossoms on each plant.

If the intention be to secure enormous flowers that are intended for exhibition the process will be entirely different. After the first pinching the plant should produce three new shoots, as indicated in Figure 4 of Diagram 23. During May, if the cuttings were "taken" in December, the growth of the stem will be arrested by the formation of a flower-bud at the top. This bud must be pinched out, so that new lateral shoots may be allowed to develop. The three best lateral shoots should now be selected and all the rest removed. After a few weeks these shoots will form
a new set of flower-buds, known as "second crown" buds. These "second crowns" will be in evidence as a rule by the first week in August, and it is these that have to be "taken"—or, to use a more satisfactory mode of expression—be retained. The "second crown" buds produce the largest and best flowers, and the grower therefore directs all his efforts towards throwing all the energies of the plant into the satisfactory development of the buds. This is assisted by the constant removal of all subsidiary growths—that is to say, all lateral or side shoots which will be formed in great numbers in the axils of the leaves.

The watering and feeding of chrysanthemums is an important operation, which if it be carelessly or inefficiently performed will spell disaster. At no time must the soil in the pots be permitted to become thoroughly dry. In very hot weather it may be necessary to give water as often as three times a day. Frequent syringings with weak but clear soot water, to which a little paraffin has been added (one tablespoonful to the gallon will be sufficient), will keep the greenfly or aphis in check. The reappearance of the sun after a period of dull cool weather may cause the plants to flag somewhat. The grower may then be tempted to induce their revival by excessive watering, and this is a practice that he should seek to avoid, since it may be fraught with danger. A sharp rap on the side of the pots will speedily inform him of the condition of the soil. If the sound be hollow the soil needs moisture, but if it be dull and heavy, it does not. All that is immediately required to revive the flagging foliage is a gentle spraying with clear rain-water. When the plants really require water give it generously, so that the soil shall be thoroughly soaked, and then withhold it until, by rapping the sides of the pots, it has been ascertained that they need a further supply of moisture.

As soon as the pots are full of roots—probably by the end of July—the plants will begin to appreciate a regular supply of manure water. Start with weak soot water, applied twice a week. Increase the doses to thrice a week a little later on, and as soon as the buds begin to form substitute weak solutions of animal manures. These may be given twice a week at the outset, but
Diagram 23. - THE YOUNG CHrysanthemum.

Fig. 1. A well-rooted cutting. Fig. 2. Repotted into five-inch pot and pinched back. Long growths should be shortened, as at A. Fig. 3. Throwing out new growths at the apex. Fig 4. The plant should be repotted in June into a larger pot, and will progress as shown.
as the buds develop they can be applied with safety almost every day. The feeding should continue until the blooms are two-thirds expanded, after which it is advisable gradually to cease their application. An occasional watering with clear water, alternating with the liquid manure, is advisable so that the air passage in the soil may be kept clear.

As soon as the flower-buds begin to colour, the cultivator must begin to bestir himself so that his plants can be safely housed under glass. It is better to be too early than too late with this operation, and therefore it behoves him to get his house in order so that it may be prepared to receive its autumn guests.

The middle of September will not be too early to place the earliest varieties under the protection of glass, since if buds that have developed sufficiently to show their petals be left to the mercy of rain and dew they are more than likely to damp and fall off. When housing the plants see that they are free from mildew and insect pests. Give them a thorough syringing with mildew wash—an excellent preparation is a wineglassful of paraffin mixed with a gallon of rain water—and remove all traces of rust by dusting the leaves with flowers of sulphur or spraying with a solution of half-an-ounce of sulphide of potassium in a gallon of water.

Great care will now be needed to bring the flowers to perfection. At the first indication of frost, fire heat will be required so as to maintain a free circulation of warm, dry air. No attempt at forcing should be made. A minimum temperature of 50° will be amply sufficient.

Watering and feeding with artificial manure must be attended to carefully, and a considerable amount of discretion be called into play. Watering will not be necessary every day: it will only be required when the soil approaches a state of dryness. It should then be supplied in generous quantities, and an interval of a few days be allowed to go by before it is given again. Great care will have to be taken to avoid spilling the water about on the floor of the house, especially late in the day, since this leads to "damping," and inevitable injury is thus done to the plants. Another pre-
ventive of "damping" is to move the plants about from time to time, so that they do not remain for long in one position.

When fog prevails a gentle heat should be maintained, and the ventilators be kept closed.

Thanks to the many kinds of early flowering hardy chrysanthemums that are now at the disposal of the amateur gardener, he is able to secure blooms of the most popular of autumn flowers from August onwards. They may be planted in the open border in April or May, and, with very little further attention save such as is necessary in regard to staking and tying, they will thrive luxuriantly and produce flowers for cutting in abundance. The early flowering section is now so comprehensive that it includes not merely the Singles, but also many representatives of the Japanese, the Pompon and the Anemone-flowered classes.

The chief cultural necessity is richly manured ground, for, as will already have been gathered, the chrysanthemum is a gross feeder. The question whether the buds of early flowering varieties should be thinned out is one the solution of which may be left to individual taste. If the grower desires to secure one or two good-sized blooms on each stem let him thin out all superfluous buds; but it is the natural habit of the plant to carry a mass of comparatively small blooms, and, for my part, I think the general decorative effect of a fine head of small flowers is better than an isolated bloom here and there. Therefore I disbud sparingly, and in many cases not at all.

In the event of dry weather during August it may be well to supply a mulch of littery manure to the base of the plants to conserve the moisture at the roots.

The outdoor chrysanthemum may be propagated either by the division of the roots in April or by means of cuttings. The latter can be "taken" in March and inserted in sandy soil in boxes, which will require to be kept in a warm greenhouse until the cuttings have rooted. When this has occurred the young plants can be placed in small pots, be hardened off in a cold frame, and be transferred to the open border in May or June.

After the plants have finished flowering in the autumn it is
desirable, in order that the roots may not be damaged by severe frost, to cut the stems down to the ground and to place a covering of ashes or littery manure over the old stool. This can be removed in early spring and the production of suitable cuttings will speedily follow.

The number and variety of first-class chrysanthemums are now so enormous that it is impossible within the limits of space to give a selection of even the best of them here. The reader may, however, be confidently recommended to study the catalogues of one or two of the famous growers, and by their aid to make his own choice. He will find the task both profitable and delectable.
CHAPTER XXVI

THE CARNATION AND THE PINK

The great family to which the carnation, the picotee and the pink belong is very appropriately designated dianthus (Greek, dios, divine, and anthos, a flower), hence the Divine Flower. This is not the place, nor indeed is there room to enter upon a historical survey of the dianthus in its multitudinous varieties. My purpose in this chapter is simply to set down a few cultural hints regarding two of its most familiar forms—namely, the border carnation and the pink.

The ever-increasing popularity of the border carnation is easily accounted for. Apart altogether from its graceful beauty—and in many but not all varieties, its scent—it is of an accommodating habit, and is an especially valuable adjunct to the town and city garden, since it will be found to luxuriate abundantly, in spite of grime, smoke and soot, in places where it would be utterly impossible to induce the rose to attain to perfection. Moreover the carnation does not require too rich a soil. In its wild form (dianthus caryophyllus) it is to be found flourishing on the walls of ruins—and this fact provides a hint for the gardener of which he has not been slow to take advantage. It has taught him the value of old mortar and lime as desirable ingredients for inclusion in the soil in which he intends to grow his carnations.

The beginner in carnation growing will probably secure his first small collection of young plants from the florist. He will be wise at first to confine his attention to those varieties that are of proved stamina and may therefore be confidently recommended for outdoor border cultivation. Here is a list from which he may choose:

0 209
SATURDAY IN MY GARDEN

<table>
<thead>
<tr>
<th>Name</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arthur Clifford</td>
<td>Rose</td>
</tr>
<tr>
<td>Bonnie Dundee</td>
<td>Scarlet</td>
</tr>
<tr>
<td>Sir Galahad</td>
<td>White</td>
</tr>
<tr>
<td>Raby Castle</td>
<td>Bright pink</td>
</tr>
<tr>
<td>Uriah Pike</td>
<td>Rich crimson</td>
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<tr>
<td>Contor</td>
<td>Purple</td>
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<tr>
<td>Duchess of Wellington</td>
<td>Lavender</td>
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<tr>
<td>Germania</td>
<td>Bright yellow</td>
</tr>
<tr>
<td>Limber Clove</td>
<td>Rich crimson</td>
</tr>
<tr>
<td>Gloire de Nancy</td>
<td>White</td>
</tr>
<tr>
<td>Miss Willmott</td>
<td>Bright pink</td>
</tr>
<tr>
<td>W. A. Clark</td>
<td>Yellow</td>
</tr>
</tbody>
</table>

The above are all self coloured. Appended are the names of a dozen fancy varieties all of which are suitable for the border:—

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aureola</td>
<td>Buff marked with crimson</td>
</tr>
<tr>
<td>La Villette</td>
<td>Buff blotched with rose</td>
</tr>
<tr>
<td>Prince of Austria</td>
<td>Buff, heliotrope and crimson</td>
</tr>
<tr>
<td>Miss Young</td>
<td>White tipped with purple</td>
</tr>
<tr>
<td>Plunkett</td>
<td>White edged with pink</td>
</tr>
<tr>
<td>Sir E. Elgar</td>
<td>White marked with heliotrope</td>
</tr>
<tr>
<td>Lucifer</td>
<td>Yellow marked with purple</td>
</tr>
<tr>
<td>Semiramis</td>
<td>Yellow marked with light rose</td>
</tr>
<tr>
<td>Sam Weller</td>
<td>Yellow marked with yellow and crimson</td>
</tr>
<tr>
<td>Mandarin</td>
<td>Yellow marked with rosy crimson</td>
</tr>
<tr>
<td>Criana</td>
<td>Terra-cotta marked with crimson</td>
</tr>
<tr>
<td>Hulda</td>
<td>Cream edged with purple</td>
</tr>
</tbody>
</table>

The picotees are a delightful section. They have either white or yellow grounds, and are beautifully tinged with colour. Here are half-a-dozen of each class to choose from:—

<table>
<thead>
<tr>
<th>Yellow Ground</th>
<th>White Ground</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berenice, scarlet edge</td>
<td>Acme, red edge</td>
</tr>
<tr>
<td>Claudia, rose edge</td>
<td>Grace Darling, red edge</td>
</tr>
<tr>
<td>Dalkeith, crimson edge</td>
<td>Amy Robsart, purple edge</td>
</tr>
<tr>
<td>Murillo, rose edge</td>
<td>Silvia, purple edge</td>
</tr>
<tr>
<td>Penelope, light rose edge</td>
<td>Favourite, scarlet edge</td>
</tr>
<tr>
<td>Lauzun, purple edge</td>
<td>Clio, scarlet edge</td>
</tr>
</tbody>
</table>

These lists may easily be supplemented by a reference to the growers’ catalogues. But if a few varieties be grown well the
amateur will have a choice collection, which he can himself increase by the methods of propagation to which I shall refer later, and which can be added to by the purchase of the most up-to-date varieties as they become available.

The best season in which to make a start in border carnation growing is undoubtedly the autumn. If orders for young plants be given early they will arrive in pots, neatly labelled and staked, early in October, and they may then be planted out into the positions in which they are intended to flower in the following summer.

Meantime some attention must be paid to the choice of aspect for the carnation bed or border, and to the preparation of the soil. With regard to situation it only needs to be said that the carnation is a sun-loving plant to put the matter beyond doubt. Avoid heavily shaded borders, therefore, if you wish your carnations to succeed. As to soil, any well-tilled garden should provide a suitable medium, provided the surface can be improved by the incorporation of a few barrow loads of strong virgin loam (the top spit from an old pasture for preference), some light manure from an exhausted hotbed, and a quantity of old mortar rubbish. These well mixed together will make an ideal home for the carnation, especially if by a little forethought preparations are made to ward off the onslaughters of that most persistent and dangerous pest of the carnation—the wireworm. An excellent artificial preventive is slaked lime, which should be applied as a top-dressing before the plants are placed in position.

Plant your carnations firmly in mid-October—or in March, if reliable plants can be obtained—taking care as they are turned out of the pots that the roots are not injured. They will require no further attention during the winter, nor, indeed, until the flowering season approaches, when they will have to be staked securely, otherwise the slender stems will inevitably suffer by the buffettings of wind and heavy rain. Early June is the time to stake and tie the plants. Use then bamboo canes for the purpose, and make sure that they are long enough—a good size is four feet. Tie with bast or raffia tape, and avoid the mistake of securing the
stems so tightly to the stake that the natural flow of the sap is arrested.

If especially large flowers are desired only one or at most two buds should be allowed to develop, but where a larger number of smaller blooms is required thinning out may be done sparingly. It will help the plants greatly at this stage if they are top-dressed with a thin mulch of short manure. This should be covered with a layer of rich leaf mould. The effect will be not only to give the plant a stimulating food, but also to maintain the roots in a suitably moist condition.

One of the chief drawbacks of many varieties of the carnation is the frequency with which the calyx splits, and thus disfigures the flower. Diagram 24 suggests some methods of coping with this drawback when it occurs. Small and misshapen carnations may have the calyx removed as in Figure 4. Three blooms thus treated can be placed together and fastened round tightly with a small india-rubber band. If the florets be neatly intermixed it is possible to produce the simulation of a fair-sized bloom, as in Figure 6. Figures 1 and 2 show the method of using the carnation collar for show purposes.

The carnation, like the chrysanthemum, requires the constant attention of the cultivator all the year round. It cannot, like many other perennials, be left to its own devices in the border—to increase and multiply at will. It needs to be renewed annually, and this can be done in two ways, either from seed or by means of the process known as layering.

The months of May and June are the time to adopt the first plan; the other and more common method should be postponed until the best of the flowers are over, towards the end of July or early in August. The propagation of carnations from seed possesses both advantages and disadvantages. These arise from the fact that one can never be sure that the resulting plant will be true to type. There may, however, be some surprises in store for the grower, and he may secure from his little seed-box a gem which he will cherish as the apple of his eye. It is this element of surprise which makes the growing of carnations from seed so
Diagram 24.—DRESSING CARNATIONS.

Fig. 1. The paper collar used for displaying carnations on the show bench. Fig. 2. Side view. Fig. 3. Collars may be purchased in bunches. Figs. 4. and 5. Small and misshapen carnations may have the calyx removed. Fig. 5. Three can be fastened together with an elastic band and the florets be neatly arranged. Fig. 6. The deception complete.
exciting and so interesting, and for this reason it is worth the while of the amateur to indulge in a little experiment.

But, first of all, let him see that his seed is good. I have elsewhere recommended the purchase of penny packets of seed for the purpose of raising cheaply some of the commoner plants which help to make our gardens beautiful, but I draw the line at carnations. Do not pay less than a shilling for a small packet of mixed carnation seed. When you have obtained it, give it the best cultivation in your power, and you will not be disappointed with the investment.

The seed may be sown out of doors in a little prepared bed; but I strongly advise the use of a box. This may be two or three inches deep, with holes drilled in the bottom for drainage. A suitable compost may be made of equal parts of loam, leaf mould and sand. This should be made firm and moist, but not saturated. Sow the seed—there will not be many—as evenly as possible, and cover it to a depth of half-an-inch. Place a sheet of glass over the top of the box, and over this again a piece of brown paper. Put the box in a cold frame, and keep the light closed until germination is apparent. As soon as the young plants begin to grow give them more air, while keeping them near the glass. Avoid over-watering.

A cardinal principle to bear in mind is that carnations do not require coddling. Therefore, as soon as the seedlings touch each other prick them out into small pots or into boxes, with the plants at a distance of two inches from each other. Or they may be transplanted into a bed of finely pulverised soil in the open. By autumn the plants should be strong and sturdy, and in October should be ready for placing in their flowering quarters.

The propagation of carnations by layering is a comparatively simple operation, provided it be done at the right time and in the right way. Diagram 25 will give some hints on the method to be adopted. It is the habit of the carnation to throw up a long wiry stem in the early summer, and it is the extremity of this thin stem that carries the flower. Simultaneously with this process another goes on This is the formation at the base of the
Diagram 25.—HOW TO TAKE CARNATION LAYERS.

Fig. 1. The layering peg. Fig. 2. Making the cut. Fig. 3. Pegging down the layer. Fig. 4. The parent plant in the centre with the layered shoots disposed round it.
plant of a cluster of shorter "tufty" shoots, known among gardeners as the "grass" of the carnation. It is this grass which provides the shoots for layering, and at the end of July they will be ready for the operation.

But a little preliminary work will be needed before this can be done. Some attention must be paid to the condition of the soil. If it is of a heavy nature a lighter compost must be introduced for a space of a foot or so round the base of the plant. This may consist of sweepings from a potting bench and some light leaf mould, with a good supply of fine sand—say one-third of the whole. When this has been thoroughly mixed it may be worked into the ground, and it will be found that the layers will root far more rapidly and strongly than if this precaution had been neglected. If the ground by a happy chance should be light and friable, nothing will be needed but the loosening of the surface round the parent plant before putting down the layers.

Another preliminary will be for the gardener to supply himself with a number of wooden pegs similar to that depicted in the diagram. These can be made from the joints of hazel twigs; or a ready-made article may be secured in the common feminine hairpin. I have used the latter with successful results many a time, and if my supply of wooden pegs runs short I invariably resort to this easily procurable substitute. The hairpins must, however, be of sufficient strength to keep the layer securely in position.

The process of taking the layers is as follows:

Select a strong side shoot growing from the base of the plant. Hold it firmly with the left hand, and, beginning from the ground level, remove carefully with the right hand all the leaves on the shoot for a space of two or three inches. Care should be taken not to tear the skin of the stem. If there is danger of this the leaves may be cut off close with a pair of small scissors. The reason for this operation is to admit of the stem being bent down into the ground, hence the term layering.

The next operation will at first perhaps be found the most difficult for the novice to attempt successfully; but with practice
it becomes easy. This is the making of a cut in the shoot about
to be layered in such a way that a tongue is formed similar to that
in the lower section of the diagram. The cut should be made with
a sharp penknife along the middle of the stem. Start to cut at
about the third joint away from the parent plant, and run the
knife along for a couple of inches. Then place the layer in the
soil so that it may be covered to a depth of about two inches.
Peg the layer down as shown in the picture, taking care to leave
the tongue open and pushing it well into the ground. It is from
the tongue that the new roots will strike. Cover the layer with
fine soil, and the operation is completed. This process should be
followed until half-a-dozen or so layers have been made from each
parent plant. When the whole of the work has been completed
give the layers a good soaking with water, and then, save for an
occasional moistening in dry weather, they may be left to their
own devices.

In five or six weeks, if the weather be favourable, the layers
will have become rooted, and they may then be detached from
the parent plant. This is done by making a sharp cut through the
stem of the layer near the old plant. It will be wise to leave the
newly formed plants where they are for a week or two longer to
allow them to become thoroughly established.

Afterwards they may be disposed of as the fancy of the gardener
dictates. Some may be wanted to go at once into their flowering
quarters for the following year. This can be done in October,
and with favourable winter weather they will be splendid plants
by the spring. Others again may be required for spring plant-
ing. These should be consigned to cold frames which have been
filled with a good compost of fairly light soil. Any of the plants
that are put into cold frames should be kept close for a few days
and afterwards be given a plentiful supply of air. Border carna-
tions, it should never be forgotten, are hardy plants; coddling
will do a great deal more harm than good.

If these directions be followed, the amateur gardener will be
the possessor in the spring of a stock of young plants that will
do him credit when the flowering season comes round again.
The pink is essentially a poor man’s possession. It is not, like its more stately brother, the choicer kind of carnation, an expensive plant. It will grow away vigorously in the border in almost any kind of soil, and it will of itself increase with surprising rapidity by reason of the thick network of roots which it throws out beneath the surface of the ground.

And what a lovely picture it makes in late June if grown in batches in the mixed border! The white kinds, notably Mrs Sinkins and Her Majesty, should be found in every amateur’s garden. Nor, taking it all round, do I know a plant that forms a more satisfactory edging to a long border than the white pink. When it is in bloom it makes a magnificent picture, and even in the depth of winter the fresh green of its foliage adds a touch of brightness to what is generally a somewhat dismal scene of desolation.

Therefore the pink is well worthy of special cultivation, and it is in July, when the best of the flowers are over, that the gardener who wishes to increase his stock should set about the task. This may be done by means of cuttings, and the method to be adopted is fully explained in Diagram 26.

First select a strong young shoot—one, if possible, that is not too soft and sappy. Hold it firmly with the left hand, and with the right hand cut it off from the parent plant just below a joint. The joint will be found at that part of the stem where a pair of leaves clasps it. Now proceed to trim the cutting by removing several pairs of the lower leaves, and when this has been done make a horizontal cut through the centre of the joint. This process should be repeated until as many cuttings as are desired have been obtained.

The cuttings, if they be taken in July, may with perfect safety be placed in the open ground. A shady spot beneath a south fence should, if possible, be selected. The plan I adopt is to make a small bed, dig it up well, and introduce as much sand into the compost as possible. I then draw drills nine inches apart, as shown in the illustration, and into the bottom about six inches deep place a good sprinkling of sifted ashes. The object of this
Diagram 26.—HOW TO TAKE CUTTINGS OF PINKS.

Fig. 1. A cutting. Fig. 2. Cut through the centre of the joint. Fig. 3. Making a drill. Fig. 4. Closing the drill, which should be trodden down firmly. Fig. 5. Cuttings planted. Fig. 6. Another method, dibble holes with a stick and drop some sharp sand in each hole. Fig. 7. The cutting planted, with some sand at the base.
is to provide good drainage, and thus prevent any accumulation of moisture at the base of cuttings. If this were allowed it might very easily prove fatal to all chances of success.

The drill is then closed with a rake and trodden down firmly. A pointed stick will be found useful for making holes about six inches apart, and into this the cuttings are placed, care being taken that the base of the cutting rests firmly on the bottom of the hole. Each cutting should be made perfectly secure in its place by pressing the soil hard round the stem. This will facilitate rooting, and contribute not a little to successful propagation. Another method which dispenses with the necessity for making drills is simply to make holes at appropriate distances in the bed, drop a small quantity of sand into the holes, and then put in the cuttings.

Many gardeners shade their pink "pipings" or cuttings with a hand-light similar to that in Diagram 28, or if the gardener have no room in his little plot for a specially prepared bed he may use a box a foot deep, make a few holes in the bottom, and place in it some rough cinders to carry away excessive moisture. Five or six inches of sandy soil should be placed over the cinders, the cuttings inserted, and the whole box covered with a sheet of glass. Thus the amateur may have a ready-made propagating frame which will serve his purpose admirably if he pay attention to shading and refrain from over-watering.

Pinks, like carnations, do not require coddling. Those set out
in the open should be allowed to remain where they are until the following spring, when they may be placed in their flowering quarters. The cuttings raised under glass should be transferred in September to a cold frame for the winter, and in spring be planted out.

In addition to Her Majesty and Mrs Sinkins, which are pre-eminent among the white varieties, there are many coloured kinds from which a choice may be made. Here are some of the best:

<table>
<thead>
<tr>
<th>Name</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adonis</td>
<td>Rose-red margin, deep red centre</td>
</tr>
<tr>
<td>Amy</td>
<td>Maroon laced, centre maroon</td>
</tr>
<tr>
<td>Anne Boleyn</td>
<td>Rosy purple, darker centre</td>
</tr>
<tr>
<td>Bookham Gem</td>
<td>White ground, maroon centre</td>
</tr>
<tr>
<td>Fairy</td>
<td>Deep crimson centre</td>
</tr>
<tr>
<td>Homer</td>
<td>Fringed rose, dark crimson centre</td>
</tr>
<tr>
<td>Lady Gib</td>
<td>Very pure white, delicate rose centre</td>
</tr>
<tr>
<td>Old Chelsea</td>
<td>Rose centre, heavy lacing of rose-red</td>
</tr>
<tr>
<td>Perfection</td>
<td>Maroon-red centre</td>
</tr>
<tr>
<td>Rosy Morn</td>
<td>Rosy lilac ground, rose-red centre</td>
</tr>
<tr>
<td>Snowdrift</td>
<td>White, rose flush</td>
</tr>
<tr>
<td>The Bride</td>
<td>Laced purplish rose, deep coloured centre</td>
</tr>
</tbody>
</table>
CHAPTER XXVII

GARDEN LILIES

Of all the hardy bulbous plants that may be grown out of doors in this country, the lily is surely the most noble and the most highly decorative. The stately beauty of a well-cultivated lily, combined with its delicious fragrance and delicate colouring, gives it a pride of place that is thoroughly well merited.

The number and variety of the species of the lily are so great that it would easily be possible to devote a whole garden to their cultivation. But this would require the surrender of so much space, and would involve an initial expenditure of so much money as to make it beyond the possibility of realisation by the vast majority of amateur gardeners.

The mental vision which the mere suggestion of such a garden conjures up is, however, so gorgeous that it surely conveys a practical hint which those who intend to plant lilies in their borders should keep steadily in mind. And it is this: that the most effective method of growing lilies in the mixed border is that of grouping. Isolated specimens planted at intervals of several yards at the back of a border are, it is true, things of beauty; but a single specimen if grown in close proximity to others of a like species seems to take on an added decorative effect, and to display its graceful foliage and shapely flowers to still greater advantage. Moreover, the plan of grouping lilies is essentially the natural method. If a Madonna Lily bulb be left undisturbed for a number of years, as it should be, it will increase and multiply until it has formed itself into a perfectly natural group.

Liliums are indigenous throughout the north temperate hemisphere—extending from California in the west to China and Japan in the east, across the continents of North America, Europe and
Diagram 29.—LILY PLANTING.

Fig. 1. General planting. Fig. 2. Planting a clump. Excavate first and place bulbs in position. Fig. 3. For cold wet soils first pot as indicated, and put in a frame. Fig. 4. Plant out in spring.
Asia. They are, therefore, found flourishing naturally in different soils, under varying climatic conditions, and in all degrees of heat and shade, drought and moisture.

The best positions for lilies in British gardens are those in which they will be shaded from the hot midday sun, since if this precaution be taken the life of the flowers will be prolonged. It is, however, necessary to avoid planting the bulbs in deep shade under trees, or in closely packed shrubberies, where the roots of the occupants are thickly matted together. The roots of the shrubs absorb so much of the food and moisture that are essential to the proper development of the lily that the latter would be starved and would speedily perish.

A further aid in the selection of suitable varieties will be obtained if it be remembered that lilies may be divided into three groups, thus:

(a) Lilies that flourish in ordinary good garden soil—that is to say, strong loam that has previously been deeply dug and enriched with well-decayed manure:

1. Bulbiferum, two feet to four feet; orange-red spotted with brown. Flowers May and June.
2. Candidum (Madonna Lily), five feet; pure white; June.
3. Chalcedonicum (Scarlet Turk's Cap), three feet; bright scarlet; July.
4. Croceum, six feet; orange spotted with purple at base; June and July.
5. Davuricum, two feet; orange-red; black spotted; July.
6. Henryii, six feet, orange-yellow; July-September.
7. Testaceum, five feet; buff-yellow dotted with orange-red; July.
8. Rubellum, two feet; bell-shaped rosy-pink flowers; June.

(b) Lilies that thrive best in sandy loam, peat and leaf soil:

1. Auratum (perhaps the most generally cultivated of garden lilies), two feet to six feet; ivory-white, yellow band down centre, deep purple blotches; July-August.
GARDEN LILIES

2. Brownii, two feet to four feet; pure white, with central purple line; July.
3. Thunbergianum, one foot to two feet; yellow and scarlet spotted with purple; July-August.
4. Humboldtii, four feet to eight feet; orange-yellow, purple spots; July.
5. Kewense, six feet; buff-coloured flowers, creamy white tips; July.
6. Longiflorum, two feet to three feet; long white flowers.
7. Speciosum, two feet to three feet; white suffused with rose.
8. Tigrinum, two feet to four feet; orange-red, blackish purple spots; June-July.

(c) Lilies that grow best in moist loam, peat and leaf soil, in a shady situation and by the side of ponds:

1. Burbanki, four feet to five feet; pale orange-yellow, chocolate spots.
2. Canadense (in several varieties, such as Rubrum, Flavum and Parvum), two feet to four feet; orange to pale red; purple spots; August-September.
3. Parryii, two feet to six feet; citron-yellow, purple-brown spots.
4. Superbum (Swamp Lily), four feet to ten feet; orange-red, violet spots.

The list printed above is far from complete, but it represents some of the best lilies in cultivation, and it will enable amateurs to make their own selection.

The difficulty that next presents itself is that of securing satisfactory bulbs. Many of these varieties are now to be obtained in the form of "home-grown bulbs," and where these can be purchased there should be no delay in getting them beneath the soil as early in the autumn as possible. The great importation of foreign bulbs, and especially of those from the Far East, such as L. Auratum, does not begin until the end of the year. In the case of these late imported bulbs it is possible to plant them in December.
with a good prospect of success if the weather be open and mild, and if, after planting, the bulbs be protected with a covering of ashes or littery manure. But where damage by frost is imminent it is advisable to plant them low down in pots, cover them with ashes or fibre, and keep them well protected. In the meantime root action will have started, and by March or the beginning of April it will be possible to transfer them from the pots direct to the soil without unduly disturbing the roots. For it should never be forgotten that if there is one thing the lily resents more than another it is disturbance while in active growth.

A close study of the root action of lilies will soon reveal the fact that in this respect there are two classes—first, those that make two sets of roots, one from the base of the bulb and the other from the bottom of the flower stem; second, those that produce roots only from the base of the bulb. L. Auratum is a striking and familiar example of the first class, while Chalcedonicum and Humboldtii are examples of the second class.

It is clear, therefore, that Class 1 should be planted deeper than Class 2. Bulbs that have basal roots only should be planted three inches deep, each bulb being placed on a layer of coarse sand, and also surrounded by sand before it is covered with soil. Bulbs that produce both basal and stem roots require to be planted from four to six inches deep. A good average rule is to plant lilies at a depth three times that of the bulb.

After planting, the bulbs will be greatly benefited by a top-dressing of well-decayed manure. This will serve the double purpose of protecting the bulbs from severe frost and of supplying them with necessary nourishment when active growth begins.
Diagram 30.—THE LILIUM AURATUM.

Fig. 1. A lilium auratum bulb. Fig. 2. When received plunge in fibre to restore plumpness. Fig. 3. Outdoor planting; good-sized hole; loose bottom; fill in with rich soil. Fig. 4. Place bulb low in the pot. Fig. 5. Stem roots which require covering as the plant grows. Fig. 6. The final filling in.
CHAPTER XXVIII

THE SWEET VIOLET

The sweet violet, whose fragrance and beauty delight the senses of the city dweller during the dark days of winter, might well find a place in the garden of every amateur who possesses a plot of ground removed from the grime and smoke of a great manufacturing town. And yet how rarely does one see violets grown to perfection save by the professional gardener!

It is true that the violet will not thrive in the absence of pure air, but there are plenty of suburban gardens in which it might be grown with every prospect of success if only the plants were treated with proper care. Neglect of a few simple rules is invariably the cause of failure. One frequently finds a bed of violets which produces nothing but leaves. The plants may have been healthy enough to begin with, and they were probably well and truly planted; but after the first season of bloom they were allowed to follow their own devices, to spread and become overcrowded. The grower perhaps forgot, if he ever knew, that the violet must be renewed and replanted every year. Failure to perform this operation spells disaster.

And yet when once the few rules to which I have referred have been mastered, the culture of the violet ought not to present any serious difficulties to the amateur who grows pansies and violas with success. For the violet is not in the least particular about the soil in which it is planted. Any soil in which good vegetables will thrive will be found equally suitable for violets.

If, therefore, the amateur contemplate making an attempt to grow violets in order to obtain bloom during autumn and winter, the month of April is a favourable time to set about the task of making a violet bed. When this is ready the florist will be pre-
pared to supply him at short notice with the necessary young plants with which to make a start.

The violet delights in summer-time in partial shade; therefore the bed should be made, if possible, under the north-east side of a fence or hedge. It will also thrive under the shade of deciduous trees such as Japanese maples, almonds and laburnums. The beds should be placed fairly well in the open, and not in the dense shadow cast by house walls.

While it is true that ordinary garden soil will suffice for successful violet culture, it is equally true that the measure of the grower's success will depend upon the care with which the soil is prepared. Deep digging is essential, and where it is possible this should be done some time before planting-out time arrives. Where the soil is inclined to be heavy it can be improved by an admixture of well-decayed manure, road grit, leaf mould and burnt vegetable refuse. But in thus enriching the soil avoid as you would the plague the use of a great quantity of rank stable manure. The inevitable and undesirable result of this operation would be the production of any quantity of foliage and of very few flowers. If the soil be light and hungry, however, it can be improved by digging in and burying fairly deep some thoroughly decayed cow manure. The effect of this will be to keep the ground cool and moist during the heat of summer. It is in conditions such as this that violets revel. When one remembers that the violet grows naturally in the woodlands, in soil that contains the accumulation of years of fallen and decayed leaves, it will be realised how advantageous it is to supply the bed with a certain proportion of leaf mould. If this be used as a dressing it will prevent the surface from becoming cracked in hot weather, and will at the same time supply the roots with the medium in which they are most at home.

As soon as the young plants are received from the florist they should be placed in their summer quarters. The plants ought to be rooted runners, similar to that depicted in Figure 1 of Diagram 81.

It is necessary that they should have plenty of room, and it is,
therefore, a good general rule to plant them not less than a foot, or at the least ten inches apart in straight rows, each of which should also be a foot apart.

Choose, if possible, a moist, dull day for planting, since it is essential to prevent the young plants from flagging. If the weather be dry, suitable precautions must be taken. It is, for example, a good plan to "puddle in" the roots. This consists in making a hole with the trowel for each plant, filling the hole with water and placing the roots in the liquid before it percolates through the subsoil. Ere this happens the hole should be filled with fine soil, and the plant be made firm with the fingers. Another method of preventing flagging immediately after planting may be adopted. If an inverted flower-pot be placed over each young violet during dry, hot sunshine, and if the pots be lifted off during periods of rain, and at night, the plants will become established with much greater ease than would be the case if the ground were allowed to become baked by the sun.

Thus far all is plain sailing, and now comes the important subject of watering. Violets will never thrive unless they be supplied with a sufficient quantity of moisture. In dry weather water must be given in copious draughts. Mere sprinkling of the surface soil will only result in producing a hard crust, through which the dew will fail to penetrate. It is a good plan to keep the surface lightly forked up. This should be done after a heavy watering, by which the roots have been thoroughly soaked. In this way the necessity for daily watering in hot weather can be avoided. The plants will also be benefited at such times, if a mulching or top-dressing of leaf mould or decayed manure be supplied.

The chief insect pest against which violets have to contend is red spider. It often makes its appearance in periods of dry, hot weather. No better method of warding off attacks can be suggested than careful cultivation—that is, the provision of a good bed of soil and the prevention of a hard, caked surface in the manner I have suggested. But when the enemy has made its appearance no time must be lost in stamping it out. A useful and easy method is that depicted in Figure 4 of the diagram. This
Diagram 31. — VIOLET CULTURE.

Fig. 1. The parent plant with the runner to be severed at the point indicated by the arrow. Fig. 2. Plant out on north border. Fig. 3. Or in a frame in the autumn. Fig. 4. If red spider appears dust with sulphur and soot.
is the sprinkling at frequent intervals over the plants of a mixture of sulphur and soot. The ingredients should be placed dry in a muslin bag tied to the end of a stick, and the contents be shaken over the bed. Care must be taken to choose a windless day for the operation, otherwise more soot and sulphur will be blown into one’s eyes than is altogether comfortable.

Another rule in the summer treatment of violets that must on no account be neglected is the removal of the runners. If they be allowed to remain attached to the plants the latter will soon be exhausted, and that will prevent the full development of the crown, upon which the coming harvest of bloom entirely depends.

Where it is intended to flower the plants out of doors it will be necessary as autumn approaches to remove them to a warm and sheltered quarter of the garden. This must be a position in which during the dull days of the year they will obtain the maximum amount of sunshine and the minimum share of cold winds.

But it is only in unexposed, sheltered places that violets will thrive in the open during winter. It is generally found necessary to transfer the plants to cold frames for flowering. Frames in which melons and cucumbers have been grown during the summer will be found eminently suitable for the purpose. A great point to bear in mind is the desirability of keeping the crowns of the plants as near to the glass as possible. If, therefore, it is necessary to raise the bed this should be done before the plants are put in their winter quarters.

A day before lifting the violets from the outdoor bed they should be well watered. By taking this precaution it will be possible to lift the roots so that they bring away with them a good-sized ball of earth. They should be planted a foot apart in the frames, and be watered in immediately.

It is well to remember that the violet is a hardy plant. Plenty of air must be supplied day and night so long as the weather remains mild; only at the approach of frost will it be necessary to supply protection by keeping the lights closed tightly down. During a severe visitation of frost it may be desirable to afford further protection by means of mats, but better success will be
achieved by exposing the plants to the air on all suitable days than by keeping them close and warm. If the plants are removed to the frames in the second week of September flowers may be expected before October has run its course. The varieties of violets now available for cultivation are becoming more numerous every year. Here are some of the best:

**DOUBLE.**—Parma (lavender), Neapolitan (pale lavender), Marie Louise (lavender and white), Mrs J. J. Astor (heliotrope), Mlle Bertha Barron (blue), Comte de Brazza (white), and Mrs d'Arcy (porcelain blue).

**SINGLE.**—The Czar (blue, white), Wellsiana (violet-purple), Admiral Avellan (blue), Perle Rose (rose), Princess Beatrice (blue), and Baronne de Rothschild (blue).
BOOK VI
BULBS AND THEIR CULTIVATION
CHAPTER XXIX

SPRING-FLOWERING BULBS

The increasing popularity of bulb growing among amateur gardeners is not difficult to explain. In the first place bulbs are cheap, and in the next their cultivation is simplicity itself. There are, of course, degrees of success in bulb growing as in everything else. The fact remains, nevertheless, that if spring-flowering bulbs be put into the ground in however haphazard a fashion during early autumn they will produce their bloom in due season. Nor does it matter much what kind of soil is chosen for their reception. They will grow anywhere in any ordinary garden soil, and in the case of many of them they will increase and multiply out of all knowledge.

But the true gardener is not content with this free-and-easy method of cultivation. He naturally desires to see his bulbs grown to perfection, and he soon learns to know that this delectable result cannot be achieved without forethought and care. As he goes about the work of planting, visions of the coming glory of the spring pass swiftly through his mind, and he knows that the realisation of his dreams depends upon the taste and skill he brings to bear upon his work in the autumn.

He may, perchance, glance back to his first efforts in bulb cultivation. How warmly he cherished his first dozen or two daffodils, tulips and hyacinths, and his larger parcel of a hundred or two crocuses! He was determined to make the most of them, and he spread them as wide apart as possible, and over as great an area as the limits of his garden would permit. His daffodils and tulips were dotted here and there at irregular intervals; his crocuses were planted in a single attenuated line round his favourite flower bed, and he hoped for the best.
But the best was not achieved. He probably paid a visit subsequently to one of the public parks where bulbs are grown to perfection, and even the most cursory glance at the magnificent array of flowers showed him the error of his ways. In his own small garden a daffodil nodded its head here and there in splendid isolation; even the thin line of crocuses failed to give satisfaction. And thus it was borne in upon him that one of the secrets of success in the growing of bulbs is to plant them in bold masses and good widths.

Therefore my first word of advice to the beginner in bulb growing—especially if the depth of his pocket be limited—is that if he have only a few dozen bulbs to plant he should confine them to a single bed, and in this way reap the fullest advantage from his outlay. Or let him select a section of the border, and determine that throughout the months of March, April and May it shall be made as gay and bright as the expenditure of time and money can make it.

I have said that bulbs will grow in any kind of soil, and this is perfectly true; but if the best results are to be secured some attention must be paid by the cultivator to the preparation of the ground. If he traces back the history of the imported bulb that he holds in his hand in readiness to plant in its allotted position, he realises that it was born and matured in the curious sandy soil of the Netherlands, that this is its natural element, and that if he is to maintain the bulb in good condition and induce it to put forth its finest blossom, he must endeavour to provide it with a like environment. Therefore he will take pains with the preparation of his soil. If it be at all heavy he will lighten it by incorporating with it as much loam, sand and road grit as he can obtain.

He will know also that the best time to plant his bulbs is when the ground is in a friable condition, and he will therefore choose a fine day for the purpose, and one also which comes not too soon after a heavy rainfall. The ground will a week previously have been well dug over, and in the early morning of the planting day he will rake the surface with a long-toothed rake and leave the
Diagram 32.—MAKING A BULB BED.

Fig. 1. The centre should be raised. Fig. 2. Marking out the design. Fig. 3. Next arrange bulbs in position on the surface of the soil. Fig. 4. A homely dibble made with a piece of stick and a nail for indicating a regulation depth for planting.
soil to dry for several hours. By midday the ground will be ready for planting. It will be found to be in a nice, workable condition instead of being wet and sticky, as might otherwise have been the case if this simple operation had been neglected.

During the leisured weeks of the dying summer the methodical gardener will also have laid his plans with some amount of precision. He will have decided upon the design of his bulb beds, will have classified his colours, and will so have chosen his varieties that in the case of a proposed mixed bed he will be able to ensure simultaneous blooming. These are points that may be left to individual taste, but important as they are for the owners of large gardens and the possessors of deep pockets, my immediate purpose is to give a few practical hints to the amateur who possesses only a small plot of ground and who desires to grow bulbs in such a manner as to produce a pleasing effect.

He may possibly have at his disposal a spare circular bed which he wishes to devote entirely either to hyacinths, tulips or daffodils. How should he prepare it and how plant it? Diagram 32 will be found useful in solving these problems. The first principle to keep in mind is that the bed must be raised at the centre. Figure 2 depicts a simple device for obtaining an almost perfect circle. It is that of an improvised compass, consisting of two pieces of stick and a length of cord or twine. After the bed has been thoroughly dug over it may be left to settle down for a week or ten days. In order to produce a perfectly symmetrical effect the bulbs before planting should be placed in position on the surface of the soil, as indicated in Figure 3, and to ensure uniformity of planting a dibbler, with a nail to mark the desired depth, as shown in Figure 4, should be used.

Next the question arises: What shall be planted? The choice is infinitely various. If a formal bed be desired, nothing can exceed in beauty a fine array of hyacinths or tulips. The colour scheme should be well thought out. It may be decided to grow only one variety, and in that case the thing is simple. But it is possible to grow several varieties, so that the colours will
SPRING-FLOWERING BULBS

blend harmoniously. If that be the intention, it may be well to bear in mind a few simple rules.

The colours that blend well are:

1. Crimson, blue and white.
2. Lilac, purple and yellow.
3. Shades of red: rose, pink, salmon and scarlet.
4. Yellow and orange.

Avoid at all costs such combinations as orange and crimson, red and yellow, red and violet, and yellow and blue.

Again, it may be decided to devote the bed to the cultivation of narcissi. In that case care should be taken in ordering the bulbs that the varieties selected flower all together. You may decide to have them early, second early, or late, but in any event ask the florist from whom you purchase them to keep the sections distinct.

Crocuses may be used for edging, and these will bring the first real patches of colour in the spring garden. Here again the variety is great, for the colours range through yellow, brown, orange, lilac, purple, blue and white. Crocuses should be planted close together, at a distance of not more than an inch or an inch and a half apart, and in belts at least six inches wide.

The depth at which each variety of the better-known bulbs should be planted may be set out as follows:

**Two Inches.**—Crocus, anemone, ixia, scilla, winter aconite, jonquil, snowdrop.

**Three Inches.**—Early tulip, daffodil or narcissus, Spanish iris.

**Four Inches.**—Hyacinth, late tulip.

In planting the larger kinds of bulbs it will be found that this can be done most effectively by the use of a trowel. Care should be taken in making the holes that they are of a uniform depth, since if there be any variation it will influence the time of flowering, and may spoil the symmetry of a whole bed. Next see that the bulb rests firmly on the base of the hole, which should be large enough to admit the bulb, so that it sinks easily into position. If, as is sometimes done, the hole be made with a dibbler, there is
danger that the bulb may be suspended midway down the cavity made for it. In this way the formation of roots may be retarded, if not prevented altogether, and thus the bulb will be spoilt.

After the planting has been completed it will be found a good plan to cover the soil with an inch-thick layer of rich manure. This should be left undisturbed till the spring, and be then lightly forked into the surface of the ground. In the meantime the winter rains will have washed the nutrient from the manure into the soil, to the great benefit of the growing bulbs. It is important to remember, however, that manure should never be allowed to come into actual contact with bulbs. If manure be placed in the soil before planting it should be dug so deeply that it remains well below the level at which the bulbs are to rest in the ground.

A problem that confronts the owner of a small garden who has devoted a considerable amount of his available space to the cultivation of spring-flowering bulbs frequently takes the following form just at that period of the season when spring is merging into summer:—"What shall I do with my bulbs of narcissus, hyacinth, tulip and crocus? Shall I leave them where they are or shall I take them up?" It may be that every foot of soil in bed and border is required for summer-bedding plants, and the doubt arises whether it may not be harmful to the bulbs to disturb them. It is a knotty problem. In the case of narcissus and crocus it is undoubtedly a good plan to disturb them as little as possible—at any rate, until at least three years after they were originally planted.

But the problem must be faced and overcome. The solution of the difficulty will give the gardener some additional trouble, but it will be effort well spent. The proper method of procedure is to lift the bulbs carefully and, without cutting off the foliage, transfer them to a corner of the garden where they can be left undisturbed till their period of development has ended. This can be ascertained when the foliage has turned brown. The bulbs should then be lifted, placed in a shady spot to dry off, and afterwards be packed neatly in boxes or trays. They may then be placed in a shed or outhouse until planting-out time returns in the autumn.
Diagram 33.—HINTS ON BULB PLANTING.

Fig. 1. Careless planting. Fig. 2. Result when the hole is filled. Fig. 3. Proper position. Fig. 4. Lever soil over as indicated. Fig. 5. Result: bulb firmly planted and cavity filled in. Fig. 6. Slovenly planting—pushing bulb into soil. Fig. 7. Later the bulb pushes itself out of the soil.
This method of treatment has the advantage that it enables one to clear the beds early in May and to dig them over and prepare them thoroughly for their summer occupants.

If, however, it be desired to leave the bulbs to increase and multiply in the ground at will, the foliage must not on any account be disturbed until it is withered. Then cut it off almost down to the ground level. Afterwards, of course, care will be necessary in forking up the soil so that the bulbs are not injured.
CHAPTER XXX

SUMMER-FLOWERING BULBS IN THE OPEN

The amateur gardener is often apt to get into a rut and to become the victim of routine, especially in regard to bulbs. He appears to imagine that bulbs are peculiarly adaptable to autumn planting and spring flowering, whereas if he would extend his field of operations a little he would find that there is an excellent range of bulbous subjects which can be planted in spring and which will produce a wealth of flowers and foliage in the height of summer.

And here perhaps it should be explained that hitherto in referring to bulbs I have used the term loosely and unscientifically. For the sake of convenience, it is a common practice to include within the scope of the comprehensive word, "bulb," all kinds of tuberous and bulbous plants that, strictly speaking, should be classified under separate headings—such as bulbs, corms and tubers. It may, therefore, be well to explain wherein these classes differ one from the other.

Among the commonest types of the true bulb are the hyacinth, the tulip, the narcissus and the lily. The bulb is built up of fleshy scales, rolled round each other as in the hyacinth, and overlapping as in the lily. It is the duty of these scales, which are in reality modified leaves, to store and keep in reserve the food which shall support the embryo stem and flowers contained within the bulb, until, by the process of root formation, a fresh source of supply has been obtained wherewith to meet the needs of the developing stem and its burden of blossom. The leaves in their turn will perform the important function of transforming and communicating to the scales fresh supplies of food which will be stored in readiness for another season of flowering, and it is for
this reason that no attempt should be made to separate the foliage from the parent bulb until it indicates by its withered and shrivelled appearance that it has completed its task.

The gladiolus, the montbretia and the crocus are perhaps the most familiar types of the corm. In this case there are no fleshy scales; the corm consists of a solid substance which, as in the case of the bulb, is food held in reserve for the sustenance of the young leaves and flowers. But the great difference between the bulb and the corm rests in the fact that whereas the bulb remains, increases in size and multiplies itself by means of offsets, the corm which has supported one season's growth withers and dies. This, however, does not occur until it has reproduced itself in the shape of one or more new corms which shall do duty another year.

The class of tuberous-rooted plants is a large one, which includes such valuable and well-known subjects as anemone, ranunculus, winter aconite, gloxinia, the tuberous-rooted begonia—and of course the dahlia and the potato. A tuber is merely a swollen underground stem which forms at the base of the plant. But all tubers are not alike. Some, like the potato, are effective for one season only. They reproduce themselves, and then perish. Others, like the begonia and the gloxinia, are of perennial duration. They have the power of absorbing additional supplies of food every year, and of increasing in size.

So much by way of explanation which will be of value as we come to consider in greater detail the methods of cultivation to be followed in regard to a few of the most popular summer-flowering bulbous and tuberous plants. For purposes of uniformity it is necessary to confine this chapter to a consideration of the hardier bulbs which provide a summer display out of doors. Those that are suitable for rockery work have already been enumerated in Chapter VIII.; bulbs that are specially adaptable for greenhouse decoration are discussed in the chapter which follows.

I suppose it may be said without exaggeration that every amateur gardener possesses a few specimens of the iris. But as a rule his experiments are confined to the common flag, or German iris, and he neglects the not less beautiful and certainly not less
Diagram 34.—SUMMER-FLOWERING BULBS.

Fig. 1. Hyacinthus Candicans. Fig. 2. Plant in a clump four inches deep.
Fig. 3. Gladiolus Brenchleyensis. Fig. 4. Gladiolus planted. Fig. 5. Ranunculus. Fig. 6. Plant in drills. Fig. 7. The Anemone.
easily grown varieties comprised in the English, Spanish and Japanese sections. Let me endeavour to dispel this indifference to a most graceful and handsome race of plants. If a careful choice of varieties be made it will be possible to have one or other of the varieties in bloom from early spring until the end of July.

The earliest to bloom is iris reticulata, a dainty Oxford-blue variety, which with the snowdrops and the scillas heralds in the opening days of the year. Its favourite spot is a nook or cranny in a rock garden, where it can rest unmolested for years. This does not mean that it requires shade and damp. On the contrary, it thrives most readily in sunshine and in moderately dry but good soil.

Among the bulbous and tuberous irises the English and Spanish types are pre-eminent. They have rightly been called the poor man's "garden orchid," for their beauty and colour are unsurpassed. The English irises, which bloom first, delight in a deep, free, sandy soil. The bulbs, which cost from ninepence to eighteenpence a dozen, should be obtained in October, and planted without delay, since they are difficult to preserve when out of the ground. Among the best varieties are Mont Blanc, La Charmante, and Queen of Lilacs.

The Spanish iris is at its best in June, and in order to grow it most effectively it should be planted in broad masses or in beds devoted entirely to its cultivation. A hundred unassorted bulbs can be obtained for about a shilling, but if named varieties are desired the cost is, of course, greater. Among the varieties may be mentioned:—Beauty (porcelain blue), Sweetheart (cream), King of the Whites (large white), Unique (blue with white tips), Louise (lavender blue), and Reconnaissance (bronze).

The Japanese iris for the most part revels in plenty of sunshine, but the variety known as Kæmpferii is at its best in a damp situation by the side of a pond or stream.

Diagram 35 shows how it may best be planted to prevent its being washed away if a pond or stream overflows. Iris Kæmpferii is the tallest and largest flowered of the family. After it has once been planted, it is advisable to leave it undisturbed. The
Diagram 35.—THE JAPANESE IRIS KÆMPFERII.

Fig. 1. The site for planting selected. Fig. 2. Front view of excavation. Fig. 3. Planted. Fig. 4. The flower. When the ditch or brook is in flood the plants will not be washed away if these suggestions be followed.
roots are fairly cheap, since a dozen can be obtained for seven shillings and sixpence.

Other irises which ought to find a place in a representative collection are I. Persica Heldreichii, which blooms in February, with flowers of shades of lavender and of violet and yellow; I. Bakeriana, a miniature variety resembling reticulata, which possesses a delightful aroma as of violets, I. stylosa, which has lilac petals, and thrives in poor soil, and the Scorpion iris, alata, which produces large flowers as late in the season as October and November. Its flowers are lilac and gold, and it should be placed in a dry, warm spot.

Diagram 34 depicts a few of the more common varieties of hardy summer-flowering bulbs, corms and tubers, and shows clearly the proper methods of planting. If a tall-growing subject is required, much delight can be derived from a group of hyacinthus candidans, which throws up a candelabrum-like spike of white bell-shaped flowers to a height of four feet. It grows well in a shrubbery if the soil be made rich, or it may be planted with good effect towards the back of a mixed border. The bulbs should be covered with four inches of soil.

What a gorgeous picture, too, can be produced in late summer by a well-grown group or two of gladioli! And how easy they are to cultivate! The flowers are many-hued—they vary from the most brilliant scarlet to pure white, and from pure yellow to bright purple. The chief point to bear in mind is the need for avoiding the folly of single planting. An isolated bulb will produce its spike of bloom in due season if it be properly planted; but how much more effective will it be if it be grown in a mass!

Several weeks previous to planting in March the ground should be thoroughly well dug over. The gladiolus revels in generous treatment, and it will therefore be necessary to enrich the soil with plenty of good stable manure. This need not be buried deeper than one foot, but it should be well broken up and mixed with the soil below the surface. This will be found a better plan than that of dumping thick layers into the bottom
Diagram 36.—MONTBRETIAS.

Fig. 1. Showing the prolific nature of some varieties. Fig. 2. A bulb without rhizomes. Fig. 3. A clump protected for the winter with straw or littery manure. Fig. 4. How to pot. Fig. 5. Winter quarters.
of the trenches as the digging proceeds, and merely covering them with soil.

For the purpose of planting in beds it will be found a useful practice to plant in drills rather than in holes made with a dibbler. The drills should be at least six inches in depth and one foot apart. Into the bottom of the drills it will be advisable to place an inch or so of river sand, such as can be purchased at the florist's or corn chandler's. The object of this is to assist good drainage, so as to carry away superfluous moisture from the base of the corm, and thus prevent rotting—a calamity that often befalls the gladiolus, unless this precaution be taken. The corms should be planted eight or nine inches apart, and be covered with soil. In doing so, use, if possible, fresh soil, from which new stable manure is completely absent. There are few bulbs, and the gladiolus is not one of them, which welcome manure in direct contact with them. After planting is completed, however, a thin layer of manure may be placed over the bed. Such a mulching will prove most beneficial when the corms get into active growth.

No flowers need be expected until July, but there is no reason why the beds devoted in this way to gladioli should be allowed to remain bare during the early months of summer. Some such dwarf plants as the viola, either creamy white, like A. S. Frater, or yellow (William Lockwood), or heliotrope (Maggie Mott), may be put in between the rows. If the planting be done early there will be a rich display of bloom from April onwards throughout the summer.

Where gladioli corms are planted in clumps in the mixed border they should be deployed at intervals of six or eight inches in the manner depicted in the illustration.

The gladiolus is not quite hardy, and it is therefore necessary in order to preserve it to lift the bulbs annually at the end of October. The corms should be raised from the ground while still attached to the stem, and be tied in a bundle preparatory to storing away for the winter. The storehouse should be either a frost-proof shed or cellar from which damp can be entirely excluded. It is a good plan to hang the bunch from a nail on
the wall and to leave it there until the corms are again wanted for planting in March.

The ranunculus and the anemone should also find a place among the spring-planted bulbous plants. It is desirable to devote a small bed to each, and to set the bulbs in drills, as shown in Diagram 34, Figure 6. Care must be taken in the case of ranunculus that the claw-like root be planted with the claws pointing downwards.
CHAPTER XXXI

BULBS FOR EARLY FLOWERING INDOORS

THE study of the florist's bulb catalogue in September invariably conjures up visions of April, with its harvest of crocus, daffodil and hyacinth, welcome harbingers of summer. But there is invariably associated with this bright prospect a subconscious dread of the dreary months that must elapse before the realisation of our hopes is achieved.

Happy, therefore, is the gardener who is the possessor of a warm greenhouse. He prides himself on his ability to ensure that he shall have flowers in bloom all the year round, and he welcomes rather than dreads the approach of autumn, since he knows that by taking a little forethought he can fill every available inch of space in his frames and greenhouse with Roman hyacinths, tulips, and freesias, and have them in flower at Christmas.

But to achieve this happy result there must be no delay in getting to work once the chill and shorter evenings of August warn us that autumn is at hand. The bulbs which are intended for forcing in the warm greenhouse should be purchased before the month is out, and while the problem of ways and means is being considered, let me offer a word of warning against the waste of money involved in the buying of cheap bulbs. True it is that the temptation is great to secure a large quantity of bulbs at a low cost, but it must be resisted if satisfactory results are to be secured.

It is far better to grow a limited number of choice, sound bulbs well, than to fill one's glasshouse with bulbs of inferior quality, half of which will probably never produce a single flower. Therefore, carefully draw up a plan of operations, go to a florist of repute, and if you are in any doubt do not hesitate to ask him for the advice
Diagram 37.—FORCING ROMAN HYACINTHS.

Fig. 1. The bulbs. Fig. 2. Five-inch pot prepared with drainage, rough stuff, and soil. Fig. 3. Bulbs placed in position. Fig. 4. Fill up with soil but leave apex exposed. Fig. 5. Cover up with fibre or leaves. Fig. 6. Put on greenhouse shelf in the light.
which he is only too ready to give; be prepared to pay a fair price for a good article, and then give it the best treatment by way of cultivation of which you are capable. Herein, I am confident, after a long and sometimes painful experience, lies the secret of successful bulb forcing.

But the amateur who has never yet attempted the practice of this delightful branch of the art of gardening will naturally desire to be advised as to the most suitable bulbs to use. His choice is a wide one. For a start, however, he would perhaps be wise to confine his selection to narcissi, Roman hyacinths, freesias, jonquils and tulips.

Of the narcissi, the best-known early forcer is Paper White, the bulbs of which are fairly cheap, but a selection from other suitable varieties, such as Sir Watkin, Stella, Golden Spur, Bicolor Horsfieldii, White Perfection, Soleil d’Or, Madame de Graaf, Jaune Suprême, and Sulphur Phoenix, may also be made if greenhouse accommodation and depth of pocket permit.

The earliest hyacinth to come into bloom is the white Roman, and this is followed soon afterwards by the charming shell-pink Italian.

Tulips in great variety lend themselves readily to forcing. The best known are the Duc van Thol varieties in many shades of colour. These, however, are rather small, and if larger flowers are desired it may be advisable to purchase a few bulbs of each of the following:—Monsieur Tresor (yellow, 11 in. high), Primrose Queen (clear lemon, 9 in. high), Proserpine (rosy carmine, 12 in. high), and Vermilion Brilliant (scarlet, 10 in. high). A good white variety is White Pottebakker.

No bulb collection for early forcing is complete unless it contains a few pots of freesia. The pure white Freesia refracta alba is well known, and is deservedly popular owing to its delicious fragrance, but several new forms have been introduced in recent years, and of these the best are F. Chapmanii (yellow blotched with orange), F. alba citrina (white with a greenish shade), and Rose Queen (a delightful pink).

All these bulbs are familiar to the experienced amateur gardener,
but there are others less well known that may be cultivated with as much success, such as the Lebanon quill (Puschkinia Libanotica compacta), a pretty little white flower striped with blue which will bloom early in March; Veltheimia viridifolia, which grows two feet tall, and produces rose and green blossoms in February; Zephyranthes, rose, white, pink or yellow, which should be potted in leafy mould, one bulb to a five-inch pot; and Ornithogalum Arabicum, a lovely white flower with a black centre.

In addition to these somewhat uncommon bulbs there are, of course, many kinds of lilium, which can be brought into flower early in the spring, and also Gladiolus Colvillei, The Bride, and many varieties of Spanish iris.

The choice, it will be seen, is wide, though the varieties I have mentioned form but a tithe of those from which a selection can be made. The next question to consider is how best to secure a constant succession of bloom so as to carry us well into the spring when the outdoor garden is beginning to revive. This is an easy matter so long as a methodical plan be adopted. The bulbs should be potted in batches—first the Roman hyacinths, freesias and Paper White narcissus. These can be potted as early as the beginning of August, and others of the same varieties at intervals of a fortnight. All daffodils, polyanthuses and narcissi should be got in by the middle of September; Spanish iris must receive attention during the closing days of August, since they are early bloomers.

If careful attention be paid to labelling, and if a record of the dates of planting be kept, it will be easy to secure a succession of bloom from the end of November to the beginning of May.

An essential preliminary to the potting of the bulbs is the preparation of an adequate quantity of good soil. For all practical purposes nothing can excel a compost of two parts fibrous loam to one of leaf mould with which has been incorporated a small quantity of silver sand and bone meal. This compost will suit all hyacinths, narcissi and tulips. For freesias it will be found advantageous to add a little peat. The soil should be moist, but not so wet and sticky that it adheres to the hand.
The illustrations show how the bulbs ought to be potted. The bulbs, save those of hyacinths and freesias, should be planted with the apex just protruding through the soil. As to the number of bulbs to be placed in each pot, everything depends on the size both of the bulb and the pot. A large bulb may have a pot to itself, while in the case of smaller bulbs, such as those of the tulip, half-a-dozen can easily be accommodated in a five-inch pot.

Hyacinths should be planted so that one-third of the bulb is visible above the soil; freesias, on the other hand, must be completely buried and be covered quite two inches deep with fine soil. The bulbs of the freesia are so small that as many as twelve can safely be planted in a six-inch and nine in a five-inch pot.

When the potting of each batch has been satisfactorily completed, the bulbs should be lightly watered in with a fine-rosed can. The pots may then be placed on ashes, either in a cold frame or outside beneath a north wall or fence. They must be completely covered to a depth of four or five inches with cocoa-nut fibre or ashes. The object of this operation is to exclude the light and to promote the formation of roots, for it is useless to attempt the forcing of bulbs until a good root basis has been established. Unless great care be taken to see that this has actually happened before the pots are introduced into a warmer temperature the bulbs will only throw up stunted or deformed flowers.

The pots should be allowed to remain in the plunging material for at least twelve weeks. By this time top-growth will have begun to be in evidence, and the pots may then be removed, a batch at a time, as requirements dictate, to a cool greenhouse or frame. Here they can remain for a week or two in partial shade, and then be transferred to the heated greenhouse to bring them into flower. A temperature of between 50° and 60° is all that is required.

At the outset it will be necessary to place the pots on a shelf as near to the glass as possible. This will promote a sturdy growth, and will prevent the shoots from becoming drawn and lanky. The bulbs must be watered whenever necessary; indeed, they
Fig. 1. Guernsey grown roots, which are elongated. The best white. Fig. 2. French grown roots; larger and more plump. Fig. 3. The mixture, one part leaf mould, three parts sandy loam, and a dash of peat. Fig. 4. Pot one inch deep, six to a five-inch pot. Fig. 5. Plunge outside in ashes or fibre.
must never suffer from lack of moisture, for if they become really dry failure is inevitable.

Staking will be required as the leaf and flower stems lengthen. When the flowering period approaches a slight stimulant of liquid manure may be applied with beneficial results.

It is well to bear in mind that once they have been used for forcing bulbs are never of any value for the same purpose again. They should not, however, be thrown away. If they be ripened off in the warm greenhouse, and then planted in a border out of doors, they will supply fair-sized blooms for cutting in subsequent years.

The practice of growing bulbs in the dwelling-house for the decoration of rooms, windows and porches is becoming increasingly popular as each season comes round. Nor is this to be wondered at when it is once realised how easily the thing may be done if a few simple rules be observed. There is the further advantage that it is not necessary to confine one’s attention to one kind of bulb. There are numerous varieties, all of which lend themselves to, and thrive under, practically the same cultural treatment. The stately hyacinth, rising in sweet-scented profusion from tall window glasses, is familiar enough. But there are others, such as snowdrops, crocuses, chionodoxas, polyanthus narcissi, and tulips, all of which may be grown in the house with success; and the process has been rendered easier and more cleanly than ever by the introduction of the plan of growing them in prepared fibre instead of in garden soil and the ordinary drained flower-pot.

Bowls and pans in a multitude of artistic designs, which are especially contrived for this method of bulb culture, may be obtained cheaply at any reputable florist’s. The prepared fibre can be purchased at the same time that the bulbs are obtained.

These preliminaries having been completed, the planting of the bulbs should be proceeded with in September, since no time must be lost if it is desired to secure an adequate floral display for Christmas.

The prepared fibre will be found to contain a number of pieces of charcoal Two or three of these should first of all be picked
Diagram 39. — HYACINTHS IN GLASSES.

Fig. 1. Symmetrical bulbs should be chosen. Fig. 2. Bulb nicely balanced, showing water line and charcoal. Fig. 3. Cones of paper used to encourage root growth. Fig. 4. The result.
out and placed in the bottom of each bowl. Charcoal is a good plant food, which will sustain the bulb at a time when the roots are most in need of nourishment. Next half fill the bowls with the fibre, if the bulbs are large like those of the narcissi, and three-quarter fill them for smaller bulbs, such as those of the crocus and the snowdrop.

The bulbs may be planted so that they almost touch each other, and be at such a height in the bowl that their tips protrude when they have been covered in. Firm packing is necessary, especially in the case of large bulbs of narcissi, which, unless this precaution be taken, lift themselves by reason of the pressure of the roots on the sides of the bowl.

If the fibre is in proper condition, as it should be when it is obtained from the florist’s, it will be damp, and will require no further supply of moisture for some time. But if for any reason there be delay in the planting of the bulbs, and the fibre in consequence become dry, it will be necessary to moisten it well and to leave it for an hour or two to drain before it is brought into use.

When the planting has been completed, the bowls must be consigned immediately to some cool, dark place, in which the roots may have an opportunity to develop before top-growth begins. The question of a suitable place ought to present no difficulties in most ordinary households. A dark cupboard or cellar from which the light can be excluded will serve the purpose admirably. But if a cupboard is selected it must be cool. If it be near a chimney flue the occasional excess of warmth will promote top-growth before root action has been properly developed, and if this be allowed failure will inevitably follow.

If no such dark resting-place as I have suggested be available, the difficulty may be surmounted by p'unging the bowls in a deep box and covering them to a depth of at least four inches in common cocoa-nut fibre. If a sheet of glass be placed over the box it will help to conserve the moisture.

Until top-growth makes its appearance the bowls should be examined at frequent intervals, say once a week, or at least every ten days. If the surface be found to be becoming dry the bowls
Diagram 40.—BULB-GROWING IN BOWLS.

Fig. 1. Hyacinths. Fig. 2. Narcissus in Imari bowls. Fig. 3. The popular paper white narcissus. Fig. 4. Paper or zinc cone used to keep out light and promote root formation. Fig. 5. Section of bowl with narcissi bulbs. Fig. 6. Dark cupboard for reception of bowls till growth begins.
should be plunged in a bucket of tepid water, then be thoroughly
drained of superfluous moisture, and returned to the dark cup-
board or box. The great point to remember is the necessity to
keep the fibre nicely moist. It will be a mistake to swamp the
fibre with water every time the bulbs are examined. Some
amount of judgment and discretion must be used.

When the pale top shoots of the bulbs are about an inch high
it will be time to introduce them gradually to the light. At first
they should be placed on a table away from the window, and be
allowed to remain in this position until the spikes assume a healthy
green colour. They may then be brought into the full light near
a window, where they will soon put out their flowering stems.

With the object of inducing a uniformly upright growth, the
vases should be turned round daily. If this precaution be
neglected the stems will inevitably lean over in the direction of
the greatest light and warmth, and the shape of the plants will
be spoiled.

During the period of their growth constant attention must be
given to watering. Where possible, tepid rain-water should be
used, but if this is not procurable ordinary tap water slightly
warmed may be utilised. Great care must be taken to keep the
tender young shoots free from frost. If the bowls be allowed
to remain close to a window in very severe weather the plants are
certain to suffer. Therefore it is advisable at such times to remove
them to the centre of the room each night, or at least, as a measure
of precaution, to place a protection of thick brown paper between
them and the window. It is attention to such apparently minor
details as these that makes all the difference between success and
failure.
CHAPTER XXXII

BEGONIAS AND GLOXINIAS

IN the great galaxy of bedding plants which help to make our
gardens gay in the height of summer there are few that can
compare, either for gorgeousness, ability to withstand the
vagaries of the British climate, or ease of culture, with the tuberous
begonia. Thanks to the efforts of the professional hybridists, it
has been brought to a pitch of perfection undreamt of twenty
years ago when it first began to be popular.

The begonia is a succulent plant, and is therefore not hardy.
It is consequently necessary in the case of tubers that have done
duty in the decoration of outdoor flower beds to lift them annually
and to preserve them against damage by frost. There need be
little difficulty in ascertaining the appropriate time for lifting the
begonia from its summer flowering bed. The plant itself will
give ample warning. At the first touch of frost, and especially
in dry soils, the foliage will shrink, the stems will collapse, and the
flowers will fall. The plants should then, without delay, be lifted
carefully from the soil, using for this purpose a fork or a trowel,
and taking great care that the corm is undamaged during the
operation.

As much soil as is possible should be removed during the pro-
cess of lifting the tubers from the soil, but it is not necessary at
this stage to remove it all. The tubers can be placed on a green-
house shelf or in any suitable corner to dry, and after a few days
they will be ready for the thorough cleansing which is advisable
before they are stored away for the winter.

The storage place should be both dry and frost-proof. If the
tubers are embedded in fibre in small boxes they will have an ideal
winter home. Here they can be left undisturbed until March,
Diagram 41.—LIFTING THE BEGONIA.

Fig. 1. On the approach of frost the leaves fall.  Fig. 2. Lift carefully.  
Fig. 3. Place tubers in greenhouse to dry.  Fig. 4. After drying thoroughly clean.  
Fig. 5. Store in fibre.
Diagram 42.—HOW TO "START" BEGONIAS.

Fig. 1. Taking the tubers from their winter quarters. Fig. 2. Tuber in well-drained pot. Fig. 3. Choice begonias may be divided to increase the stock. Fig. 4. The half potted.
when they should be brought out and placed to about two-thirds of their depth in a mixture of fibre and leaf mould. They must be placed in a gentle heat and kept moist, and in a very little time pink eyes will make their appearance at the top of the corm, and roots will speedily be formed.

This is the signal that they are ready for potting. Each tuber should be potted singly in a two-and-a-half-inch or five-inch pot, according to the size of the tuber. The begonia thrives best in soil composed of turfy peat chopped fine, leaf mould, loam and sharp sand. A little charcoal may be added with advantage.

The tuber should not be buried too deeply, but be only just covered, as shown in Figure 2 of Diagram 42. Where it is desired to increase the stock the tubers of choice kinds may be divided with a sharp knife (see Figure 3) and be planted against a ball of sand, as shown in Figure 4.

It will be necessary at first to maintain a temperature of at least 55°. When growth begins freely and plenty of roots have formed, repotting will be necessary—especially where it is desired to keep the plants in the greenhouse throughout the summer. In this case the pots may be as large as eight inches across the top, but a five or six inch pot is large enough for ordinary purposes. By the time the first or second week in June arrives the plants will be strong enough for transference to their flowering quarters out of doors where it is desired to do this.

The customary method of increasing a stock of begonias is by seed-sowing (described fully in Chapter XV.). But the amateur is not advised to attempt this unless he can be sure of preserving a fairly high temperature until the plants are well established. The seed is very fine, and is expensive; the best double begonia seed costs eight pounds an ounce, but since only a pinch is needed to ensure the production of dozens of plants the ultimate cost need not alarm the economical gardener unduly.

The treatment of gloxinias, which for brilliancy of colouring even outclass the begonia, is very similar to that advised for begonias. The bulbs are considerably smaller, however, and during the season of growth it is necessary to maintain a higher
Diagram 43.—PROPAGATING GLOXINIAS.

Fig. 1. A natural leaf notched by two sharp cuts on the main rib. Fig. 2. The leaf may be laid on the ashes or fine soil on the staging among the pots, the stone being used to keep the cuts firmly on the surface of the ashes. Fig. 3. Section of the leaf in position. Fig. 4. Result after a week or two.
temperature than is required for begonias. This should be between 65° and 75°. A moist atmosphere is also essential.

It is a good plan to preserve the bulbs in silver sand during the winter, and in February to embed them in fibre refuse in shallow boxes. They must then be kept moist until new shoots two inches long have formed, when they can be potted and grown on in a stimulating heat.

The gloxinia can be raised from seed if one has sufficient time and patience to attend to the seedlings constantly, but a far easier method of propagation is depicted in Diagram 43.

If a matured leaf be removed from the parent plant, and the rib be partially cut through, as at A A in Figure 1, and if the leaf be then turned over and placed on a layer of ashes or fine soil in a box or on the greenhouse bench, as in Figure 2, it will soon produce new bulbs which can be potted up and grown on for another season.

The method is quite simple, and provides a sure and certain way of increasing one's stock of plants.
BOOK VII

THE CARE OF THE GARDEN
CHAPTER XXXIII

IN PRAISE OF THE HOE

LET us project ourselves into early June. The gardener who has kept pace with the advancing season is at last nearing the realisation of his hopes. Patches of colour here and there in the borders and beds herald the coming wealth of bloom which will gladden his heart from midsummer until the frosts of autumn proclaim its doom.

The cultivator of even the smallest garden plot, if he be a true lover of plants, will have devoted months of labour in the autumn, the winter and the spring to the endeavour to attain perfection in the summer garden. He will not have been content to let other people do the work, but will have tended his plants from their infancy, and will himself have watched over their progress until, now that the fruition of his efforts is at hand, he can wait confidently for the issue.

He may, if he be short-sighted enough, be tempted to pause in his efforts, and to let Nature unaided bring his labours to their fulfilment. He has, no doubt, ere this, cleared all his frames of tender summer plants and put them safely into their flowering quarters. His dahlias are growing apace under the influence of a week of heavy rain that came at the psychological moment; his rosebuds are swelling in a way that bears promise of a rich harvest of bloom in the near future, and in the kitchen garden his crops are healthily green and vigorous.

But if he be wise he will resist the temptation to take his ease. There is much to be done, and not the least important work of the moment is the waging of an incessant warfare against weeds. A few showers of rain during the preceding fortnight have probably brought up a crop of weeds which are growing away riot-
ously. These must be kept in check at all costs, and therefore it is that I sound the praises of the hoe. It is an indispensable gardening implement, which I am afraid is not used by the average gardener with anything like the frequency that it ought to be.

It serves two useful purposes. The first, as I have indicated, is the eradication of weeds; and the next—and it is hardly less important—is the preservation of a fine tilth on the surface of the soil.

Nothing conduces to the steady, uninterrupted progress of plants, whether they be vegetables or flowers, during early summer so much as the constant breaking up of the surface of the soil in which they are growing. Nor is this difficult to understand. If the ground be kept porous the free admission of the oxygen in the air is made possible. This acts with beneficial effect upon the plant food constituents in the soil, and increases its fertility to a degree that will surprise the gardener who has never tried the experiment.

Still another benefit which frequent hoeing brings in its train is that it conserves the moisture in the ground by preventing evaporation. If the surface be baked hard by the sun, and if no effort be made to loosen it, the moisture is brought to the surface by capillary attraction, and the roots—especially in the case of plants that thrust their roots deep into the ground—are starved.

It is after heavy rain that the soil is most likely to become baked by the sun, and it is this state of things which must be obviated by the use of the hoe. If the ground be lightly broken up it will then be in a condition to benefit to the fullest extent by the next shower.

And now for the weeds. They are worth studying if the gardener is to wage a successful warfare against them. If he has been attacking them long enough he will soon come to recognise that there are two classes—those which disappear if the tops be cut off and those that persist in making their reappearance no matter how often decapitation be accomplished. The first are annuals and the second are perennials. Some of the latter are
Diagram 44.—THE VALUE OF HOEING.

Fig. 1. The Canterbury hoe, specially recommended. Fig. 2. The short-necked hoe. Fig. 3. Sun-baked surface of soil, showing escape of moisture; a young plant receiving no benefit. Fig. 4. Top soil disturbed by the hoe, moisture channels broken and distributed; young plant receiving its share.
sturdy beggars with long tap roots, and many of them, sad to say, seem to thrive best the more they are beheaded.

Here is a list of the commonest kinds:

- Nettle
- Thistle
- Bindweed
- Dandelion
- Dock
- Plantain
- Daisy
- Clover
- Coltsfoot
- Couch grass

The only effectual method is to pull them out by the roots, and at all costs to prevent them from spreading. It is a job that requires much patience and a persistent determination, but it is worth doing well.

Annual weeds are best dealt with by the hoe. The most persistent are the following:

- Chickweed
- Speedwell
- Shepherd's purse
- Burdock
- Deadnettle
- Groundsel
- Charlock
- Pimpernel

These should be cut down mercilessly. For this purpose the flat thrust or Dutch hoe may be recommended, especially if the soil be light. Make a double stroke at each weed, the first near the surface and the next lower down, so as to do as much damage to the roots as possible. For heavy land the draw hoe will be found most useful.

The hoe can only be used effectually where the garden is cropped in rows, and, especially between vegetables, it should be kept constantly employed. For beds and borders hand-weeding is the only method worth attempting, and this should be done previous to the periodical forking up of the soil.

It is a fatal mistake to allow weeds to flower. This will certainly involve more trouble in the future, for the seed will be spread broadcast, and the weeds will multiply themselves a hundred and a thousand fold. The only safe precaution is to attack them as soon as they appear, and to give them no mercy. And here the value of good comradeship and co-operation among gardeners becomes apparent. You yourself may attack your weeds as
methodically as you please, but unless you can induce your neighbours to follow your good example the pest of weeds will never be kept in check. The winged seed from your neighbour's generous crop of thistles and dandelions will be wafted gently in the breeze over your wall or fence, will settle lovingly in your carefully tended rockery or flower beds, and you will have to pay the penalty of other people's neglect.

In the case of perennial weeds with long tap roots which have been allowed to become thoroughly established it is sometimes a difficult matter to remove every bit of root. In such an event the application of a weed killer may be recommended, if care be exercised in its use. Weeds of this character can be eradicated by thrusting into the centre of the root a skewer dipped in strong sulphuric acid. It need hardly be said that weed killers should not be used indiscriminately on the borders. The result would inevitably prove disastrous to other things than weeds.

For gravel paths two applications during the year of liquid weed killer may be recommended, the first in March and the second in September. These, with a little occasional hand-weeding, will keep the paths clean and neat. The use of salt is not altogether satisfactory, since although it will undoubtedly kill weeds, it afterwards acts as a fertiliser and helps ultimately to produce a larger crop of weeds than before.
CHAPTER XXXIV

STAKING, TYING AND WATERING

As midsummer approaches the whole energies of the gardener must be directed towards keeping the garden at a high level of excellence, and this can only be done by unceasing care and attention. Not the least important operation that falls to his lot at this season of the year is the staking and tying of his plants. It is a duty that must not be neglected if the garden is to retain an appearance of orderliness and its occupants are to be preserved from being snapped or otherwise mutilated by boisterous winds and from being dragged in the mire and utterly disfigured by heavy rain.

Where the garden is of any considerable size and the borders are filled—as they should be by this time of the year—with sturdy perennials and vigorous annuals, the task is one that calls for not a little time and patience.

It is well, therefore, to approach it systematically and to be well prepared beforehand. Most economically minded amateurs save and store for the winter the stakes and sticks used in a previous year. To prevent annoyance and possible injury to oneself owing to the snapping of rotten stakes as they are thrust in the ground, it is essential to examine them carefully before bringing them into use again. Not less necessary is it to sort them out into their various sizes, so that time may be saved while the work is in progress.

The stock should be replenished from the nearest nurseryman, ironmonger or general hardware dealer, and the sizes should range from six or seven feet in length to twelve inches. The stakes may be obtained either in the rough state, such as the stout hazel and ash stakes that are used for dahlias or hollyhocks, or
Diagram 45.—HINTS ON TYING AND STAKING.

Fig. 1. Stake firmly in the case of pot plants, and see that the stick is thrust right to the bottom of the pot. Fig. 2. Hollyhocks require to be staked firmly. Fig. 3. Tying a clump. Fig. 4. The correct tie. Figs. 5 and 6. Bad ties.
they may be carefully trimmed deal sticks, that can be purchased in bundles of a hundred at from a few pence up to several shillings a bundle. They may be either plain or painted green. The painted sticks are less obtrusive, but they are slightly more expensive. The economically disposed gardener can, however, get along quite conveniently with the plain deal sticks if he take pains to conceal his handiwork during the operation of staking, or he can paint the stakes himself.

An adequate supply of bast or raffia-tape—the latter is coloured green, and can be purchased in skeins or reels—should also be obtained. Thus armed, the successful tying and staking of his plants depends entirely on the skill displayed by the gardener.

A few guiding principles ought to be kept in mind, and they may be set forth as follows:

(1) Whenever it be possible, so stake and tie a plant that the artificial support may at least be disguised even if it cannot be kept from sight altogether.

(2) Study carefully the growth of the plant, so that when it is fully developed the stake shall not be taller than the plant itself.

(3) A good rule is to have the stake two-thirds the ultimate height of the plant. This applies particularly to lilies, whose appearance is utterly ruined if the stake protrude above the graceful heads of flowers, which should be allowed to arch over and bend downwards a little.

(4) For tall, heavy flowers like dahlias, hollyhocks, delphiniums, Gladioli and lilies see that the stakes are driven into the ground to a depth of at least a foot or eighteen inches. Press the soil round the base of the stake firmly with the heel of the boot, and be thoroughly satisfied that the stake is secure.

(5) In tying the cardinal rule to observe is to make the plant secure in such a manner that its stem is left free to develop. It should not be tied in such a way that the flow of the sap is checked in the slightest degree. Therefore the principle of looping should be adopted.
Diagram 46.—PLANTS IN POTS OUT OF DOORS.

Figs. 1 and 2 show the common practice of placing pots on the soil and gravel paths and the effect. Fig. 3. The ball with the pot removed. Fig. 4. Pots should be placed on slates, boards or tiles.
Avoid tying bushy subjects like phloxes and Michaelmas daisies so that after the bast has been drawn towards the stake and secured the head of the plant looks like a sweep's broom. Allow the plant to grow freely and naturally, and if necessary use more than one stick. This applies particularly to delphiniums, whose sappy and brittle stems need thorough protection from the wind.

Do not be content with one round of staking and tying, but examine the plants at frequent intervals, and as they reach upwards supply the necessary support.

If these rules be observed sudden storms of wind may be defied, and the appearance of artificiality which one finds in not a few gardens will be happily lacking in your own.

All this will help to provide an air of tidiness in the garden as the season develops. But there are other essential duties to be attended to if it is to be maintained. One of these is the constant removal of spent flowers. Every gardener knows, of course, how necessary this is in the case of sweet peas, violas and pansies; but how frequently does one find the same duty neglected in the cases of geraniums, fuchsias and petunias, and annuals such as Shirley poppies, godetias and cornflowers. If any of these plants be allowed to run to seed, their flowering period must inevitably be considerably shortened, and in the case especially of the annuals they speedily turn yellow and fade away. Nothing then remains but to pull them up and throw them on the rubbish heap.

The watering of plants in the open, while of course necessary in periods of prolonged drought and heat, is a matter that requires careful discrimination on the part of the amateur gardener. The country gardener is fortunate above his town-dwelling fellow in that he is in nine cases out of ten the happy possessor of a great rain-water butt, the contents of which, warmed by the sun, may be used fearlessly without involving danger to the health and well-being of his plants. The town dweller is not so happily circumstanced. He has to depend mainly upon the household supply for his needs, and he is never better pleased than when in the dusk of a hot summer's evening he essays the task of directing
Box Edged Paths.

On the left of the picture is a climbing rose, and to the right of it is a fine clump of delphiniums.

Photograph by Capt. J. D. Reeth, R.A.
douches of icily cold water through the hose pipe on his beds and borders. In contemplative mood he smokes his pipe and, almost oblivious to the task in hand, directs the silver stream, straight from the “main,” at the foliage and stems of his sweet peas, and then discovers to his dismay a day or two later that they have collapsed and been utterly ruined. Plants are in many ways as sentient as a human being, and the cold douche may have produced a chill—a veritable shock to the system from which there is no hope of recovery.

The moral is plain. Use soft rain-water for the supply of necessary moisture to plants wherever and whenever it is procurable. But failing that, and being compelled by circumstances to depend upon cold hard water, direct the stream to the surrounding soil rather than straight at the base of the stem. If it be afforded in generous enough quantities it will find its way to the roots, and as it percolates through the soil will become sufficiently warm before it reaches its destination to afford the maximum of benefit to the growing plant.

Except in the case of tiny seedlings whose roots have not yet penetrated far below the surface of the ground, and whose prosperity depends upon a frequent application of moisture in dry weather, the constant use of the hose and the watering-pot ought not to be necessary so frequently as the beginner in gardening supposes. Even in the event of a fairly long drought—and by this I mean a couple of weeks, for a longer period of dry weather in this country is a very rare event—water should be withheld as long as possible. The day when watering becomes absolutely necessary may be postponed for a time if the gardener will only make more frequent use of the hoe and the small fork. Keep the soil porous and you will help to keep it moist.

But when once you start watering do it thoroughly—a mere sprinkling with the watering-can will be worse than useless. Pour the water round the bases of rose, phlox, delphinium and dahlia in generous quantities so that the roots may really benefit by the supply.
CHAPTER XXXV
SOME COMMON PESTS

It is only when the beginner comes to close grips with the art
and practice of gardening that he realises that there is a
seamy side to his hobby. His breast swells with satisfaction
as he contemplates a bed of well-grown roses at the zenith of
summer, and as he gazes with well-merited satisfaction at a clump
of perfect sweet peas which are a tribute to the assiduity with
which he has carried out the cultural rules laid down by experts.
He knows, however, as the mere onlooker does not, that his
success has only been achieved by the waging of an incessant
warfare against the multitude of insect and other enemies that
assail his fruit, his flowers and his vegetables.

The gardener needs to keep close ward and watch over the
foliage of his plants at all seasons of the year, but he requires to be
specially vigilant in this respect as spring is merging into summer.
Probably, as frequently occurs in normal seasons, a period of
almost tropical weather in the middle of May stirs into life and
activity myriads of foes to vegetation. At the first sign of the
oncoming of the devastating host the gardener must be ready
to attack and to exterminate it. For if once the investing army
be allowed to capture the citadel all may be lost. It may be too
late then to attempt to expel it; irreparable damage will have
been done.

And in order that the attack may be carried on with methodical
precision it is well to bear in mind that there are two great classes
of insect pests that it will be necessary to fight. These are pests
which in one stage of development or another injure the plants
beneath the surface of the soil by attacking their roots, and those
that feed on the leaves and young sappy stems that emerge above
the ground. I have already mentioned the point, but it is worth emphasising again, that half the battle against grubs, maggots, caterpillars and slugs is won in the autumn and winter by the gardener who digs his soil early, turns it over often, and exposes both it and the insect life it contains to the rigours of frost and snow. The career of many a promising grub is thus cut short, and much future trouble averted, whereas if he and his kind had been left undisturbed throughout the winter in a neglected piece of ground they would have come forth as soon as the atmospheric conditions were genial enough and wrought their wicked way through many a promising batch of seedlings and young vegetables.

But though thorough cultivation of the soil will do much to mitigate the evil, there will still be plenty of work before the gardener who seeks to keep his plants clean and healthy, and for his guidance I have set out in the following pages a list of the commoner garden pests which he will encounter, together with a few hints as to the methods by means of which they may be combated. Dealing first with the pests which attack the roots of plants, we have:

**Wireworm.**—This grub is among the most destructive of its kind. It has a long slender yellowish body with a dark brown head and three pairs of legs. The best way to trap the wireworm is by burying small slices of turnip, carrot or potato in the soil near its haunts. The slices of turnip, etc., should be secured on a skewer, and lifted every morning. The wireworms can then easily be caught and destroyed.

**Cockchafer Grub.**—This grub is nearly white and has a bluish tail. It is not so easily trapped as the wireworm and must therefore be killed whenever, in digging the soil, it is discovered. The cockchafer itself, which is a brown leathery beetle, flies at night and should be destroyed on sight.

**Leather Jacket Grub.**—This is the common daddy-long-legs grub which attacks the roots of grass. He may be trapped in the manner recommended for wireworms. The grub is legless but moves with great rapidity. Where a lawn is attacked
a good plan for destroying the grubs is a frequent rolling of the grass.

The pests that make their attack on the leaves and stems of plants form a much larger class, and first among them is:

**THE APHIS.**—This is the common greenfly, which, in spite of its diminutive size, can, by reason of its marvellous powers of reproduction, cause untold damage in an extremely short space of time. Here thumb-and-finger work may be recommended at the outset and in cases where the aphis has not secured a foothold.

But where a firm hold has been obtained nothing remains but to bring the syringe and a suitable insecticide into operation at once. (See Chapter XXI., "Rose Pests.") Use a strong syringe so that a powerful stream may be directed at the affected parts, and thus dislodge the enemy.

**CUCKOO-SPIT.** (See Chapter XXI., "Rose Pests.")

**GOOSEBERRY CATERPILLARS.**—These are the bane of the gooseberry grower's life. An excellent plan where they have not secured a good hold is to place sheets of paper on the ground beneath the bush, and give it a vigorous shake. Many caterpillars can in this way be dislodged, and afterwards killed. Where this is not completely effectual, hand-picking will serve the purpose. Other methods are to dress the foliage above and beneath the leaves with slaked lime, especially after rain or heavy dew, while they are still damp. Repeat the dressing at intervals.

**BLACK FLY.**—This pest makes its appearance nowhere more certainly than at the top of the stems of broad beans in dry soil just as the beans are coming into flower. The tops of the stems should be cut off as soon as the fly is detected, and burned.

**RED SPIDER.**—This is a minute pest that attacks gooseberries, violets, and many greenhouse plants. The best remedy is a frequent application of cold water overhead. If liver of sulphur be added to the water at the rate of a quarter of an ounce to the gallon, the disappearance of the pest will be more rapid.

**CABBAGE BUTTERFLY.**—The white butterfly will be found to be
very busy among the cabbages, propagating its species by laying eggs in the heart of the plants during May. The larvae are thus difficult to get at, and whenever it is possible the butterfly itself should be destroyed. Otherwise a multitude of the familiar green caterpillars will speedily make their appearance, and then there remains nothing but to search for them among the leaves and kill them outright. Dusting with lime is said to be effectual, but this operation will need to be repeated after every shower.

**Turnip Flea-Beetle.**—This is a most destructive insect which often destroys a whole breadth of young seedling turnips. The best preventive is constantly to keep the hoe in play between the rows. Frequent dustings of soot and wood ashes after rain or heavy dew will also keep it in check, while another mode of attack is to spray the leaves with an emulsion of quassia extract and paraffin.

**Celery Fly.**—The larvae of this pest cause great damage by tunnelling between the membranes of the leaves. A good remedy is to spray the young plants with quassia solution once a week during the early stages of their growth. This acts as a deterrent to the fly laying its eggs.

**Onion Fly.**—This is a very troublesome pest if it be allowed to get a firm foothold. The method recommended for celery fly should be adopted. The important thing is to keep the young shoots coated with the insecticide so long as the fly shows a propensity to lay its eggs.

**Woolly Aphis.**—This pest is perhaps better known as American Blight. Its ravages in orchards are disastrous unless means be taken to check them. It is a small bug which envelops itself in a mass of white filmy threads resembling cotton wool. On its first appearance in small patches it may be possible to eradicate it by dipping a camel’s-hair brush in methylated spirit and thoroughly wetting the affected part. But when the disease is widespread recourse must be had to spraying with a solution of soft soap, crude potash and caustic soda. The proper proportions are one pound of each to seventeen gallons of clear water. This
preparation needs to be used carefully owing to its burning properties, and it should only be applied in winter, when the trees are without foliage.

The Pear Midge.—This small fly lays its eggs in the centre of the flower when the trees are in blossom. The maggots thus produced feed inside the young fruits, cause malformation, and induce premature falling. The object to be aimed at therefore is to prevent the midge settling on the blossom, and this is best done by spraying with liver of sulphur at the rate of one ounce to the gallon, just before the buds open for blossoming.

Wasps.—These do great damage just as fruit is becoming ripe in the orchards. Nests should be sought for and destroyed, which can most conveniently be done by pouring in a quantity of gas-tar. Wasps may be trapped by placing jars containing a mixture of beer and sugar among the trees.

Slugs and Snails—The amateur gardener who sallies forth with lighted lantern on moist summer evenings in search of snails and slugs is often held up to ridicule by his non-horticultural friends. But this plan of attacking the foe has everything to recommend it, and he should not be discouraged from pursuing it if he have time and patience enough for the task. Slugs, especially in neglected gardens, make their appearance in thousands after heavy rain, and then is the time to make war on them. A useful check to their work of devastation may be found in frequent dustings of a mixture of slaked lime and soot along rows of sweet peas, and round the roots of violas, pansies, delphiniums and other tender plants. Where they can be obtained an excellent trap can be made of brewers' grains. Place a handful, in the evening, near the plants attacked, but by no means in contact with them, and if the day has been dry water the surrounding earth slightly. Go out when it is dark, carrying a lamp and a jar of strong solution of salt, and if you are troubled with slugs you will find many of them congregated all round and on the grains, and, indeed, coming towards them on all sides, quite forgetting the plants which appeared so tempting before. If dropped into the solution mentioned as they are gathered they seem to die almost directly.
you clear each patch of the pests place a cabbage leaf lightly over it, and when you go out in the morning—the earlier the better, by the way—you will probably find a great many more, and also have the pleasure of seeing that no harm has been done during the night.
BOOK VIII

THE PROPAGATION OF PLANTS
CHAPTER XXXVI
WAYS AND MEANS

The cardinal truth which the gardener learns at the very outset of his practical experience, that next year's garden is made out of this year's, is never brought home to him more vividly and convincingly than when he essays the task of propagating a few plants which shall increase his stock and provide him with the wherewithal to furnish his flower beds and borders another season. If his ambition be, as it will be when the love of gardening has gripped him, to depend mainly upon his own unaided efforts for his supply of young plants, he will also come to realise that his hobby demands perennial and constant attention, and that either in the direction of seed-sowing and propagation by means of cuttings or layering he will find a task ready to his hand during every month in the year.

But in order to achieve success he must have the necessary appliances. He will require to call in artificial aids, and among them all the cold frame is the most indispensable. For tender and half-hardy plants, the shelter of the warm greenhouse will be necessary at certain stages of their development, while yet another useful adjunct, especially in early spring, will be found in the hotbed over which a glass-covered frame can be placed to conserve the heat. The subject of greenhouse management is discussed in another part of this book and I need not therefore enlarge upon it at this point.

It is, however, upon the cold frame that the amateur will largely depend for his propagating operations at the outset, and the provision of this invaluable accessory to the well-equipped garden demands some consideration. The frame need not be a very elaborate affair. In my own garden I have a home-made
frame in which year after year hundreds of shrubby calceolarias have been "struck" and wintered. Its framework consists of the sides of an old flat packing-case, the bottom of which was knocked out. A glass covering which cost only a few shillings was made to fit over the top, and the thing was complete.

Ready-made frames are, however, easily procurable from the horticultural builders. A small frame will cost from ten to twelve shillings, larger and more elaborate erections proportionately more. But in any case it will be money well spent, for by its aid wonders can be performed which would be utterly impossible without it.

Where there is room in the vicinity of a greenhouse it is a good plan to have a low frame fixed close up to the lower panels of the greenhouse and on its sunniest side. If trap doors be cut in the panels, so that the heat from the hot-water pipes may circulate through the frame, slight frost can easily be excluded, while if the cold become intense the use of a few mats will effectually preserve the plants from damage. A frame constructed on this principle is also far more effective for propagating purposes than an absolutely cold frame. Thus one finds it easy to "strike" cuttings of geraniums, violas, pentstemons and the like in early autumn, and to keep them growing steadily until the time comes for planting them out of doors.

The hotbed may be used for a variety of purposes, and is especially valuable in propagating work in the absence of a heated glasshouse. For example the seeds of flowers and vegetables may by its aid be germinated and grown on at a much earlier period of the year than is possible without it, chrysanthemum cuttings may be struck, and dahlia roots started. But excellent as are the advantages of a hotbed it would be a mistake to suppose that the utilisation of its beneficent influence can be carried into operation until a day or two before the time arrives for seed-sowing or the striking of cuttings.

The making of a hotbed is a comparatively simple matter, but it takes time, and the amateur gardener who intends to employ it to the best advantage must set about its construction several weeks before he intends to sow his seed or plant his cuttings.
Diagram 47.—THE HOTBED.

Fig. 1. The site may be excavated if there be no standing water. Fig. 2. The bed shaped and watered in to produce fermentation. Fig. 3. Dimensions of the finished bed. Fig. 4. Interior of a single-light frame with pots plunged. Ventilation may be given, as shown, by using bricks or flower-pots. Boxes of seeds or cuttings are placed on fibre or ashes,
A hotbed possesses merits peculiarly its own over every other form of artificial heating. In the first place, the atmosphere produced within the frame is especially genial and favourable to young growth, and in the next, after it has served its primary purpose in the raising of seeds, its utility as a valuable manure is not to be despised. Again, after the earliest seedlings have been produced the frame and the hotbed may be used with profitable effect for the summer growth of cucumbers or melons.

How, then, should a hotbed be made? Diagram 47 gives some valuable hints in regard to its construction; but before the processes there depicted are reached it will be necessary for the gardener to determine how large a hotbed he requires, and to order the proper quantity of stable manure accordingly. For the amateur's single-light frame—say four feet six by three—in which it is desired to maintain a growing temperature from the end of February to the beginning of April, at least two loads of manure will be necessary. This should be absolutely fresh from the stable, and it should consist half of manure and half of straw stable litter. Avoid, above all things, manure with which peat moss and sawdust have been incorporated. If possible, have the fresh stable manure brought to the garden a week or ten days before it is intended to make up the hotbed. This is necessary, so that the manure may be got into proper condition for use.

The composition should be formed into a conical heap directly it arrives. Every hard clump or clot must be broken up and the litter shaken out with a fork. Where in places the straw has become dry or mildewed, it should be watered with a rose-can and be well incorporated with the rest of the material. When the whole heap has thus been turned over and carefully formed, it should be allowed to stand for a couple of days. By that time, so strong will the process of fermentation have become that the mass will be steaming hot.

The operation of turning the whole heap over must now be repeated, care being taken to see that what was first at the top and outside is now at the bottom and in the centre of the mound. As each layer, a foot or so in depth, is placed in position water
PROPAGATION BY LAYERING.

The picture at the top shows a shoot of Aucuba Japonica with incision in stem prepared for layering. Below the shoot is seen layered in position and covered with soil.

Photograph by Charles Jones.
must again be applied through a rose-can. If the heat is still too strong, the same process, after two or three days' interval, must be repeated, and then, after another brief period of waiting, the construction of the hotbed proper may be proceeded with.

The bed should be shaped as depicted in Figure 2 of the diagram, and it should have an area on the surface large enough to allow a margin of a foot or eighteen inches on each side of the frame. In building up the bed the great object to be attained is that of solidity and uniformity. Mark out a plot as shown in Figure 1, and if there be no danger of standing water excavate to a depth of a foot. Fill in the material so that the heap is at least four feet above the ground-level, and tread each layer down firmly. It is a good plan to work from the edges towards the centre, so that the innermost forkful is always the last.

Push a stake about three feet into the centre of the bed; withdraw occasionally to test the heat, and when the stake can be comfortably grasped the hotbed is ready for the operations that follow.

When the bed has been properly shaped spread four inches of garden soil over the manure inside the frame. This keeps down the rank steam which would rise through the hotbed if it were allowed to remain uncovered. The light should now be put on the frame and closed down. A thermometer may then be hung on a nail fixed inside the frame, and the heat tested. If it is too strong—that is to say, higher than 75°—the bed should again be damped down with water, and the light be raised an inch or so from the top end of the frame. This will help to disperse the vapour, the colour of which should be observed as it settles in small globules on the inside of the glass. At first they will be the colour of beer, but as the heat declines they will become clear. This is a sign that all is now well, and that it is safe to put in the seeds or cuttings.

Perhaps the most important operation associated with the propagation of cuttings is the preparation of the soil. Let us see what is the object to be aimed at in this direction. It is the production of a compost which shall be fresh and sweet, and at the
same time shall not retain moisture in such quantities as to make the soil sour. Stagnant moisture is the great bane of all unrooted cuttings. If ordinary soil and leaf mould be the only ingredients in the compost stagnation is inevitable, and it is worse than useless to attempt to strike cuttings in such a compost.

"Damping off," as it is called by the professional gardener, can be obviated by incorporating with the soil a plentiful supply of sand. And when I write of sand I do not mean the dark yellow material which the builder uses. The proper kind of sand is almost white. It is "sharp," gritty and coarse, and consists almost entirely of water-worn nodules, pebbles and flint. This can be obtained in sufficient quantities and at a reasonable price from any florist or seedsman. An ideal mixture for the reception of cuttings should be composed of light loam, leaf mould, peat and sand. These constituents should be mixed thoroughly, and passed through a quarter-inch sieve.

The next point to be decided is whether the cuttings shall be induced to root in pots, boxes, or in a bed made up in the frame itself. The last-named plan is undoubtedly the best for shrubby calceolarias. If the cuttings be zigzagged three inches apart in rows three inches asunder they will root readily, and when growth becomes vigorous in the spring they will have room for expansion. If pots or boxes are employed it is of the utmost importance to have them thoroughly clean. More failures in gardening than the inexperienced amateur imagines are due to the use of dirty, non-porous pots. If possible, use new, well-made, light red-burnt pots for cuttings; but where it is necessary to use old pots, see that they are scrubbed absolutely clean before bringing them into use. The same precaution is necessary in regard to the crocks used for draining the pots. Attention to details such as these may mean all the difference between success and failure.

You will also require a dibbler, with which to make spaces in the soil for the reception of the cuttings. This may be constructed from the sharpened end of a stout flower stake, which should be the thickness of an ordinary black lead pencil.
NOW for the cuttings! It will naturally be asked at the outset what are the plants which the man with a small garden and unheated glass structures can hope to propagate with success. The beginner in the art of propagation will probably give expression to the doubts and problems that confront him somewhat in the following form:—

(1) What plants can I raise from cuttings in small (26 in. by 21 in.) garden frames WITHOUT BOTTOM HEAT?
(2) When should cuttings be taken?
(3) Should the blooms be taken off the plants before cutting; if so, how long before?
(4) When the cuttings are in the frame should the latter be kept closed?

I will first of all attempt to answer these pertinent questions generally and then deal in detail with the methods of propagating a few of the plants that usually find a place in the amateur’s garden.

The solution of the problem what to propagate in a small cold frame depends largely upon the character of the present occupants of the garden border. Shrubby calceolarias are among the bedding plants that are probably easiest to propagate, and the gardener will devote at least a small portion of his somewhat limited accommodation to maintaining a stock of this excellent plant.

If at the end of August his garden is gay with violas he should on no account neglect to propagate a batch or two of cuttings.
The professional gardener divides his cuttings into two classes—namely, hard and soft wooded—and it is to the latter class that the viola belongs. Happily, also, the viola is a hardy subject; therefore there need be no hesitation about consigning the cuttings to a cold frame.

Another most delightful border plant which lends itself readily to this method of propagation is the pentstemon. No amateur gardener who has once included the pentstemon in his collection will care ever to be without a few well-grown specimens, and if he "take" cuttings in September and insert them in a cold frame he will have no difficulty in increasing his stock.

Among hard-wooded subjects suitable for cold frame treatment there is a wide range of choice in evergreen shrubs, some properly prepared cuttings of which are depicted in Diagram 48.

Shrubby veronicas may also be raised in a cold frame, while a nice little stock of own-rooted rose-trees, especially the climbing varieties, such as Crimson Rambler and Dorothy Perkins, may be obtained if the precaution be taken to insert them very firmly in sandy soil to a depth of about six inches.

Another method of propagating hard-wooded plants, the cuttings of which do not root readily in the usual way, is that known as layering.

The plan is to make an incision in a portion of the bark and wood in the lower side of a branch, to peg the newly formed tongue down in the ground, and cover it to a depth of two or three inches with a mixture of fresh loam and sand. By this means a stock of ivies and rhododendrons may also be raised.

Let me here offer a word of warning. In making a choice of bedding plants upon which it is intended to try the experiment of propagation in an absolutely cold frame, avoid all attempts to include zonal pelargoniums (commonly called geraniums), marguerites, heliotropes and fuchsias. All are half-hardy, and any endeavour to propagate them without the aid of artificial heat must end in inevitable disaster.

With regard to Question No. 2, "When should cuttings be taken?" the answer is, either in spring or early autumn, and, as a
general working rule, after the plant has reached its highest stage of development. Cuttings that are best "struck" in spring, such as fuchsias, dahlias and chrysanthemums, must have the assistance of protection from frost and the stimulation of artificial heat; harder subjects, such as shrubby calceolarias, violas, pansies and pentstemons, provide strong plants if the cuttings be taken during the months of September and October.

And here the beginner may be assured that he need have no hesitation in "taking" cuttings while any of the last-mentioned group of plants is still in flower. Take the viola, for example. It does no possible harm to a well-developed clump to take off a few cuttings as early as the month of July, when it is flowering prodigiously, and root them out of doors. The effect of reducing the size of the parent plant is to give it increased vigour, and to prolong its flowering period.

The preparation of the cuttings is not a difficult matter if it be remembered that the power of protruding buds or roots resides chiefly at the joints, or those parts of the stem where leaves or buds already exist. For this reason cuttings ought to be cut across horizontally in the majority of cases, and in all cases the closer to the joint this is done (providing the entire joint, with the side eyes intact, is retained) the better is the chance of the successful formation of roots.

When inserting a cutting in the soil care should be taken to see that its base rests firmly on the bottom of the hole that has been made previously with a lead pencil or similar pointed piece of stick. Unless this precaution is taken the cutting will hang loosely in the hole and will rot off, because its base is not in contact with the soil. Firm planting is also essential. Water should be given copiously as soon as the planting has been completed, in order to settle the cuttings in the soil.

And now I come to the fourth question: "When the cuttings are in the frame should the latter be kept closed?" The answer is: Yes, for a week or ten days immediately after the cuttings are inserted. Afterwards, however, the subject of ventilation will require judicious care. When the young cuttings have
settled down into their new quarters air must be admitted to the
frame on all suitable occasions. It should be done, however, so
as to avoid strong draughts. This can be accomplished if note be
taken of the direction of the wind, and the ventilator or light be
tilted accordingly. Until really cold weather sets in the frame
may be left slightly open at night, but when frost threatens it
must, of course, be closed, and in the case of a severe visitation it
may be necessary to afford additional protection by placing mats
over and around the frame. But above all avoid coddling. The
great essential is to produce strong, sturdy plants, and this can
never be done unless they have plenty of fresh air.

Appended are some practical hints about the propagation of a
few favourite plants:—

CALCEOLARIAS.—The amateur must distinguish between the
two classes of calceolaria—namely, the shrubby or hard-wooded,
which do duty year after year in the decoration of the open border,
and the herbaceous, which are usually raised from seed and pro-
duce large pendulous multicoloured flowers under the stimulus
of gentle warmth in the greenhouse. It is the shrubby calceolaria
with which we are concerned here.

If the stem of a plant be examined in September it will be found
that it carries small shoots bearing four or five leaves. These
shoots may be detached from the stem by a sharp downward pull.
If this be done skilfully the shoot will carry away from the stem
a small heel, which should on no account be detached, since this
will help in the production of roots. The lower leaves should be
removed, and the cutting is ready for insertion in the soil.

Cuttings suitable for propagation are produced in such pro-
fusion by the shrubby calceolaria during early autumn that if
the accommodation be available it is worth while to devote one
small frame entirely to their welfare during the winter months.
Where this is possible a bed of sandy soil should be made up
inside the frame and the cuttings be inserted three inches apart
in rows three inches asunder. This will allow room for develop-
ment when root action begins in the spring and the plants
begin to grow apace. After the plants have been well watered in
Diagram 48.—CUTTINGS OF SOFT-WOODED PLANTS.

The diagram shows the proper method of making cuttings of soft-wooded bedding and greenhouse plants: Fig. 1. Zonal Pelargonium. Fig. 2. Begonia, “Madame Charrat” (winter flowering). Fig. 3. Coleus. Fig. 4. Show Pelargonium. Fig. 5. Gazania Splendens. Fig. 6. Heliotrope. Fig. 7. Marguerite. Fig. 8. Calceolaria (yellow). Fig. 9. Campanula (Isophylla alba).
the light should be kept closed for a week or ten days, afterwards air must be given on all favourable occasions. The only precaution that needs to be taken is to protect the cuttings from severe frost by means of mats.

Soon after growth becomes active in early spring the top of each stem should be pinched out so as to promote a bushy habit. By the middle of April they will have become strong and sturdy, and may then be planted out in the beds and borders where they are to flower.

VIOLAS AND PANSIES.—The propagation of the viola and the pansy may be undertaken in late summer or early autumn, provided the conditions are favourable. It would not be wise—indeed, it would most assuredly be followed by failure—if the attempt were made during hot, dry weather. Dull, showery weather is the best time to perform the operation. Some such period should be watched for in August or September and advantage be taken of it.

A glance at Diagram 49 will afford several useful hints as to the best method of propagation by means of cuttings. The large group at the top of the picture shows the kind of clump from which the cuttings may be taken, and the portions indicated in black show the right kind of cuttings to take. These are made from the short sturdy growths sent up from the base of the plant.

The cuttings should be trimmed as in Figure 3. The lower leaves are removed from the stem and a sharp horizontal cut made just below the lowest joint. Avoid above everything the kind of cutting depicted in Figure 4. This is hollow, and should be discarded as useless. In selecting a batch of cuttings care should be taken to keep each variety separate and properly named, so as to avoid confusion when the time comes for planting out.

As to the best place in which to put the cuttings, it will not be difficult to arrive at a decision if the natural preference of the plant for shade and moisture be borne in mind. If you have a cold frame and can spare space in it for a few dozen viola and pansy cuttings, put it in a cool corner facing north. This will save you a good deal of trouble in providing shading later on. It is a good plan
to place the frame on a raised bed composed of finely sifted soil and road grit. This compost should be pressed down firmly, and be edged with boards on all sides, so as to have the bed six inches above the ground-level.

Next comes the work of inserting the cuttings, and the only implements required are a dibbler and a small tray of sharp sand. First draw parallel lines three inches apart from top to bottom of the bed, and along each line scatter a slight covering of sand. In drilling the hole to receive the cutting care must be taken to make it to the proper depth, so that the base of the cutting may rest firmly on the soil. The cuttings should be placed two inches apart. As each row is completed the proper label bearing the name of the variety should be placed in position.

When the bed is full the frame should be placed over it, and the cuttings be supplied with a good sprinkling of water. The light must then be shut down, and kept closed for a few days. Shading should be supplied if it is required, and at the end of a fortnight the light may be raised and air admitted to the frame.

If cuttings be taken early in August, sturdy little plants will have formed by the beginning of October, and they may then be planted out in the beds and borders for flowering in the following spring.

An even simpler method of increasing the stock of violas and pansies is that known as division. This can be done in the autumn and the spring. The old clump should be taken out and just pulled to pieces. Care must be taken, however, to see that each piece has an attachment of roots. In the case of well-rooted sections they may go into their flowering quarters without delay, and if room cannot be found for them temporary quarters may be made in a frame or a prepared bed in a fairly sheltered spot. Planting out can then be postponed till the spring, but it will be found that the strongest clumps and the earliest flowers come from autumn planting.

GERANIUMS (Zonal Pelargoniums).—"Geraniums!" I can imagine many of my readers exclaiming, "Why can't we propagate our geraniums?" Of course you can, but let not the gardener...
who has no proper heating apparatus in his greenhouse or frame
be deluded into the belief that he can preserve his geranium
cuttings through the winter. Unless they can be kept fairly dry
and free from frost failure is certain. If an attempt be made in
autumn to strike cuttings in an unheated frame there is always
the danger to be faced that they will "damp off" as soon as cold,
wet weather sets in.

These perils may be avoided if an early start be made in the task
of propagation, and I strongly advise that it be undertaken
towards the end of July or early in August. This can be done
without the aid of glass. The cuttings, if planted out of doors,
will root readily in a month or six weeks.

Diagram 50 will afford some hints on the proper methods to
be adopted in preparing the cuttings. First of all select strong
growing plants from which to take "slips," and adopt some kind
of system so as not to strip a plant completely and make it un-
sightly, for it must be borne in mind that there are still two
months in which we may expect the geranium to make our
gardens gay.

Figure No. 1 in the diagram shows the kind of cutting to be
secured if possible. All flowers should be cut off where it has
been impossible to obtain a "slip" without buds. Very little work
is required to make the cutting ready for insertion in the
ground, but what little work there is is important. First pull
off the two lowest leaves as indicated by the dotted lines in
Figure 2; next remove the stipule at the base of the cutting as
shown in Figure 4; and third, make a clean cut at the point
marked "A" in Figure 1. This last rule should be strictly
observed. Many amateurs make the mistake of cutting through
the "slip" slantwise. The transverse cut is the correct
method.

While in the case of most tender plants cuttings should not be
allowed to droop or flag, the opposite policy seems to be a good
one for geraniums. It is an excellent plan to allow an interval
of a day between the taking of the cuttings and their planting out.
This allows time for the "slips" to dry off somewhat; it gets rid
Diagram 49.—PANSY AND VIOLA CUTTINGS.

Figs. 1 and 2. The clump and the parts to select for cuttings. Fig. 3. The cutting trimmed. Fig. 4. Hollow stems are useless. Fig. 5. Dibble into a cold frame, using a little sand in each hole.
of excessive moisture, and hardens the cuttings so that they can withstand all kinds of treatment.

If the cuttings are planted out of doors, see that the soil is fairly light, and incorporate some coarse sand with it. Geraniums may be started in pots, and the soil for these should be composed of half loam and half leaf mould, with a good quantity of sand. Six or eight cuttings can be inserted round the edge of a six-inch pot. Another method is to place the cuttings in a box eighteen inches long, twelve inches wide and three inches deep. Holes should be bored in the bottom of the box to allow for drainage, a few rough ashes and crocks placed in first, and the prepared soil afterwards. Three or four dozen cuttings can be inserted in a box of this size.

Another golden rule to observe is to see that all cuttings are inserted firmly. No cutting is tight enough if it can be pulled out of the ground easily. Firm planting entices the new roots to get to work quickly, and this helps to ensure success.

A good soaking of water when the cuttings are inserted will last a long time if the weather be not too hot. Care must, however, be taken not to allow the roots to become absolutely dry, otherwise the leaves will wither and fall off, and the life of the cutting may be endangered. But as a rule it is better to give geranium cuttings too little water than too much.

As soon as the cuttings in pots or boxes have become properly rooted they may be transferred singly into small pots and allowed to grow on out of doors until danger of frost appears. They must then be removed to their winter quarters, preferably the top shelves of the warm greenhouse.

If the plants are intended for outdoor bedding it will be necessary to transfer them to larger pots in March, and a month later place them in a cold frame to harden off so as to have them ready for planting out during the third week in May.

Where artificially heated frames and glasshouses are available, cuttings of geraniums may, of course, be "struck" at any time. In the case of cuttings taken in the autumn they will be ready for bedding out in early summer; those propagated in
Diagram 50.—GERANIUM CUTTINGS.

Fig. 1. Cutting trimmed; (a) exact point to cut. Fig. 2. Detach two leaves of the stem, which should be bushy and short. Fig. 3. A cutting inserted in a small pot. Fig. 4. The stipule which must be removed from lower joint.
spring will provide a display of bloom in the greenhouse during winter.

VERBENAS.—The verbena, like the carnation, is essentially a plant that lends itself to propagation by means of the process known as layering, as may be seen by a glance at Diagram 51. The long shoots may easily be bent downwards and be placed lengthwise along the ground. All that is then required is that they should be pegged down with pins, such as those depicted in Figure 8 of the diagram.

Before the layering is begun it is necessary to fork up the ground round the plants and to top-dress it with a shallow layer of fine new soil. The stem which it is intended to layer should then be placed flat on the surface of the soil and be pegged down in two or three places. New leaves will speedily make their appearance, as indicated by the dotted lines in Figure 1. The lower section of the diagram shows the method of layering border plants, spreading them out neatly and evenly so as to give plenty of room for the development of new roots and shoots.

When these have been produced and have become well established they may be detached, by cutting with a sharp knife, from the parent plant. The young plants should then be dibbled in boxes of fine soil, and be placed in a cold frame until the approach of wintry weather, say, about the middle of October. The hardier the growth during the earlier stages of their existence the better will their constitution become, and the less likelihood will there be of damping off or an attack of mildew when the time comes for transferring them to warmer quarters during the winter months. A frame which can be heated to keep out the frost is an ideal place for wintering verbenas. It is enough to maintain a temperature of 45°. Excessive coddling would only prove fatal.

Verbenas may also be propagated by means of cuttings. These can be taken in July and August, and they will thrive in a frame or under a bell glass in the open if young, strong, healthy shoots without flower-buds are selected for the purpose.

EVERGREEN SHRUBS.—The methods of making cuttings from the shoots of a few representative evergreen shrubs are depicted
Diagram 51.—LAYERING THE VERBENA.
Fig. 1. Growths may be expected from each joint. The dotted lines indicate the new growth. Fig. 2. Method of layering on the edge of a border, plants one foot apart. Fig. 3. The "pins" which may be used (a hairpin will do).
The best time to strike them is during early autumn, and if they be inserted in sandy soil in a cold frame they will root during the winter and be ready for planting out in spring. Of all the methods of propagation that are open to the gardener to adopt that known as root division is most easy to perform and most certain in its results. The plants which lend themselves readily to this treatment are numerous. Among them may be mentioned polyanthuses, auriculas, pinks, columbines, primroses, irises, London pride, arabis, aubretia, and violets, in addition to a whole host of hardy perennials whose culture is discussed in Chapter VI.

Division of roots may be performed with success at two stages of the plant's development. The first is soon after it has finished flowering; the second is a few weeks in advance of the time at which it will bloom. Generally these opportunities will come either in spring or autumn. Care must be taken in making the division that the severed pieces have roots attached to them, and that these are firmly planted in well-dug soil. Damp showery weather should be chosen for the operation. Where this is not possible, and the work has to be done when the ground is parched, the newly planted roots will need to be well supplied with water at the outset and kept moist until they have taken a firm hold of the soil.

By the aid of the diagrams and the foregoing hints the beginner will be able to master the first principles of propagating plants by means of cuttings, layers and division of roots, and he can put them to practical use and extend the scope of his operations as time and opportunity permit.
Diagram 52.—CUTTINGS OF EVERGREEN SHRUBS.

Fig. 1. Osmanthus Illicifolius. Fig. 2. English Yew. Fig. 3. Skimmia Japonica. Fig. 4. Veronica Traversii. Fig. 5. Green Euonymus. Fig. 6. Laurustinus.
BOOK IX

FRUIT FOR THE SMALL GARDEN
CHAPTER XXXVIII

PLANTING HARDY FRUIT TREES

HOW rarely does one see in the ordinary suburban back garden any real attempt to cultivate hardy fruit trees! Yet one cannot but suppose that if only the process were better understood no garden, however small, would be without its apple, pear and plum trees, its currant and gooseberry bushes, or its raspberry canes.

It may be urged that the larger kinds of fruit trees occupy too much space, to the exclusion of flowers and vegetables; but it is not essential that the amateur with a small plot of ground should needlessly use up his spare space by planting standard apple and pear trees in it. These may be left to the gardener whose ground is not confined within the usual limits of sixty feet by eighteen feet, which is the customary space allotted by the builders of suburban middle-class houses.

The owners of such gardens will find it more profitable, both from a utilitarian and a decorative point of view, if they direct their attention to the cultivation of espaliers (trees trained flat on a trellis or row of stakes), bush trees, and pyramids. Walls and fences may also be clothed with beauty at the time of spring blossoming, and if the situation and method of culture be right the reward in a bounteous harvest of fruit when the bearing season arrives will amply repay any expenditure of effort and money that may be made.

The month of November is by far the most suitable period of the year to take in hand the planning and planting of a fruit garden. In a normal season planting should be started early in the month, but if there has been an excess of moisture in September and October the downward falling of the sap and the resultant drop-
ping of the leaves will be retarded to such an extent that the "lifting" of trees in the nurseries will be proportionately delayed.

But whatever the state of the weather, it is a good plan to order your fruit trees as early in the autumn as possible. Even if you have to wait several weeks for their delivery there will be no cause for anxiety. So long as you get all your planting done before Christmas you can afford to wait complacently with entire dependence on the judgment of the nurseryman, and with profit, for the arrival of a suitable spell of dry weather in which to complete the work.

Let us suppose that—as is usually the case in the smaller type of garden—one half of the plot is devoted to flowers and the other to vegetables. It is obvious that the introduction of standard or bush fruit trees into the flower beds and borders would be neither good for the flowers nor profitable for the fruit trees. It is clear, therefore, that room for the new-comers must be found in the vegetable portion of the garden, but this can be done in such a manner as not to swallow up any great extent of ground.

Nothing adds more to the charm of a garden than a suitable partition between the kitchen and the flower sections. This may be provided in many ways. It may either be a trellis fence covered with climbing roses, nasturtiums or canary creeper, or merely a well-grown privet hedge. But why not combine profit with beauty by planning a row of espalier apple or plum trees to serve the same purpose? Such a partition as this need not rob your kitchen garden of more than a foot of ground. At the far end of the vegetable plot two rows of bush trees, either apple, pear or plum, could be planted with advantage, and along each side currant or gooseberry bushes would provide an excellent setting for the vegetable quarters. For walls or fences apples, pears, plums, cherries, and peaches may all be utilised. They should be trained flat against the wall, either horizontally—T-shaped; or fanwise—V-shaped. Apples and pears are usually trained horizontally and plums and peaches obliquely.

As a preliminary to planting, the ground in which the trees are to thrive must be thoroughly trenched. At the bottom of the
Diagram 53.—HOW TO PLANT FRUIT TREES.

Fig. 1. A pyramid pear-tree. Note the manner in which the roots are spread out. Fig. 2. If roots are jagged or broken cut away damaged portion upwards as in B. Fig. 3. Make the tree firm by treading down the soil. Fig. 4. A mulch of well-decayed manure may be applied after planting. Fig. 5. Standard apple properly planted and staked.
trenches will probably be found clay, or at best hard, unyielding soil. This should be broken up with a fork, and the better soil then filled in on top. The surface of the ground should be left rough, so that the late autumn frosts and rains may work upon the soil to the fullest advantage. The frost following upon the rain will reduce even the hardest lumps of soil to such a condition of friableness that when later it is desired to break them up they will yield to very little effort.

It is not necessary to apply manure to the ground at this stage of the proceedings. The less chance there is of rank stable manure coming in contact with the tender roots of the trees when they come to be planted the better it will be for their future welfare. Manure should only be supplied as a surface dressing after the work of planting has been completed, or its use may even be postponed till spring.

The methods of planting recommended by the most successful growers are worth studying. It is not sufficient to dig a deep hole, as if one were about to erect a telegraph post, push the roots in an inextricably mixed mass a foot below the surface, cover them thickly with manure, stamp it down, and pile up the soil round the stem and press it close in the belief that at any rate the tree has been firmly planted. This method can only end in disaster. The first year after planting, the tree may produce a few leaves, and less fruit, but thenceforward its decline and demise are assured.

First of all, the roots of the tree should be spread out so that some idea may be gained of their extent. Then a hole sufficiently wide to receive them should be prepared. Shallow planting is better than deep planting; the hole, therefore, should not be made too deep. In the case of a three-year-old apple-tree this need not be more than eighteen inches.

The depth to which the tree should be planted can be ascertained by examining the base of the stem. Here will be found the mark which will show how deeply the tree was planted in the nursery, and it may be taken as a good rule in replanting not to sink the stem more than an inch lower than it was before the tree was dug up from the ground.
Next the roots of the tree should be carefully looked over, and if any of them be found to be jagged and torn the points should be cut off cleanly with a sharp knife. It is a good plan at the same time to shorten back all thick straight downward shoots. The object of this is to induce the roots of the tree to spread in an outward horizontal direction, so that they may thrive upon the good soil near the surface, instead of thrusting themselves downwards into the coarse and less nutritive soil beneath.

Sprinkle some fine soil over the surface of the hole, and then place the tree firmly upon it, carefully spreading out the lowest roots and adding more soil as the work proceeds. Shake the tree from time to time so that the soil may run in between the fine roots. As each layer of roots and soil is placed in position it should be trodden down lightly. This should be done with discretion. The tree must be planted firmly, but not trodden in so that the surrounding soil is like a block of concrete after the work is finished.

In the case of standards it will be advisable to give the tree some support against the buffetings of the wind. This can be supplied by inserting a stout round stake at the time of planting. For attaching the stake to the stem there is nothing more serviceable than a piece of sacking fastened round both the stem and the stake to prevent chafing. Care should be taken not to bind this so tightly round the stem of the tree as to hinder its expansion. In future years it will be necessary from time to time either to loosen the binding or to renovate it, as circumstances direct.

These rules for planting apply to all kinds of fruit trees, except that dwarf and pyramid trees do not require any permanent staking, though it may be advisable to afford them a little support during the first winter until the roots have become firmly established in their new quarters.

For the espalier-trained tree it will be necessary to obtain a supply of stoutish stakes and galvanised wire. The stakes may be made either of iron or of wood. The iron stakes, of course, have the advantage of permanency, but the initial outlay is heavier.
The choice will naturally depend upon the depth of the gardener's purse.

For pears, peaches and plums that are to be grown on walls the aspect should, if possible, be a southern one, and the training of the trees should begin as soon as they are planted. A number of strips of stout cloth and some strong nails will be found the most effectual means of keeping the spreading branches in their places. But even here, as in most gardening operations, there is a right and a wrong method of going to work. The piece of cloth should not be bound tightly round, nor should the nail be inserted below the branch. The latter should be allowed to rest lightly in a sort of loop made by the cloth, and the two ends fastened to the wall or fence above the branch. Care must, of course, also be taken in driving the nail to avoid hitting the branch and bruising it.
Rose Covered Arches.
The picture shows the charming effect produced by the use of arches in the case of a long path.
Photograph by Miss E. Hill.

An Orchard in Tubs.
Apple trees deployed along a path in a London garden.
Photograph by H. C. Pedrick.
Diagram 54.—WALL-FRUIT PLANTING.

Fig. 1. Just arrived from the grower and unpacked. Fig. 2. Method of planting against a wall; put a slate or some rubble beneath the roots to keep them to the good soil. Fig. 3. The fan trained tree arranged and fastened to fence. Fig. 4. A horizontal trained tree placed against fence.
THE PROPER pruning of fruit trees, I am afraid, presents more difficulties to the inexperienced amateur than almost any other branch of the art of gardening. In all too many cases he neglects it altogether. He allows his fruit trees to run riot year after year, and he reaps smaller and less satisfactory crops with each succeeding autumn. Truly he has his reward. Trees may be planted with the utmost care and they may appear to the undiscerning eye to be flourishing abundantly, but unless attention be paid to pruning when the proper season arrives, the growth will become merely rampant and the fruit will be hard to find.

A little study of the theory and practice of pruning will, however, soon convince the negligent gardener of his folly. Let him get firmly fixed in his mind what are the objects which it is sought to achieve by pruning, and he will assuredly never neglect his fruit trees again.

What, then, are the objects which are achieved by the pruning of fruit trees? Obviously, the chief aim is to secure the production of a satisfactory crop of fruit each year. It is the natural tendency of all fruit trees to revert to their original wild state, and for their crops to deteriorate both in quality and in quantity as yearly growth extends, unless the pruning knife be used at regular intervals.

But other useful purposes, all tending towards the production of fruit, are also served by pruning. First comes the desire of the cultivator that his trees shall be shapely and pleasing to the eye, and he can only thus regulate their form and size by pruning. Next he wishes to make the growth as far as possible uniform,
and he does this by curtailing unduly vigorous shoots and encouraging weaker ones. Again he knows by experience that air and light are essential to the production of blossom and fruit, and in cutting back his trees he keeps this object well in view as he removes systematically all dead, diseased or redundant wood.

At first sight the achievement of these purposes does not present any great difficulties to the man who is possessor of a stout and efficient pruning knife and a small saw. But once again the warning that a little knowledge is a dangerous thing would be more than justified if the wielder of the pruning knife and the saw treated all his fruit trees alike. There might, it is true, be regulation of form and size, but there would be precious little fruit.

A somewhat deeper study of the peculiarities of one’s trees is necessary before the pruning knife is brought into play. One must fix firmly in one’s mind that while some trees carry their fruit buds on old wood or spurs, others bear on young wood, and it will therefore be of assistance if the two classes are tabulated as follows:—

(1) Trees which bear on old wood:

<table>
<thead>
<tr>
<th>Apples</th>
<th>Nuts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pears</td>
<td>Apricots</td>
</tr>
<tr>
<td>Plums</td>
<td>Currants (white and red)</td>
</tr>
<tr>
<td>Cherries</td>
<td>Gooseberries</td>
</tr>
</tbody>
</table>

(2) Trees which bear on new wood:

<table>
<thead>
<tr>
<th>Peaches</th>
<th>Morello cherries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nectarines</td>
<td>Currants (black)</td>
</tr>
</tbody>
</table>

New wood can generally be distinguished by its paleness as compared with old wood, and by the fact that it grows from the ends or from the sides of the established wood.

Care must also be taken to discriminate between the fruiting spurs and the leaf shoots. This can be done if the tree is examined closely when it has been stripped clean of leaves. The fruit spurs of an apple-tree will have knotted plump projections at intervals
along its whole length, while the leaf s' em will be smoother and will bear only the slightest little knots which indicate the points at which new leaves will be formed in the spring. The fruit spurs of a plum-tree will be smooth and brown. Another point to remember is that the fruit bud in the case of trees which bear on old wood is rarely found on one-year-old shoots. It is nearly always formed on the spurs and short side growths of the second and later years. Let these principles be kept clearly in view, and most of the difficulties of the inexperienced growers of fruit trees will be removed.

The pruning of the trees is best accomplished when they are at rest—that is to say, after the leaves have fallen in the autumn, and before the sap begins to rise in early spring. From the end of December to the end of January is an ideal period within which the work may be carried out, and it is not a bad plan to get it done during a spell of dry, frosty weather.

For all ordinary purposes the only implement required is a good pruning knife, which should be made of the best steel, and be curved in the blade, so that the user can obtain a good grip of the wood and make his cut with precision. In the case of older trees, which have been neglected, a hand-saw may have to be brought into operation for the removal of stout branches. Where sawing takes place, however,
the end of the severed stem must not be left rough and jagged. It should be cut smooth with the pruning knife, or with a mallet and a sharp chisel.

Diagram 56 will help the reader to understand the methods to be adopted in pruning. In the case of young apple-trees of, say, three years' growth it is advisable to shorten the branches rigorously, cutting them all back to within fifteen inches of the stem. If the roots are in good order a free growth will result, and plenty of fruit buds will be formed. This method of pruning will produce the framework of a shapely standard. In the following year the number of branches will be doubled, and the cutting back may be repeated, though it should not be done so low down as in the first instance. If the tips six or eight inches long are cut back, two or three growths will form near the end, and blossom buds appear on the part below. The number of branches will thus be increased, and the production of fruit buds be induced by the same operation.

In the case of an older tree the chief point to bear in mind is that the growth of the past season must be shortened. This should be done according to the strength of the shoots: strong ones cut back one-third of their length, weaker shoots to a half or two thirds, and very weak ones back to two or three buds. All decayed, cankered or dead wood must be ruthlessly removed. The young wood should be encouraged, and the spent branches cut out. This will have the effect of admitting a free circulation of air and sunshine to the centre of the tree.

These rules apply generally to all fruit trees, but it should be noted that stone fruits resent too severe pruning. In their case the work should be done as early as possible in the winter.

Not infrequently is it found that despite careful attention to proper methods of planting and branch pruning, young fruit trees make an abundance of growth, but bear very little fruit. The trees have, perhaps, been well manured—over-manured, in fact—and the rich soil has induced a too vigorous growth. Long stems and plenty of leaves are produced readily. But it has been forgotten that along with this process above the ground another,
not less important, has been proceeding underneath. Long shoots above the ground must have their counterpart in long roots within it. This accumulation of root-power has had the effect of producing stronger branch growths with each succeeding year until the trees have become little better than thickets. Fruit-bearing has become an impossibility.

A very simple operation is all that is necessary to obviate this difficulty. It is what is known as root-pruning, and Diagram 56 shows how this should be done. The long tap-roots that have been formed, and which thrust themselves down into the unproductive subsoil, must be cut back. It is sometimes necessary to prune all round the roots of a tree, but in most cases it is found efficacious if one-half be cut back one year and the remainder in the succeeding year or the third year.

A trench is dug round the tree to a depth of two feet, and at a distance from the main stem of not less than four feet. The soil is carefully drawn away from the tree so as to expose the roots, and the thickest and grossest of them are then cut asunder. In the case of an old tree it may be necessary to use a saw, but as a rule a sharp pruning knife will be found sufficient. The cut should be made upwards, towards the person and away from the trunk of the tree. Carefully replace the remaining root in a horizontal position, cover over with soil, and make it firm. From the shortened roots new fibrous roots will be thrown out, and it is these which will in the succeeding seasons supply the proper nourishment to the tree.

In the case of a wall tree the whole area of the roots will be brought under inspection at the same time. The effect of root-pruning will not be wholly apparent until the second year after the operation has been accomplished, because the fruit buds for the following year have already been formed. It will, however, have the immediate effect of checking the formation of wood, and this will be all to the advantage of the tree.

The summer pruning of fruit trees may be accomplished with advantage both to the prospect of the present year's crop and to the future well-being of the trees. Experts differ with regard to
Diagram 56.—ROOT-PRUNING OF FRUIT TREES.

Fig. 1. Root-pruning: Make the cut at an angle similar to that indicated. Fig. 2. The dotted line shows the second season’s operations. The whole circle may, however, be completed at once, if necessary. Fig. 3. Apple shoot showing leaf buds. Fig. 4. Apple shoot with fruit buds. Fig. 5. A fruiting spur.
the precise time when this operation can best be performed. As a matter of fact, it is advisable to extend the work over a considerable period, and this means a constant study of the growth of each variety of tree.

Take the case of an apple-tree that is being trained along a wall or fence. Soon after vegetation has become really active, about the middle of June, a whole thicket of shoots will be found growing on each tree. If these be allowed to remain, the centre of the tree will be entirely denuded of light and air. It is useless merely to snip off the ends of these superfluous shoots. Many of them should be cut right out, and, if need be, so as to ensure that the centre of the tree can receive its proper share of light and air, one or two of the main branches should be sacrificed as well.

It is necessary, of course, to use discretion, so that promising fruiting shoots are not removed wholesale. The small diagram (No. 55) will show the amateur the difference between a growth which will produce foliage only and one which will bear fruit. The fruiting shoot on the left is the one to retain and shorten at the point indicated by the arrow. The leaf shoot can be sacrificed altogether.

In the summer pruning of hardy fruit trees the leading shoots—those at the ends of branches—must not be stopped where plenty of room is available. These should be retained and nailed up. All other growths of the current year may, however, be shortened to six or eight buds—an operation which will give a slight check and throw the sap back into the remaining wood and fruit. When the tree is in full leaf, too, it is much easier than it is in the winter-time to see where the dead wood is. This, of course, should be removed.

The primary object of summer pruning is to strengthen the basal fruit buds of the new shoot, so that they may remain dormant during the current year and produce blossom and fruit in the following season. For this reason it is well, while of course indulging in a preliminary thinning out early in the season, to defer anything like systematic pruning till the end of July or the beginning of August. If the pruning is done in the early
summer, when growth is rampant, the buds may start into secondary growth and be spoiled. They are much more likely to remain dormant if the pruning be deferred until August, when the flow of the sap is less vigorous.

Red and white currants should be thinned out after fruiting. The new shoots may be reduced to half their length, and the low branches which touch the ground be removed entirely. Gooseberries may receive the same treatment, but black currants require little pruning in summer. New basal shoots are thrown out each season. If these are not being produced satisfactorily, it may help them if the leading old shoots are cut down a little.
CHAPTER XL

BUSH FRUITS

The amount of space that can be allotted in the amateur's garden to the cultivation of small bush fruits will depend, of course, upon the dimensions of his plot. In the little suburban garden which is sometimes not more than a dozen feet square, fruit-growing is out of the question, but where there is room to grow both flowers and vegetables, there also it will be possible by the exercise of a little ingenuity to cultivate small bush fruits. Included in this class are gooseberries, raspberries, and currants, red, white and black, and I propose in this chapter to discuss the methods of cultivation of each in turn.

Gooseberries.—The gooseberry has been cultivated in this country since the sixteenth century, and the origin of the name is supposed to be due to the fact that at one time it was the practice to eat the berries with goslings. An interesting point to remember is that the gooseberry has been found to bear better flavoured fruit in the comparatively cool climate of Scotland and the north of England, the reason being that the fruit is not so good when brought to maturity by very hot weather as it is when its development has been somewhat retarded in a moderate temperature.

The soil most suitable for gooseberries is one that is rather moist than dry. The bush does not thrive well in stiff, clayey soils which are prone to become consolidated during hot, dry weather. Ordinary garden soil in which there is a fair proportion of good turfy loam will be found an admirable medium. Before planting the ground should be deeply dug or bastard-trenched, and at the same time a good supply of rotten stable manure should be incorporated with it. Planting is best carried on in late autumn,
Diagram 57.—GOOSEBERRY CUTTINGS.

Fig. 1. The correct cutting, properly trimmed. Fig. 2. Plant in rows.
Fig. 3. First year’s growth. Fig. 4. Making the trench.
towards the end of November for preference. If possible secure two-year-old trees from the nurseryman. These will cost sixpence each, and will be found more satisfactory than newly struck cuttings. Among the best varieties are the following:

Broom-Girl.—Erect growing; fruit large, thin skinned, yellowish olive in colour; early

Crown Bob.—Bright red

Champagne.—Branches erect; fruit small, roundish oblong, hairy, yellow, thick skinned; rather late.

Keepsake.—Branches slightly pendulous, strong grower; fruit green and large; ripens early.

Whinam's Industry.—Erect branches; fruit red, large when ripe; best variety for picking green.

Langley Gage.—Berries medium size; silvery white, nice flavour.

Sulphur.—Small, yellow, hairy; early.

In planting the bushes care should be taken that the holes are sufficiently large to accommodate the roots when they are spread out to their fullest limits. The bottom of the hole should be convex. This will enable the planter to place the base of the bush firmly on the soil and will help to keep the roots evenly distributed. The plants should not be sunk deeper than they were before their removal from the nursery.

The pruning and training of the gooseberry form an important feature in its cultivation. In pruning it is well to remember that the most satisfactory fruit is borne on long shoots that developed during the previous season. Therefore it is desirable when pruning in January to retain most of the young shoots at their full length, or nearly so, in order to be able to replace old and worn-out branches which should be cut away regularly each season. In summer after the fruit has been picked the centre of the bush should be thinned out, so that it does not become a thicket and thus exclude valuable air and light.

If it be desired to grow gooseberries by the side of paths against walls and fences the best method to adopt is that known as
cordon training. The plants can be trained against a wire trellis by placing stout posts at intervals along the row. The posts should be fixed firmly and be allowed to stand six feet above the level of the soil. A wire should then be run from post to post about one foot from the ground, and another along the top of the posts. Bamboo canes can be fixed to these wires fifteen inches apart and the framework is complete. The gooseberry plants are next inserted in the soil at intervals of two and a half feet, and tied to the canes. All that is necessary afterwards is to prune back the lateral growths to four or five leaves, taking care not to stop the leading shoot. In winter, however, the unripe tip of the leader may be cut off, and the summer-pruned laterals be shortened to one inch. It is claimed that plants grown in this manner are less liable to be attacked by bud-destroying birds in spring, the reason ascribed being that the branches do not form convenient perches for them.

Gooseberries are propagated by seeds, cuttings and layers. Seedlings do not bear fruit until the third or fourth year. The amateur who cannot wait so long for the product of his labour may be recommended therefore to confine his activities to propagation by cuttings. The best time to "take" them is October or November. The shoots used for the purpose should be well ripened and be from twelve to fifteen inches in length. The method of preparing them is to cut horizontally through the bottom of the shoot just below a joint and then to cut off the unripened top, and to remove all the buds with the exception of five at the top. The cutting is then ready for planting, and this is best done in a V-shaped trench about nine inches deep. Insert the cutting so that the first of the five remaining buds is just above the level of the ground; then fill in with soil and tread it down firmly. The cuttings may be planted six inches apart in rows eight inches asunder. By the following autumn they will have formed serviceable roots and can then be lifted and planted in their permanent quarters.

Raspberries.—The best time to form a raspberry plantation is October or early November. Sound one-year-old roots can then
be obtained cheaply, and they will bear fruit in the following season. The best varieties to select from are:

  **Baumforth's Seedling.**—A large round variety.
  **Superlative.**—Best for general garden cultivation.
  **Hornet.**—A strong grower.
  **Fastolf.**—Prolific bearer.
  **Red Antwerp.**—Fruit sweet and rich in flavour.
  **Golden Queen.**—Yellow fruit, delicious flavour.
  **Yellow Antwerp.**—Good bearer.
  **Yellow Superlative.**—Excellent for preserving.

Raspberries are generally planted in rows and their canes tied to stakes. When this method is adopted the stools should be planted five feet apart, in rows, and from three to three and a half feet between each plant. Another method is to plant for training on walls or wires, fan-like fashion. When this is done a distance of at least two feet should be allowed between the stools.

Pruning is best accomplished in October or November. Where the plantation is well established it will be necessary to cut out all two-year-old canes. Young canes will be making their appearance, and where these show signs of bending or twisting the tops should be cut off. An old raspberry plantation should never be deeply dug, for the reason that the roots form a matted mass near the surface and would suffer injury in the process. All that is required is a light forking over in the autumn and a heavy dressing of manure in November. At the same time stakes should be driven into the ground and the canes tied to them with tar twine.

The best method of propagating the raspberry is by means of offsets or division of roots. They are taken in October or the beginning of November. Care must be exercised to cause as little damage as possible to the plant from which the offset is detached. Replanting should take place immediately or with as little delay as possible, or the roots will shrivel.

**Currants.**—There are three principal varieties: the black (Ribes Nigrum), the red (Ribes Rubrum), and the white and pale
fruited variety of the red. All can be grown in almost any soil, but perhaps the best is a well-drained deep loam which is not likely to become caked and hard in the hottest period of the summer. The best situation is one in which plenty of sunshine is available; but currants can be grown successfully against a north wall, and if the plants are properly managed the fruit will be of good size and colour and will afford a satisfactory late crop.

The bushes should be planted in October or November, the holes being prepared in the same manner as for gooseberries. The bushes may be planted six feet apart each way.

The methods of pruning black and red currants differ somewhat. In the case of black currants the operation should be directed chiefly towards the encouraging of the production of healthy young wood from the base of the bush. Old wood that has fruited should therefore be removed. If it be borne in mind that the black currant fruits on young wood and not on spurs the secret of successful pruning will have been probed.

For red and white currants the object to be aimed at is to form a bush with eight or ten strong branches springing from one stem as regularly placed as possible and leaving an open centre to the bush. All lateral growths should be pruned to two or three eyes annually to form spurs. If it be desired to train currants against a wall they should be planted three feet apart.

Six good varieties of currants are as follows:—

Carter's Champion.—Black; heavy bearer.
Lee's Prolific.—Black; hangs well after ripening.
Boskoop Giant.—Black; large berry; heavy bearer.
Knight's Sweet.—Early; red.
Raby Castle.—Late; red berries; large.
White Dutch.—Berries large; transparent, yellowish white.

The currant, like the gooseberry, is best propagated by cuttings. In the case of the red and white varieties straight, well-ripened shoots fourteen inches long are suitable for the purpose and they should be prepared in the manner recommended for goose-
berries. For black currants it is unnecessary to remove any buds, as suckers are required and not a "leg" as is the case with red and white currants.

Logan Berries.—This is a comparatively new fruit. It is a hybrid between the American blackberry and the red raspberry, and produces large luscious berries somewhat like the mulberry in shape and colour.

Wall culture is best for the logan berry, since it grows very rapidly and will speedily cover a bare space if properly trained. It may, of course, be grown as a bush and be fastened to stakes, but as the plants ramble, the fruit is in danger of coming in contact with the ground and of being spoiled.

Propagation is best effected by means of layers pegged down in the ground in September. A young plant will emerge from each leaf axil in spring, and can be detached and replanted when it has become thoroughly rooted. As is the case with raspberries, the logan berry produces a matting of surface roots, and these should therefore be disturbed as little as possible. A frequent stirring of the surface with the Dutch hoe to keep down weeds and open the soil is all that is necessary.
To the amateur gardener who has never attempted it, the culture of the grape vine presents so many difficulties that in not a few cases I am afraid he has allowed himself to drift into a state of mind bordering on a settled conviction that with his limited resources and want of time the thing is impossible.

But is it? I shall endeavour to show in this chapter that the obstacles are not insurmountable. Successful grape cultivation, like successful chrysanthemum, sweet pea or carnation growing, requires in the cultivator a plentiful stock of patience, a constant and unwearying attention to the needs of his vines, and some knowledge of their habits and peculiarities. But the virtues of patience, diligence and an unceasing devotion to his favourite hobby are never absent from the equipment of the enthusiastic amateur gardener. If, therefore, he is possessed by the desire to cultivate his own vine and to induce it to provide him with at least a few bunches of fully-matured home-grown grapes, he needs only to allow his own inherent virtues to have full play to achieve success.

The month of January provides an ideal opportunity to begin operations. To ensure a crop of fruit it is, of course, essential that the vine shall be grown under glass. The ordinary lean-to greenhouse, especially if its aspect be southern or south-western, forms an ideal lodging-place for the vine, but the commoner span-roofed house will serve the purpose equally well if its position be such that it is possible to take the fullest advantage of all available sunshine.

If the glasshouse can be devoted exclusively to the cultivation of the vine, the prospects of success will be all the brighter, but where this is found impossible there need be no hesitation in
introducing a cane or two of the vine in conjunction with low-growing plants that do not require to occupy space. It would invite failure, for instance, to attempt to grow tomatoes and vines in the same small house, but the vine, in conjunction in summer with such subjects as begonias, gloxinias, and in autumn with chrysanthemums or ferns, would not be out of place.

The next point to be decided by the grower is whether he shall make his border inside or outside the house. Either or a combination of both will serve the purpose, but for very practical reasons the outside border is to be preferred, if room can be found for it. These reasons are that the outside border is much more easily renovated than that inside the house. If it be properly constructed, it will require very little attention for some years other than a liberal surface dressing of rich soil during winter and soakings at intervals with water and liquid manure during the heat of summer.

How to construct the border is the next problem that needs solution. Much depends upon it, for if it be badly made there need be little hope of ultimate success. Thorough drainage is the first essential in a properly made border. No matter how good the soil or how well placed the house, if the drainage be deficient satisfactory cultivation is impossible. And in order to ensure this essential element it is advisable first to dig out the border to a depth of at least three feet nine inches. The width of the border may be as little as four feet where space is limited, but if possible it should be as much as six or even eight feet.

An excellent drainage system can be established if on the bottom of the cavity brickbats, rubbish, and stones be placed to a depth of at least nine inches. If a quantity of broken chalk can also be introduced, so much the better. In any case, the brickbats, etc., should be rammed down hard, preparatory to placing in position the next layer. This should consist of good thick turves, two deep, and laid grass downwards. On top of this a fairly thick layer of fibrous loam, with which some well-rotted manure has been mixed, should be added, and for the surface a thickness of fine soil composed of a mixture of loam, bone meal and peat.
Diagram 58.—PREPARING A VINE BORDER.

Fig. 1. The site excavated. Fig. 2. The first layer of brickbats, etc., for drainage. Fig. 3. The vine planted six inches below the surface of the soil.
The inside border should be constructed in the same manner, save that in this case it will not be found possible to make it much more than two feet wide.

In making a start with the planting of such a border the beginner will be best advised to choose for the purpose well-matured one-year-old canes, and in selecting varieties he cannot do better than depend almost entirely on the well-tried and familiar Black Hamburgh. Other kinds that will suit his purpose are Foster’s Seedling (white), Royal Muscadine (white), Black Alicante and Muscat of Alexandria (pale amber).

The canes will arrive from the nursery in pots, and if they are to give satisfaction they will cost from five shillings to seven shillings and sixpence each. The roots should be carefully shaken free from soil, and spread out so that the delicate tendrils are not damaged. The roots must be planted to a depth of not more than six inches in such a manner that the extremities are farthest from the wall of the house. They should be covered with fine soil and trodden down firmly.

The canes can be easily manipulated, and these should now be introduced into the house through an arched hole made either in the brickwork or the wooden panels. The stems will be found to be from three to six feet in length, but as no fruit is to be expected during the first year, some drastic pruning is necessary at once. Therefore, in order to induce new and stronger growth, the first thing to do is to cut back the canes to the two or three eyes nearest the soil. This is recommended where the glass comes nearly down to the ground-level. If the panels are rather deep the cane should not be cut so short.

In a few weeks’ time growth will begin from the remaining eyes. The weakest should be rubbed off, and only two be permitted to attain a length of three inches. When this stage has been reached the weaker of the two must be removed, so that only a single growth is allowed to find its way up the wires or trellis fixed at a distance of twelve inches from the glass. This growth will form the main stem in succeeding years, and in the meantime for the next twelve months the whole efforts of the plant should be directed
Diagram 59.—A HINT IN VINE CULTURE.

Fig. 1. The growth appearing from the top eye of a rod. Fig. 2. If not pinched out the growth will assume large proportions. Fig. 3. Cane lowered to distribute the sap evenly; Fig. 4, so that growths appear at each eye.
towards giving it a fair start and allowing it to become well established.

There are two well-recognised methods of training the vine. In the first case the season’s growth is cut back yearly in December or early January to within one or two eyes of the main stem, and in the other it is permitted to extend each season with reasonable stoppings at the extremities. The first, which is known as the "spur" system, is by far the most suitable for a small house, since it enables one to keep the growth within reasonable limits and is more conducive to satisfactory fruit-production.

So soon as the vines are in flower the atmosphere of the house should be kept drier than has been the case during the earlier stages of the plant’s growth. The damping down of the floor should only be done on hot days, when the sun is shining brightly, and the heat in the pipes must be kept in check. A temperature of 70° by day and 60° by night is all that is necessary. A gentle tapping of the branches twice a day will help to "set" the fruit, and at this stage it is important to remember that the vine should never be allowed to lack for moisture at the roots. Weak doses of liquid manure may be given once a fortnight.

If large luscious fruit is desired the branches of grapes must be rigorously thinned out as soon as the fruits have attained the size of well-developed peas. A pair of grape-thinning scissors with sharp points should be used for this purpose, care being taken as the superfluous fruits are removed that the grapes that are allowed to remain are not bruised in any way. The slightest touch may damage them and cause an unsightly scar when the fruit attains its maturity.

The crop must be gathered as soon as it is ripe. Afterwards all the efforts of the grower will be directed to inducing the plant to go to rest during the winter. This process will be assisted by giving plenty of air in the house, and keeping the border in a healthy condition.

Diagram 60 suggests an inexpensive method of constructing a small vinery, which will appeal to the ingenious amateur who combines carpentry with his favourite hobby. A dry, gravelly
Diagram 60.—AN INEXPENSIVE VINERY.

Fig. 1. Dimensions of trench. Fig. 2. Second operation—line with tiles at the bottom, slates at the sides. Fig. 3. Vinery completed (without the glass). Fig. 4. Vine planted in prepared bed.
or sandy border sloping to the south or south-west is the most desirable situation, but a flat surface will do if it be fully exposed to the sun. The frame should be placed on bricks to admit of proper ventilation. Cover the outer ends with match-boarding, and after planting the vine outside, admit it to the frame through the notch shown in Figure 3.

The soil, before planting, should be well stirred two feet deep and six feet square, and be enriched with rotten manure and what are known as one-inch bones or bone dust. Let the vine grow until it reaches the end of the frame. Pruning on the spur system is the only method to be adopted in such a case as this.

The vine is supported on iron rods, as shown in the diagram. The bunches of grapes will hang in the furrow, and, owing to the heat of the tiles and slates, will ripen well. Owing to the moisture of the soil red spider—one of the greatest pests of the grape vine—rarely puts in an appearance. The trench may also be utilised for early salads.
CHAPTER XLII

STRAWBERRIES

It is really remarkable, considering the ease with which strawberries can be cultivated, that this most luscious of summer fruits is not found growing more frequently in the gardens of country cottages and homesteads, and even in the smaller plots of ground attached to suburban and town houses. In not a few gardens one finds an old strawberry bed, made years ago, in which the plants have been neglected, and have become matted and choked with runners. They are too utterly exhausted to produce fruit, and are merely wasting space, to the exclusion of more productive occupants.

Where this state of affairs has been allowed to prevail it is best to dig up the whole plantation and make a fresh start, and the end of July is an excellent opportunity for accomplishing the task.

The simplest and safest plan is to obtain new rooted plants in pots. These, of course, cost a little more than rooted runners taken direct from the ground, but they will be found to be stronger and better established, and will be more likely to yield a good crop of fruit in the following June and July than the less sufficiently matured runners.

A most important operation in the efficient culture of the strawberry is the preparation of the bed or border in which they are to thrive. Strawberries require rich feeding, and it is useless to attempt to grow them on hungry soil, from which they cannot derive the nourishment necessary to their well-being. Therefore the soil should be good to begin with, and it should be deeply dug and worked beforehand, so as to be ready for the young plants when the time comes for putting them out. While the digging is
proceeding a generous amount of the finest farmyard manure obtainable must be thoroughly incorporated with the soil.

The evening before it is intended to set out the new plants the soil should be well soaked with water, if the weather has been at all dry and hot, for it is obvious that the young growing roots will fail immediately if they are transferred to parched ground.

The plants should be set in rows from eighteen inches to two feet asunder. The planting had better be done with a trowel or a hand-fork, so that a hole of sufficient size can be made to allow of the spreading out of the roots to their fullest extent. This plan is much better than that involved in the use of the dibbler, since in the latter case a slender hole is the result, and the roots are bound to be cramped.

The life of a strawberry bed in full bearing is about four years. At the end of this time the position should be changed and a new bed be formed. If there is room it is an excellent plan to add a few new rows each season.

After the new plants have become well rooted they will require regular cultural attention. For instance, a sharp watch must be kept for the appearance of weeds. These will have to be eradicated ruthlessly, for it is obvious that if they be allowed to establish themselves in the beds they will rob the young plants of their proper share of food, light and air.

Plants that are got into position early will inevitably throw out runners towards early autumn, and as these are not required for the production of fruit until the following season they must be removed promptly. While it is true that strawberries thrive well in a firm root-run, it is a mistake to allow the surface to become caked over and hard. Therefore the hoe should be brought into frequent use to keep the top loose and open. Care will, however, be necessary in using the hoe to see that it is not plunged too deeply into the ground, to the injury of the roots. The hoeing will also help to maintain the soil in a moist condition, but if it becomes too dry, as the result of hot weather, water must be supplied in generous quantities. When spring arrives the plants will require some fresh stimulus, and this can best be supplied by
Layering Strawberries in Pots.
The runners in position and pegged down.
Photograph by Charles Jones.

Dividing Perennial Plants.
A large root of phlox lifted from the ground preparatory to dividing into smaller pieces for replanting.
a mulching of manure placed to a depth of three inches between the rows.

The layering of strawberry runners with a view to the production of new plants is a very simple process. First a number of small pots should be filled with rich but light soil, and be placed on the beds near the plants. Next select the runner it is intended to layer, and place that portion of it from which leaves are growing on the surface soil in the pot. To keep the runner in position a stone or wooden peg should be used. Water must then be supplied, and if the pot be kept moderately moist roots will soon be formed. When these have been produced in sufficient quantity the young plant can be detached from its parent and be left to its own devices until it is required for planting-out purposes.

Some of my readers who contemplate making new strawberry beds may be puzzled to know which varieties will be most suitable for their purpose. Experience has shown that for the main crop there is nothing to beat Royal Sovereign, but these are over by the middle of July, and if it be desired to cultivate a late-fruiting variety either Waterloo, Eleanor, Laxton’s Latest or Givon’s Late Prolific will be found to answer the purpose.

Strawberry beds are often badly neglected after the fruiting season is over. This is a mistake which can be remedied by a very little trouble. A week or two after the last berry has been picked the plants should be carefully examined and any excess of leaves be cut away. This does not mean completely denuding the plants of their foliage. The work must be done judiciously, for if all leaves are removed, as is done by some gardeners, it means that fresh foliage has to be produced, and this at a time when the plants should be forming their crowns in preparation for next season’s crop. Runners that are not wanted for propagating purposes should, of course, be removed, since, if they are allowed to remain, they will rob the plants of much nourishment. When autumn arrives there ought to be very few runners in a well-ordered strawberry plantation.

Like all other plants which are raised to a high standard of cultivation, strawberries are assailed by a variety of insect pests—
among the most prevalent and destructive of which is the wire-worm. If this is present in the soil to any considerable extent a good dressing of lime should be applied, but this must be done at least four months before it is intended to put out the plants.
CHAPTER XLIII

TOMATOES: INDOOR AND OUTDOOR

THE successful cultivation of tomatoes finds a high place among the achievements to the accomplishment of which the amateur gardener directs his best endeavours. Nor is this surprising, for the cultural rules to be observed are comparatively simple, and there is this additional stimulus towards making the effort in the fact that the man who is able to cut regularly a few pounds of ripe fruit from midsummer to the end of September will find himself becoming increasingly popular with the domestic powers that be.

The grower's own self-esteem will, however, be immeasurably increased if he is able to point to the circumstance that he presided over the destinies of his tomato plants from their very earliest stages—that he sowed the seed himself and carefully nursed the seedlings until they gave him his reward in a rich harvest of luscious fruit. But in order to achieve this result he must have the necessary heated greenhouse accommodation, for while it is true that the tomato can be induced to ripen successfully in the open in a normal British summer, it is useless to attempt to produce sturdy young plants sufficiently early to ensure fully developed fruit unless artificial heat be called in to their aid during the initial stages of their growth.

But this does not mean that the glass structure must necessarily be devoted entirely to tomato culture. During winter months the chief use of the greenhouse in most amateurs' gardens is that of protecting tender plants which are destined to resume their places in the beds and borders when summer is at hand. When these are removed there will be plenty of room available, and then it is that tomatoes may take their place.
Provided a minimum temperature of 55° or 60° can be maintained, the raising of a satisfactory batch of tomato seedlings is a comparatively simple matter.

Let the cultivator first of all decide how many plants he intends to grow. This will depend principally upon the size of his glasshouse and also on whether he intends to grow any of his plants out of doors. As a rule one fair-sized seed-pan or shallow box will hold enough seeds to provide the amateur whose space is limited with as many plants as he wants.

It is immaterial whether pots, boxes or shallow seed-pan are used, but it is essential that they should be clean. Nothing is more conducive to failure than to use dirty receptacles for young and tender seedlings. Therefore see that all pans, pots and crocks are well scrubbed in warm water before being brought into use. In the case of new pans or pots it is advisable to soak them for a few hours in clean water. If this precaution be neglected the porous pottery will absorb all the moisture in the soil and leave it dry just at a time when germination is at hand. The results can only be disastrous.

The soil in which it is intended to sow the seed must on no account be rich—and this is a rule to follow throughout all the earlier stages of the young tomato plant's growth. If a quantity of fresh loam—and the best kind is that known as "top spit," taken from beneath some old turf—be mixed with an equal quantity of coarse river sand, an ideal compost will be obtained.

The pots should be filled with soil to within an inch of the top. The seed of the tomato is fairly large, and is easily handled. It should be sown thinly—ten or a dozen seeds to a five-inch pot—and be gently pressed into the soil with the forefinger. The soil can then be drawn over the seed, and an application of tepid water follow.

To ensure rapid germination a minimum temperature of 55° or 60° is essential, and in order the better to ensure this it is advisable to place the pots or seed-pan in a small propagating case. This may be the ordinary propagator, whose heat is conserved by a simple but reliable oil lamp, or, better
still, it may be a small frame placed on the greenhouse bench in close proximity to the stove.

I have such a small frame in my own greenhouse, and I find it an indispensable aid to my propagating and seed-raising operations. It is only thirty inches long and twenty-four inches broad; its glass frame covering is fixed on hinges, so that ventilation can easily be controlled; it rests on thin match-boarding, and this in turn supports moist cocoanut fibre to a depth of six or eight inches. Into this material the pots in which seeds are being raised are plunged, and in this way "bottom heat," which is so essential to the propagation of tender plants, is obtained.

This object may be equally well secured by a home-made contrivance. This is a fairly deep box filled nearly to the brim with cocoanut fibre refuse. In this the pots can be plunged to the rims, and the whole surface of the box be covered with sheets of clean glass. The box should then be fixed over the hot-water pipes under the greenhouse bench, and, if proper attention be paid to watering—it is fatal to allow the soil in the pots to become dry—growth will soon be in evidence.

The seedlings must not be allowed to remain in the seed pots or pans for an unnecessary day. As soon as two, or at most four, leaves have been formed they must be pricked off into other pans or boxes, or—and this is preferable—be transferred singly into thumb pots. In order to avoid a check to the seedlings the soil that is to receive them should be taken into the greenhouse a few days before the pricking-off process begins. This will enable the compost to become thoroughly warmed through.

The pots should be ranged on the top shelf of the greenhouse, so as to promote a sturdy growth, and from this stage it will be necessary to attend closely to watering, so that the plants, in the drier atmosphere of the greenhouse, shall not lack for moisture.

Frequent repotting into larger sizes will become necessary as the roots find their way through the soil. An important point to remember is that the tomato is a stem-rooting plant, and that in order to enable the young seedlings to emit roots freely it is essential when repotting to bury the stem deeper than would
ordinarily be the case in respect to the majority of soft-wooded plants. The soil for the earliest pottings may be similar to that in which the seed was sown, but when the plants are transferred into pots four and a half inches to five inches in diameter a stronger and more compact compost should be used. The sand may be entirely dispensed with in favour of burnt garden refuse or wood ashes. A small quantity of bone meal will also be found an excellent additional ingredient.

At this and all subsequent stages firm potting is a *sine qua non* of successful tomato culture. The soil should be rammed down hard in the pots, not half-heartedly but with a will, for loose potting, while it will ensure plenty of foliage, will not be productive of a satisfactory crop of fruit. Slow, sturdy growth, with bunches of fruit in close proximity to each other, is the object to be aimed at, and this can never be secured by loose potting or planting.

As the roots become established in their new quarters growth will become rapid, and some attention will have to be paid to staking and tying, so that the main stem may be kept straight and erect. If the seed were sown in January flower trusses should make their appearance in May, and it will then be necessary to come to a decision in regard to the permanent quarters of the plants. These may either be boxes or large pots.

If boxes are used they can rest either on the greenhouse bench or on the floor, according to the size and height of the house. The boxes can be made of any length that is desired, but they must be at least a foot deep and ten inches across. If they have been strongly constructed they will last for several years. For purposes of drainage eight or nine holes must be drilled in the bottom. Over these broken pieces of flower-pots should be placed, and above these a layer two or three inches thick of rough siftings of soil and turfy loam.

The ideal soil for the final stages of the development of the tomato is undoubtedly good fibrous loam such as can be obtained from the top spit—the soil immediately beneath the surface of the grass—in a field over which fat stock have grazed or poultry have had a free run. If a very little well-rotted manure be incor-
Diagram 61.—SOWING TOMATO SEED.

Fig. 1. The materials. Fig. 2. Section of five-inch pot filled ready for sowing. Fig. 3. Press the seed gently into the pot. Fig. 4. Pots in fibre in boxes with glass over placed on the pipes in the greenhouse.
porated with the soil so much the better; while if the soil be at all heavy it will be found advantageous to add a quantity of clean road scrapings.

The prepared compost should be placed firmly in the boxes to a depth of seven inches, leaving five inches of space at the top. The object of this is to allow for several top-dressings of soil as the plants grow taller. If they are watched carefully it will be seen that from the stem just above the surface of the soil new roots are thrown out. These it should be the aim of the cultivator to encourage, since they help in feeding and strengthening the plant at a time when fruiting is near, and when every bit of nutriment is required. Two or three times during the season fresh layers of loamy soil should therefore be supplied until the box is filled almost to the top.

Three, or at most four, plants will be enough for each box. As the plant grows taller it should be tied to a stout bamboo cane, and then trained along wire or stout cord upwards towards the apex of the slanting roof of the greenhouse. The wire should be fixed at a distance of not less than nine inches from the glass.

If pots are used for fruiting they ought to be at least ten inches across the top. They may be placed on the benches a foot apart.

When a fairly large number of flowers have developed a very necessary point of culture must be attended to. Once every day, about noon, if possible, the stem of each plant must be gently tapped with the finger with the object of liberating the pollen and assisting fertilisation.

There are several methods of training the tomato plant, but, taking everything into consideration, nothing can excel the single-stem system. This involves from a comparatively early stage the rubbing off or pinching out as they appear of all the laterals or side growths. Immediately a full crop of fruit is set the top of the stem is stopped, either by pinching it out or cutting off the extremity. The removal of superfluous leaves, defoliation as it is called, will also require attention as the plants gain strength. Care must be taken, however, not to remove too many of the leaf shoots, since the untimely stripping off of all the leaves will cer-
Diagram 62.—PLANTING OUT TOMATOES.

Fig. 1. The amateur should select sturdy plants only. Fig. 2. Method of planting as a protection against sudden frost and heavy winds. Fig. 3. Several plants may be accommodated in a frame and trained on wires. Fig. 4. Plant out four feet apart and fix the stakes, which should be stout.
tainly cripple the growth of the plants and check the proper development of the fruit.

It is to be remembered that tomato plants are gross feeders, and that in order to ensure a satisfactory crop of fruit their roots require to be constantly nourished. This, because of the plant's stem-rooting habits, is best done, as has already been explained, by means of surface mulchings and top-dressings. It is a mistake, frequently made, to start feeding the plants with manure too early. The best time to begin is when the second bunch of fruit has become well set, and those on the first set are as large as pigeons' eggs.

Afterwards the regular application of manure, in liquid form if possible, may follow. It should be given at first in weak doses, once or twice a week, the strength of the doses being slightly, and only slightly, increased, as the fruit nears maturity. Any of the artificially prepared manures, such as Clay's, or Thompson's, or the special preparations of guano and superphosphates, may be used with confidence, provided they be not applied in excessive proportions. These can be used in their dry, powdered state, but they must not be applied when the soil is dry. Give a good watering first and then spread the manure over the surface of the soil, taking care not to exceed the quantities recommended by the makers. Other excellent stimulants for surface-feeding are soot and bone meal. These should be mixed in small quantities with the soil, and pressed firmly round the stem of the plant.

Plenty of air must be afforded the plants when grown under glass; the tomato is impatient of too close and sluggish an atmosphere. During the early stages of its growth a temperature of from 60° to 65° will be ample. The aim should be to avoid extremes of heat and cold, and this can be managed if attention be paid to ventilation and the stoking of the greenhouse fire. Later in the season, when the sun gains power, fluctuations of temperature cannot so easily be guarded against, but there will be nothing to fear if the house be thoroughly well ventilated.

Tomatoes revel in plenty of moisture at the roots. Watering must, therefore, never be neglected, but care must be taken not to
apply water when the soil is already sodden. Give the plant a chance to absorb the moisture and then supply water when it is needed. Syringing is sometimes recommended, but this had better be avoided save in the hottest weather, and then only in the early morning, since the practice of syringing too often induces disease.

The fruit should be cut a few days before it is quite ripe; the proper time is just when it is turning from a dark golden colour to a bright red.

For outdoor culture the principal object to aim at is to secure for the plants a bright, sunny position. In this case also the temptation to make the soil too rich at the outset must be avoided. Dig a hole about a foot square and eighteen inches deep. Loosen the subsoil and place at the bottom of the hole a layer of well-decayed manure. If a supply of fresh fibrous loam can be obtained so much the better for the future prosperity of the plants, but failing this insert it in ordinary garden soil that has been well broken up. The stems may be trained against a fence or wall, care being taken to see that they are tied securely, so as not to be damaged by the wind.

Provided the young plants have been thoroughly well hardened off in a cold frame they may safely be planted out in the open from the middle of May. The directions for indoor culture are equally applicable to outdoor work. Firm planting is essential, and over-crowding must be avoided. If the plants are set at a distance of fifteen inches apart they will thrive, but the space between them should certainly not be less and may with advantage be a little more.

The mistake must not be made of turning the plants out from their pots in a dry state. They should be well watered an hour or so beforehand and then be planted deeply, burying the stem at least six inches lower than it stood in the pot from which it is taken. A subsequent watering will settle the roots in their place. If the operations of training, thinning, defoliation and feeding be efficiently carried out there will be an excellent prospect of gathering in a good crop of fruit during August and September in a normal summer.
BOOK X

VEGETABLES FOR THE SMALL GARDEN
CHAPTER XLIV

CROPPING BY ROTATION

The methods that may be adopted in the planning and laying out of the vegetable plot in a garden of small dimensions were suggested in Chapter II., and there is therefore little need to dilate further on the subject. Whether in the case of a diminutive town garden it is worth while for the amateur to attempt to grow any vegetables at all is a matter that is best left for him to decide. He will, of necessity, consider the problem from the economic standpoint, and if he face the dilemma fairly and squarely he will probably arrive at the conclusion that in view of the cheapness of vegetables, especially those that are commonly used for culinary purposes in the small household, there is nothing to be saved and very little to be gained by devoting a portion of his small plot exclusively to their cultivation.

On the other hand there is much personal satisfaction of a sentimental character to be derived from the knowledge that the peas, the cabbages, the potatoes and the beans that are served at the household dinner-table have been cultivated and brought to maturity in one's own kitchen garden. To the enthusiastic amateur who is prepared to sacrifice a certain small proportion of his income upon his garden the economics of the subject present no difficulties. It is enough for him that his vegetable plot has yielded its produce at his behest, and he troubles himself not at all on the score of expense. Probably it would have paid him better in the long run to depend for his domestic supply of vegetables upon the local greengrocer; but he has his reward in the assurance that his efforts at vegetable-growing have not been altogether unsatisfactory and that he is an object of envy to his less enterprising neighbours.
There are, happily, thousands of amateur gardeners who are influenced by considerations such as these, and the purpose of this section of the book is to suggest methods by which, even though the space that can be allotted to the kitchen garden be extremely limited, the fullest possible return can be secured for the time and effort that are expended upon its cultivation.

And at the outset the principle that needs to be adopted and kept ever closely in mind is that known as cropping by rotation. This means, in effect, that no given crop should be allocated to the same site year after year. Market gardeners and professional growers long ago discovered the undesirability of this method. A little scientific study of the needs of each variety of crop soon reveals the fact that every species of plant extracts from the soil nourishment peculiar to itself. It follows therefore that unless the principle of rotation be adopted the ground speedily becomes denuded of the special nutritious elements that are necessary for the full development of the plant; deterioration sets in, and failure is the inevitable sequel. Disappointment will follow, no matter how regularly an attempt is made to rectify the deficiencies in the soil by the use of organic manure.

For this reason it is necessary that the would-be vegetable-grower should give himself ample room in which to put the principle of rotation into practice. No useful purpose is served by crowding a limited area of soil with growing vegetables in such a manner that the ground is always occupied in spring and summer and vacant for the remainder of the year. Wherever it is possible an uncropped space should be left for seed-raising, or for experiment, and especially so that there will be no necessity to wait for one crop to come off before another can take its place.

So that the reader may fully understand the object to be aimed at it will be advisable to show by example what is meant by rotation. Here are a few hints that are worth keeping in mind:

Cabbages, which are an exhausting crop, should not be planted in soil which immediately before has borne a similar crop.
—such as broccoli or brussels sprouts. Cabbages will thrive well in an old onion bed.

Potatoes should succeed crops of a leguminous order, such as peas and beans; cauliflowers, or brussels sprouts.

Peas and broad beans may follow parsnips, savoys, etc., carrots, beet and potatoes. Early peas can be sown in a cleared celery trench, which will be rich enough to produce a good crop without any further manuring.

Onions will do well on the site of a discarded asparagus bed, or celery trenches.

Runner beans and dwarf beans can be sown where potatoes have been grown previously.

Turnips, beet, carrots and parsnips will thrive in soil which has borne winter greens.

These are only a few suggestions which illustrate the method of cropping recommended for adoption. The changes can be rung indefinitely, and always with good results if it be borne in mind that the object to be aimed at is to secure for the crops the fullest benefit that the fertilising properties of the soil can be induced to yield. As a general rule a top crop should be followed by a root crop.

Let us suppose that the owner of a new and uncropped garden intends to cultivate vegetables in a portion of it for the first time. What should be his method of procedure? In drawing up his plan of operations he will need to determine the kind of vegetables he desires to cultivate and to place them in the most convenient positions and in the most suitable soil. The importance of deep digging and trenching has already been so emphatically insisted upon that it is only necessary here to refer the reader to Chapter IV. for directions as to the proper methods of preparing the soil.

The choice of suitable first crops will present no difficulties, if at the outset attention be confined to those that are of robust growth—such as potatoes, the various kinds of brassica, beans, peas and celery. These will all assist in pulverising the soil and in bringing it into good condition.
Suitable situations should be chosen for each variety. For example, the south and west borders may be devoted with satisfactory results to the production of peas, French beans, lettuce, turnips, carrots and potatoes. In the north and east borders places should be found for crops which during the heat of summer thrive best away from the glare of the sun and revel in a certain amount of shade. Among these may be mentioned radishes, spinach, turnips and lettuce. The centre beds of the kitchen garden may be devoted to onions, peas, celery, parsnips and potatoes. The amount of space to be allotted to each kind of vegetable will, of course, depend upon individual taste and the size of the kitchen garden.

By far the most economical method of cropping a vegetable plot is by the sowing of seed, and in the case of many subjects that do not bear transplanting there is no other way. So that there may be as little waste of seed and of effort as possible I have drawn up the following table which shows the quantity of seed necessary for a given length of row or area of ground and the period at which it should be sown:

<table>
<thead>
<tr>
<th>Name of Vegetable</th>
<th>Quantity</th>
<th>When to Sow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beans, Broad</td>
<td>1 pint for 30 yards of row</td>
<td>February and March</td>
</tr>
<tr>
<td>Beans, French</td>
<td>1 pint for 30 yards of row</td>
<td>May and June</td>
</tr>
<tr>
<td>Beans, Runner</td>
<td>1 pint for 30 yards of row</td>
<td>May and June</td>
</tr>
<tr>
<td>Beet</td>
<td>½ oz. for 25 yards of row</td>
<td>April and May</td>
</tr>
<tr>
<td>Broccoli</td>
<td>1 oz. for 8 square yards</td>
<td>March and April</td>
</tr>
<tr>
<td>Brussels sprouts</td>
<td>1 oz. for 8 square yards</td>
<td>February to April</td>
</tr>
<tr>
<td>Cabbage, Early</td>
<td>1 oz. for 8 square yards</td>
<td>August</td>
</tr>
<tr>
<td>Cabbage, Main</td>
<td>½ oz. for 30 yards of row</td>
<td>March and April</td>
</tr>
<tr>
<td>Carrots</td>
<td>1 oz. for 8 square yards</td>
<td>April, May and June</td>
</tr>
<tr>
<td>Cauliflower, Early</td>
<td>1 oz. for 8 square yards</td>
<td>August and February</td>
</tr>
<tr>
<td>Cauliflower, Main</td>
<td>½ oz. for 30 yards of row</td>
<td>March and April</td>
</tr>
<tr>
<td>Lettuce</td>
<td>½ oz. for 8 square yards</td>
<td>January to August</td>
</tr>
<tr>
<td>Onions</td>
<td>½ oz. for 30 yards of row</td>
<td>February and March</td>
</tr>
<tr>
<td>Parsnips</td>
<td>½ oz. for 8 square yards</td>
<td>February and March</td>
</tr>
<tr>
<td>Peas, Early</td>
<td>1 pint for 25 yards of row</td>
<td>February</td>
</tr>
<tr>
<td>Peas, Late crop</td>
<td>1 pint for 25 yards of row</td>
<td>May</td>
</tr>
<tr>
<td>Peas, Main crop</td>
<td>1 pint for 25 yards of row</td>
<td>March and April</td>
</tr>
<tr>
<td>Radish</td>
<td>1 oz. for 8 square yards</td>
<td>January to August</td>
</tr>
<tr>
<td>Savoys</td>
<td>1 oz. for 8 square yards</td>
<td>April</td>
</tr>
<tr>
<td>Turnips</td>
<td>½ oz. for 20 yards of row</td>
<td>April to July</td>
</tr>
</tbody>
</table>
By a reference to the above table the amateur will be able to avoid the waste incidental to the purchasing and sowing of too much seed. If the quantities be sown as directed, there will still be ample opportunity for the thinning out and transplanting in the case of cabbages, cauliflowers, etc., which will be necessary if satisfactory results are to be obtained.

If the precaution be taken to sow thinly the growth will be found to be sturdy enough. But even with the most sparing sowing the young plants will still come along too thickly to provide satisfactory crops, and constant attention must be paid to the task of thinning them out severely.

Here is a little table showing how far apart the young plants should be left after they have been properly thinned out:

<table>
<thead>
<tr>
<th>Ins. apart</th>
<th>Ins. apart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parsnips . . . 12</td>
<td>Beet . . . 12-18</td>
</tr>
<tr>
<td>Dwarf French beans . 12</td>
<td>Onions . . . 6-12</td>
</tr>
<tr>
<td>Broad beans . . 6</td>
<td>Turnips . . . 9</td>
</tr>
<tr>
<td>Runner beans . . 9</td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER XLV

POTATOES

The luxury of being able to dig a dish or two of early potatoes from one's own garden towards the middle of June is one that the amateur gardener will not readily forgo once he has tasted its delights. But to be able to achieve this triumph regularly, as each season comes round, presupposes some previous experience in the art of successful potato-growing, a fair amount of space, and a suitable situation in the kitchen garden in which to mature the crop.

The average suburban garden, limited in area as it usually is, is almost invariably—and quite rightly, as I think—devoted to the cultivation of flowers, small fruit trees, and such vegetables as occupy the minimum of space and yield the maximum of useful produce for the larder. In choosing among the thousand and one subjects which invite experiment at the hands of the amateur gardener with limited time and means at his disposal, potatoes should be the first to be jettisoned. Where potatoes are grown from reasons of domestic economy, and where in consequence the amateur allots almost all his available space to their cultivation, I should be sorry if any arguments of mine diverted him from his purpose. But I venture to say that among the vast majority of small suburban gardeners this necessity does not arise. Ground which would be occupied by the cultivation of a dozen or two rows of main crop potatoes could, I am certain, be put to better, more profitable and greater pleasure-yielding uses.

Where a main crop is grown with the object of securing a house-hold winter supply there will be very little chance of obtaining more than one crop of potatoes from the garden during the year.
The line of true economy to be followed by the owner of a small kitchen garden is that of seeking to make his plot yield its produce almost all the year round. Rotation of crops, as was emphasised in the preceding chapter, is the principle he should adopt. If he do so he will find that his few rods of ground will give him in turn early potatoes, early peas, and a good supply of main crop peas; that when his early potatoes have been removed he will have space in which to grow turnips, spinach and lettuce, and that later on the ground can be profitably occupied by a variety of winter greens which will be available for culinary use from November until early spring comes round again.

This brings me back to the point—that there is real luxury to be gained by the cultivation of early potatoes. There are difficulties to be encountered, but they are not insurmountable. And the first that will confront the inexperienced amateur will undoubtedly be the choice of suitable varieties. Let him for a start make an experiment with one of the early ashleafs, of which there are several excellent kinds—such as Carter's Improved, Myatt's, or Veitch's. Other varieties to select from are Sutton's May Queen, Sharpe's Victor, Mid-Lothian Early, Ringleader, Sharpe's Express, Early Regent, Sir John Llewelyn, and Duke of York. A trial box of any of these varieties can be obtained at prices ranging between one shilling and one shilling and sixpence. These will contain enough tubers to plant one or two fair-sized rows, but if larger quantities are required, they can be obtained at the rate of from two shillings and sixpence to five shillings a peck. Half-a-peck will provide enough tubers for planting twenty-five square yards of ground.

The order for the seed should be given at the end of January, for this will mean the securing of sound, plump tubers, whereas if their purchase be postponed there is a danger of being supplied with the "fag end," and therefore the weakest of the stock. As soon as the tubers arrive they should be ranged in shallow boxes in the manner indicated in Diagram 63. This is for the purpose of inducing "sprouting." The advantages of this method over the old haphazard practice of taking sets from tubs and clamps
and placing them directly in the ground are so great that they require little emphasising.

A merely cursory examination of the kitchen gardens of the majority of amateur gardeners at a time when the haulm of the potato is in vigorous growth will reveal the fact that the rows are uncomfortably overcrowded. This is due to neglect in the proper preparation of the tubers, each of which in a congested row such as I have referred to supports half-a-dozen or more stems, four or five of which should have been removed in the early stages of their development.

This condition of things, which inevitably brings in its train attenuated and unsatisfactory crops, can be avoided absolutely if the system of "sprouting" the sets be adopted. The boxes containing the seed tubers should be shallow—not more than six inches in depth—and they should be half filled with leaf mould, loam, and sand well mixed together. In this soil the tubers can be packed closely, care being taken to place the thick end of the set, where the strongest eyes or buds show themselves, uppermost. The boxes should then be placed in a light and airy but frost-proof frame, shed or attic. The tubers will soon turn green, and in due time will begin to sprout. The shoots will be short, thick and sturdy, and they will be in the best condition for planting when they are about two inches in length.

Before planting it will be necessary to remove all superfluous shoots. If a comparatively small crop of potatoes of large individual size, such as those required for exhibition, for example, are required, it will be advisable to remove all but one shoot, but for general purposes a much heavier crop of medium-size tubers will be obtained if the three strongest shoots on each "set" are retained.

Another advantage to be derived from "sprouting"—and it is a great one where space is limited, and where only a few rows of potatoes can be cultivated—is that it enables one to detect blank tubers before putting them in the ground. Any that fail to sprout should be rejected, for it is the use of these which is chiefly responsible for the empty spaces which one often finds in a row of
Diagram 63.—HOW TO PLANT POTATOES.

Fig. 1. Place tubers in shallow boxes to encourage growth. Fig. 2. Otherwise the amateur may expect this result. Fig. 3. One or two eyes may remain, rub off the remainder. Fig. 4. Place in a trench preparatory to covering, twelve to eighteen inches apart. Fig. 5. Result of careless dibbling, and consequent weak growth.
potatoes, even when one has planted what are to all outward appearance ideally shaped and satisfactory tubers.

These methods of preparing seed potatoes are strongly advocated, whether the crop to be grown be early or late, but they are especially desirable in the case of early varieties, since they enable the grower to ensure that his sets shall make a good start into growth even before he commits them to the ground.

While the "sprouting" is in progress the ground should be prepared. If there be an available piece in a warm, sheltered, sunny position that was thoroughly well dug and manured in the autumn so much the better, but if not, it should be put into proper condition to receive the tubers without a moment's delay. If frost comes after the digging so much the better, it will pulverise the soil and will enable the grower to fine it down with a Dutch hoe preparatory to planting.

By far the best method of planting—and this should be done towards the end of February in the case of early varieties—is that of placing the tubers one foot apart in trenches five or six inches in depth. This is far preferable to the plan of using a dibbler and then thrusting the tuber into the cavity in the hope, but not the certainty, that it will rest firmly on the bottom of the hole. The tubers should be taken direct from the trays one at a time, exercising such care that the tender shoots are not damaged in the process. When a row has been planted the soil must be drawn carefully over the tubers and levelled down.

There need be no fear of damage by frost until the green shoots appear above the ground. Henceforth a close watch must be kept on atmospheric conditions, and at the first sign of the approach of frost the rows must be earthed up in ridges. This is best done with the hoe, and the operation will require to be repeated so long as the danger of frost exists.

There is the more need for these precautions because early potatoes are much more liable to be affected by cold winds and late frosts than are the main crop and late varieties. The effects of the blackening of the haulm by frost are bound to be serious. A severe check, which will undoubtedly have a deleterious
influence upon the ultimate yield of tubers, will follow. Therefore, to make assurance doubly sure, it is worth while to take a little additional trouble, and in frosty weather to cover the rows with clean straw to a fair depth, removing it in periods of mild weather and restoring it when danger of frost is at hand. Early varieties of the kinds mentioned at the outset of this chapter if planted in February will yield a crop in June.

The tubers of mid-season main crop potatoes may be planted during April in the south of England, but it is the height of wisdom not to be in too great a hurry to get this important operation completed, since there is always danger of sudden sharp frosts, even in May, causing damage to the top-growth soon after it has made its appearance above ground.

An ideal soil for potatoes is a deep, strong, warm loam with a dry subsoil and one that has not been rendered rank by the incorporation at frequent intervals of organic manures. If the soil be too rich the inevitable result will be the production of a luxuriant growth above the ground and a poor crop of potatoes beneath it.

Another important point to remember is that deterioration of the crop will inevitably follow if it be grown in the same position season after season. It is a good plan to change both the position and the seed at intervals. Some great growers change their ground periodically from one county to another with the object of introducing fresh soil essentials, and thus keeping their stocks in vigorous condition. From this fact the amateur gardener may draw his own conclusions and act accordingly.

The planted tubers should be covered to a depth of four inches, and then for a few weeks afterwards it will be found of great benefit to the production of sturdy growth if the soil between the rows is forked at regular intervals. In this way the soil will be aerated, and the sprouts will come through strongly and evenly.

The operation of earthing up or moulding potatoes will be necessary in the case of the main crop about the beginning of June. This involves the drawing up of the earth towards the centre of the rows in such a manner that ridges are formed which serve the double purpose of keeping the growing stems erect and
of providing a covering of soil later on for the newly formed tubers. Neglect to perform this operation might result in exposing the tubers to the air and sun. They would if thus exposed turn green and be rendered unfit for food. Earthing up should be done with a hoe, first of all taking care to remove all weeds at the sides of the rows and afterwards carefully drawing the soil round the stems in such a manner that none of them shall be either completely covered or damaged by coming in contact with the blade of the hoe. A second earthing up is advisable a few weeks after the first.

In selecting varieties for cultivation in the garden it is as essential for the amateur as for the professional potato-grower to beware of those kinds which are known to be subject to disease. New varieties are introduced every year; and it is therefore a somewhat difficult matter for the inexperienced amateur to determine the kind upon which he shall depend for his season's crop. Happily the scientist has come to the aid of the gardener and he has been able by careful trial and experiment to determine which are the varieties that are most susceptible to the dreaded disease—black scab—which in some seasons causes untold harm in the potato fields and the kitchen garden. He tells us that the varieties that are most liable to be attacked by the disease are the following:—Up-to-date, Northern Star, King Edward VII., Eldorado, Royal Kidney, British Queen, Talisman, Epicure and May Queen, and that the varieties that are safe against black scab are Golden Wonder, What's Wanted, Langworthy, Sutton's Abundance, and Findlay's Conquest.

The amateur is best advised in obtaining his seed potatoes, no matter what variety he determines to grow, from a trustworthy and reputable firm, and by being guided by them in his choice. The grower may then by the adoption of the usual methods of cultivation be reasonably sure of digging a satisfactory crop of tubers, but to make assurance doubly sure and to guard against any likelihood of attacks of disease, he should follow the example of the great growers, who invariably spray the tops of their potatoes twice during the season, the first time soon after the tops first
appear and again about a month later. The mixture for spraying should be composed of one pound of sulphate of copper and one pound each of fresh lime and soft soap. Each ingredient should be dissolved in a separate utensil containing a gallon of hot water. The liquid sulphate of copper and the dissolved lime must first be mixed together and the soft soap solution be added afterwards. The whole preparation should then be thoroughly well stirred, and as soon as it is cool be applied to the top-growth through a syringe.
CHAPTER XLVI
PEAS AND BEANS

No vegetable is more highly esteemed by the amateur gardener, and there is none that is more profitable, than the culinary pea. The months of March and April provide the most suitable time to sow the seed, though if an early crop is desired it may be put in the ground early in February, provided the situation chosen for its reception be a well-protected sunny border which faces south or south-west.

The first essential in satisfactory pea-growing is deep cultivation of the soil; the second is efficient feeding. No matter how careful the subsequent culture of the vegetable, if these requirements are not forthcoming the resultant crop will inevitably be unsatisfactory.

The site selected for the principal crop of peas should be open, and it should be one in which the soil is naturally rich, or to which manure has been liberally applied for a previous crop. If the soil has been well trenched in the autumn—and this is by far the better plan where the ground is inclined to be heavy—the seed may be sown early in March. But where the preparation of the ground has been postponed until February it will be wiser to wait until the beginning of April to allow the soil to settle down and become thoroughly aerated before the seed is put in.

The finest crops are ensured if the seed be sown in trenches as indicated in Diagram 64. The trenches should be dug out to a depth of fifteen inches. The subsoil should be well forked over and loosened, and in the bottom of the trench a layer of well-decayed manure be placed. Over this a layer of fine soil at least six inches thick will be essential. With this soil may be mixed a further supply of finely chopped manure, a sprinkling of
Diagram 64.—HOW TO GROW PEAS.

Fig. 1. The trench, fifteen inches deep. Fig. 2. Trench ready for sowing.
Fig. 3. Peas sown. Fig. 4. A simple device—twigs and black cotton—to keep off the birds.
wood ashes saved from the autumn bonfire, and a few handfuls of soot.

After the soil has been allowed to settle for a few days it is a good plan in dry weather to tread it down lightly, and it will then be ready for sowing. Thick sowing should be avoided. If the seeds are placed from four to six inches apart they will be quite close enough. They need not be covered with more than two inches of soil, which for the surface dressing should be fine and friable, and so arranged that the top of the trench is two inches lower than the surrounding soil. The trenches should not be less than five feet apart for tall-growing varieties.

The aim of the cultivator of peas, if he have room, should be to secure a succession of crops. If he sow early varieties in February, such as Mayflower, he will have peas by the end of May; Edwin Beckett sown early in March will yield full pods by June; Carter's Early Morn sown in April will also yield in June, while for other sowings in April may be mentioned Quite Content (a magnificent variety), Dreadnought (one of the largest blunt-podded peas in cultivation), and Model Telephone. For a later sowing, from the end of May until the middle of June, Michaelmas is a heavy cropper. These varieties, if sown in succession in the order named, will provide crops from June to November.

There are two natural enemies that the cultivator of peas will require to guard against during the early stages of their growth. These are slugs and birds. In the event of very damp weather following immediately upon the appearance of the tiny green shoots above the surface of the soil slugs may prove very destructive. If a mixture of lime and soot be dusted along the trenches at the time of sowing and a further dusting be given along the surface a fortnight later the enemy may be kept in check, but he will need to be carefully watched and at the first sign of a renewed attack the application of soot and lime must be repeated.

The attacks of birds can be warded off more easily. A reference to Diagram 65 will show the simple methods commonly in use.

At Figures 2, 3 and 4 are depicted various contrivances, which can easily be made at home—the only utensils required being a
Diagram 65.—PROTECTION FOR PEAS.

Fig. 1. The method of sowing peas for exhibition: a, fine soil; b, good soil; c, mixture of manure and soil. Figs. 2, 3, and 4. Easily made protectors for peas. Fig. 5. How to stake peas. Fig. 6. Tops of sticks used in early stages for supporting young growth. Fig. 7. The effects of mulching.
few pieces of wood, some strong black thread and a few nails. A more primitive method is that in common use. This is to insert a few short stakes at either end of the rows, to tie one end of a reel of thread to one of the stakes and to pass it backwards and forwards, over the peas, making it fast at each stake as the work proceeds.

Figure 5 shows the proper method of staking peas, and Figure 6 indicates how the thin and wiry tops of the pea-sticks may be used to give support to the plants in their early stages.

Peas require generous feeding. In Figure 7 the results of a good mulching are indicated. The mulching consists of placing a layer of rich manure along each side of the row, and the sketch shows the effects in a fine, vigorous top-growth and an excellent production of root.

In periods of dry weather watering must be resorted to, and while one is about it it is well to ensure that the soil is brought into a thoroughly moist condition. Dryness at the roots means that the supply of food to the plants is arrested, and it is only by supplying moisture copiously at such times that the plants can be kept growing healthily. Where soft rain-water can be obtained it should always be used in preference to tap water. Surface hoeings along the sides of the rows will help to retard evaporation in the soil and will postpone for a time the necessity for supplying water to the roots. But whatever means are adopted it is essential that the roots shall not want for moisture, especially at that season of the plant’s development when it is putting forth its flowers or forming its pods.

Both scarlet runners and dwarf beans may be sown with perfect safety out of doors from the middle of May. Their cultivation is so simple that it is not surprising to find them growing in almost every amateur’s garden. Runner beans especially have a decorative as well as a utilitarian value, which makes their popularity easily understood.

In many small gardens the old and well-tried plan of growing them in straight rows across the broadest bed in the kitchen garden, and formally in straight lines along a stretch of bare fence,
is still largely followed. But for purposes of decoration I should like to commend another plan. It is to sow a few beans inter-
mittently along the mixed border. They can be sown in clumps of five or six seeds, and the plants can then be trained to sticks arranged in circular or other artistic designs.

But whatever be the manner in which it be grown, whether for decorative or crop-producing purposes, the runner bean must be supplied with a rich soil medium if it is to thrive. Deep digging and forking are essential. Some time before the seed is sown a quantity of well-seasoned farmyard manure should have been incorporated with the soil.

The beans should be sown about three inches deep. If it be intended to grow the runners in rows it is a good plan to adopt the double drill system—as being economical in that it gives a large return for the space occupied. The drills are drawn three inches deep and about nine inches apart, a space of two and a half feet being allowed between the pairs of drills. The seed may be placed in the drill three or four inches apart, and be thinned out ultimately to nine inches. This can be done in such a way that the young plants stand alternately in adjoining drills and not opposite each other. Where the single drill method is followed the rows should be not less than two feet asunder, a similar thinning out to nine inches apart being adopted in this case also.

In ten days or a fortnight the seedlings will appear through the ground, and then the grower must keep a sharp look-out for slugs. If they are at all troublesome they can be kept in check by dusting the rows lightly with lime and soot.

Towards the end of May or the beginning of June it will be necessary to put in the stakes. These should never be less than seven feet in length, and where the rows are likely to be exposed to boisterous winds care must be taken to see that the stakes are strongly and firmly fixed in the ground.

Among the best varieties of the scarlet runner bean are Giant Scarlet, Ne Plus Ultra, Invicta and Al. Painted Lady is a distinct type in which the flowers are partly white and partly
scarlet, the variegated colouring producing a splendid decorative effect when the plants are trained on trellises or on fences.

Red spider sometimes attacks scarlet runner beans in very dry weather, but the pest may easily be kept in check by frequent watering and syringing of the foliage.

A sowing of dwarf Kidney or French beans may be made a little earlier than is the case with scarlet runners, but in any event it is not wise to place the seed in the open ground before the first week in May. Subsequent sowings for succession may be made until the end of June. The seeds should be placed in drills three inches deep, in soil that has previously been enriched in the manner recommended for runner beans. After thinning the plants should be left nine inches apart. Very little staking will be required, but for safety’s sake it is advisable to erect a low trellis or row of stakes beside each drill so that if any support is required by the plants it will be available. Among the best Kidney beans are Canadian Wonder, Early Six Weeks and Sir Joseph Paxton.

Broad beans thrive best in fairly stiff soil which has been well manured in the previous autumn, and the earlier they are sown after the end of January the better the prospects of success. For the first sowing the variety known as Mazagan is to be recommended, and another early cropper worth trying is Long Pod. For a later sowing Mammoth Green, Giant Seville and old Green Windsor are recommended.

The seed may be sown in broad drills, either in single or double rows. The drills should be at least three inches deep and the seed be placed three inches apart. Black fly is the chief pest of the broad bean. It makes its appearance when the flowers form at the top of the stem. The only effectual remedy is to cut off the tops that are infested and burn them without a moment’s delay.
Diagram 66.—AN ASPARAGUS BED.

Fig. 1. Planting asparagus on the flat. Fig. 2. The bed finished. Fig. 3. Method of planting on ridges. Fig. 4. Section of finished bed.
CHAPTER XLVII

ROOT AND STEM CROPS

In this chapter I propose briefly to give a few cultural hints on the growing of root and stem crops suitable for the small garden.

Asparagus.—Who that has grown asparagus successfully would ever be without a bed or two of this most delicious of vegetables? Nobody, I should imagine. But if there are any of my readers who have never attempted it let me recommend them, if they have plenty of room and a good store of patience, to try the experiment. April is the most suitable period for planting.

Supposing at the outset the intending grower determines to confine his efforts to the cultivation of one bed of asparagus only—what should be his mode of procedure? To begin with, he must choose a site which will afford suitable soil. A low, damp piece of ground ought to be avoided, since asparagus never thrives in soil that is waterlogged. But ground which in the ordinary way will produce satisfactory crops of deep-rooted vegetables will be found not unsuitable for asparagus.

The soil must be trenched to a depth of two feet if possible, and the bottom section be composed of a mixture of the rougher soil and farmyard manure. The second spit should be made up of good soil, with which if possible some road scrapings, mortar rubbish and wood ashes have been incorporated. Here again autumn preparation of the soil would have been preferable, but where this has not been possible let not the beginner be deterred from starting his experiment in asparagus cultivation in spring. The experienced nurseryman from whom you will obtain your two-year-old plants will not send them in frosty weather, and in
Diagram 67.—SOWING BEET.

Fig. 1. The peculiarities of germination (good seed has two, three, and four seeds in the pod. Reading from left to right are shown: the seed; cut in half; germinating; cover being carried out of the soil by one of the seedlings). Fig. 2. Ordinary cultivation: making the drill; the drill; sowing seed; raking in. Figs. 3. and 4. Growing for exhibition: make a hole with a stout stick; fill in with contents of old cucumber bed, working it in with a stick; sow about four seeds in the depression, afterwards cover in, leaving one healthy plant finally.

2 B
the interval the ground can be made ready to receive its future occupants.

The roots may be planted either on the flat, as shown in Figure 1, or on the apexes of ridges, as indicated in Figure 3 of Diagram 66. But whichever course be adopted, be ready for the plants when they arrive, since it is important to expose the tender roots to the influence of the air as little as possible. Great care, too, is needed in handling them, for the fibres of the roots are very brittle, and if broken do not mend rapidly. The plants should be set twelve inches apart in straight rows. The crown of the root should be at least three inches below the surface when the final covering of soil is put on, as shown in Figure 2.

And now the virtue of patience will be required. The plants must be left to develop throughout the summer, and in the autumn be covered over with a thick layer of rich manure. Cuttings may be made during the following spring in the case of two-year-old plants set out in April, but this should be done sparingly at first. It is advisable to allow the plants plenty of time to develop, and to leave a fair number uncut annually.

Asparagus can be grown from seed sown in drills on well-prepared beds, but in this case no cutting should be attempted until the plants are three years old.

**BEET.**—The sowing of the earliest beet—the round-rooted, of which Blood Red is the best variety for the purpose—may be undertaken in favourable weather in April. The seed of the later—tapering-rooted—kinds may be sown at any time during May. Excellent varieties are Nutting’s Red, Blood Red and Pragnell’s Exhibition. These all have dark crimson foliage; varieties with greener leaves are Cheltenham Black and Sutton’s Black.

The soil for beet should be deeply tilled and fairly rich. But the use of manure immediately preceding the sowing of the seed should be avoided, since its presence in the ground will exercise a deleterious influence upon the roots, in that it will cause them to branch and produce objectionable side roots. The manure is best applied in early autumn and even then it should not be
administered in lumpy masses but be thoroughly mixed with the soil.

**CARROTS.**—The carrot revels in a light soil, and the sowing of seed on heavy, clayey land should therefore be avoided. As in the case of all tap-rooted vegetables there is urgent need for deep tilling. Sowing is best done in drills ten inches apart. The seed is fine and light, and so that thin sowing may be rendered more certain it is a good plan to mix some sand with the seed and afterwards to distribute it evenly along the drills.

Shortly after the feathery shoots make their appearance above the ground—as soon indeed as they can be conveniently handled—a rigorous thinning out will be necessary.

The accompanying diagram, which shows a section of a row of carrots before and after the thinning-out process, indicates clearly what is required. Neglect to perform this operation at the earliest possible moment will spell disaster. If the carrots be allowed to become overcrowded the product will be nothing but a multitude of attenuated roots, little thicker than a lead pencil. These are, of course, useless for culinary purposes.

In thinning out some study must be made of the requirements of the varieties to be dealt with. If they be short-rooted the seedlings should be thinned ultimately to six inches apart. The longer and larger varieties require more space, and will need to be thinned out so that the roots that remain are from nine to twelve inches apart.

After the thinning-out operation has been successfully performed the ultimate success of the crop will then depend largely on the frequent use of the hoe. This implement should be plied

**Diagram 68.**

**THINNING OUT CARROTS.**

The diagram shows, on the left, the good effects of a vigorous thinning out of carrots, and on the right, the evil results of neglecting this operation.
frequently between the rows, especially in dry, hot weather. The ground will thus be kept well aerated, and at the same time the hoe will help to hold weeds in check.

Carrots that are growing strongly on clean, well-tilled soil are perhaps more immune from the attacks of insect pests than any other vegetable crop. Greenfly, however, may make its appearance, and when this happens it is a good plan to dust the plants occasionally with a mixture of nitrate of soda and lime. While keeping the pest in check the application of this mixture will at the same time provide a valuable stimulant to the growing plants.

**Celery.**—It is a comparatively easy matter to grow celery well, and yet how rarely does one find the plant produced in perfection in the kitchen gardens of amateurs who do not rely at all on professional assistance. The chief reason for frequent failure is, I think, that not sufficient attention is paid to the preparation of the soil. A point to bear also in mind is that celery is a semi-aquatic, and that the plants must be kept moist at all stages of their development.

The seed may be sown at any time from January to April. This will depend on whether the celery is required early or late, but the principal sowing ought to be made about the middle of March. The seed is sown in boxes of light, rich soil, and started into growth either on a gentle hotbed in a frame or in the warm greenhouse. As the seedlings progress they are pricked off into other boxes and gradually hardened in a cold frame until the time comes for planting them in a prepared bed out of doors. This will take us to the early part of June, and the plants may be left to develop until the time comes for putting them in the trenches in July.

The preparation of the trenches requires great care, for upon the attention to detail that is observed in this branch of the work a good deal of the future success of the plants will depend. The trenches should be dug to a depth of a foot or so, and be about fifteen inches wide if for a single row of plants, and twenty-four inches if for a double row. It is, of course, essential that plenty of rich manure should be used in the preparation of the trenches, but the mistake that is often made of dumping a thick layer at the
Diagram 69.—PLANTING CELERY.

Fig. 1. Young plants ready for planting. Fig. 2. Select sturdy specimens. Fig. 3. The trench one foot deep. Fig. 4. Filled in ready for planting; well-rotted manure worked in the bottom, and fine rich soil added to within about six inches of the top. Fig. 5. Plant nine inches apart.
bottom should be avoided. The bottom of the trench must first of all be thoroughly broken up with a fork, and the manure be then mixed with the subsoil.

When this has been done the trench should be filled in to within six inches of the top with a deep layer of fine rich soil, into which the plants may be put. It will be found a good plan to place them in a regular line or lines at least nine inches apart. It is a mistake to plant too closely; good celery needs plenty of room. When planting see that it is done firmly, so as to induce a good root-run.

The after-treatment consists first of all in preventing the young plants from flagging at the outset of their sojourn in the trenches. This can be accomplished by laying bushy sticks across the trenches so as to shade the young celery from hot sunshine, and by syringing the plants twice a day until they have taken a firm hold of the soil. Constant attention must be paid to watering, for whichever part of the garden goes short in this respect the celery trenches must on no account be neglected. Water must therefore be supplied in copious quantities.

But pure water will not be sufficient to produce fine, succulent heads of celery. The plants will require a stimulant from time to time, and this may take the form of weak liquid manure water applied once a week, or of a dressing of one or other of the artificial manures in commerce at the present time. If applied in the dry state these concentrated fertilisers should be sprinkled lightly along the trenches, but only after the latter have been thoroughly soaked with water. Care must also be taken to keep these manures off the foliage, otherwise it may be damaged. Another excellent stimulant is a weak solution of soot, diluted until it is the colour of weak tea.

As the plants grow taller the trench must be gradually filled in to the top, holding all the leaves together as the soil is packed in. If only a single row is cultivated the plants will require earthing up on each side as they advance in growth.

Horseradish.—This is a vegetable which the amateur gardener frequently fails to grow well. Too often he thrusts a piece of root into any odd corner of the vegetable plot,
Diagram 70.—HOW TO PLANT HORSE RADISH.

Fig. 1. Select a thick stick and remove crown as indicated. Fig. 2. Side growths should be removed. Fig. 3. Dibble holes and plant crown as shown. Fig. 4. Result of shallow planting—all foliage.
and leaves it to its own devices, careless, perhaps, whether it produces a shapely, serviceable stick, suitable for culinary purposes, or not.

Diagram 70 provides a few hints which may indicate what has hitherto been a very common cause of failure, and what are the methods to be employed to ensure satisfactory results. It is true that a piece of horseradish root of any shape or size will "strike," but in order to produce good thick sticks it is advisable to use for planting purposes crowns such as that indicated in Figure 1. Crowns prepared in this manner can be obtained very cheaply from any nurseryman. They should be trimmed so that all side growths are removed. Such a projection as that shown in Figure 2, for example, should be taken off.

Ground intended for the reception of the crowns will need to have been deeply dug previously, and the planting should proceed as depicted in Figure 3. First a hole, at least ten inches in depth, should be made with a dibbler. The crown must then be inserted in the cavity in such a manner that it rests firmly on the bottom. Now comes a point in culture which can be left to the individual discrimination of the grower. If the soil be fairly light there is no necessity to fill in the holes. If left alone they will be gradually filled as the rain washes loose surface soil into the cavity. The crown will soon take root, and will proceed to make its way towards the surface, its growth being even and symmetrical. The root will gradually thicken, and by autumn will be ready for use. Where the ground is at all heavy, the hole after planting had better be filled with fine soil.

The secret of successful horseradish culture, it will be seen, is deep planting. The results of shallow planting are shown in Figure 4; these are a few attenuated forked roots, absolutely useless for any culinary purpose, and a great wealth of foliage.

When the crop is ripe the whole of it should be dug up in the late autumn and stored ready for use. It is necessary to see that not the smallest piece of root is left in the ground, otherwise it may run wild and become a nuisance and a hindrance to other crops which it may be desired to grow in the same piece of ground.
Diagram 71.—MUSHROOMS OUT OF DOORS.

Fig. 1. The proper shape of the bed. Fig. 2. Push the pieces of spawn in the side of the bed to a depth of three inches. Fig. 3. The bed complete with a covering of Russian mats. Fig. 4. Result of careful cultivation.
MUSHROOMS.—Mushrooms may be grown out of doors even in the smallest garden. The experiment is not a costly one, and August is the ideal time for making the attempt. Diagram 71 will suggest some of the methods to be employed.

The first essential is to get the necessary materials together. Procure fresh stable manure (straw litter manure, not peat litter), shake out well, leaving as little straw as possible; the better the manure the better the bed will bear. After shaking out stack the short manure closely, just as you would prepare a hotbed, and there let it remain for a week. Then turn it over, and place what has been outside the heap into the centre; repeat this turning at intervals of three days. Four turnings should be sufficient, and if dry, use water enough to moisten the manure gradually at each turning. If you get your material right in regard to moisture, whatever shape you make your beds, whether flat beds or ridges, you will not be likely to experience any trouble afterwards. The ideal temperature is 55° to 60°.

For making outdoor beds the material should be put in a heap, the measurements of which should be two feet six inches at the bottom, two feet six inches high, and six inches wide at the top, and the shape when completed should be that shown in Figure 1. The bed may be made to any length required, but it should be rendered quite firm. When it is completed and properly shaped, stakes should be put down the centre by which to gauge the heat, and the whole should then be covered with a long litter.

When a temperature of 80° has been reached the bed is ready for spawning. A couple of bricks should be enough for a small bed. They should be broken up into pieces about two inches square, and inserted into the bed three inches deep in the manner indicated in Figure 2, at a distance apart of eight inches.

The next operation is to cover the whole bed with fresh fibrous loam, and beat it well down. It should then be watered, and the surface made smooth with the back of a spade. Now cover the bed with Russian mats, as shown in Figure 3. The object of this is to keep out the light and to avoid excessive moisture.

If these rules be followed the first crop of mushrooms should be
Diagram 72.—ONIONS AND SHALLOTS.

Fig. 1. The ordinary shallot. Fig. 2. The “mammoth” shallot. Fig. 3. Plant just below the surface six inches apart in rows one foot apart. Fig. 4. A potato onion, which should be planted so as to leave the apex above ground. Fig. 5. Shows how the potato onion increases—partial growth indicated. Fig. 6. The “tree” onion, showing bulbs below and above. Fig. 7. The “seed,” which should be planted two inches deep.
ready in about six or eight weeks, and they will then appear as depicted in Figure 4. When gathering the mushrooms use the thumb and finger, giving the mushroom a gentle twist to sever it from the bed.

Onions.—The wise gardener is he who does not wait till spring arrives to set about the preparation of the ground for his onion crop but who looks ahead and trenches it well in October. It is an excellent plan to dig out a deep trench, throwing out the soil on either side until the clay or subsoil is reached. This is broken up thoroughly, and left to the influence of the frost and rain for several months, and at the same time a good covering of rich manure is applied. Later this is thoroughly incorporated with the soil, which should be thrown back into the trench and formed up until a raised bed has been produced. This operation is best performed in early February, and towards the end of the month, if the ground be sufficiently dry, the bed will be ready for the reception of the seed.

The final preparation of the bed consists in applying a dressing of soot and superphosphate of lime—the latter especially in damp seasons. These act both as a manure and as a ward against pests.

A little later the ground, which has been left rough on the surface, should be broken up with the rake and the fork until a fine tilth has been obtained, and it should then be made thoroughly firm by treading it down with a shuffling tread in all directions.

Seed-sowing should be delayed until the ground is in a fairly dry condition. It is better to wait until the middle of March than to sow when the soil is the consistency of mud. The seed should be sown in drills, since this method allows of thin and even sowing, and facilitates the easier tackling of weeds later on.

The drills should be drawn one foot apart, some charcoal dust being strewn along the drill with the object of preventing canker. The seed must be sown thinly and be slightly covered to a depth of not more than three-quarters of an inch. The bed can then be raked over and receive another transverse treading. This completes the operation of seed-sowing, and nothing remains to be done until the time for thinning out arrives. This should be
Diagram 73.—HOW TO GROW PARSNIPS.

Fig. 1. The well-shaped root obtained by deep trenching. Fig. 2. The result of shallow digging. Fig. 3. The trench. Fig. 4. Growing for show.
carried out at intervals until a distance of four inches between each plant has been allowed.

When the plants are in vigorous growth the use of the hoe between the rows should not be omitted; while an occasional dressing of soot or a simple artificial manure such as guano will be found valuable so soon as the bulbs begin to form. At this stage also it is advisable to press down the stems immediately above the bulbs. This assists in the development of the bulbs, and also, if the stems are all pressed down in one direction, lends an air of neatness to the bed. Spring-sown onions will be ready for lifting and storing early in September.

But there are other methods of raising onions that are not often adopted by the amateur. Diagram 72 gives some hints with regard to them. The potato or underground onion is very easily cultivated. It is shown in Figure 4, and its offsets in Figure 5. The potato onion is largely grown in Devonshire, where, in view of the mildness of the climate, the rule is to plant on the shortest day with the hope of taking up the crop at midsummer.

The bulbs, which can be obtained at any florist's or seed merchant's, should be planted almost on the surface in ground that has been previously well prepared and manured, and in rows fifteen inches apart, and from six to ten inches from each other in the rows.

The peculiar tree onion (shown in Figure 6) can also be planted in February. It bears small onions at the top of a stem, and it is these which may be "set" four inches apart in rows eight inches asunder. Stems that bear heavily will require some support. When the bulbs are matured they can be preserved in a cool place after they have been allowed to dry in the sun for a brief period.

The principal crop of shallots should be planted early in March. The ground must not have been manured recently, but ought to have been enriched in the autumn. The bulbs are planted so that the tips just remain out of the ground, at a distance of six inches apart and in rows a foot away from each other.

Parsnips.—The secret of successful parsnip-growing is deep
Diagram 74.—HOW TO STORE POTATOES.

Fig. 1. Make a "clamp" out of doors. Dig the trench six inches deep, raised a trifle in centre. Fig. 2. Line with straw and place tubers therein. Fig. 3. Cover with straw. The soil may be used to bank up sides as indicated. Fig. 4. For a small grower a circular arrangement can be made on the same principle. Note how the straw is kept in position. Fig. 5. Storing in a cellar or outhouse. Note the straw at the back and bottom.
culture, and Diagram 73 will explain what is required in this respect. The cottage gardener and allotment holder often entertain the desire to compete at local shows, and the most certain way to win prizes for long, shapely parsnips is to adopt the method suggested.

First a trench of the desired length should be dug out to a depth of three spits (three spades, as indicated). Into the bottom of the trench a layer of old manure should be introduced and thoroughly incorporated with the soil. The excavated soil may now be returned to the trench and the surface be left to the disintegrating influences of the weather for a week or so. As soon as the soil becomes sufficiently dry the surface should be broken up and raked down to a fine tilth. The seed may then be sown sparingly in drills and the plants be afterwards thinned out to eight or nine inches apart.

The effect of inefficient, shallow digging is shown in Figure 2 of the diagram. This will inevitably be stunted, split roots, that are absolutely useless for exhibition purposes, and of very little utility for the table.

If particularly large specimen roots are desired the plan depicted in Figure 4 may be adopted. This involves the dibbling of a few holes with a pointed piece of wood at least a foot long. The holes are filled with fine rich soil. Five or six seeds are sown in each, and covered to a depth of about a quarter of an inch. When the young plants are up only one should be left in the centre of each hole; the others should be discarded. When this plan is adopted, the practice of feeding on the surface should be discarded.

If the soil be made rich enough in the first instance, and if deep trenching, as recommended, has been practised, there need be no fear of the ultimate success that will attend this method of cultivation.

RADISHES.—For a quick-growing crop which may be grown in succession throughout the summer the radish is among the most valuable occupants of the kitchen garden. It does not occupy much room, and its usefulness for salads in early summer needs no emphasis. Its culture is simplicity itself. The seed may be
Diagram 75.—HOW TO FORCE RHUBARB AND SEAKALE.

Fig. 1. Sturdy seakale crown, trimmed for forcing. Fig. 2. Suitable for planting only. Fig. 3. Rhubarb stool selected for forcing. Fig. 4. Seakale pot and method of planting. Fig. 5. Rhubarb planted for forcing. Fig. 6. Seakale forced in a frame.
sown fairly thickly on well-manured ground out of doors at any time from early March. When the early growth shows through the ground some protection, such as rope or wire netting, should be afforded against birds. The radish should be pulled young, before it has had time to become rank or hot in flavour. Fortnightly sowings may be made until July.

**Rhubarb.**—The simplest method of making a rhubarb bed is to obtain divided plants from the nurseryman during November. The crowns, as they are called, should be planted not less than two feet apart in well manured soil, and be allowed to grow on naturally for a full year before any sticks are pulled. In the second spring after planting, the stems will be plump and strong and will provide constant supplies from March to the end of May. An earlier supply than could be obtained in the ordinary way may be secured by the adoption of the simple device illustrated in Diagram 76. This is the use of a few drain-pipes or tubs. If these be placed over the roots, long and ripe sticks of rhubarb can be produced in about three weeks.

If there be room under the greenhouse staging this space can be used to good advantage. A disused orange-box half filled with rich soil will form an excellent receptacle for the roots, which should have a top covering of strawy litter. The top of the box can be covered with the lid, and with the further object of excluding the light and retaining the heat thrown out by the hot-water pipes a length of matting can be hung from the bench to the floor. Careful attention will, of course, have to be given to watering. It is essential that the soil in the boxes be kept nicely moist, and for this purpose it is best to use only tepid water.

**Seakale.**—The tender blanched stalks of seakale invariably form a welcome addition to the dinner-table when other vegetables are scarce and dear. Seakale can, of course, be grown from seed, but as a rule, unless exceptional methods of cultivation be adopted, two years elapse before the plants are fit for forcing. The vegetable is, therefore, most frequently propagated by means of root cuttings. These are on the market in December and can readily be obtained from any nurseryman.
Diagram 76.—OTHER METHODS OF FORCING RHUBARB AND SEAKALE.

Fig. 1. Drain-pipe placed in position over rhubarb with slate or other covering to enable contents to be watered and inspected. Fig. 2. Result in about three weeks' time. Fig. 3. Seakale covered with inexpensive articles to provide an early dish. Fig. 4. The whole covered in straw to retain the warmth.
The crowns suitable for forcing will be similar to that shown in Figure 1 of Diagram 75. They must be thick and sturdy, and not thin as in Figure 2, which will be serviceable only for planting in the ordinary way.

Seakale may be forced either in a frame placed on a gentle hot-bed made of moderately fresh manure, or in any other warm place, such as beneath the staging of a greenhouse. The simplest, and, when a large quantity is not required, the most convenient method is to place a few crowns three inches apart in a large flower-pot, the soil in which has been made fairly rich. Since four heads will be needed to provide a satisfactory dish it is a good plan to use four crowns to a pot. The top of the crown should be left just showing above the soil.

Seakale must be forced in total darkness. Therefore, above the pot in which the crowns have been planted it will now be necessary to place an inverted flower-pot of the same size, and carefully to exclude the light by stopping up the drainage hole with a cork. After watering, the pots can be packed away in a warm corner of the greenhouse, or be placed in a hotbed, the latter having holes scooped out of the top to receive the pots.

Figure 4 in the diagram shows the kind of seakale pot usually employed by market gardeners, and the approved method of planting. The thinner crowns or roots are planted out, four or five to the pot, and then covered over thickly with littery manure. In this way the plants are grown on until they are ready for use at the proper season.

**Vegetable Marrow.**—Diagram 77 affords hints on the cultivation of the vegetable marrow, the seed of which should be sown early in April in pots in a gentle heat in the greenhouse. The object to be aimed at is to have young healthy plants ready for planting out in prepared beds by the end of May. The seed should be sown edge upwards, low down in five-inch pots. The purpose of this is to allow of top-dressing as the plants form vigorous roots.

The method of preparing outdoor marrow beds consists in constructing low mounds of rough soil, hollowed out in the middle.
Diagram 77.—VEGETABLE MARROWS.

Fig. 1. Seed should be sown edge upwards. Fig. 2. Seed-sowing; soil low in the pot to enable a top-dressing to be given. Fig. 3. Planted out on the hotbed. If the amateur possesses no handlight he may cover at night with a large pot. Fig. 4. Seed may be sown out of doors in May six inches apart; thin out trailing varieties to three feet, as shown.
In the cavity, a bushel or two of half-decayed manure is placed, and above this a good layer of rich loamy soil is deposited. Here the young marrows are planted when all danger of frost is over. Seed may be sown out of doors in May in beds prepared in the manner indicated in the diagram.

Copious supplies of water are required at all stages of the marrow's growth. Liquid manure is best applied when the fruit begins to swell. The best-flavoured marrows are those that are cut when young and rather small. These are always most suitable for culinary purposes.
CHAPTER XLVIII

CABBAGES AND GREENS

So valuable an element in the economy of the kitchen garden is the cabbage and its allies that the ideal of the amateur with sufficient room at his disposal should ever be "cabbages and greens all the year round." And this aim can be successfully attained if attention be paid to a few guiding principles which may be set out thus:—

(1) The need for deep and thorough cultivation of the soil. This point has been so often insisted upon in the preceding pages that the reader may be tempted to regard it as the inevitable prelude to every chapter, and for that reason be inclined to consider its further repetition unnecessary and irksome. But it is an all-important feature of the science of vegetable culture, and in no part of the kitchen garden is it more essential than in the cabbage patch.

(2) In selecting a piece of ground on which to cultivate members of the brassica tribe preference should always be given to soil in which any of its representatives have not been grown in the immediate past.

(3) Adequate replenishment of the soil by the application of seasoned farmyard manure in which well-rotted straw finds a place. The manure should be employed as an autumn dressing at the rate of two barrow loads to six square yards of ground, and it should afterwards be dug in and thoroughly mixed with the soil.

(4) Seed-sowing in succession—the principal months being March and August, so that provision can be made to
furnish supplies not only during summer, but in winter and spring as well.

The principal members of the cabbage or brassica tribe which are ordinarily cultivated in British gardens are broccoli, brussels sprouts, cabbage, cauliflower, colewort, kale or borecole, and savoy. The main principles of culture are similar in the case of them all, but in the following hints any slight differences in detail that call for attention will be pointed out:

**Broccoli.**—The broccoli is among the most valuable vegetables for autumn, winter and spring use. If seeds be sown in succession in a small prepared bed of fine soil from early in March at intervals of a fortnight, more than enough young plants can be provided for subsequent planting out so as to ensure a plentiful supply of broccoli from October until April. The first batch could be either Michaelmas White or Walcheren; the second, to be ready at Christmas, Snow’s Winter White; the third, for early spring, Adams’ Early; and for the latest crop Veitch’s Model or Cattell’s Eclipse. The seed may be sown either in drills or broadcast, but in any case due attention to thinning out must be observed. The golden rule to be followed is never to allow the seedlings to touch each other so that their growth becomes drawn and lanky. Only the most sturdy and vigorous specimens should be planted out. This is best done in showery weather, when the soil is moist but not sticky. Firm planting is essential. Subsequently the rows must be kept clean of weeds by hoeing. In the event of severe frost it may be necessary to afford protection to the tops of the plants by covering them lightly with a litter of straw, or by “heeling in” the plants. This latter operation consists in forcing the broccoli over with a spade so that they will grow slantwise on their sides with their heads facing the north. Care must be taken not to expose the roots after “heeling in”; it is therefore necessary to earth them up.

**Brussels Sprouts.**—Seed should be sown in March or April, and after the usual operation of thinning out it is a good practice to transfer the seedlings as soon as they are large enough to handle
Diagram 78.—AUTUMN WORK IN THE VEGETABLE GARDEN.

Fig. 1. Spare ground dug and left in ridges. Fig. 2. Earth up celery.
Fig. 3. Protect remaining cauliflowers. Fig. 4. Store carrots and parsnips.
Fig. 5. The broccoli. Fig. 6. Broccoli heeled over to the north.
into another bed, so as to give them a further interval of vigorous growth before they are planted in their permanent quarters. This will be necessary during July and August. The great essential is to allow the plants plenty of room in which to develop satisfactorily, and for this reason vigorous growers should be allowed three feet of space between each plant. Smaller growers will do well two feet apart. Among the best varieties are Dwarf Gem and Paris Market, for early sowing, and these may be followed by Scrymger's Giant, London Market, and Cambridgeshire Champion.

CABBAGE.—The first sowing may be made in March on a sheltered border, though where there is frame and greenhouse accommodation early plants can be raised from seed sown in February. In this case the plants will need to be thoroughly hardened off in cold frames before they are planted out in April. Sowings may be repeated during April and again at the beginning of August for a crop of spring cabbage. For the summer crop Nonpareil or Enfield Market will be found to be good varieties, while Ellam's Dwarf Flower of Spring and Wheeler's Imperial are excellent cabbages for spring cropping.

If the best results are to be obtained, care in the selection of a piece of ground must be observed for planting out. The cabbage is a gross feeder, and needs a rich and well-dug soil to attain its full development. It is for this reason a good plan to plant cabbages in a bed from which in a previous year a crop of onions has been taken.

The planting of cabbages requires to be done with care, and the methods best suited to the purpose are clearly set forth in Diagram 79. If possible, choose a time for planting when the surface of the soil is in a fairly dry condition. This will enable the planter to use the dibbler so that the soil will not adhere to it and retard his operations.

Planting should be done in straight rows two feet apart where it is intended to plant the larger varieties and allow them to attain their full maturity. If, however, the purpose is to cut young plants at the earliest possible moment, the rows need not be more
Diagram 79.—PLANTING CABBAGES.

Fig. 1. Dibbler inserted. Fig. 2. Plant in position. Fig. 3. Dibbler inserted ready for levering over. Fig. 4. Levered over—plant gently forced into position; cavity (a) to be filled in with soil. Fig. 5. Cabbage properly planted and in line. Fig. 6. Dry weather planting; make a trench and water well first.
than a foot apart, since if every alternate cabbage is cut, those
that remain will be two feet asunder, and will have ample space in
which to develop. The plants should be placed in the rows, each
at a distance of a foot from its neighbour.

The method of planting with the aid of the dibbler is depicted
in Figures 1, 2, 3, and 4 of the diagram. First, a hole should be
made with the dibbler; next the cabbage plant must be placed
in the cavity and held in position with the left hand; with the
right hand thrust the dibbler in the ground two or three inches
behind the plant, and lever it towards the cabbage, so as to
fill the hole with soil, and the operation is practically complete.
Firm planting is essential, and to make assurance doubly sure it
will be advisable to press the soil down hard round the collar of
the plant with the fingers, so as to make it tight and secure.

If it be found necessary to plant in dry weather, straight,
shallow drills should be drawn with a hoe and the soil be well
moistened before planting takes place.

CAULIFLOWER.—The cauliflower requires somewhat similar
culture to that recommended for cabbages, with this difference,
that it is much more susceptible to frost. Its season is from June
to November. Like the cabbage it demands very generous
treatment and will not succeed unless it be grown on deeply
cultivated and well-manured soil. For outdoor culture in which
no effort is made to afford protection by glass, the seed should
be sown in April or May. Where a supply of heat is available,
the seed can be sown during autumn and the production of good
heads be hastened on. Another method is to sow the seed in a
sheltered bed in August, to transfer the seedlings to a bed of fine
soil under a frame as soon as possible and to grow them on steadily
until the spring, when they may be planted out of doors. Under
glass the young plants should be at least six inches apart, and
when they are transferred to their permanent quarters out of
doors a distance of two feet asunder will not be found too great.
During the growing period watering will be necessary in dry
weather, while frequent applications of liquid manure will be found
helpful in the production of large hearts. Three of the best
varieties for general cultivation are Early Snowball, Veitch’s Autumn Giant and Walcheren.

COLEWORT.—This is a useful member of the cabbage tribe which takes up less room in the garden than most of its allies and can be cultivated by successional seed-sowing so that it is ready for use during summer, autumn and winter. Seed should be sown in March for the summer crop and in June and July for the autumn and winter supplies. The method of culture is the same as that for cabbages, but in planting out there is no necessity to allow so much room—one foot apart will be found to serve admirably. The colewort is generally sold by the greengrocer under the name of bunch greens or “collards.”

KALE OR BORECOLE.—The seed is sown in March, and the subsequent treatment is the same as that recommended for cabbages. If the plants are put out at a distance of two feet one from the other there will be ample room for satisfactory development. For the small garden Cottager’s and Dwarf Scotch will be found excellent varieties for cultivation.

SAVOY.—This is an admirable vegetable for autumn and winter use. Seedlings can be raised in March and April and their subsequent treatment in regard to thinning out and transplanting is the same as that suggested for cabbages. Useful varieties are Universal (small), Dwarf Green Curled (medium), and Drumhead (large).

SPINACH.—This is a valuable vegetable that thrives particularly well in London gardens. The first sowing may be made in drills fifteen inches apart in a warm border about the middle of March. The soil should previously have been deeply dug and liberally manured. Successional sowings can be made until the end of August, and in this way a supply can be obtained from late summer until early spring. Adequate thinning out is necessary to ensure the production of satisfactory leaves. The plants, therefore, should be allowed to stand nine inches apart.

In gathering the leaves it should be the object to pick from as wide an area as possible, so that it should be necessary to remove only one or two leaves from a plant at a time.
The chief disease to which all the members of the cabbage family are subject is club-root. This is a fungoid disease which causes the roots to rot and present a slimy and very objectionable appearance, and it is more prevalent on light sandy soils than in stiffer binding land. When it makes its appearance the infected plants should invariably be burned, since the spores of the fungus are produced in vast multitudes and if they be allowed to spread will cause an immense amount of damage. A valuable preventive is a good dressing of the soil in autumn with fresh gas lime, while a frequent use of soot or a mixture of kiln-lime and soot dusted upon the seed beds will also be found to be a good precautionary measure.
BOOK XI

THE AMATEUR'S GREENHOUSE
CHAPTER XLIX

THE FIRST ESSENTIALS

THERE must be thousands of inexperienced amateur gardeners who have set off gaily and light-heartedly on the sea of greenhouse management, expecting by the aid of a very little expenditure of time and money to achieve success, and to reach the port of a greenhouse always warm and always gay.

They have, I will undertake to say, been speedily disillusioned. They have probably furnished their greenhouses with a nice array of plants in September or October, and have been told that if they "just keep out the frost" with the aid of an oil lamp set in the centre of the greenhouse floor their success is assured. There could be no greater mistake. I have tried the plan myself, and the experiment has proved as disastrous and disappointing as it has turned out to be expensive.

In the first place, the lamp must be a very powerful one if it is to "keep out the frost" during the severest spells of winter weather, let alone maintain a temperature in which even the hardiest greenhouse plants can thrive. In the next place you may wake up one fine morning to find the glass of your greenhouse black with pungent sooty smoke and your plants choked and almost dead. If you are still determined to persist in your attempt to achieve success with inadequate equipment you may perhaps set to work—as I have done—to clean your glass and staging, and to wash your plants in the hope that you may restore them to their pristine beauty and freshness, and start again. There will be a full supply of faith and hope in your heart, but there will be very little charity left to lavish on the lamp that has played you so scurvy a trick.

After long and bitter experience you may be inclined to abandon
your experiment in despair. Your greenhouse will in due time become a storehouse for rubbish, or serve no more useful purpose than that of a tool-shed. If this be its fate its downfall in your affections will have been brought about solely owing to the fact that you tried to accomplish the impossible.

The greenhouse, if it is to serve its purpose adequately, and if it is to afford you the maximum of pleasure, must be soundly built and properly heated. Therefore, if you contemplate buying a greenhouse, go to a long-established and therefore practical and experienced maker, and see that you have a reliable and efficient heating apparatus installed. The latter is as important as the first.

Experience has taught that nothing can excel the common method of heating a greenhouse by means of a boiler and hot-water pipes. It is true that the initial expense is somewhat heavy—it will cost you between four and five pounds to fix the apparatus to a small greenhouse—but the outlay on fuel will be insignificant compared with the cost of running an oil stove. Coke is cheap; oil is dear. The heating of a small greenhouse by means of an oil stove works out at two shillings a week, or, say, two pounds ten shillings for the winter months. The expenditure on coke sufficient to heat a fair-sized house, say, one twelve feet by nine feet, will be well under a pound for the same period. Thus in a few years you will have more than paid for the hot-water heating apparatus by the saving of expenditure on oil. Add to this the certainty that your plants will thrive better in a house heated by hot water, and you have an unanswerable argument against the use of the small oil lamp.

A little experience in the management of a greenhouse soon convinces its owner that it requires constant attention; that neglect, even for a couple of days, may mean all the difference between success and failure; that he must be an expert stoker, with one eye constantly on the thermometer and the other on his stove; and that, above all, he must study weather conditions closely, and if possible turn himself into a human barometer, so that he shall be able to anticipate and guard against violent atmospheric changes.
His chief aim, where the culture of tender plants is concerned, must be the maintenance of a fairly even temperature in his glass structure. There should, if the plants are to be kept in a healthy condition, be no excessive alternations of heat and cold, and, of course, it need hardly be said that frost must be kept out at all costs. Therefore it is that if the heating be conducted on sound principles, the apparatus be kept in perfect condition, and stoking be carefully attended to, more than half the battle of greenhouse management is won.

But these things, important as they are, do not constitute the whole of the equipment that is necessary if the gardener is to achieve the ideal of the greenhouse always gay. Next to the glass-house itself its most useful—nay, indispensable—adjunct is a cold frame. The owner of a greenhouse cannot hope to extract the maximum of enjoyment from his house unless he is able to raise most of his own plants himself, and he cannot expect to do this successfully without the aid of at least one frame. He can find uses for two or even more if he have room for them, but at any rate he must have one, or nearly all his efforts will be brought to naught.

To the town-dwelling owner of a greenhouse perhaps the greatest problem that confronts him is the securing of an adequate supply of the various kinds of soil, such as loam, leaf mould, sand, and so on, that are employed in the making up of the composts, as they are called, used for the cultivation of plants in pots. He is under the stern necessity of purchasing these ingredients from the florist, and as a rule they cost him from a shilling to eighteen-pence a bushel. But it is necessary that he should have them if his greenhouse is to be a success, and for the sake of economy it is, therefore, essential that he shall have a place in which to store them so that none may be wasted. For this purpose a potting-shed, fitted with bins or boxes for the reception of the various kinds of soil and sand, will be found a great convenience, but failing this a corner near the greenhouse may be fitted up with a rough covering which shall provide a protection against rain, and also a storage place for pots, boxes and tools.

The gardener who lives in the country is more happily placed
with regard to the provision of suitable potting soils than his town-
dwelling colleague. He need never want for an adequate supply of loam provided he lives near an old pasture or common. The best loam is that obtained from the top spit—the first layer of soil beneath the turf—and if permission to take this can be got the basis of all good potting soils will have been secured. The turf and soil procured in this way should be stacked grass downwards with a layer of manure between each layer of turf, and be allowed to remain in the open air for several months before it is brought into use. Then when it is wanted the face of the stack should be chopped off and the soil will be found to be that choice, rich fibrous loam in which the heart of the greenhouse owner delights. As it is required the fibrous lumps can be torn to small pieces with the fingers, and the crumbly residue be retained in a separate box for seed-sowing.

The country dweller need never be without an abundance of leaf mould if he will take a little trouble to secure it. Fallen leaves should be carefully collected in the autumn and placed in a heap in a corner where they are fully exposed to the disintegrating influences of the atmosphere. The leaves will need to be turned over once a month until they are thoroughly decayed, and then be sifted through a coarse sieve, and those that are still too large to go through the mesh be returned to the heap to enable them to decay further. All leaves are not of equal value in the making of good leaf mould. First in quality are those of the oak, next the beech, and after these the elm and the lime.

Peat will be required for the cultivation of such plants as azaleas, camellias, and the many varieties of heaths, while silver sand, both coarse and fine, will be needed, especially in soil used for the important operations of seed-sowing and propagation by means of cuttings. River sand, where it can be obtained, is excellent for these purposes, but failing this source of supply it will have to be purchased at the florist's or the corn chandler's.

A careful study of the nature and requirements of his plants will tell the amateur in what proportions these ingredients should
be mixed, but for his guidance the following hints may be useful:

For such plants as maidenhair fern, aralia, canna, gloxinia and heliotrope, equal parts of loam, peat, leaf mould and sand will be found suitable.

A compost made up of two parts loam, one part leaf mould
and one part sand will enable such subjects to thrive as aspidistra, begonia, celosia, cineraria, cobæa scandens, cyclamen, hydrangea, geranium, smilax, verbena and all the common annuals.

Azaleas and heaths require more peat, and this should be supplied in the proportion of two parts of peat to one portion of sand.

And now a word or two about flower-pots. These are best made of ordinary earthenware, and should not be glazed. Neither should they on any account be painted on the outside. One sees this done sometimes, and one is sorry for the plants the pots are intended to hold. The paint neutralises the porosity of the ware, and effectually prevents evaporation, which is essential to the well-being of the plant.

There are about a dozen sizes of flower-pots in general use, and professional gardeners know them by the number of pots contained in a "cast." Here is a list, beginning with the largest:

<table>
<thead>
<tr>
<th>Size</th>
<th>Diameter across top</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Twos</td>
<td>18 inches</td>
<td>14 inches</td>
</tr>
<tr>
<td>Fours</td>
<td>15 inches</td>
<td>13 inches</td>
</tr>
<tr>
<td>Sixes</td>
<td>13 inches</td>
<td>12 inches</td>
</tr>
<tr>
<td>Eights</td>
<td>12 inches</td>
<td>11 inches</td>
</tr>
<tr>
<td>Twelves</td>
<td>11 ½ inches</td>
<td>10 inches</td>
</tr>
<tr>
<td>Sixteens</td>
<td>9 ½ inches</td>
<td>9 inches</td>
</tr>
<tr>
<td>Twenty-fours</td>
<td>8 ½ inches</td>
<td>8 inches</td>
</tr>
<tr>
<td>Thirty-twos</td>
<td>6 inches</td>
<td>6 inches</td>
</tr>
<tr>
<td>Forty-eights</td>
<td>4 ½ inches</td>
<td>5 inches</td>
</tr>
<tr>
<td>Sixties</td>
<td>3 inches</td>
<td>3 ½ inches</td>
</tr>
<tr>
<td>Thumbs</td>
<td>2 ½ inches</td>
<td>2 inches</td>
</tr>
<tr>
<td>Thimbles</td>
<td>2 inches</td>
<td>2 inches</td>
</tr>
</tbody>
</table>

When new pots are received from the pottery the first thing necessary is to soak them thoroughly in water before using them. This is essential, because they are naturally so dry that if used in their original state they would suck all the moisture out of the soil and cause injury to the newly potted plant.

When old pots are to be used again—and the life of a flower-pot depends chiefly upon the care with which it is handled—cleanliness must be made the cardinal rule. More ill-success in the cultivation of plants in pots is due to uncleanness than to almost
any other cause. Therefore all dirty pots should be thoroughly scrubbed in warm water before they are brought into use again. And the same rule applies equally to the crocks—or broken pieces of flower-pot—that are used for drainage. They should also be perfectly clean.

This leads one naturally to the subject of drainage. Some amount of judgment is necessary here. If the plant is only intended to remain in its new quarters temporarily—say, for instance, if it be a young geranium intended for bedding out in June—it will be quite sufficient for the purpose if one or two crocks are placed over the drainage hole. But where the plant is to remain in the pot over a considerable period of time, the drainage must be made as perfect as may be. It must occupy as little space as possible, and therefore it must be done systematically and carefully. First of all a large crock should be placed convex side upwards over the hole, over this a layer of slightly smaller pieces should be placed, and after this yet another layer of still smaller pieces. The crocks should next be covered with a piece of fibrous old turf, to prevent small particles of soil from being washed down through the crocks to choke up the drainage.

Diagram 80 affords some hints on the proper methods of potting. Before transferring the plant to its new quarters care should be taken to remove the old crocks from the base of the roots, and shake out as much of the spent soil as is possible without damaging the roots. Place as much soil in the new pot as will bring the upper surface of the old ball nearly level with the rim of the new pot, and then fix the plant exactly in the centre. New soil should be placed round the roots and be pressed home firmly, using either the fingers or a potting stick for the purpose. When the pot is nearly full of soil give the bottom a sharp rap, so as to settle the soil in place, and proceed to dress the top of the pot with layers of soil until it is within half-an-inch of the rim. It is essential to leave this amount of space for holding water. Make a study of the roots of plants, and if they are fleshy be sure that they do not require such firm potting as is demanded by roots of a fibrous nature.
HAVING obtained a greenhouse with its necessary adjuncts, a cold frame or frames, and a well-stocked potting-shed, the amateur should make up his mind at the outset to what purpose he intends to put it. He will have to decide whether he desires to make it a hothouse in which what are known as stove-plants—that is to say, plants that require a high temperature to bring them to perfection—are to be cultivated; whether it is to be a warm greenhouse in which during the depths of winter a minimum temperature of 45° to 50° be maintained; or whether it is to be a cool or cold house in which, while frost can generally be excluded, the subjects which are grown in it will not perish if they be just touched by frost in very severe weather.

There is still another alternative—and it is one that is all too often adopted by the beginner. This is to turn his greenhouse into a general storehouse for plants of very varying natures, in which are collected a number of subjects totally unsuited for cultivation under precisely similar conditions. Herein lies the cause of many failures. It stands to reason that a temperature that is suitable for gloxinias, caladiums and calla lilies, will not suit primulas, cinerarias and auriculas. The plants in the first section require considerable warmth; those in the second thrive best in a moderate temperature.

The better way is to confine one's energies to a restricted variety of plants, taking care, in selecting them, to choose those which require similar treatment, especially in regard to temperature. It is far better in the long run to grow a few plants well than to attempt to bring under cultivation in the same greenhouse a larger number of choice subjects each of which demands special
treatment, and each of which is likely to be attacked by disease and insect pests that are its own peculiar enemies. A self-registering thermometer which shows maximum and minimum temperatures will be found an indispensable adjunct to the greenhouse.

The art of stoking is not one that can be acquired immediately or without effort, but if an efficient heating apparatus be installed, and if it be in perfect order, a little practice will soon disclose the difficulties that need to be surmounted. The vast majority of the owners of small greenhouses possess only one heated glass structure and they do not therefore attempt the higher flights of stove plant cultivation. They are content if during winter they can maintain a temperature which varies between 45° and 70°, and they learn very speedily, after a brief experience, that the secret of success lies in maintaining the atmosphere of the greenhouse in a buoyant condition, brought about by keeping the air constantly in circulation.

To produce this satisfactory and ideal state of things it is necessary to be a good stoker. The enthusiast will make a close and constant study of the weather, so that he may check immediately any tendency towards a too rapid rise in temperature, or may stimulate the heat if outside there be any indications of frost. He will carefully examine his heating apparatus so that he may understand the principles on which it works; will ascertain whether there are any signs of leakage in the pipes, and will either put them right himself or call in the aid of a hot-water engineer or horticultural builder. This precaution is necessary since if there be any serious leakage, and the pipes become empty, there is great probability that the section nearest the stove will become red-hot, and if that unfortunately occurs the adjacent wood is certain to be scorched even if it does not actually catch alight and involve the whole structure in destruction.

The efficient stoker will likewise pay close attention to the provision of suitable fuel. He must remember that his aim will be to ensure the fire burning steadily throughout the long and cold nights of winter, and he will find that the best fuel for this pur-
pose is small coke broken up into pieces not larger than a pigeon's egg. The material commonly called "breeze" will be found serviceable, especially if a proportion of small coal be added to it. Anthracite coal mixed with the coke produces a great heat and it has the further advantage that it is smokeless, but the cost is so great as to be almost prohibitive in the case of the amateur of limited means.

So that a boiler fire may be kept alight throughout the night, it will be necessary early in the evening, especially if the fire has been burning all day, carefully to rake out all the spent ashes and clear out the ashpit. Pull the unburnt fuel together, add a little fresh dry coke, draw out the damper, and open the ashpit door. This will create a good draught and cause the fire to burn brightly. In an hour's time it will be ready for banking up. The coke and coal which it is intended to use should previously have been moistened with water. This will cause it to burn more slowly and will give it the "lasting" quality which is so essential in the case of a fire which must remain unattended for ten or twelve hours. The stove should be filled up to the top with coke. It will be found a useful plan to finish off on the surface with a layer of damp ashes.

The regulation of the dampers can only be accomplished satisfactorily after some amount of experience and experiment, but it may be taken as a good working rule that on a calm, clear night the damper should be pushed in half-way and the ashpit door be allowed to remain half-way open. This will create sufficient draught to keep the fire burning steadily and will not cause it to roar away and become exhausted before morning. When there is a high wind the damper should be pushed in further and only the merest chink for the admission of air be allowed to show itself at the ashpit door.

In the morning if, as it should be, the fire is still alight, all that is necessary is to rake out the spent ashes, add a little fresh coke, and if the sun shines merely keep the fire smouldering till the time comes to bank it up again in the evening.

The amateur will of course need to use his own judgment in
regard to the time when the heating apparatus must be brought into use and when it must be stopped. This will depend principally upon the state of the weather, but as a general rule artificial heating will be found to be necessary from the end of September until the middle of May.

In regulating temperatures the ventilators will play an important part, but they must be so employed as not to create a sudden draught so that cold currents of air are directed straight at tender plants that have been brought forward under the stimulus of artificial heat. The direction of the wind must be ascertained and the ventilators be opened on the leeward side of the house as soon as the desired maximum temperature has been reached. Avoid the simultaneous opening of ventilators that are opposite to one another, since this will immediately create the draught which it should be your aim to avoid. Do not be afraid of admitting plenty of air on suitable days or even at night-time if there be no danger of frost. The greenhouse should not be transformed into an oven. The object should be to allow a free circulation of air so that the plants may derive the fullest benefit from a constantly changing atmosphere of an equable temperature.

When the sun increases in power towards the middle of spring the glass roof and sides of the house will require to be shaded. If this be done efficiently much time will be saved in watering; the plants will be kept in a healthy condition, and the flowers will retain their beauty for a longer period. If the owner of a greenhouse can afford to purchase them, undoubtedly the best method of providing shade is to have fixed to the roof adjustable roller blinds which can be raised and lowered at a moment's notice in accordance with the condition of the weather. Failing this recourse must be had to a wash shading—there are many cheap and useful varieties on the market—which can be applied to the outside of the glass with a paint brush. The shading will be found to last throughout the summer, and as autumn approaches the rain will gradually thin it down until with very little effort it can be removed altogether so as to leave the glass clean and transparent for the winter, when there is all too little light and sunshine
SATURDAY IN MY GARDEN

for the well-being of the occupants of the house. A serviceable home-made preparation is one composed of whiting and "size," to which a little green colouring matter can be added at discretion.

The watering of greenhouse plants in pots requires a good deal of care and wise discrimination. It must not be done by rule of thumb. It is obvious that more frequent watering will be necessary during hot, sunny weather than during the dull, dark days of winter, and it is just as certain that a plant will require more water when its roots fill the pot in which it is growing than it will need when its tender rootlets are just finding their way through the soil. If a plant be fully developed and be growing away vigorously, the best method of ascertaining whether it is in need of moisture is to give the pot a sharp rap with the knuckles or a piece of wood. If the resulting sound be dull and heavy no water is required, if it be hollow and resonant water must be supplied in sufficient quantities thoroughly to moisten the soil.

In the height of summer it may be necessary to attend to the watering of greenhouse plants three times a day. Early in the morning the floor should be damped so that as the sun gains in power the atmosphere may be rendered moist. The plants that need it should be watered at the same time, and again at midday and in the early evening. Frequent syringing among the pots and on the staging will also help to keep the plants in good condition, though care should be taken not to permit water to rest upon fully developed flowers. Soft water is always to be preferred to hard, but where there is a difficulty in obtaining it in sufficient quantities hard water may be softened by dissolving an ounce of common soda in a quart of hot water and adding it to ten gallons of water. Another excellent arrangement is to have a water tank in the greenhouse with pipes leading into it from the gullies at the sides of the roof. In this way a good supply of rain-water can frequently be obtained. When the supply becomes scarce, the tank can be filled with hard water which will become warmed to the temperature of the house and be ready for use in twelve hours or so.

If the waging of a determined warfare against insect pests is
essential in the garden out of doors it is doubly necessary in the
garden under glass. Not a few of the pests that are active out-
side are equally destructive indoors, and the remedies recommended
in a previous chapter may be employed with just as satisfactory
results in the greenhouse as in the open. But the owner of a
greenhouse has this advantage in fighting the pests that attack
his plants, that he can vaporise or fumigate his glass structure and
in this way check or destroy many insects which the outdoor
gardener is only able to exterminate by syringing. For fumigat-
ing or vaporising there are several well-tried and effective pre-
parations that can be obtained from the florist. The basis of
them all is usually nicotine in one form or another, and if it be
properly used its effects on the insects it is designed to exterminate
are disastrous, while no harm is done to the plants.

The best time for fumigating is the evening of a calm day,
since by choosing this time it is possible to keep the house closed
until the morning, and thus a sufficient period will be allowed
in which the fumes can perform their deadly work. All ventilators
must be closed tight and all holes be stopped up so that none of the
fumes can escape. For aphides or greenfly one fumigation will
be found enough, for thrips two may be necessary, and for red
spider three. These should be on consecutive days.

Among the commonest insect pests with which the owner of a
greenhouse will have to contend are aphides, mealy bug, red
spider, scale and thrips.

For aphides the usual remedy—quassia and soft soap solution—
may be applied, while an excellent preventive is an occasional
syringing with clear soot water.

Mealy bug can be checked by washing the leaves and stems
of plants with an emulsion composed of one pound of soft soap
and half a pint of paraffin dissolved in ten gallons of water.

Red spider can be kept at bay by maintaining a moist atmo-
sphere in the house. Frequent syringing will be found beneficial.
Where the pest has obtained a foothold the leaves should be
sponged with soft soap and water, and the hot-water pipes be
sprinkled with flowers of sulphur.
Scale is difficult to remove because of the clinging habit of the insect. Sponging with nicotine soap will be found an effective remedy; but where hard-wooded plants are infested it will be found a more effective plan thoroughly to scrub the stems with a brush and a strong nicotine insecticide.

Fungoid diseases, among which mildew is the most common, are often caused by draughts, or by a damp, close atmosphere. If the house be thoroughly ventilated and the air be allowed to circulate freely there will be little danger of their appearance. Flowers of sulphur dusted over the affected parts will be found an effective remedy, while for most fungoid diseases an occasional syringing with a solution of sulphide of potassium (half-an-ounce to one gallon of water is the proper proportion) will help to keep them in check.
CHAPTER LI

SOME FAVOURITE GREENHOUSE PLANTS

The majority of amateur gardeners demand of their greenhouses that they shall serve a double purpose in winter. They must first of all provide a harbour of refuge for as many as room can be found for of the half-hardy summer-flowering plants that have been lifted from the borders, and next they must give a steady succession of flowers during the dull, cold days of the year when to expect bloom out of doors is out of the question.

The endeavour to achieve this double purpose may at times lead to inconvenient overcrowding, but this can be mitigated by a little careful study in the art of arrangement. For example, it is not necessary that the fuchsias it is desired to preserve should all be deployed on the greenhouse benches and shelves. If they be trimmed back in early autumn they can be packed under the benches, provided they be kept fairly dry. The pots can be placed on the floor side downwards, and in this way space will be saved.

But better than all other contrivances for economising room is the possession of a frost-proof frame in which to house such tender subjects for the winter. And for this purpose, as I suggested in a previous chapter, low frames fixed close up to the panels of the greenhouse on its sunniest side will be found efficacious, especially if by means of trap doors in the greenhouse panels the heat from the hot-water pipes can be admitted to the frames. In this way many half-hardy plants can be stored for the winter and they will be safe so long as they can be kept free from frost.

With the greenhouse thus relieved from congestion one is able the better to provide with a greater prospect of success for a succession of bloom throughout the winter and spring months.
and of course more easily still during the genial days of summer. In this chapter I propose to suggest some of the plants and flowers that deserve the attention of the beginner in greenhouse management and to give briefly some hints on their cultivation.

ARUM (OR CALLA) LILY.—This is a deservedly popular greenhouse plant. A well-grown arum, with its stately flowers towering well above the handsome glossy leaves, presents a striking appearance during the winter and spring months.

Its cultivation is not difficult, if one or two leading principles are borne in mind. It must, first of all, be remembered that it is a sub-tropical plant, and that its natural home is in the ditches of South Africa. Hence it follows that when it is in full growth it must be liberally supplied with water.

It is possible for the amateur who has never yet grown arums to introduce them into his greenhouse in early autumn, and at very small cost. Small bulbs can then be purchased from any florist or seedsman, and they should be potted at once. The soil should be fairly rich, and consist of two parts fresh loam and one part of equal proportions of peat, leaf mould and silver sand. The bulbs may be buried an inch below the surface. After the first watering-in moisture must be given very sparingly until root action starts and the stem begins to shoot upwards. Afterwards it may be applied in increasingly generous quantities.

The treatment after the flowers die down in spring consists in dividing and repotting the roots where this is thought to be necessary. In June the plants can be placed out of doors, and left exposed to the influence of the summer warmth, until October. They are then returned to the greenhouse, and grown on for early flowering.

Another method which bears good results is to divide the old plants in May and plant them a foot apart in the open ground. The position chosen should be one facing south-west, near a fence or wall, where the sun can have full play. Repotting will be necessary in September, and by this time the plants will have become fine, healthy specimens.

AZALEA.—The azalea is among the most valuable of greenhouse
plants in early spring. The most popular varieties are the Indian (Azalea Indica), specimens of which can be purchased very cheaply in January and February. If unpotted roots are secured they should be potted immediately in soil with which a good proportion of peat has been incorporated. As soon as growth restarts abundance of water must be supplied, and at intervals applications of liquid manure will be found beneficial.

The after-treatment of azaleas, when flowering is over, requires careful attention if satisfactory heads of bloom are to be secured in subsequent years. It is the habit of the azalea to shed its blossoms on attaining maturity, thus leaving the seed-pod exposed. With the object of promoting a sturdy leaf growth, it is a good plan to cut the seed-pod away neatly with a pair of scissors. This done, the new growths will speedily make their appearance, and will play an important part in building up the strength of the plant for another season of bloom.

Where the roots have become potbound, repotting will be found to be necessary. What the professional gardener calls "overpotting" must, however, be guarded against. This is the placing of the plant in a pot several sizes too large for it. All that is necessary in the case of a healthy azalea is that it shall be replanted in a pot not more than one inch in diameter larger than the one from which it has been removed.

The soil should be composed of two parts of peat chopped rather fine and one part of silver sand. Plenty of drainage must be provided, and, as is the case with all hard-wooded plants, hard potting is necessary—that is to say, the soil should be rammed down firmly and evenly.

A little later in the season—about the beginning of June—the plants should be plunged in ashes in the open to ripen their growths. If they are again taken under glass in September or October they will produce another splendid display of blossom the following spring.

Among the best Indian azaleas are Deutsche Perle (double white), Madame Van Houtte (white and carmine), Flaubeau (crimson) and Due de Nassau (rosy purple).
The variety known as Azalea mollis, unlike A. indica, is deciduous—that is to say, it sheds its leaves after flowering. It is quite hardy and may therefore be grown with success in a cold greenhouse. After the plant has bloomed it should be repotted in a pot slightly larger than that it has occupied previously, be well watered in, and be allowed to remain in the greenhouse until new flower-buds have formed. When the buds have become firm and plump the plant should be placed out of doors in a sunny position to mature. It may remain exposed until the beginning of November, when it should be removed to a cold greenhouse where in spring it will flower freely. If earlier blooming is desired Azalea mollis can be forced in a gentle heat. Some excellent varieties are Consul Pecher (pink), Hugo Koster (salmon), Frère Orban (cream) and Charles Darwin (red).

Begonia (tuberous). See Chapter XXXII.
Bulbs for Forcing. See Chapter XXXI.
Calceolaria (herbaceous).—This handsome plant, which must not be confounded with the more common shrubby calceolaria used so extensively for bedding purposes, is grown from seed. This can be sown under glass any time from the beginning of May to the middle of July. The soil should be rich, firm, and, above all, porous. The seed is as fine as snuff, and even distribution may be secured by mixing it with a small quantity of fine sand. Spread it thinly over the surface of the soil in the pot or pan, and sift over it a mere dusting of fine earth.

In about ten days the seed will be through, and if watering is necessary this should not be done from above by the aid of a watering-can, but by partly submerging the pot in a pail of tepid water.

Pricking off should not be delayed beyond the appearance of the second leaf. The seedlings will still be very tiny, but delay may be fatal. Pay careful attention to shading, and do not on any account allow extremes of temperature. Generous treatment in the matter of potting and feeding with liquid manure when the plants are in vigorous growth will help to produce the wonderful
Diagram 81.—THE AZALEA AFTER FLOWERING.

Fig. 1. The full-blown flower.  Fig. 2. The flower drops, leaving the seed-pod.  Fig. 3. Cut away neatly with fine scissors and, Fig. 4, young leaf growths will speedily make their appearance.
pendulous flowers which are the pride of the professional gardener and nurseryman.

CARNATIONS (Perpetual Flowering).—The amateur who essays to grow a heterogeneous collection of plants in his greenhouse often makes the mistake of including among their number a few pots of perpetual flowering or American tree carnations in the hope that they will flower and do him justice if he afford them similar treatment to that given to his other plants. Any such expectation can only lead to disillusionment and failure. Any attempt to grow these choice denizens of the greenhouse in a structure already crowded with miscellaneous plants cannot fail to result in lanky attenuated growth, diseased foliage, and poor and sickly blooms.

The culture of perpetual flowering carnations should, therefore, only be essayed when they can be afforded plenty of room, and in glasshouses in which the atmosphere can be kept buoyant and the temperature equable. Where these conditions can be realised there should be no hesitation about undertaking their culture. The flowers are beautiful in themselves, are excellent for cutting, and last a long time both on the plant and after they have been severed from it.

The best time to obtain a small collection is in the autumn, and some of the most choice and dependable varieties are Enchantress, Britannia, T. W. Lawson, Beacon, Mrs Burnett, Harlowarden, Lady Bountiful, Afterglow, Rose Dorée, President Roosevelt and White Perfection. The plants will be in five-inch pots, and they should be placed in a moderately cool greenhouse. As soon as they have become acclimatised they may be repotted in eight-inch pots for flowering. It is essential that the pots be scrupulously clean. The most suitable soil should consist of three parts turfy loam, together with equal parts of leaf mould, sharp sand, and well-decayed manure. Do not bury the old ball of roots deeply; keep it near the surface, and be sure that the soil is made very firm as the potting proceeds.

Careful watering will be necessary for a time so as not to induce a waterlogged condition of the soil. But when root growth be-
comes active, the plants must never be allowed to lack moisture. Water thoroughly once every two or three days, and be sure that the soil is approaching a dry state before the dose is repeated. A frequent spraying with clear soft water will keep red spider at bay and help to maintain the foliage in a healthy condition.

The best method of propagation is by means of cuttings. These should be taken in early spring from the young shoots, which in generous quantity are thrown out by the ordinary healthy plant.

The soil for the reception of the cuttings should be composed chiefly of sand. Half-a-dozen cuttings can be inserted round the edge of a five-inch pot, and the latter should then be plunged in cocoa-nut fibre in a box and treated in a similar way to that recommended for tomato seedlings. Here, if a temperature of 65° can be maintained, they will root quickly, and when growth starts the little plants can be potted on into small pots.

It is a good plan to plant a few well-rooted winter-flowering carnations out of doors in June. Here they will grow sturdily, and as soon as the buds begin to form the plants should be potted up and transferred to the greenhouse, where they will speedily bear many handsome blooms.

CINERARIAS.—The cineraria is best treated as an annual which when it has flowered had better be thrown away or burned. The seed should be sown in June. Many amateurs fight shy of introducing the cineraria into their greenhouses because of its propensity to harbour and become infested with greenfly. But if a sturdy, healthy growth be promoted by giving the plants cool treatment from the earliest stages onwards, and if the greenfly be kept under by frequent light fumigations with tobacco, or, better still, vaporisations with nicotine, every two or three weeks, the enemy can be repelled and the reward in early spring will be great.

For the final potting when this is due—and its necessity can be ascertained by an inspection of the ball of soil to discover whether
the pots are filled with roots—attention must be paid to the subject of drainage. This is best promoted by arranging the crocks carefully in layers in such a manner that the outlet hole is kept open, and by placing immediately over the crocks a layer of fibrous material so as to prevent the drainage from being choked by fine soil from above. The compost for the final potting ought to be thoroughly porous. It should be made up of fine yellow loam and leaf mould—three parts to two is the proper proportion—and a fair quantity of silver sand.

When new growth becomes vigorous, water must be given regularly, and when the buds appear weak doses of liquid manure applied two or three times a week will be found admirably stimulating. Above all, extremes of temperature must be avoided. An average of 45° to 55° is ample, but at the same time frost must be excluded from the house at all costs.

Coleus.—Among the many plants that are cherished in the greenhouse for their brilliant foliage alone the coleus takes a high place. Its culture is fairly easy, the chief essentials being warmth during the cold dark days and nights of winter, and plenty of air when the conditions become more congenial. The plant is easily propagated by taking cuttings if a little bottom heat can be supplied.

Diagram 82 gives a useful hint or two with regard to the cultural treatment of the coleus. Where the plants are growing tall and lanky, as in Figure 1, or are becoming misshapen, as in Figure 2, they should be trimmed at A. The resulting shoots need not be thrown away. If they are placed in thumb pots and kept in the greenhouse on a shelf near the glass they will soon strike and become established plants. Meantime the pruning of the parent plants will result in the throwing out of side shoots, which will help to make them shapely and bushy.

Coleus may also be grown from seed sown in heat in March or April, but propagation by cuttings in the early months of the year is an easier and surer method for the amateur who lacks facilities for maintaining a proper amount of warmth in his greenhouse.
Diagram 82.—HOW TO TRIM COLEUS.

Figs. 1. and 2. Misshapen plants may be cut back at A. Fig. 3. Cutting trimmed ready for propagating. Fig. 4. The cutting potted.
Cyclamen.—The measure of success that is obtained in the culture of the cyclamen in the greenhouse depends very largely on the summer treatment of the corms. The pots should be kept in a cold frame on a bed of ashes, exposed to the light as much as possible. They will benefit greatly when growth is becoming vigorous by frequent applications of weak soot-water and liquid manure.

The plants should also be syringed at intervals with clear soot-water. This will promote the production of healthy foliage, and will at the same time help to keep greenfly, thrip and red spider in check.

The syringing must be persevered with after the plants have been removed from the frame to the greenhouse stage, which should be about the middle of October. Healthy plants will produce flowers from November until March.

Dracænas.—One of the most popular of foliage plants for the warm greenhouse is the dracæna. It belongs in reality to the class known among gardeners as stove plants, but during summer may safely be brought into the dwelling-house and used with gratifying effect for table decoration.

It is the habit of the dracæna to cast its lower leaves as it grows older, and in time it becomes so "leggy" as to be both unsightly and unsuitable for decorative purposes. Diagram 83 indicates a simple method of dwarfing the plants. Figure 1 shows a tall, "leggy" dracæna, and the plan adopted for shortening it and at the same time increasing the stock is shown in Figure 2. A small flower-pot, of the size known as sixty, is cracked through the centre by means of a sharp blow with the edge of a trowel. Figure 3 shows how the stem should be treated. The bark is cut round with a sharp knife, and a circular piece removed. Next a "V"-shaped incision is made in the wood of the stem. The broken pot is fixed in position by means of supports, as shown in Figure 2, and then filled with sandy soil. After a few weeks new roots will have formed, and the top of the plant may be removed and repotted, as in Figure 4.

The lower part of the plant should be left in its original pot,
Diagram 83.—DWARFING A DRACAENA.

Fig. 1. The plant. Fig. 2. Crack a large 60 pot, place round base of foliage, support with thin sticks, and bind with tarred string. Fig. 3. The cut inside the pot. Fig. 4. The plant repotted. Fig. 5. The stem will sprout from the top downwards and produce large numbers of cuttings, which, when detached and planted, will root freely like weeds.
and from the head of the stem remaining new leaves will sprout. These will form excellent cuttings, which when detached and planted in small pots will root easily, and help to increase the stock of plants.

**Epacris.**—The epacris, or Australian heath, forms a splendid addition to the winter-flowering plants in the greenhouse, and is similar in habit to the erica, or heath—that is to say, very stiff and erect in growth. It flowers early in the year, and forms a very pleasing object on the greenhouse bench. Towards the end of May the plants can be turned out of doors and be allowed to develop until the autumn, when they should be sheltered under glass. The epacris is propagated by means of cuttings taken in August.

**Ferns.**—To treat adequately of the culture of ferns would require a whole volume, but the presence of a few ferns in the amateur's greenhouse is so essential to its beauty that a few general hints are necessary. It may be said at once that most ferns that are suitable for ordinary greenhouse culture will thrive under similar cultural conditions, and the chief points to be remembered are that they require plenty of moisture both at the root and in the atmosphere; that they delight in shade and should therefore not be exposed to the full glare of the sun or placed immediately over hot-water pipes which will cause the soil in the pots to dry too rapidly. For soil a mixture of sandy loam, enriched with peat or leaf mould, will generally be found satisfactory. Ferns may be propagated either by sowing the spores in heat or by division. The spores are sown in sandy soil in pot or pan placed under a bell glass or in a small frame situated in a warm corner of the greenhouse. If the soil be kept moist the young plants will speedily begin to form and they should then be pricked off into a box or into thumb pots and be grown on in a genial temperature.

The division of ferns is best done in early spring. If, at this season of the year, a pot of the familiar maidenhair fern be inverted and the edge tapped sharply on the bench the ball of soil and roots will leave the pot, and it will probably be found
Diagram 84.—WINTERING FUCHSIAS.

Fig. 1. A plant lifted from the border. Fig. 2. Potted up, placed in the greenhouse, and watered sparingly. Fig. 3. The plants after potting may be placed thus on the floor of a cold greenhouse, and water withheld entirely. Fig. 4. How to prune in spring. Fig. 5. Afterwards empty the pot, shake out soil from roots, and repot in fresh soil.
that the roots are tightly matted together. This is a sign that repotting is necessary.

The plant is, perhaps, an old one, and in that case division is advisable. If the roots be cut through from top to bottom with a sharp knife three or four new sections can be obtained and these should be inserted in smaller pots. The best soil for the purpose is a mixture of equal parts of loam, leaf mould, peat and sand. Fairly firm potting is necessary, especially in the lower part of the pots. The inexperienced amateur sometimes goes to the other extreme. He leaves the soil loose beneath, and presses it down too firmly on the surface. After potting, the ferns should be watered in with a fine-rose watering-can.

**Fuchsia.**—The fuchsia is one of the most accommodating and easily cultivated plants. Its value as a decorative subject is unrivalled, whether it be grown in the open or confined in a glass structure. And it possesses the additional advantage that even old age does not cripple its energies nor hamper its efflorescence. It may be grown in a great variety of shapes, either as a standard, in bush or pyramid form, or as a climber, and in all, if it receive proper attention, it will flourish abundantly.

The fuchsia, which came originally to this country from South America little more than a hundred years ago, is not quite hardy, and, save in the extreme south and south-west of England, it needs to be protected from severe frost. Therefore, as soon as the flowering season is over, and the foliage begins to fall—in a
normal year this generally occurs early in October—the plants that have been grown in the beds and borders are lifted. The owner of a warm greenhouse need entertain no fears about saving his plants for another year.

Diagram 84 shows the proper method of procedure. Lift the plant with a good ball of earth, as shown in Figure 1, and if there be plenty of room on the greenhouse benches place the plants in fair-sized pots. It is not at all necessary to supply fresh soil, for the point to bear in mind is that the plants are going to rest, and therefore require no stimulation. Water may be supplied immediately after the plants have been potted, but from this time until early spring arrives it should be given very sparingly.

The fuchsias, if this treatment be applied, will remain almost dormant, and they should be left in this state until February. Then they may be pruned back hard, as shown in Figure 4. The stems should be cut down to within six or eight inches of the base of the stem. After this has been done the pots should be emptied out completely, and the roots trimmed and cleared of all superfluous soil. The plants must now be repotted in fresh soil, which should be composed of good turfy loam, leaf mould and sand, with a small proportion of well-rotted manure. After potting, a good soaking with clear water should be given, and then the plants may be placed in a gentle heat to promote growth. This will speedily show itself, and an abundance of shoots suitable for propagation by cuttings will soon be available.
Many amateur gardeners are not the fortunate possessors of heated glass structures, but they need not on that account despair of preserving their fuchsias through the winter. If they have a cold greenhouse the plants may be stored under the benches, as shown in Figure 3 of the diagram. The great thing to bear in mind is that they must be kept dry. If this is done all the protection necessary can be afforded by sheets of calico or sacking, which should be placed lightly over the plants during severe frost.

Where space is a consideration fuchsias may be safely wintered if the old roots are placed close together in a fairly deep box. If placed under glass, either in a greenhouse or a frame, they will come to little harm.

Gloxinia. See Chapter XXXII.

Hydrangea.—For decorative purposes in the garden there are few shrubs that excel the hydrangea. The hydrangea is almost hardy, and therefore requires cool treatment.

The autumn is the time, if it is desired to increase one's stock of plants, to do so by means of cuttings. These should be secured from strong, healthy plants, and should consist of the tops of vigorous shoots about five inches long. The lowest pairs of leaves should be stripped off and the cutting inserted singly in a small pot filled with sandy loam. The pots should, if possible, be plunged to the rim in a gentle hotbed over which a frame-light can be placed. Here the cuttings will root, and when growth becomes active the young plants can be removed to a cool greenhouse. In this position they will grow sturdily until the time comes for planting out.

The hydrangea, which means literally "water vessel," is above everything else a moisture-loving plant. When it is in full growth water must be supplied in copious quantities if it is to thrive. The most common forms of hydrangea are Hortensia (pink) and paniculata grandiflora (white). The latter bears fine heads of bloom of pyramid shape, and forms a magnificent picture if massed in a bed and planted in deep, rich soil. Another variety worthy of the attention of the amateur is hydrangea petiolaris—a climber, which
Diagram 87.—FORCING LILY OF THE VALLEY.

Fig. 1. The bundle of crowns as received from the freezing chambers; these may be shortened as indicated. Fig. 2. Plant ten or twelve in a five-inch pot. Fig. 3. Shelter from the strong light by a paper cover. Fig. 4. The retarded crown produces leaves with the flowers. Fig. 5. The ordinary crown does not.
fixes itself by means of aerial roots to the greenhouse woodwork with the greatest facility.

**Lily of the Valley.**—Lilies of the valley at Christmas! The thing is not impossible to the owner of a warm greenhouse, and it has been rendered feasible owing to the practice of "retarding" the crowns. These are roots that have been kept in a dormant condition in a cold storage chamber. They are obtainable in November at the establishments of any of the well-known florists and seed merchants.

The method of treating the crowns is clearly shown in Diagram 87. The roots will arrive in a bundle, as shown in Figure 1. They should be shortened by cutting off the lower extremities with a sharp knife. Ten or twelve crowns may be planted in a five-inch pot filled with ordinary good potting soil. The pots should be placed in a cold frame for three or four days, and then be removed to the warm greenhouse.

The flowering period may be regulated by the heat maintained in the glasshouse. If a uniform temperature of 70° be possible they will flower in twenty-one days, but the amateur will probably be content to keep his house slightly cooler, and to wait for flowers a little longer. Retarded lily crowns should not be forced in a strong light. They may be shaded in the manner indicated in Figure 8.

**Primula.**—For moderately warm greenhouse culture the primula, especially the single-flowered Japanese and Chinese varieties, forms a most accommodating and beautiful plant which adds to the beauty of the glasshouse in early spring. The primula is best raised from seed sown in succession during May and June. A temperature of 60° is advisable to secure rapid germination. The seedlings may be pricked off into boxes or pans, and, when further growth has taken place, be removed to small pots. A cold frame will provide suitable quarters until the autumn, when the young plants, which by this time should be strong and sturdy, may be removed to the greenhouse for flowering. By this time they will be in six or eight inch pots. A suitable soil for the final potting is three parts of turfy loam and one part of well-decayed
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manure or leaf mould. Careful watering will be required during the dark days of winter, but as soon as the flower-buds begin to form it may be given in generous quantities. An average temperature of 45° to 50° should be maintained.

Another fine primula is P. obconica, but the amateur should be warned against attempting its cultivation if he is susceptible to skin disease, since its leaves, if brought into contact with the hands, often cause a painful form of eczema.

Schizanthus.—Of all the greenhouse plants that can be raised from seed the schizanthus is unsurpassed for grace and beauty. It is a half-hardy annual, whose flowers resemble butterflies, and for this reason it is sometimes called the butterfly flower. The seed may be sown thinly in pots from August to the middle of September to secure a spring display of bloom. The plants need cool treatment at the outset, but must of course be kept free from frost. For this reason it is necessary to grow them on during the winter in a moderately warm house. Seed sown early in the year will produce bloom towards the end of the summer. For the final potting eight-inch pots should be used and the soil be made fairly rich.

Solanums.—A bright spot in the greenhouse during winter is provided by a plant or two of Solanum capsicastrum (Star capsicum). The plants are covered with bright red berries, and these add to the cheerfulness of the house, which is being rapidly filled with the flowers of winter carnations, arum lilies, Begonia de Lorraine, and early forced bulbs.

The solanum is a half-hardy shrub of the potato family, to which, by the way, the tomato also belongs. Specimens may be planted out of doors in a warm, sunny spot in May, and be allowed to remain there until the end of September. They are then potted in fairly rich soil, and after being placed in the shade for a week, are transferred to the warm greenhouse. By the end of November they make nice tall, bushy plants, full of plump, handsome berries. The solanum can easily be raised from seed sown in early spring in a temperature of from 55° to 65°.
Tuberose—Polianthes tuberosa, to give it its scientific name.—Everybody knows the pure white sweet-scented flower so popular for greenhouse decoration in spring. There is nothing to be said against it on the ground of expense. The tubers can be purchased in the autumn from first-class florists at from 2s. to 2s. 6d. a dozen. They are therefore as cheap as the ordinary bedding hyacinths or tulips. This price refers to the African variety; the American or Pearl, which arrives in December, costs just half the sum that it is necessary to pay for the African kind.

Do not put all your eggs in one basket—in other words, do not pot up all your tubers at the same time. Rather aim at attaining a succession of bloom by potting at intervals of a few weeks. This is a good rule to follow in regard to all bulbous and tuberous plants intended for forcing.

Nor do I think it wise, as is the practice of some growers, to put more than one tuber in a pot. Tubers vary in size, and this means irregularity both in the quality of the flowers and the time of blooming.

Clean, well-drained pots should be used invariably. A suitable compost or mixture of soils can be obtained by using three parts loam, one part leaf mould, and one part sand. Each tuber should be trimmed as shown in the illustration—if it has not already been done by the florist—and potted to about half its depth in such a position that the top of the tall bulb is just above the rim of the pot, which should be only half filled, thus leaving the upper portion of the bulb exposed.

The object of this method of planting is to allow the vacant space to be filled with a rich top-dressing of well-manured mould so soon as growth becomes active.

The pots should now be treated just as the Roman hyacinths and narcissi were dealt with—that is to say, placed in a cold frame and covered to a depth of four inches with cocoa-nut fibre refuse. Water should be given at somewhat prolonged intervals till root growth has started. Then as they are wanted for forcing they should be brought into the warm greenhouse, where a minimum
Diagram 88.—TUBEROSES FOR FORCING.

Fig. 1. The bulbs are often supplied in this form. Fig. 2. The bulbs should be trimmed thus. The side shoots are removed. Fig. 3. Tubers may be planted one in a five-inch pot or more in larger pots. Fig. 4. Proper depth to plant. Fig. 5. Stand in a cold frame and cover with cocoa-nut fibre.
temperature of about 60° can be maintained. Care must be taken not to over-water. In this way African tubers started in September can be had in flower by Christmas or soon afterwards.
BOOK XII

THE AMATEUR'S GARDEN DAY BY DAY
### A CHRONOLOGICAL TABLE OF OPERATIONS FOR EVERY DAY OF THE YEAR*

#### JANUARY

1. Trench, dig and manure in the vegetable plot. Make out seed order for early vegetables. Prune vines under glass.

2. Plan out vegetable plot on paper. Make new and renovate old garden paths.

3. Pot up shrubs for forcing and pot tuberoses.

4. Thoroughly clean glass of greenhouse inside and out and fumigate cinerarias if greenfly has made its appearance.

5. Plant horseradish. Finish pruning fruit trees where this has not already been done.

6. Take chrysanthemum cuttings; plant trees and flowering shrubs in mild open weather; sow small batch of tomato seed in warm greenhouse.

7. Sow seed of begonias, gloxinias and streptocarpus in heat.

8. Sow seeds, in boxes in warm house, of leeks, onions, carrots and radishes.

9. Sweep and well roll lawns. Top-dress with well-decayed manure, or bone meal at the rate of a handful distributed over a square yard.

10. Sow cyclamen seed. Sow hollyhock and antirrhinum for flowering in the succeeding summer.

11. Pot auratum and other lilies for greenhouse cultivation. Bring further batches of bulbs from the cold frame into the warm house for flowering.

12. Protect hearts of broccoli by snapping a large leaf and bending it over.

13. Prune fuchsias to start them into growth in greenhouse. Lightly prune climbing roses in greenhouse. Wash the trunks and

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*As a general rule the operations recommended herewith should be carried out a fortnight later than the dates suggested in the North of England and in Scotland.*

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lower branches of trees in the open with mixture of lime and soot to check insect pests.

14. Continue to trench and manure vacant ground. Finish pruning and nailing up of wall fruit-trees.

15. Pot early gradiolus The Bride for forcing in greenhouse. Pot on autumn-struck bedding geraniums and grow them on in gentle heat. Plant ivy and other hardy climbers, also rhododendrons in mild weather.

16. Make new box edgings; build up hotbed for early raising of vegetable and flower seeds. Sow broad beans in warm situation.

17. Continue to take cuttings of late chrysanthemums, and propagate perpetual flowering carnations by cuttings.


20. Prepare seed potatoes for planting by placing them close together in shallow boxes on the top shelf of the greenhouse. Sow cauliflowers and lettuces in boxes.

21. Sow a few pots of sweet peas and place in cold frame. Give liquid manure to arum lilies showing bloom. Pot rooted cuttings of chrysanthemums singly in small pots.

22. Sow seeds of cannas in temperature of 65° to 75°. Open frames containing violets on suitable days so as to give plenty of air and promote sturdy growth.

23. Repot and divide ferns in greenhouse. Repair bare patches on lawns by returfing in mild weather.

24. Prune outdoor vines. Plant fruit trees if weather is open. This is the latest period at which it can be done with safety.

25. Sow mustard and cress in shallow boxes, making soil firm. Grow on in warm greenhouse. Clean up beds and borders and transplant herbaceous subjects if the weather is suitable.

26. Sow early peas on warm border in light soil. Prepare onion bed ready for receiving autumn-sown onion plants. These are best put in in March. Give water to violets in frames in dry
weather and supply plenty of air. Top-dress hardy ferns with manure.

27.—Sow dahlia seeds in heat. Dig and manure ground for sweet peas where this was not done in the autumn.

28.—Sow half-hardy annuals—such as nicotiana, petunia, verbena and balsam—in warm house. Use pots or boxes and sow in fine soil.

29.—Take more chrysanthemum and winter-flowering carnation cuttings—especially if any of the previous batches have failed.

30.—Attend to cuttings in cold frames and remove failures. Give air in generous measure on mild days.

31.—Finish pruning fruit trees. Repaint outside of greenhouse if required.

**February**

1.—Make further progress with trenching and manuring of vegetable ground. Build new arches and pergolas.

2.—Place old dahlia tubers in warmth in boxes. Cover lightly with soil and sprinkle with water to induce production of cuttings. Sow spinach on warm, sheltered borders.

3.—Place tubers of begonias and gloxinias in heat to start growth. Prick out seedlings of tomatoes if ready. Continue to sow pots or frames of half-hardy plants.

4.—Plant anenomes and ranunculuses in open borders. Pot up cuttings of fuchsias and heliotropes as soon as ready.

5.—Disbud vines in greenhouse. Make preparations for forcing rhubarb and seakale out of doors.

6.—Plant shrubs such as aucubas, boxes, cypresses and ribes.

7.—Give calceolarias in frames plenty of air and if growth is rapid pinch out the tops. Propagate marguerites by cuttings. Stir surface of bulb beds with fork as soon as shoots are well above the ground.

8.—Strawberries and raspberries may be planted in well-prepared soil. Sow lettuce, radish and turnip in sheltered places.

9.—Plant lilies of the valley in shady borders. Finish renovation of lawn by laying new turf where this has not been completed.

10.—Watch temperature of greenhouse during day-time and supply moisture by syringing when the sun gains power. Sow more
sweet peas in pots in cold frame. Place lobelia cuttings in moist sandy soil in heat.

11.—Take cuttings of zonal pelargoniums in greenhouse and cut back old plants. Plant primroses out of doors.

12.—Roll lawns frequently and use birch broom freely to distribute worm casts. Continue to divide and replant herbaceous plants in the border in suitable weather.

13.—Watch for attacks of birds on fruit buds and protect currants, etc., with netting.

14.—Syringe vines morning and afternoon as soon as new growth is apparent. Plant young vines in prepared border.

15.—Sow further batch of tomato seed, and continue to sow half-hardy annuals in warm greenhouse.

16.—Make up a good mushroom bed. Remove dead wood from climbing plants in greenhouses and carefully train new shoots.

17.—Take cuttings of coleus and grow on in warmth. Sow early peas in well-prepared ground out of doors.

18.—Divide London Pride and plant polyanthuses for flowering in April. Plant hardy lilies in the open border in moist situations.

19.—Repot plants that need it in the greenhouse. Have pots and drainage crocks perfectly clean and water sparingly after repotting.

20.—Sow parsnips in fairly dry situations. Plant clematis, honeysuckle, jasmine and Virginia creeper in the open.

21.—Remove from greenhouse bulbs that have finished flowering, store in cold frame and replant in open ground in May. They are useless for forcing again.

22.—Bring into warm greenhouse lilies that were plunged in cocoa-nut ashes or fibre in the autumn. Give them a light airy position.

23.—Remove dead leaves from strawberries, and top-dress soil with decayed manure. Syringe leaves of arum lilies frequently with quassia and soft-soap solution to keep down greenfly. Give plenty of air to cinerarias and keep temperature cool.

24.—Sow parsley in sheltered corner. Sow early dwarf peas.

25.—Overhaul mowing machine and if necessary send it away for sharpening of blades and other repairs.
26. Cover rhubarb roots with drain-pipes or old tubs to hasten growth of sticks.

27. Sow box or pan of celery seed in warmth. Roll lawns at every available opportunity.

28. Plant out border carnations raised from autumn-struck cuttings. Repot azaleas that have flowered.

**MARCH**

1. Clean and weed asparagus beds and top-dress them with old manure, nitrate of soda or salt.

2. Transplant autumn-sown onions and sow more seed. Prune shrubs and cut back ivy on walls and fences.

3. Sow ten-week stocks, asters, zinnias, scabious and other half-hardy annuals in pots and boxes in warmth.


5. Trim back climbing roses, taking out all dead wood and withered extremities, but leaving shoots produced last season intact.

6. Plant herbaceous subjects in mild open weather. Finish all digging and manuring in vegetable garden as early as possible.

7. Plant early potatoes in sheltered border. Dust soot between rows of early spring cabbage and hoe it in.

8. Plant rockeries and hardy ferneries.

9. Sow sweet peas out of doors in well-prepared ground.

10. Repot plants in greenhouse that need it. Sow early lettuce, cauliflower, cabbage, brussels sprouts in boxes in cold frames.

11. Prune red and white currants, black currants and gooseberries.

12. Plant out biennials raised from seed sown the previous summer.

13. Thoroughly harden off shrubby calceolarias and plant in permanent quarters.

14. Make new lawns and have all ready for sowing grass seeds in early April.

15. Prune clematis Jackmani. Continue to strike cuttings of fuchsias, heliotropes, marguerites. Remove litter placed for protection on beds of bulbs, but only if the weather is mild and open.

16. Start cucumbers in frame over a brisk hotbed.
17. Plant gladioli corms, using plenty of sand at the bottom of the holes made for their reception.
18. Pot on chrysanthemum cuttings and after they have become established keep them growing sturdily in a cold frame.
19. Prune climbers in greenhouse and fumigate for greenfly. In vegetable garden sow broad beans, peas, onions, parsnips and parsley.
20. Plant main crop of potatoes. Cut down recently planted raspberries and top-dress with rich manure.
22. Sow hardy annuals if weather is fine and soil fairly dry. Plant evergreen shrubs and ivy.
23. Shade auriculas growing in pots in a cool house and keep them well supplied with water as they come into flower.
24. Sow cabbage out of doors for autumn use. Make new asparagus beds. Sow seed in drills half-an-inch deep and six inches apart.
25. Prune hybrid perpetual roses.
26. Sow more sweet peas out of doors either in rows or clumps.
27. Take and pot up dahlia cuttings as soon as ready. Place pots on top shelf of greenhouse and keep moist and warm.
28. Prick out into boxes and pans seedlings of half-hardy annuals and harden off in cold frames.
29. Continue planting in herbaceous border.
30. Make further sowing of hardy annuals.
31. Pot on tomatoes and keep near glass to promote sturdy growth. Water sparingly until roots begin to fill the soil in the pots.

APRIL

1. Sow carrots, and plant out cauliflowers that have been wintered in frames.
2. Divide and replant hardy perennials and herbaceous plants generally.
3. Plant out sweet peas raised in pots. Attend to staking at the same time. Sow carnation seed in pots and boxes and give cold-frame treatment from the outset.
4. Pentstemons struck from cuttings in autumn may be planted out.
5. Prune hybrid tea roses.
6. Sow seeds of annual flowering grasses, and plant tubers of *Tropæolum Tuberosum* at the foot of arches, trellises or pergolas.

7. Provide shading for greenhouses as the sun gains in power. Sow grass seed to make new lawns and renovate old ones.

8. Start mowing lawns if they are not too soft, and keep the mowing machine regularly at work once or twice a week. Roll grass frequently.


10. Scatter lime and soot under gooseberry and currant bushes and dig in lightly to check caterpillars and saw-fly. Also dust lime and soot round fresh green growth of herbaceous plants to prevent attacks of slugs.

11. Prune tea roses.

12. Sow further batches of hardy annuals. Half-hardy annuals may now be sown out of doors.

13. Plant out in the open borders old roots of dahlias. Divide old roots of early flowering chrysanthemums that have remained out of doors during the winter.

14. Harden off bedding plants that have been raised in the greenhouse by removing them to cold frames.

15. Azaleas that have finished flowering should have seed-pods carefully removed. Syringe foliage regularly to promote fresh growth.

16. Pot on chrysanthemums into five-inch pots, after pinching out. Top-dress with fresh soil and manure liliums in pots that are now making strong growth in the greenhouse.

17. Pot on begonias started from old tubers. Make soil fairly rich and keep plants in shade.

18. Cover strawberry beds with netting to prevent attacks of birds.

19. Sow last batch of peas, and finish planting potatoes.

20. Sow beet and plant out lettuce raised in boxes in frames. Plant out cabbages.

21. Plant out clematises and other climbers raised in pots, taking care to see that they are provided with suitable supports at the same time.

22. Remove violets from frames and plant out in shady corner.

23. Sow seeds of tall nasturtiums, canary creeper and convolvulus at foot of arches, etc.
24.—Sow seed of primula for winter display in greenhouse.
25.—Sow seeds of hardy perennials in boxes in frames.
26.—Provide stakes for sweet peas sown in the open.
27.—Take cuttings of geraniums for autumn flowering in the greenhouse.
28.—Sow French beans in sheltered border.
29.—Prepare trenches for celery.
30.—Plant out vegetable marrows on specially prepared bed with plenty of manure at the base.

MAY

1.—Start cutting asparagus. Sow seed of primrose and polyanthus in boxes or cold frames.
2.—Keep soil in beds or borders loose on the surface by a frequent use of the small fork or hoe.
3.—Earth up early potatoes; sow biennials, such as campanulas and aquilegias for next season’s flowering.
4.—Sow seeds of cinerarias in pots; keep in shade and give cool treatment.
5.—Supply hydrangeas coming into flower with weak doses of liquid manure and soot water.
6.—Sprinkle onion beds with soot to prevent attacks of the onion fly.
7.—Remove withered foliage of crocuses; prepare plans and get beds ready for summer bedding.
8.—Syringe rose-trees to keep down greenfly. Keep close watch for attacks of grub and caterpillar.
9.—Sow runner beans in well-manured trenches. Thin out vegetable seedlings and use hoe freely between the rows.
10.—Remove azaleas, cytisuses, lilacs and other hard-wooded plants that have done flowering from greenhouse to cold frames, or a shady position out of doors to develop and harden new growth.
11.—Stake culinary peas. Plant tomatoes out of doors if the weather is favourable.
12.—Pot on dahlia cuttings and remove to cold frame to harden off.
13.—Dust roses affected with mildew with flowers of sulphur. Feed trees with weak liquid manure and see that they do not lack moisture at the roots. Remove superfluous buds and thin
Diagram 89.—PROTECTION FOR WINTER.

Fig. 1. The pyramid of stakes to cover choice shrubs and tender plants. Fig. 2. The same covered with straw or, Fig. 3, with a mat. Fig. 4. Mat and straw covering for trees on fence. Fig. 5. Bank up the hotbed to preserve the heat—straw round the sides and mat on top. Fig. 6. Simple covering for small plant, pyramid of sticks covered with paper or canvas. Fig. 7. A protection for low-growing vegetables.
14. Divide and replant mint. Earth up potatoes that require it.
15. Make another sowing of runner beans if there is space for them and sow another row or two of turnips.
16. Sow a first batch of wallflowers in boxes.
17. Keep down weeds in the vegetable garden by frequent use of the hoe.
18. Sow seeds of ornamental gourds and pumpkins out of doors and treat as for vegetable marrows.
19. Tomatoes in the greenhouse beginning to show fruit should be fed with weak doses of liquid manure or be top-dressed with dry fertilisers.
20. Start planting out summer bedding subjects, beginning with edgings such as alyssum, lobelia, pyrethrum, etc.
22. Remove arum lilies that have flowered from greenhouse and plant in trenches out of doors.
23. Lift bulbs from flower beds and plant in reserve bed to ripen off. Thin out hardy annuals.
24. Plant out geraniums, dahlias, fuchsias and other tender subjects in their summer quarters.
25. Attend carefully to ventilation of greenhouse. Syringe plants night and morning and water freely on hot days. Repot azaleas and heaths if they need it.
26. Plant out half-hardy annuals raised in heat and afterwards hardened off in frames.
27. Divide and replant aubrietias and arabis. Give the same treatment to border auriculas.
28. Continue planting out for summer bedding, especially in damp weather. If ground is dry attend carefully to watering plants turned out from pots.
29. Make another sowing of French and runner beans for succession.
30. Place clean straw between strawberry plants to keep fruit clean.
31. Syringe wall fruit-trees to keep down insect pests and maintain foliage in healthy condition.
A CHRONOLOGICAL TABLE

JUNE

1.—Plant and stake dahlias.
2.—Plant out winter and spring green crops. Sow salads such as radish and lettuce for succession. Sow parsley for winter use.
3.—Continue to thin out and where necessary stake hardy annuals. This will especially apply to Shirley poppies and cornflowers.
4.—All bedding out should now be hurried on and completed as soon as possible, especially if the weather is showery.
5.—Repot ferns that require more root room.
6.—Sow herbaceous calceolarias, cinerarias and primulas for greenhouse, and wallflowers, Canterbury bells, campanulas, evening primrose, and other biennials and perennials for furnishing the borders next year.
7.—Remove faded blooms from pansies and viola, and stir the soil regularly between the plants.
8.—Sow main crop of winter turnips. Look for black fly on broad beans, and where it appears cut off the tops and burn them.
9.—Plant out early rows of celery.
10.—Finish earthing up potatoes. Plant vegetable marrows in prepared beds.
11.—Continue to syringe roses for greenfly, and thin out buds if large blooms are desired.
12.—Apply liquid manure to roses after rain or after a heavy watering.
13.—Stake and tie carnations, and also attend to staking of tall-growing subjects in the herbaceous border.
14.—See that newly planted half-hardy annuals do not lack for water, and use the hoe freely to keep down weeds and loosen the surface soil.
15.—Feed asparagus bed with liquid manure or a good dressing of artificial manure to promote strong growth and the production of crowns for next season's crop.
16.—Remove axillary growths from stems of tomatoes, and give generous supplies of moisture in dry weather. As soon as fruit forms, feed with frequent doses of liquid manure.
17.—Roses may now be fed twice a week with liquid manure. An ounce of guano in a gallon of water makes a serviceable preparation.
18. Start the final potting of chrysanthemums in nine-inch or ten-inch pots.

19. Sow pansy seed in a shady place. Such annuals as mignonette, candytuft and sweet alyssum if sown now will bloom in the early autumn.

20. Where the leaves of rose-trees are attacked by mildew apply dustings of flowers of sulphur.

21. Take cuttings of pansies, pinks and hollyhocks, place in cold frame and keep shaded.

22. Plant out main crop of Brussels sprouts. Tie up Cos lettuce and keep carrots and turnips well thinned out, and thoroughly weeded.

23. Plant out vegetable marrows on well-manured mound of soil.

24. Give dahlias liquid manure at frequent intervals and attend carefully to tying.

25. Summer prune gooseberries and currants.

26. Begin layering of strawberries as soon as picking is finished. Pinch out all runners not required for propagating purposes.

27. Stake dwarf kidney beans, and see that the strings and stakes are properly fixed for runner beans which will now be growing rapidly.

28. To ensure an early supply of peas, pinch out the tops of stems and the pods will swell out rapidly.

29. Thin out grapes when they have attained the size of small peas.

30. Keep hydrangeas in flower in the greenhouse moist and apply frequent doses of liquid manure to ensure long flowering and large heads of bloom.

JULY

1. Thin out buds of carnations, and give top-dressing of rich loamy soil.

2. Continue to take cuttings of pinks if a large stock is required. Keep under hand-light or in a cold frame till well rooted.

3. Thin out beet and hoe frequently between the rows. Plant out borecole and kale.

4. Turn roses that have done flowering in the greenhouse into cold frames, placing them on a bed of ashes, and repotting them after the wood is ripened.
5. Protect dahlias and delphiniums against slugs by placing a ring of soot round the base of the stems.
7. Transplant seedling wallflowers six inches apart each way and make quite firm to promote sturdy growth.
8. Top-dress Japanese irises with rich soil and keep very moist until they come into flower.
9. Pinch out the points of runner-bean stems as soon as they reach the tops of the sticks. Sow a few more dwarf beans for a late crop.
10. Cuttings of coleus may be taken and grown on in the warmth of the greenhouse.
11. Sow seeds of forget-me-nots for spring flowering. Continue to thin out and transplant perennials and biennials sown early in June.
12. Sow East Lothian stocks for spring blooming.
13. Finish planting out early flowering chrysanthemums. Attend carefully to watering and secure tying of late varieties now in their flowering pots. Syringe twice a day in hot weather.
14. Summer prune wall fruit-trees by thinning out rampant growth.
15. Bud roses in moist weather.
16. Continue layering carnations and take last batch of cuttings of pinks. Insert cuttings of hydrangeas and keep in frame.
17. Give gladioli in borders frequent applications of liquid manure.
18. Carefully and regularly remove all withered blooms of pansies, violas and other bedding plants. This operation will keep the plants growing vigorously and will prolong the flowering period.
19. Propagate roses by inserting cuttings in sandy soil in a shady corner.
20. Prick out seedlings of cinerarias and primulas and keep close till they have started into vigorous growth.
21. Cut off flowering stems of delphiniums when they have ceased blooming, to promote a second crop of flowers.
22. Bend over the tops of spring onions near to the neck of the bulbs, so as to hasten their development.
23. After flowering, lift and transplant bulbs of lilium candidum.
24. Sow cabbage seed for spring, also spinach, turnips and lettuce.
25.—Insert cuttings of show and fancy pelargoniums in sandy soil.
26.—Trim box edgings, and clip yew, laurel and other hedges.
27.—Thin raspberry canes after the fruit is gathered.
28.—Take cuttings of geraniums in flower beds and insert them in pots, boxes or in the open ground.
29.—Clear off withered annuals, and in the places they have occupied plant seedling Canterbury bells, campanulas and sweet-Williams.
30.—Remove the seed-pods of nasturtiums and canary creeper to promote continuous flowering.
31.—Earth up celery in order to blanch the stems. The more sandy the soil used for this purpose the better. Look out for celery fly and pinch out all leaves affected by it.

AUGUST

1.—Sow cabbage seed for earliest cuttings next season.
2.—Repot cyclamens that have been resting in a cold frame. Pot Gladiolus Colvillei for early flowering under glass.
3.—Watch for suckers coming up from the bases of rose-trees and cut them off below the surface of the soil.
4.—Give frequent supplies of weak soot-water to chrysanthemums in pots.
5.—Roll lawns regularly in moist weather. Sow grass seed over bare patches and keep edgings neatly trimmed.
6.—Plant out well-rooted strawberry runners.
7.—Plant bulbs of winter aconite. Make a first potting of Roman hyacinths and freesias.
8.—Divide and replant campanulas. Plant pyrethrums.
9.—Sow seed of mignonette for winter and spring blooming under glass.
10.—Give camellias that are forming flower-buds plenty of water and occasional doses of soot-water.
11.—Layer evergreen shrubs and trees; also propagate by cuttings.
12.—Take plenty of cuttings of pansies and violas and insert in sandy soil in cold frame. Keep shaded until well rooted.
13.—Plant out winter greens between rows of potatoes.
14.—Make mushroom beds.
15.—Sow annuals for early flowering in pots, send for bulb catalogues and order supplies early.
16.—Cut down with shears a few well-developed lobelias which will soon break into fresh growth and provide cuttings for propagating in September.
17.—Take cuttings of petunias, heliotropes and more geraniums.
18.—Pull spring onions and lay them out to dry in the sun.
19.—Transfer strawberries layered in pots into larger pots for forcing.
20.—Pot on cinerarias, primulas and calceolarias raised from seed; keep cool and moist.
21.—Take cuttings of pentstemons and insert in boxes or in frame.
22.—Sow seed of schizanthus for early spring flowering.
23.—Pot narcissus—the Paper White variety first for forcing—and plunge in fibre.
24.—Take cuttings of roses, especially rambler varieties, and La France and Gloire de Dijon, and insert four inches apart in trenches with sand or road grit incorporated with the soil.
25.—Pot crocuses for early flowering under glass.
26.—Turn begonias that have flowered under glass out of doors, place pots on bed of ashes in shady place and withhold water. This will enable the bulbs to develop and attain a much larger size than would be possible without this treatment.
27.—Take cuttings of ivy-leaved geraniums. Supply plenty of moisture to violets and pinch off all runners.
28.—Give liberal supplies of liquid manure to celery and continue to earth up rows in dry weather.
29.—Cut back show and fancy pelargoniums that have flowered; keep plants dry, and well syringed until they break into fresh growth.
30.—Thin out superfluous dahlia shoots and attend carefully to tying and staking.
31.—Pot tulips for forcing and plant out fritillarias and Crown Imperials.

SEPTEMBER

1.—Sow seed of violas in boxes and keep in cold frame. Also sow seed of antirrhinums and pentstemons.
2.—Withhold water from lilies that have flowered under glass. Keep dry until foliage dries down and repot in November.
3. If not already done, divide and replant strong roots of primroses, polyanthuses and border auriculas.
4. Lift potatoes as they become ready.
5. Detach rooted carnation layers and either pot or plant in a cold frame.
6. Repot tea roses grown under glass and plunge pots in ashes out of doors so as to ripen wood.
7. Take cuttings of fuchsias for spring flowering in the greenhouse.
8. Thrust spade round arum lilies and salvias planted out of doors, preparatory to removing them a few days later and potting them for greenhouse flowering.
9. Keep runner beans well picked. If seed is allowed to mature further growth and production of beans will be checked.
10. Transfer cuttings of geraniums struck in the open ground to pots or boxes and place in greenhouse or frame that can be kept frost-proof.
11. Make further pottings of bulbs for forcing and plunge in fibre or ashes. They must be kept covered for nine or ten weeks before exposure to the light so as to induce a satisfactory production of roots.
12. Plant out biennial and perennial seedlings that were sown in early summer into their winter or flowering quarters. They can be transplanted again in spring if necessary.
13. Lift violets and plant in frames for winter flowering.
14. Trench and prepare new rose beds for planting in November.
15. Return azaleas and camellias left out of doors for the summer to the shelter of the greenhouse. House chrysanthemums whose buds are showing colour.
16. Make new lawns by sowing grass seed. Carefully protect seed from birds either by the use of netting or strands of cotton drawn diagonally across the sown area.
17. Place cinerarias, primulas and geraniums for winter flowering in their flowering pots and water sparingly for a few days until growth becomes vigorous.
18. Plant out wallflowers, primroses, auriculas and polyanthuses for spring decoration of the beds and borders.
19. Prepare ground for planting hardy fruit trees. Deep trenching is essential.
20.—Plant narcissi, snowdrops, chionodoxas and scillas. Divide and replant bulbs of lilium candidum without delay.
21.—Plant English and Spanish irises in beds.
22.—Rooted cuttings of pinks may be planted in their permanent quarters, preferably as an edging beside a long path.
23.—Keep beds and borders neat and tidy by removing exhausted annuals and cutting down withered perennials.
24.—If frost threatens, give a little heat to the greenhouse, and wash off all shading material on glass outside.
25.—Lift gladioli that have done flowering, tie in bunches and hang up in a shed to dry.
26.—Insert cuttings of marguerites in sandy soil in cold frame, or in pots and boxes in a cool greenhouse.
27.—Plant shrubs for edgings or decoration of beds and borders.
28.—Dress vacant land infested with wireworms with lime and allow it to lie exposed for two or three months. Then dig in during trenching.
29.—Thin out weak shoots of bush roses, trim back old shoots and tie in new shoots of climbing roses.
30.—Plant out double daisies, honesty, forget-me-nots and silene pendula compacta.

OCTOBER

1.—Lift carrots and beet and store in sand for winter use. Take shrubby calceolaria cuttings.
2.—Take cinerarias grown on in frames into the greenhouse, and stand seedling primulas on top shelves near the glass. Continue to give cool treatment.
3.—Lift begonias, dahlias and cannas from beds and borders in the open.
4.—Clear ground of late potatoes.
5.—Freesias in pots may be transferred to greenhouse where without forcing they will supply early bloom.
6.—All late flowering chrysanthemums should now be under glass. They will require plenty of air on suitable days.
7.—Plant out border carnations in soil with which some old mortar has been incorporated.
8.—Renovate defective lawns by laying turf.
9. Bulbs for indoor cultivation either in glasses or bowls of prepared fibre should now be got ready.

10. Withhold water from tuberous begonias, dry off and store in boxes in frost-proof situation for the winter.

11. Lift bedding plants that it is desired to preserve, place in pots and boxes, and store in frost-proof frame or greenhouse.

12. Plant spring cabbages in shallow drills.

13. Sweep up leaves and store for making leaf mould.

14. Dig vacant ground in dry weather and leave surface in ridges.

15. Plant more bulbs, especially tulips and hyacinths.

16. Thin out wood of climbers on greenhouse roofs, walls and pillars.

17. Place potted fuchsias and heliotropes under greenhouse staging, away from drip, in moderate temperature. Here they will be safe for the winter.

18. Dig and manure ground intended for sweet peas next season. Leave surface rough.

19. Cut down withering asparagus growth and clean up beds by removal of weeds.

20. Dig holes preparatory to planting fruit trees.


22. Order rose trees and fruit trees.

23. Repot lilies dried off in frames and keep them in a cool structure for the winter.

24. Pot up retarded lily of the valley crowns for forcing.

25. Divide and plant out montbretias in open borders.

26. Rearrange and replant old herbaceous borders.

27. Lift a root or two of mint, place in a box of soil and grow on in greenhouse for a winter supply.

28. Plant hardy creepers and ivy.

29. Root-prune fruit trees that bear much foliage and little fruit.

30. Pot tuberoses and place in warm greenhouse.

31. Finish mowing for the season and top-dress lawn with fine soil and decayed manure.

**November**

1. Plant horseradish. Make asparagus beds for planting in spring.
2. Draw out plan for next year's cropping in the vegetable plot. Continue to dig and trench.
3. Start planting fruit trees.
4. Earth up celery for the last time. Plant new vines and lift and replant unhealthy specimens.

Diagram 90.—A SIMPLE METHOD OF KEEPING FROST OUT OF A COLD FRAME.

5. Plant paeonies in deeply trenched and well-manured ground. Also plant ranunculus.
6. Lift and store late dahlias, also tubers of Tropæolum Tuberosum. Store in dry frost-proof shed or attic.
7. Plant roses, but only when ground is fairly dry. If soil is too wet heel in the newly arrived trees and await a favourable opportunity for planting.
8. Heel over broccoli with their heads to the north.
9. Pot another batch of bulbs for late blooming in the greenhouse.
10. Make a plantation of raspberries.
11. Keep greenhouse, furnished with chrysanthemums, nicely warm in wet and foggy weather. Give plenty of air on suitable days.
12. Place mushroom spawn in prepared beds.
13. Pot spiraea japonica for forcing.
14. Top-dress borders containing hardy perennials with decayed manure. This can be forked in during early spring.
15. Make and repair paths.
16. Plant gooseberries and red and white currants.
17. Plant hardy fruit trees and start pruning established trees.
18. Make rockery where there is room. Plant bulbs, but defer general planting till early spring.
19. Give shrubby calceolaria cuttings plenty of air so as to maintain a sturdy growth.
20. Plan and form new flower beds. Fill with bulbs and early spring-flowering subjects. If the weather is open, it is not too late to plant wallflowers.
21. Give newly planted fruit trees a mulching with decayed manure, spreading it out well so as to cover the whole area of the roots.
22. Plant rhododendrons in soil that does not contain lime.
23. Take and plant cuttings of gooseberries and currants.
24. Give arum lilies a temperature of at least $55^\circ$, otherwise they will not bloom.
25. Collect all garden rubbish and burn in a bonfire. Save ashes in boxes for use as a fertiliser in spring.
26. Plant hardy shrubs, such as aucuba, box, euonymus, laurel, yew, privet and lilac.
27. Prune wall and pyramid fruit-trees.
28. Cut down chrysanthemums that have bloomed and keep the soil in the pots moist so as to induce a good production of shoots for cuttings.
29. Continue to trench vacant ground.
30. Take out a few pots of Roman hyacinths from the cover of fibre or ashes and gradually inure them to the light before introducing them to the warm greenhouse for flowering.
December

1. Make further improvements in the garden. Construct paths, make new beds, build a shed, erect trellis-work, arches and pergolas.

2. Prepare soil for chrysanthemum cuttings. It should be fine and sandy. Wash pots and pans, and thoroughly clean boxes that are to receive cuttings.

3. Sweep the surface of the lawn to break down and distribute wormcasts. Roll at intervals when ground is fairly soft.

4. Lift rhubarb roots and place them in deep boxes filled with rich soil, under greenhouse staging. Exclude light and keep moist.

5. Bring hyacinths in glasses that have started to form shoots into the light.

6. Sow blue lobelia seed for next summer's bedding.

7. Take chrysanthemum cuttings as they are ready.

8. Thin out crowded buds on camellias. Give plenty of air to cinerarias and primulas. Vaporise for greenfly as required.


10. Lay in a good stock of labels in readiness for the coming seed-sowing season. Paint one side white and write names ready for use.

11. Continue to plant roses and fruit trees in mild weather.


13. Place seakale roots in large pots and boxes for forcing. Treat as for rhubarb.

14. In frosty weather, when the ground is hard, wheel manure to places where it is required, and distribute over vacant plots.

15. Give slightly increased heat to arum lilies forming spathes. Apply liquid manure in frequent doses.

16. Give ferns a period of rest and withhold water for a time.

17. Look over stakes required for next year's use. Reject all rotted sticks and carefully sort out and tie into convenient sizes.

18. Purchase Indian azaleas, pot in peaty soil and introduce into greenhouse for early blooming.

19. Plant briars for budding roses next season.

20. Cover beds of bulbs with a mulching of fibre refuse. This protects the bulbs and gives the beds a tidy appearance during the dull days of winter.

21. Fork up gravel walks and put down new gravel where required.
SATURDAY IN MY GARDEN

22.—Take further cuttings of chrysanthemums. Keep cuttings close until they have recovered and are rooting well.

23.—Plant German irises out of doors.

24.—Prune pot roses and remove from frames to warm house for early blooms.

25.—Expose more bulbs in pots to the light and arrange hyacinths, freesias, lilies of the valley, etc., in bloom on greenhouse shelves.

26.—Ventilate cold frames freely on warm days. Look over violets, remove decayed leaves, and gently stir soil between the plants.

27.—Sow begonia and gloxinia seed in heat.

28.—Propagate vines by "eyes" or cuttings.

29.—Trench and break up soil not already prepared for vegetables.

30.—Finish pruning fruit trees. Look over climbing roses and cut out all dead wood.

31.—Sow first batch of tomato seed for an early crop.
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